
SKC
2020-2021
SCIENCE. SERVING PEOPLE.
SKC
THE ESSENTIAL SOURCE FOR SAMPLING INSTRUMENTS AND MEDIA

PRODUCTS. EXPERTISE. SCIENCE.

Serving People WORLDWIDE.

Your critical mission requires best-in-class tools to protect workers from exposures. SKC is your partner for quality sampling solutions that make your job easy.

We are committed to:

- Supporting our customers with 200+ combined years of experience
- Sharing our expertise through training and online resources
- Ensuring easy access to our products online and in 60+ languages
- Delivering quality occupational safety and industrial hygiene equipment and media
- Providing technical support from our team of scientists

Our Science. Committed to Serving You.

FASTFIND

NEW FROM SKC

FOR THE INDUSTRIAL HYGIENIST AND SAFETY PROFESSIONAL

AirChek Essential

We are proud to introduce AirChek Essential with key features from the SKC AirChek TOUCH pump and a lower price.

See pages 10-11

AirChek Connect

Love the SKC AirChek TOUCH and Pocket Pump TOUCH? The AirChek Connect combines the popular Pocket Pump TOUCH screen navigation and Bluetooth® connectivity with the flow range and brawn of the AirChek TOUCH.

See pages 14-15

SKC SmartWave App

Monitor and control SKC Pocket Pump TOUCH and the new AirChek Connect with SmartWave for IOS or Android tablets/phones and Bluetooth low-energy connectivity.

See page 17

High-flow chek-mate Calibrator

The chek-mate accuracy and ease of use are now available in a high flow calibrator that measures 5 to 30 L/min with a certified volumetric accuracy of 1% of reading.

See pages 40-41

Introducing SKC Noise

Yes, SKC does noise! We are pleased to introduce the SKC Noise line including: SKC NoiseCHEK personal dosimeter, SoundCHEK Essential and SoundCHEK Connect sound level meters, AcoustiCHEK calibrator, and SKC CHEKBox cloud-based storage.

See pages 146-153

CLI by SKC

SKC announces the acquisition of Colormetric Laboratories (CLI), further expanding our surface and dermal sampling offerings to include amines, isocyanates, acids/bases, and phenols. SKC also provides skin and surface decontamination solutions — a complete line of products for dermal exposure reduction programs.

See pages 166-169

SCIENCE. **SERVING PEOPLE.**

SKC Expanding Sampling Solutions and Expertise

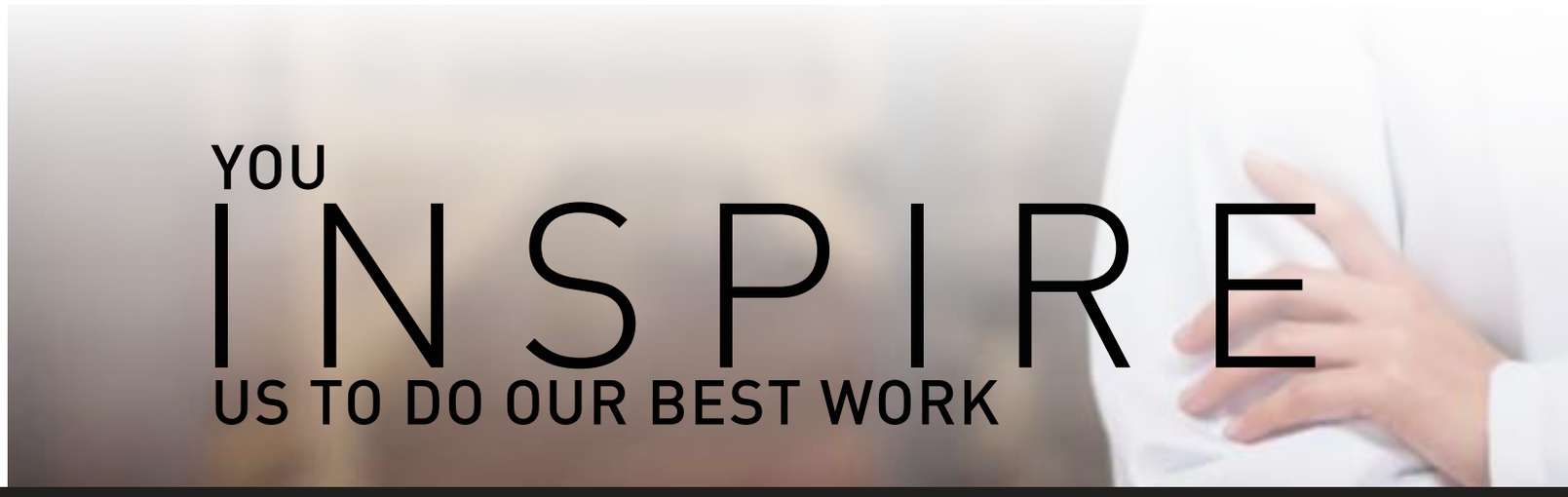
for the Safety and Health of the Workers You Protect

SKC NOISE

WHERE TO LOOK

CLi technology by SKC

WHERE TO LOOK



YOU INSPIRE US TO DO OUR BEST WORK

Your important mission of protecting the health and safety of workers is the reason we work so hard to apply our science and provide you with best-in-class tools.

SAMPLING SOLUTIONS

AIR

NOISE

SURFACE/ DERMAL

CUSTOMER SUPPORT WORLDWIDE

200+
combined years

Technical Support from our team of scientists

Our Science. Serving You.

See the **SKC** story
skcinc.com

EXPERTISE

SKC Science Serving People through Training and Resources

Expertise is the foundation and heart of our solutions

SKC is dedicated to sharing its expertise to serve industrial hygiene, safety, and environmental professionals. Our goal is to help you protect the health and safety of people at work and in their communities.

- **Webinars and Presentations**
- **Videos**
- **Publications**
- **Sampling Guides**
- **Validation Reports**

Look for the Expertise Fast Find to alert you to online training and resources available at **skcinc.com/Training.**

V Video | P PowerPoint | W Webinar | S Sampling Solution

Visit skcinc.com/Training

SKC Air Sample Pumps

Professionals have always relied on SKC pumps for ruggedness and reliable performance. That same durability and reliability continues in our latest models that also feature ergonomic design, touch screen operation, PC compatibility, and Bluetooth connectivity. Built with the quality upon which you have always relied and backed by the expertise, service, and support you deserve — SKC air sample pumps are the clear choice of professionals. SCIENCE. SERVING PEOPLE.

SKC Sample Pump Selection Guide

Choose the Features You Need, Get the Quality You Expect

Choose by Flow Range	20 to 500 ml/min	5 to 3000 ml/min			5 to 5000 ml/min			5 to 15 L/min
Choose by Compensation Range	Up to 20 inches water BP at 500 ml/min	Up to 30 inches water BP at 2 L/min	Up to 25 inches water BP at 2 L/min	Up to 20 inches water BP at 2 L/min	Up to 40 inches water BP at 2 L/min	Up to 50 inches water BP at 2 L/min	Up to 50 inches water BP at 2 L/min	Up to 12 inches water BP at 10 L/min
Choose by Feature								
Programmable/ PC Compatible	Keypad/PC	Keypad/PC	No	No	Keypad (PCXR8)	Keypad	Keypad/PC*	Keypad/PC
Listed for Intrinsic Safety	UL/ATEX§ IECEx	Ex	UL/ATEX§	No	UL/ATEX§	UL	UL/ATEX§	No
Compensates for Changes in Atmospheric Pressure	Yes	Yes	No	No	No	No	Yes	Yes
Compensates for Changes in Temperature	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Battery Type	Li-Ion	NiMH	NiMH	Alkaline	NiMH	Li-Ion	Li-Ion	Li-Ion
Approximate Run Time	20+ hours at 500 ml/min	12+ hours at 2 L/min	12+ hours at 2 L/min	10+ hours at 2 L/min	12+ hours at 4 L/min	20 hours at 2 L/min	40+ hours at 2 L/min***	24+ hours at 10 L/min

§ *Specific models*
* *Not applicable to AirChek Essential*
*** *20+ hours at 2 L/min for AirChek TOUCH*

Pocket Pump TOUCH
Pages 18-19

AirChek 3000
Pages 28-29

AirChek 52/ Sidekick
Pages 24-25

AirLite
Pages 26-27

Universal XR
Pages 22-23

AirChek XR5000
Pages 20-21

AirChek Essential
AirChek Connect
AirChek TOUCH
Pages 10-15

Leland Legacy
Pages 30-31

Air Sampling Pump Kits from SKC Inc.

With Accessories for U.S. Methods

Don't Forget . . .

SKC Air Sampling Kits provide the pumps and accessories you need for your applications. Order the following items separately:

☑ **A calibration device** – Select a calibration device based on the accuracy requirements of your application. *See pages 40-43.*

☑ **Sample Media** – Base your choice of sampling media on the application and the method used. Consult the SKC Air Sampling Guides for information on recommended sampling media for specific compounds. *See sampling media beginning on page 48 and Air Sampling Guides starting on page 174.*

SKC Inc. carefully designs its air sampling pump kits to meet the unique sampling requirements of individual regions. When selecting a pump kit, consider the configuration that will best fit your application. Most of the SKC Inc. pumps are available in Starter Kits with pump, tubing, and charger; single kits (one of each kit component); and 5-pack kits (5 of each kit component except the charger and the case). Kits do **not** include sample media or a calibrator (unless otherwise noted). Kit content can vary depending on the pump model.

Starter Kits

- Pump
- Battery charger or cradle
- Power supply
- Tubing
- Collar clip with cable tie

High Flow Sampling Kits

- Pump
- Battery charger or cradle
- Power supply
- Filter cassette holder
- Tubing
- Screwdriver set
- Soft-sided nylon carry case (single) or Pelican case (5 pack)

Low and High Flow Sampling Kits

- Pump
- Battery charger or cradle
- Power supply
- Filter cassette holder
- Tubing
- All-in-One adjustable tube holder
- Type A tube cover
- Screwdriver set
- Soft-sided nylon carry case (single) or Pelican case (5 pack)

Low Flow Sampling Kits

- Pump
- Battery charger or cradle
- Power supply
- Type A tube holder
- Tubing
- Soft-sided nylon carry case (single) or Pelican case (5 pack)

See specific pump pages for ordering information.

Air Sampling Pump Kits from SKC Ltd.

With Accessories for Euro Methods

SKC Ltd. air sampling pump kits are designed to suit your applications without a lot of extra purchases. One durable carry case houses the equipment you need for gas/vapour sampling, dust/particulate sampling, or both. A basic kit is available to which you may add equipment for specific applications. Kits are available in single and 5-pack configurations. Kits do **not** include a calibrator or sample media. Contents of kits may vary with pump model.

Basic Air Sampling Kits

- Pump
- Battery charger or cradle
- Power supply
- Tubing
- Screwdriver set
- Step by Step Guide
- Durable carry case

Gas/Vapour Sampling Kits

- Pump
- Battery charger or cradle
- Power supply
- Tubing
- Tube breaker
- All-in-One adjustable tube holder*
- Type A protective tube cover
- Screwdriver set
- Step by Step Guide
- Durable carry case

Dust/Particulate Sampling Kits

- Pump
- Battery charger or cradle
- Power supply
- Tubing
- IOM Sampler (plastic)
- IOM Cassettes (4, plastic)
- Calidaptor
- MultiDust Foam Discs (10)
- Screwdriver set
- Step by Step Guide
- Durable carry case

Combined Dust and Vapour Sampling System

- Pump
- Battery charger or cradle
- Power supply
- Tubing
- Tube breaker
- All-in-One adjustable tube holder
- Type A protective tube cover
- Calidaptor
- IOM Sampler (plastic)
- IOM Cassettes (4, plastic)
- MultiDust Foam Discs (10)
- Screwdriver set
- Step by Step Guide
- Large, durable carry case

* *Not included in Pocket Pump TOUCH Kits*

See specific pump pages for ordering information.

AirChek ESSENTIAL

Low-price, Simple Operation Touch Keypad Sample Pump

New!

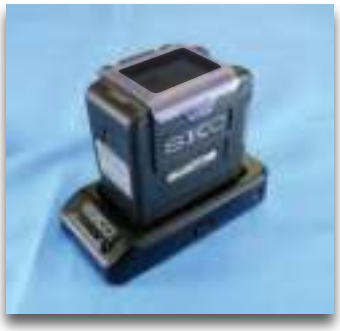
- **No manual needed!**
- **Flows from 5 to 5000 ml/min**
  - 5 to 500 ml/min with low flow holder, *see page 38*
  - Multi-tube sampling in low flow mode, *see page 39*
- **High back pressure compensation**
  - Up to 50 inches water at 2 L/min
- **Li-Ion battery**
  - Over 40-hour run times
- **Corrects flow for changes in temperature and atmospheric pressure**
- **Bright running and status LEDs**
- **Tough no-slip case**
- **Ultra-quiet**
  - Average 51.7 dB at 3 feet*
- **Small and lightweight**
  - 4.1 x 3.7 x 2.8 inches (10.4 x 9.4 x 7.1 cm)
  - 19.4 ounces (550 grams)
- **Screen protection and security**
  - Protective cover
  - Screen lock-out feature

** With 37-mm, 0.8-µm MCE filter on pump running at 2 L/min*

Intuitive touch screen operation

Certifications

CE 0539 intrinsically safe IECEx



Standard Charging Cradle – universal to AirChek Essential, TOUCH, and Connect pumps

Use one power source — chain up to 5 cradles

Flow fault with auto-restart

Elapsed time on large display

ORDERING

Description	SKC Inc. Cat. No.	SKC Ltd. Cat. No.
AirChek Essential Pump only* with Li-Ion battery pack and screwdriver set, *requires Standard Charging Cradle and power supply; see kits or accessories below*	**220-3000**	**220-3000**

AirChek Essential Pump Kits*		Cat. No.	Cat. No.
Starter Kit includes pump as described above, Standard Charging Cradle, power supply with cord, 3 feet (0.9 meter) of Tygon tubing, and collar clip with cable tie	**100-240 V**	**220-3000-S**	
Single Pump Basic Kit includes pump, single cradle and power supply (220-800 and 220-600), 1 meter (39 inches) of Tygon tubing, and 1 Step by Step Guide, in a durable carry case			**220-3000K**
Single High Flow Pump Kit includes pump as described above, Standard Charging Cradle, power supply with cord, and filter cassette holder, in a soft-sided nylon carry case	**100-240 V**	**220-3000-K**	
Single Pump Kit-Dust/Particulate includes pump as described above, single cradle and power supply (220-800 and 220-600), calidaptor, 1 meter (39 inches) of Tygon tubing, plastic IOM MultiDust Sampler, 4 extra MultiDust cassettes, 1 pack of 10 MultiDust foam discs, and 1 Step by Step Guide, in a durable carry case			**220-3000KP**
Single High/Low Flow Pump Kit includes pump as described above, Standard Charging Cradle, power supply with cord, filter cassette holder, All-in-One adjustable tube holder, and Type A protective tube cover, in a soft-sided nylon carry case	**100-240 V**	**220-3000-KD**	
Single Pump Kit-Dust and Vapour includes pump as described above, single cradle and power supply (220-800 and 220-600), 1 meter (39 inches) of Tygon tubing, All-in-One adjustable tube holder, tube breaker, Type A protective tube cover, calidaptor, 1 meter (39 inches) of Tygon tubing, plastic IOM MultiDust Sampler, 4 extra MultiDust cassettes, 1 pack of 10 MultiDust foam discs, and 1 Step by Step Guide, in a durable carry case			**220-3000KC**
3-pack High/Low Flow Pump Kit includes 3 pumps as described above and 3 each: Standard Charging Cradles and power supply with cord, filter cassette holders, All-in-One adjustable tube holders, and Type A protective tube covers, in a Pelican case	**100-240 V**	**220-3000-K3D**	
5-pack High Flow Pump Kit includes 5 pumps as described above and 5 each: Standard Charging Cradles and power supply with cord, and filter cassette holders, in a Pelican case	**100-240 V**	**220-3000-K5**	
5-pack Pump Kit-Dust/Particulate includes 5 each: pumps as described above, charging cradles and 1 multi-cradle power supply (220-800 and 220-700), plastic IOM MultiDust Samplers, 1-meter (39-inch) lengths of Tygon tubing; 10 extra MultiDust cassettes; 1 pack of 10 MultiDust foam discs, 1 calidaptor, and 3 Step by Step Guides, in a durable carry case			**220-3000K5P**
5-pack High/Low Flow Pump Kit includes 5 pumps as described above and 5 each: Standard Charging Cradles and power supply with cord, filter cassette holders, All-in-One adjustable tube holders, and Type A protective tube covers, in a Pelican case	**100-240 V**	**220-3000-K5D**	
5-pack Pump Kit-Dust and Vapour includes 5-each: pumps as described above, charging cradles and 1 multi-cradle power supply (220-800 and 220-700), 1-meter (39-inch) lengths of Tygon tubing, All-in-One adjustable tube holders, Type A protective tube covers, plastic IOM MultiDust Samplers; 10 extra MultiDust Cassettes; 1 pack of 10 MultiDust foam discs, 1 tube breaker, 1 calidaptor; and 3 Step by Step Guides, in a durable carry case			**220-3000K5C**

Accessories		Cat. No.
Standard Charging Cradle, for AirChek Essential, TOUCH, and Connect pumps, *requires power supply, see below*		**220-800**
Single Cradle Power Supply	**100-240 V**	**220-600**
Multi Cradle Power Supply for use with 2-5 charging cradles	**100-240 V**	**220-700**
Low Flow (5 to 500 ml/min) Kit includes All-in-One adjustable tube holder and Type A tube cover		**210-500**
chek-mate Calibrator, 0.5 to 5 L/min, includes a 9-volt alkaline battery, *see details on pages 40-41* with NIST-traceable calibration certificate with UKAS-traceable calibration certificate		 **375-0550N** **375-0550**
Replacement Battery Pack,* Li-Ion		**P75718**
Protective Pouch, nylon, with adjustable waist belt and shoulder strap, black		**224-911**

* *AirChek Essential pumps contain Li-Ion batteries and are subject to special shipping regulations.*

AirChek Essential requires ¼-inch ID tubing; see page 47

Air Sample Pumps

5 to 5000 ml/min

AirChek TOUCH

Fully Programmable Color Touch Screen Pump

- **Flows from 5 to 5000 ml/min**
  - 5 to 500 ml/min with low flow holder, *see page 38*
  - Multi-tube sampling in low flow mode, *see page 39*
- **High back pressure compensation**
  - Up to 50 inches water at 2 L/min
- **Patented CalChek® feature for hands-free calibration with chek-mate Calibrator,** *see page 41 for details*
- **Li-Ion battery**
  - Over 20-hour run times
- **DataTrac Pro PC Software for easy pump programming and advanced reporting,** *see page 16*
- **Corrects flow for changes in temperature and atmospheric pressure**
- **Flow fault with auto-restart**
- **Continuous, timed, and intermittent sampling**
- **Bright running and status LEDs**
- **Rugged no-slip case**
- **Ultra-quiet – Average 51.7 dB at 3 feet***
- **Small and lightweight**
  - 4.1 x 3.7 x 2.8 inches (10.4 x 9.4 x 7.1 cm)
  - 19.4 ounces (550 grams)
- **Screen protection and security**
  - Protective cover
  - Screen lock-out feature

** With 37-mm, 0.8-µm MCE filter on pump running at 2 L/min*

Certifications

CE

intrinsically safe

Standard Cradle

Charging and CalChek Calibration

e-Cradle

Charging, CalChek calibration, and PC communication

Use one power source

Chain up to 5 cradles

V Video | P PowerPoint | W Webinar | S Sampling Solution

Visit skcinc.com/Training

ORDERING

Description	SKC Inc. Cat. No.	SKC Ltd. Cat. No.
AirChek® TOUCH Pump only* with Li-Ion battery pack and screwdriver set, *requires charging cradle and power supply; see kits or accessories below*	220-5000TC	220-5000TC

AirChek TOUCH Pump Kits*	SKC Inc. Cat. No.	SKC Ltd. Cat. No.
Starter Kit includes pump as described above, Standard Charging Cradle, power supply with cord, 3 feet (0.9 meter) of Tygon tubing, and collar clip with cable tie **100-240 V**	220-5000TC-S	220-5000TCK
Single High Flow Pump Kit includes pump as described above, Standard Charging Cradle, power supply with cord, and filter cassette holder, in a soft-sided nylon carry case **100-240 V**	220-5000TC-K	
Single Combined Kit includes pump as described above, Standard Charging Cradle, power supply with cord, plastic IOM MultiDust Sampler, 4 MultiDust cassettes, 10 MultiDust foam discs, All-in-One adjustable tube holder, Type A protective tube cover, tube breaker, calidaptor, and 1 meter (39 inches) of Tygon tubing, in a durable carry case		220-5000TCKC
Single Dust Kit includes pump as described above, Standard Charging Cradle, power supply with cord, plastic IOM MultiDust sampler, 4 MultiDust cassettes, 10 MultiDust foam discs, calidaptor, and 1 meter (39 inches) of Tygon tubing, in a durable carry case		220-5000TCKP
Single Vapour Kit includes pumps as described above, Standard Charging Cradle, power supply with cord, All-in-One adjustable tube holder, Type A protective tube cover, tube breaker, and 1 meter (39 inches) of Tygon tubing, in a durable carry case		220-5000TCKV
Single High/Low Flow Pump Kit includes pump as described above, Standard Charging Cradle, power supply with cord, filter cassette holder, All-in-One adjustable tube holder, and Type A protective tube cover, in a soft-sided nylon carry case **100-240 V**	220-5000TC-KD	
Single High/Low Flow Enhanced Pump Kit includes pump as described above, e-Cradle, power supply with cord, USB cable for use with free DataTrac Pro software download, filter cassette holder, All-in-One adjustable tube holder, and Type A protective tube cover, in a soft-sided nylon carry case **100-240 V**	220-5000TC-KDE	
3-pack High/Low Flow Pump Kit includes 3 pumps as described above, 2 Standard Charging Cradles, 1 e-Cradle, power supply with cord, and USB cable, for use with free DataTrac Pro software download, 3 each: filter cassette holders, All-in-One adjustable tube holders, and Type A protective tube covers, in a Pelican case **100-240 V**	220-5000TC-K3D	
5-Pump Combined Kit includes 5 pumps as described above, 4 Standard Charging Cradles, 1 Charging e-Cradle, power supply with cord and USB cable, 5 plastic IOM MultiDust samplers, 10 MultiDust cassettes, 10 MultiDust foam discs, 5 All-in-One adjustable tube holders, 5 Type A protective tube covers, tube breaker, calidaptor, and 5 one-meter (39-inch) lengths of Tygon tubing, in a durable carry case		220-5000TCK5C
5-Pump Dust Kit includes 5 pumps as described above, 4 Standard Charging Cradles, 1 Charging e-Cradle, power supply with cord and USB cable, 5 plastic IOM MultiDust samplers, 10 MultiDust cassettes, 10 MultiDust foam discs, calidaptor, and 5 one-meter (39-inch) lengths of Tygon tubing, in a durable carry case		220-5000TCK5P
5-Pump Vapour Kit includes 5 pumps as described above, 4 Standard Charging Cradles, 1 Charging e-Cradle, power supply with cord and USB cable, 5 All-in-One adjustable tube holders, 5 Type A protective tube covers, tube breaker, and 5 one-meter (39-inch) lengths of Tygon tubing, in a durable carry case		220-5000TCK5V
5-pack High Flow Pump Kit includes 5 pumps as described above, 4 Standard Charging Cradles, 1 e-Cradle, power supply with cord, USB cable, and 5 filter cassette holders, in a Pelican case **100-240 V**		220-5000TCK5
5-pack High Flow Pump Kit includes 5 pumps as described above, 4 Standard Charging Cradles, 1 e-Cradle, power supply with cord, USB cable, for use with free DataTrac Pro software download, and 5 filter cassette holders, in a Pelican case **100-240 V**	220-5000TC-K5	
5-pack High/Low Flow Pump Kit includes 5 pumps as described above, 4 Standard Charging Cradles, 1 e-Cradle, power supply with cord, and USB cable, for use with free DataTrac Pro software download, 5 each: filter cassette holders, All-in-One adjustable tube holders, and Type A protective tube covers, in a Pelican case **100-240 V**	220-5000TC-K5D	

Accessories	Cat. No.
Standard Charging Cradle, *requires power supply, see below*	220-800
Enhanced Charging Cradle (e-Cradle) includes USB cable, for use with DataTrac Pro software, *requires power supply, see below*	220-900
Single Cradle Power Supply, for use with one charging cradle **100-240 V**	220-600
Multi Cradle Power Supply, for use with 2 to 5 charging cradles **100-240 V**	220-700
DataTrac Pro for AirChek TOUCH Hardware Accessory Kit, *see page 16*	877-93
CalChek Cable, *required for automatic calibration with medium flow chek-mate, see details and calibrator on pages 40-41s*	375-200
Low Flow (5 to 500 ml/min) Kit includes All-in-One adjustable tube holder and Type A tube cover	210-500
Replacement Battery Pack,* Li-Ion	P75718
Protective Pouch, nylon, with adjustable waist belt and shoulder strap, black	224-911

* *AirChek TOUCH pumps contain Li-Ion batteries and are subject to special shipping regulations.*

AirChek TOUCH requires 1/4-inch ID tubing; see page 47.

Air Sample Pumps

5 to 5000 ml/min

AirChek CONNECT

Bluetooth-connected Touch Screen Sample Pump

New!

- **Flows from 5 to 5000 ml/min**
  - 5 to 500 ml/min with low flow holder, *see page 38*
  - Multi-tube sampling in low flow mode, *see page 39*
- **High back pressure compensation**
  - Up to 50 inches water at 2 L/min
- **Li-Ion battery**
  - Over 40-hour run times
- **Bluetooth low-energy connectivity for in-range pump operation/monitoring from:**
  - IOS and Android phones and tablets with free SKC SmartWave app; *see page 17*
  - Your PC with DataTrac Pro software; *see page 17*
- **Corrects flow for changes in temperature and atmospheric pressure**
- **Flow fault with auto-restart**
- **Continuously displays parameters on a large display**
- **Bright running and status LEDs**
- **Rugged no-slip case**
- **Ultra-quiet — average 51.7 dB at 3 feet***
- **Small and lightweight**
  - 4.1 x 3.7 x 2.8 inches (10.4 x 9.4 x 7.1 cm)
  - 19.4 ounces (550 grams)
- **Screen protection and security**
  - Protective cover
  - Screen lock-out feature

** With 37-mm, 0.8-µm MCE filter on pump running at 2 L/min*

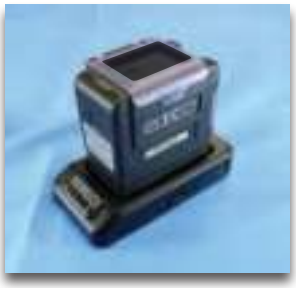
Eight-area touch screen for intuitive operation

Certifications

CE 0539 intrinsically safe IECEx

Connect with PC and DataTrac Pro Software – see page 17

Monitor one or more in-range pumps from phone or tablet – see page 17



Standard Charging Cradle – universal to AirChek Connect, TOUCH, and Essential pumps

ORDERING

Description	SKC Inc. Cat. No.	SKC Ltd. Cat. No.
AirChek Connect Pump only* with Li-Ion battery pack and screwdriver set, *requires Standard Charging Cradle and power supply; see kits or accessories below*	220-4000	220-4000

AirChek Connect Pump Kits*	SKC Inc. Cat. No.	SKC Ltd. Cat. No.
Starter Kit includes pump as described above, Standard Charging Cradle, power supply with cord, 3 feet (0.9 meter) of Tygon tubing, and collar clip with cable tie **100-240 V**	220-4000-S	
Single Pump Basic Kit includes pump, single cradle and power supply (220-800 and 220-900), 1 meter (39 inches) of Tygon tubing, and 1 Step by Step Guide, in a durable carry case		220-4000K
Single High Flow Pump Kit includes pump as described above, Standard Charging Cradle, power supply with cord, and filter cassette holder, in a soft-sided nylon carry case **100-240 V**	220-4000-K	
Single Pump Kit-Dust/Particulate includes pump as described above, single cradle and power supply (220-800 and 220-900), calidaptor, 1 meter (39 inches) of Tygon tubing, plastic IOM MultiDust Sampler, 4 extra MultiDust cassettes, 1 pack of 10 MultiDust foam discs, and 1 Step by Step Guide, in a durable carry case		220-4000KP
Single High/Low Flow Pump Kit includes pump as described above, Standard Charging Cradle, power supply with cord, filter cassette holder, All-in-One adjustable tube holder, and Type A protective tube cover, in a soft-sided nylon carry case **100-240 V**	220-4000-KD	
Single Pump Kit-Dust and Vapour includes pump as described above, single cradle and power supply (220-800 and 220-900), 1 meter (39 inches) of Tygon tubing, All-in-One adjustable tube holder, tube breaker, Type A protective tube cover, calidaptor, 1 meter (39 inches) of Tygon tubing, plastic IOM MultiDust Sampler, 4 extra MultiDust cassettes, 1 pack of 10 MultiDust foam discs, and 1 Step by Step Guide, in a durable carry case		220-4000KC
3-pack High/Low Flow Pump Kit includes 3 pumps as described above and 3 each: Standard Charging Cradles and power supply with cord, filter cassette holders, All-in-One adjustable tube holders, and Type A protective tube covers, in a Pelican case **100-240 V**	220-4000-K3D	
5-pack High Flow Pump Kit includes 5 pumps as described above and 5 each: Standard Charging Cradles and power supply with cord, and filter cassette holders, in a Pelican case **100-240 V**	220-4000-K5	
5-pack Pump Kit-Dust/Particulate includes 5 each: pumps as described above, charging cradles and 1 multi-cradle power supply (220-800 and 220-700), plastic IOM MultiDust Samplers, 1-meter (39-inch) lengths of Tygon tubing; 10 extra MultiDust cassettes; 1 pack of 10 MultiDust foam discs, 1 calidaptor, and 3 Step by Step Guides, in a durable carry case		220-4000K5P
5-pack High/Low Flow Pump Kit includes 5 pumps as described above and 5 each: Standard Charging Cradles and power supply with cord, filter cassette holders, All-in-One adjustable tube holders, and Type A protective tube covers, in a Pelican case **100-240 V**	220-4000-K5D	
5-pack Pump Kit-Dust and Vapour includes 5-each: pumps as described above, charging cradles and 1 multi-cradle power supply (220-800 and 220-700), 1-meter (39-inch) lengths of Tygon tubing, All-in-One adjustable tube holders, Type A protective tube covers, plastic IOM MultiDust Samplers; 10 extra MultiDust Cassettes; 1 pack of 10 MultiDust foam discs, 1 tube breaker, 1 calidaptor; and 3 Step by Step Guides, in a durable carry case		220-4000K5C

Accessories		Cat. No.
Standard Charging Cradle, for AirChek Connect, TOUCH, and Essential pumps, *requires power supply, see below*		220-800
Single Cradle Power Supply	100-240 V	220-600
Multi Cradle Power Supply, for use with 2 to 5 charging cradles	100-240 V	220-700
DataTrac Pro USB Bluetooth Adapter, for AirChek Connect and Pocket Pump TOUCH, *see page 17 for details*		877-94
Low Flow (5 to 500 ml/min) Kit includes All-in-One adjustable tube holder and Type A tube cover		210-500
chek-mate Calibrator, 0.5 to 5 L/min, includes a 9-volt alkaline battery, *see details on pages 40-41* with NIST-traceable calibration certificate with UKAS-traceable calibration certificate		 375-0550N 375-0550
Replacement Battery Pack,* Li-Ion		P75718
Protective Pouch, nylon, with adjustable waist belt and shoulder strap, black		224-911

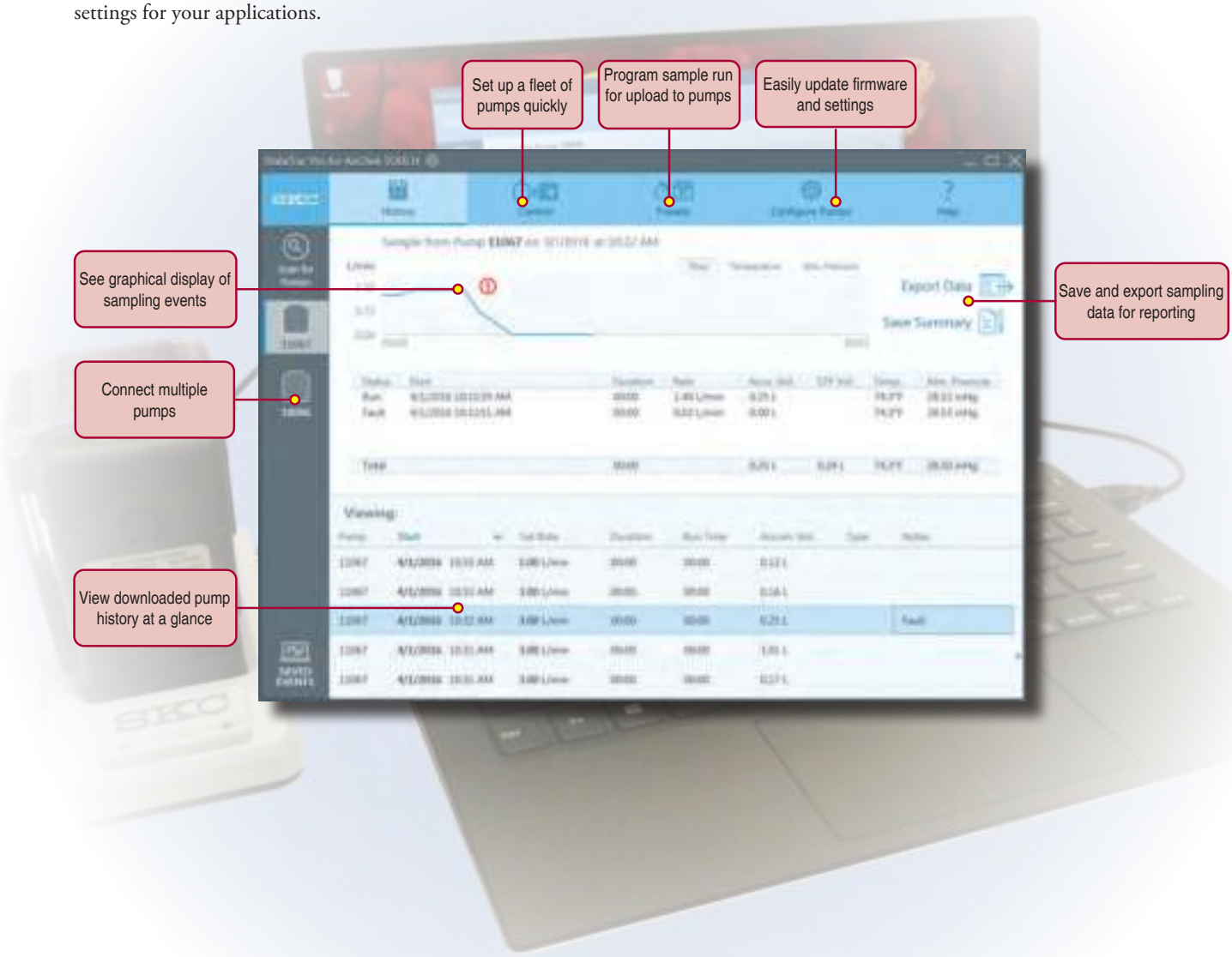
* *AirChek Connect pumps contain Li-Ion batteries and are subject to special shipping regulations.*

AirChek Connect requires ¼-inch ID tubing; see page 47

DataTracPro

PC Software for SKC AirChek TOUCH

DataTrac Pro Software is a time-saving pump and data management accessory for your AirChek TOUCH sample pumps. Use DataTrac Pro's intuitive tabs to access/manage pump history, control/monitor pump operation, program sample run presets, and configure pump settings for your applications.



DataTrac Pro for AirChek TOUCH

DataTrac Pro-AirChek TOUCH Hardware Accessory Kit includes e-Cradle, single power supply, and USB cable for connection to PC, *required for free software download and use of DataTrac Pro for AirChek TOUCH Software. See skcinc.com/DataTracPro for system/hardware specifications*

Cat. No. 877-93

Easy cradle and USB connection to PC

PC Software for Pocket Pump TOUCH and AirChek CONNECT

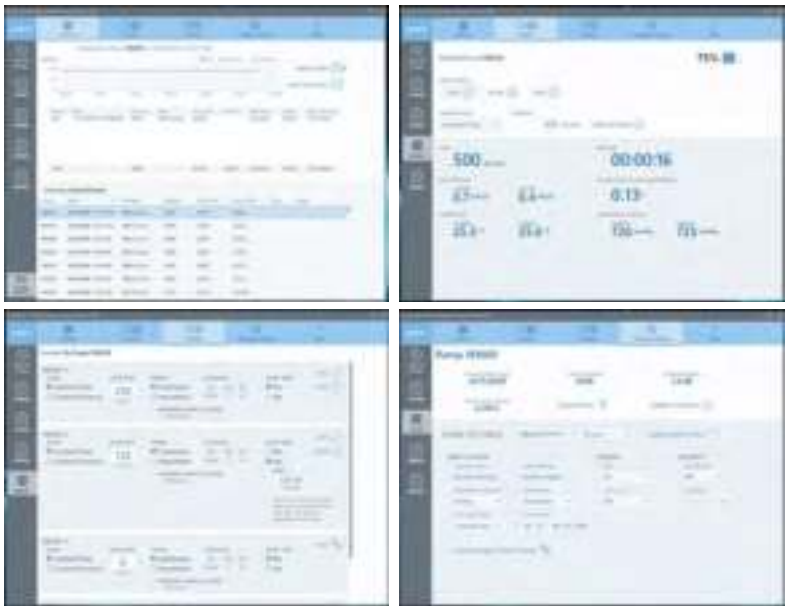
Save time managing your fleet of Bluetooth-connected SKC sample pumps and sampling data with DataTrac Pro Software. Intuitive tabs allow you to access and export pump history, control/monitor pump operation, program sample run presets, and configure pump settings for your applications from your PC.

DataTrac Pro for Bluetooth-connected Pumps

USB Bluetooth Adapter *to be installed in USB port on PC, required for free software download and use of DataTrac Pro Software. See* **skcinc.com/DataTracPro** *for system/hardware specifications*

Cat. No. 877-94

Convenient Bluetooth connection to PC with adapter



SKC SmartWave

Mobile App for Pocket Pump TOUCH and AirChek CONNECT

Monitor one or more Pocket Pump TOUCH and AirChek Connect sample pumps with your IOS® or Android® tablets and phones using Bluetooth low-energy connectivity.

- **Check in-range pump status**
- **Monitor run time parameters**
- **Set flow and operate sample runs**
- **Spot pump fault status**
- **Select display units and name pumps**
- **Use with Pocket Pump TOUCH Secure Lock feature**

Get the free SKC SmartWave app: Download on the App Store | Google Play

Air Sample Pumps

20 to 500 ml/min

Pocket Pump® TOUCH

The Low Flow TOUCH in Air Sampling from 20 to 500 ml/min

- **Intuitive touch screen for easy programmability**
- **Constant flows from 20 to 500 ml/min**
  - Accommodates typical flow rates for sorbent tubes
- **Bluetooth low energy (BLE) communication**
  - With PC and DataTrac Pro Software, *see page 17*
  - With IOS and Android tablets and phones using the SKC SmartWave app, *see page 17*
  - Non-BLE pump model available, *see ordering on page 19*
- **Exhaust port for direct filling of sample bags**
  - Optional quick-connect accessory for secure connection
- **Magnetic charging connector**
- **Large backlit screen displays time, date, constant battery status, flow rate, sample volume, temperature, atmospheric pressure, remaining run time (programmed run), and elapsed run time**
- **Rubber overmolded case provides quiet operation, impact protection, and a no-slip grip**
- **Compact and only 8.3 ounces (235 grams)**
- **> 20+ hours run time at 500 ml/min with powerful Li-Ion battery**
  - Extended run times with AC adapter/charger
- **Multi-tube sampling**
  - Sample with up to four tubes simultaneously; saves time and uses fewer pumps
  - Constant flow and pressure modes *(see page 39 for accessories)*
- **Automatic flow fault and restart**
- **Screen auto-lock provides for secure sampling**

Non-BLE
model available

Certifications

CE 0539 intrinsically safe IECEx

V Video | P PowerPoint | W Webinar | S Sampling Solution

Visit skcinc.com/Training

BLE communication with PC and DataTrac Pro Software for pump and data management

Non-BLE model available!
See ordering.

BLE communication with IOS and Android devices and SKC SmartWave app for pump control and monitoring

Exhaust port with optional quick-connect accessory for secure bag sampling

Easy calibration with Low Flow chek-mate Calibrator; see pages 40-41

Description	With BLE Cat. No.	Without BLE Cat. No.
Pocket Pump TOUCH only* with Li-Ion battery and screwdriver, *requires charger; see kits or chargers below*	220-1000TC	220-1000TCNB
Pocket Pump TOUCH with Charger* includes pump as described above and single charger (cable and wall cube with U.S. plug)	220-1000TC-C	220-1000TCNB-C
Pocket Pump TOUCH Starter Kit* includes pump and single charger as described above, 3 feet (0.9 meter) of Tygon tubing, and collar clip with cable tie **100-240V**	220-1000TC-S	220-1000TCNB-S
Single Pump Kit* includes pump and single charger as described above, and low flow tube holder with Type A cover, in a soft-sided nylon carry case **100-240V**	220-1000TC-K	220-1000TCNB-K
Pocket Pump TOUCH Single Pump Vapour Kit includes pump, single charger, low flow tube holder with Type A cover, tube breaker, mini tool kit, Basic Step by Step Guide and carry case	220-1000TCKV	
3-pack Pump Kit* includes 3 pumps as described above, 3 single chargers (cables and wall cubes with U.S. plug), and 3 low flow tube holders with Type A covers, in a Pelican case **100-240V**	220-1000TC-K3	220-1000TCNB-K3
5-pack Pump Kit* includes 5 pumps as described above, 5 single chargers (cables and wall cubes with U.S. plug), and 5 low flow tube holders with Type A covers, in a Pelican case **100-240V**	220-1000TC-K5	220-1000TCNB-K5
5-pack Deluxe Pump Kit* includes 5 pumps as described above, 5 low flow tube holders with Type A covers, 5 single charging cables, one 5-port USB charging hub with power cable (U.S. plug), and 1 DataTrac Pro USB Bluetooth Adapter (software available via free download), in a Pelican case **100-240V**	220-1000TC-K5D	220-1000TCNB-K5D
Pocket Pump TOUCH 5 Pump Vapour Kit includes 5 pumps as described above, 5 USB charging cables, one 5-port USB charging hub with power cable, 5 low flow tube holders with Type A covers, tube breaker, 5 mini tool kits, and 3 Basic Step by Step Guides, in a carry case	220-1000TCK5V	

Accessories	Cat. No.
Single Charger, USB, magnetic connector, supplied as cable and wall cube with U.S. plug **100-240V**	220-300
5-port USB Hub with power cable (U.S. plug), *requires up to 5 single charging cables available as Cat. No. P75739*	220-400
Single charging cable, USB, **without wall cube**	P75739
Replacement Li-Ion Battery Pack*	P76303
Quick-connect Bag Sampling Adapter, installs on pump exhaust port for secure connection to tubing for bag sampling, accepts 1/4-inch OD PTFE tubing	220-200
Single Kit Case, nylon, with shoulder strap	224-903
5-pack Kit Case, Pelican	224-915
DataTrac Pro for Pocket Pump TOUCH USB Bluetooth Adapter, *required for free software download and use of DataTrac Pro software*	877-94

* *Pocket Pump TOUCH pumps contain Li-Ion batteries and are subject to special shipping regulations.*

Pocket Pump TOUCH requires 1/4-inch ID tubing; see page 47.

AirChek XR5000

High Power, Small Size

- **Extended flow range: 5 to 5000 ml/min†**
  - Suitable for low flow gas/vapor or high flow particulate sampling
  - Multi-tube sampling option allows up to four tube samples to be taken simultaneously, each at different flow rates if desired, *see page 39*
- **Extended back pressure capabilities**
  - Up to 50 inches of water at 2 L/min
- **2 interchangeable battery options**
  - High-power Li-Ion for extended runs to 40 hours
  - Standard Li-Ion for runs to 20 hours
- **Highly accurate electronic flow control system**
- **Automatic flow correction for changes in temperature provides accurate air volumes**
- **Extremely simple operation**
  - Large three-button keypad
  - Continuous run with the push of a button
  - Bright blue pump status LED
  - Easy-to-read LCD displays elapsed time and accumulated run time
- **Set-and-go timer**
  - Timed and delayed runs up to 9999 minutes
- **Sample integrity**
  - Lockable keypad
  - Automatic flow fault
  - Auto-restart attempted after 15 seconds in flow fault
- **Standard model weighs only 16 ounces (454 grams)**

† *5 to 500 ml/min with low flow adjustable holder, see page 38*

Partner with the 4 L/min PPI for higher flow respirable dust sampling

see pages 130-132

Certifications

CE

intrinsically safe

Enhanced Battery Power for Extended Runs!

XR5000 Model	2 L/min*	5 L/min*
High-power Li-Ion	40 hours	22 hours
Standard Li-Ion	20 hours	11 hours

* *Results of run time tests using 37-mm, 0.8-µm MCE filters with new pumps and batteries. Pump and battery performance may vary.*

V Video | P PowerPoint | W Webinar | S Sampling Solution

Visit skcinc.com/Training

Enhanced battery power for extended run times

2 Li-Ion battery options

Bright blue status LED

Small footprint and only 16 ounces!

SKC Inc. AirChek® XR5000 Kits

Description	4-cell High-power Battery Pack SKC Inc. Cat. No.	2-cell Standard Battery Pack SKC Inc. Cat. No.
Pump with battery* and screwdriver set, *requires charger; see kits below or chargers on p. 37*	210-5001	210-5002
Starter Kit includes pump, charger, 0.9 meter (3 feet) of Tygon tubing, and collar clip with cable tie **100-240 V**	210-5001-S	210-5002-S
Single Pump Kit includes pump, charger, cassette holder, in a soft-sided nylon carry case (224-903) **100-240 V**	210-5001K	210-5002K
5-pack High Flow Pump Kit includes 5 pumps and cassette holders and Take Charge 5 Multi-charger (100-240 V), in a Pelican case (224-914)	210-5001K5	210-5002K5
5-pack High/Low Flow Pump Kit includes 5 pumps, cassette holders, All-in-One adjustable tube holders, and Type A protective tube covers and Take Charge 5 Multi-charger (100-240 V), in a Pelican case (224-914)	210-5001K5D	210-5002K5D
Replacement Li-Ion Battery Pack*	P85004A	P85002A

* *AirChek XR5000 pumps contain Li-Ion batteries and are subject to special shipping regulations.*

SKC Ltd. AirChek XR5000 Kits

Description	4-cell High-power Battery Pack SKC Ltd. Cat. No.	2-cell Standard Battery Pack SKC Ltd. Cat. No.
Pump with battery, *requires charger, see kits below or charger on p. 37*	210-5001	210-5002
Single Pump Basic Kit includes pump, charger, 1 meter (39 inches) of Tygon tubing, and 1 Step by Step Guide, in a durable carry case (224-98) **100-240 V**	210-5001K	210-5002K
Single Pump Kit-Gas/Vapour includes pump and battery, single charger (223-241), 1 meter (39 inches) of Tygon tubing, All-in-One adjustable tube holder (224-27), tube breaker (800-01200), Type A protective tube cover (224-29A), and 1 Step by Step Guide, in a durable carry case (224-98) **100-240 V**	210-5001KV	210-5002KV
Single Pump Kit-Dust/Particulate includes pump and battery, single charger (223-241), calidaptor (391-01), 1 meter (39 inches) of Tygon tubing, plastic IOM MultiDust Sampler (225-70A), 4 extra MultiDust cassettes (225-71A), 10 MultiDust foam discs (225-772), and 1 Step by Step Guide, in a durable carry case (224-98) **100-240 V**	210-5001KP	210-5002KP
Single Pump Kit-Combined includes pump and battery and all media and accessories as described in the Single Gas/Vapour and the Single Dust/Particulate kits, in one durable carry case (224-98) **100-240 V**	210-5001KC	210-5002KC
5-pack Pump Basic Kit includes 5 each pumps and batteries, 5 one-meter (39-inch) lengths of Tygon tubing, 3 Step by Step Guides, and 5 single chargers, in a durable carry case (224-97B) **100-240 V**	210-5001K5	210-5002K5
5-pack Pump Kit-Gas/Vapour includes 5 each pumps and batteries, All-in-One adjustable tube holders (224-27), and Type A protective tube covers (224-29A), 5 one-meter (39-inch) lengths of Tygon tubing, tube breaker (800-01200), 3 Step by Step Guides, and 5 single chargers, in a durable carry case (224-97B) **100-240 V**	210-5001K5V	210-5002K5V
5-pack Pump Kit-Dust/Particulate includes 5 each pumps and batteries, plastic IOM MultiDust Samplers (225-70A), and Plastic Cyclones (225-69), and 5 one-meter (39-inch) lengths of Tygon tubing, 10 MultiDust foam discs (225-772), calidaptor (391-01), 10 extra MultiDust cassettes (225-71A), 3 Step by Step Guides, and 5 single chargers, in a durable carry case (224-97B) **100-240 V**	210-5001K5P	210-5002K5P
5-pack Pump Kit-Combined includes 5 pumps and batteries and all media and accessories as described in the 5-pack Gas/Vapour and the 5-pack Dust/Particulate kits, in one durable carry case (224-97B) **100-240 V**	210-5001K5C	210-5002K5C
Replacement Battery Pack*	P85004A	P85002A

* *AirChek XR5000 pumps contain Li-Ion batteries and are subject to special shipping regulations.*

AirChek XR5000 requires 1/4-inch ID tubing, see page 47.

Universal XR Series

Classic Workhorse from 5 ml/min to 5 L/min

- **Constant flows from 1 to 5 L/min**
- **Low flows from 5 to 500 ml/min with adjustable tube holder,** ***see page 38***
- **Multi-tube sampling option,** ***see page 39***
- **Long 12+ hours run time** *(4 L/min at 20 inches water back pressure)*
- **Heavy duty and rugged**
- **Lightweight — only 34 ounces (964 grams)**
- **Choose the automatic features that meet your requirements**

PCXR8 Universal Pump
Programmable Solution

- ✓ High-accuracy timer
- ✓ Automatic fault shutdown/ time retention
- ✓ Convenient HOLD feature
- ✓ Delayed start
- ✓ Timed shutdown
- ✓ Intermittent sampling
- ✓ Extended intermittent sampling up to 7 days

PCXR4 Universal Pump
Compliance Solution

- ✓ High-accuracy timer
- ✓ Automatic fault shutdown/ time retention
- ✓ Convenient HOLD feature

44XR Universal Pump
Economical Solution

- ✓ Turn on and go

Universal XR Pumps, Kits, and Accessories

Description	Voltage	5 to 5000 ml/min SKC Inc. UL Listed	5 to 4000 ml/min SKC Ltd. ATEX approved
Universal Pump with NiMH battery pack and screwdriver set *Low flow (5 to 500 ml/min) requires adjustable low flow holder*		224-PCXR8 224-PCXR4 224-44XR	224-PCMTX8 224-PCMTX4 224-44MTX
Starter Kit includes pump, single PowerFlex charger (223-2000) with cable (223-1002), 0.9 meter (3 feet) of Tygon tubing, and collar clip with cable tie	100-240 V	224-PCXR8-S 224-PCXR4-S 224-44XR-S	
Single Pump Kit-Basic includes pump as described above, single charger (223-203A), 1 meter (39 inches) of Tygon tubing, and 1 Step by Step Guide, in a durable carry case (224-98)	110-240 V		224-PCMTX8K 224-PCMTX4K 224-44MTXK
Single Pump Kit-High/Low Flow includes pump as described above, single PowerFlex charger (223-2000) with cable (223-1002), filter cassette holder (225-1), adjustable low flow holder (224-26-01), and Type A protective tube cover (224-29A), in a soft-sided nylon carry case (224-903)	100-240 V	224-PCXR8KD 224-PCXR4KD 224-44XRKD	
Single Pump Kit-Dust/Particulate includes pump as described above, single charger (223-203A), calidaptor (391-01), 1 meter (39 inches) of Tygon tubing, plastic IOM MultiDust Sampler (225-70A), 4 extra MultiDust cassettes (225-71A), 10 MultiDust foam discs (225-772), and 1 Step by Step Guide, in a durable carry case (224-98)	110-240 V		224-PCMTX8KP 224-PCMTX4KP 224-44MTXKP
Single Pump Kit-Gas/Vapour includes pump as described above, single charger (223-203A), 1 meter (39 inches) of Tygon tubing, single adjustable low flow holder (224-26-01), tube breaker (800-01200), Type A protective tube cover (224-29A), and 1 Step by Step Guide, in a durable carry case (224-98)	110-240 V		224-PCMTX8KV 224-PCMTX4KV 224-44MTXKV
Single Pump Kit-Combined includes pump as described above and all media and accessories as described in the Single Gas/Vapour and the Single Dust/Particulate kits, in one durable carry case (224-98)	110-240 V		224-PCMTX8KC 224-PCMTX4KC 224-44MTXKC
5-pack Pump Kit-Basic includes 5 pumps as described above, 5-station charger (223-103A), 5 one-meter (39-inch) lengths of Tygon tubing, and 3 Step by Step Guides, in a durable carry case (224-97A)	110-240 V		224-PCMTX8K5 224-PCMTX4K5 224-44MTXK5
5-pack Pump Kit-High/Low Flow includes 5 each pumps as described above, single adjustable low flow holders (224-26-01), Type A protective tube covers (224-29A), and filter cassette holders (225-1), and a 5-station PowerFlex charger (223-1000) with 5 cables (223-1002), in a Pelican carry case (224-908)	100-240 V	224-PCXR8K5D 224-PCXR4K5D 224-44XRK5D	
5-pack Pump Kit-Dust/Particulate includes 5 each pumps as described above, plastic IOM MultiDust Samplers (225-70A), 5 one-meter (39-inch) lengths of Tygon tubing, 10 extra cyclone cassettes (225-62), 10 MultiDust foam discs (225-772), calidaptor (391-01), and 3 Step by Step Guides, in a durable carry case (224-97A)	110-240 V		224-PCMTX8K5P 224-PCMTX4K5P 224-44MTXK5P
5-pack Pump Kit-Gas/Vapour includes 5 each pumps as described above, single adjustable low flow holders (224-26-01), and Type A protective tube covers (224-29A), 5 one-meter (39-inch) lengths of Tygon tubing, a 5-station charger (223-103A), tube breaker (800-01200), and 3 Step by Step Guides, in a durable carry case (224-97A)	110-240 V		224-PCMTX8K5V 224-PCMTX4K5V 224-44MTXK5V
5-pack Pump Kit-Combined includes 5 pumps as described above and all media and accessories as described in the 5-pack Gas/Vapour and the 5-pack Dust/Particulate kits, in one durable carry case (224-97A)	110-240 V		224-PCMTX8K5C 224-PCMTX4K5C 224-44MTXK5C

Universal Pumps require 1/4-inch ID tubing; see page 47.

Certifications

CE Ex UL intrinsically safe

Accessories

More Information
skcinc.com

AirChek 52/Sidekick
Simple, Sturdy, Economical

The small, lightweight, and economical AirChek® 52/Sidekick Sample Pump is designed for rugged industrial use at flows from 5 to 3000 ml/min. Ideal for on-worker applications, use the compact AirChek 52/Sidekick for short-term or full-shift sampling with sorbent tubes, impingers, cyclones, PPIs, or filter cassettes. Reliability, ease of use, and precision flow control make the AirChek 52/Sidekick one of the most popular personal air sample pumps in the industry.

ABOUT

Sidekick Sample Pump
The SKC Ltd. Sidekick is available in three models:

- **224-50MH**
  - Non-ATEX approved
- **224-51MTX**
  - ATEX approved, no LCD
- **224-52MTX**
  - ATEX approved, with LCD indicator

Wide flow range
- Constant high flows from 1000 to 3000 ml/min
- Low flows from 5 to 500 ml/min with low flow holder (*see page 38*)
- Ideal for most personal sampling applications

Full-shift run times
- Provides 12+ hours run time at 2 L/min, 25 inches water back pressure

Simple design
- Impact-resistant case is easy to clean and decontaminate
- Easy on/off and flow control
- Quick change battery pack mounted on bottom of pump

Small, compact, and lightweight
- Weighs only 20 ounces (567 grams)

Highly accurate display
- Digital time display tracks sample run time in minutes up to 99,999
- Indicates low battery condition or flow fault without losing sample run time
- Attempts auto-restart up to 5 times from flow fault

Multi-tube sampling saves time and uses fewer pumps
- Multiple low flow tube holder and Constant Pressure Controller (CPC) accessories allow up to four tube samples to be taken simultaneously, each at different flow rates if desired *(see page 39)*

All-in-One Adjustable Tube Holder
- Permits single sorbent tube sampling from 5 to 500 ml/min without a separate CPC *(see page 38 for details)*

Top view: AirChek 52/Sidekick with LCD indicator

AirChek 52/Sidekick Pumps and Kits

Description	Voltage	AirChek 52 SKC Inc. Cat. No.	Sidekick SKC Ltd. Cat. No.
AirChek 52/Sidekick Pump with NiMH battery pack and screwdriver set		224-52	224-50MH 224-51MTX 224-52MTX
Starter Kit includes pump, single PowerFlex charger (223-2000) with cable (223-1004), 0.9 meter (3 feet) of Tygon tubing, and collar clip with cable tie	100-240 V	224-52-S	
Single Pump Kit-Basic includes pump as described above, single charger (223-203A), 1 meter (39 inches) of Tygon tubing, and 1 Step by Step Guide, in a durable carry case (224-98)	110-240 V		224-50MHK 224-51MTXK 224-52MTXK
Single Pump Kit-High Flow includes pump as described above, single PowerFlex charger (223-2000) with cable (223-1004), and filter cassette holder (225-1), in a Pelican carry case (224-901)	100-240 V	224-52KH	
Single Pump Kit-Dust/Particulate includes pump as described above, single charger (223-203A), calidaptor (391-01), 1 meter (39 inches) of Tygon tubing, plastic IOM MultiDust Sampler (225-70A), 4 extra MultiDust cassettes (225-71A), 10 MultiDust foam discs (225-772), and 1 Step by Step Guide, in a durable carry case (224-98)	110-240 V		224-50MHKP 224-51MTXKP 224-52MTXKP
Single Pump Kit-Gas/Vapour includes pump as described above, single charger (223-203A), 1 meter (39 inches) of Tygon tubing, All-in-One adjustable tube holder (224-27), tube breaker (800-01200), Type A protective tube cover (224-29A), and 1 Step by Step Guide, in a durable carry case (224-98)	110-240 V		224-50MHKV 224-51MTXKV 224-52MTXKV
Single Pump Kit-Combined includes pump as described above and all media and accessories as described in the Single Gas/Vapour and the Single Dust/Particulate kits, in one durable carry case (224-98)	110-240 V		224-50MHKC 224-51MTXKC 224-52MTXKC
5-pack Pump Kit-Basic includes 5 pumps as described above, 5-station charger (223-103A), 5 one-meter (39-inch) lengths of Tygon tubing, and 3 Step by Step Guides, in a durable carry case (224-97)	110-240 V		224-50MHK5 224-51MTXK5 224-52MTXK5
5-pack Pump Kit-High Flow includes 5 each pumps as described above and filter cassette holders (225-1), and a 5-station PowerFlex charger (223-1000) with 5 cables (223-1004), in a Pelican carry case (224-907)	100-240 V	224-52K5	
5-pack Pump Kit-High/Low Flow includes 5 each pumps as described above, All-in-One adjustable tube holders (224-27), Type A protective tube covers (224-29A), and filter cassette holders (225-1), and a 5-station PowerFlex charger (223-1000) with 5 cables (223-1004), in a Pelican carry case (224-907)	100-240 V	224-52K5D	
5-pack Pump Kit-Dust/Particulate includes 5 each pumps as described above and plastic IOM MultiDust Samplers (225-70A), 10 MultiDust foam discs (225-772), 5 one-meter (39-inch) lengths of Tygon tubing, calidaptor (391-01), 10 extra MultiDust cassettes (225-71A), 5-station charger (223-103A), and 3 Step by Step Guides, in a durable carry case (224-97)	110-240 V		224-50MHK5P 224-51MTXK5P 224-52MTXK5P
5-pack Pump Kit-Gas/Vapour includes 5 each pumps as described above, All-in-One adjustable tube holders (224-27), and Type A protective tube covers (224-29A), 5 one-meter (39-inch) lengths of Tygon tubing, a 5-station charger (223-103A), tube breaker (800-01200), and 3 Step by Step Guides, in a durable carry case (224-97)	110-240 V		224-50MHK5V 224-51MTXK5V 224-52MTXK5V
5-pack Pump Kit-Combined includes 5 pumps as described above and all media and accessories as described in the 5-pack Gas/Vapour and the 5-pack Dust/Particulate kits, in one durable carry case (224-97)	110-240 V		224-50MHK5C 224-51MTXK5C 224-52MTXK5C

AirChek 52/Sidekick Pump requires 1/4-inch ID tubing, see page 47.

Certifications

CE

intrinsically safe

ATEX model available; contact SKC

(Sidekick models 224-51MTX and 224-52MTX)

For Accessories

Battery Chargers.....pages 36-37
Tube Holders .....pages 38-39
Flowmeters.....pages 40-43
Filter Holders..... page 118

AirChek 52/Sidekick Sample Pump with PPI respirable dust sampler on worker

More Information
skcinc.com

AirLite — Economy on the Go

5 to 3000 ml/min with Alkaline Batteries

- **Now available with timer!**
- **Simple operation**
  - Turn on, calibrate, and sample — no programming or battery charging
- **Simple power**
  - Economical, disposable AA alkaline batteries are ready to go anytime for over 10 hours *(see run times below)*
- **Compact design**
  - AirLite fits in the palm of your hand!
  - 12 ounces (340 grams)
- **Sample integrity**
  - Constant flows up to 3000 ml/min‡
  - Patented** flow control system holds constant flow to ± 5% of set-point
  - Compensation for back pressure and temperature changes
  - Low battery and flow fault indicator and shut-off
- **Multiple-tube sampling with accessories;** *see page 39*
- **The simple choice for:**
  - Abatement projects
  - Indoor air sampling
  - Emergency response
  - Silica

AirLite® is the simple solution when a 5 to 3000 ml/min sampler is needed for abatement projects, indoor air sampling, and emergency response in environments that do not require intrinsic safety. AirLite maintains full back pressure compensation from 1000 to 3000 ml/min; flows from 5 to 500 ml/min require a low flow accessory *(see page 27)*. Powered by economical, disposable AA alkaline batteries, AirLite provides run times greater than 10 hours. AirLite is ready to go anytime you are!

‡ *Flows from 5 to 500 ml/min require the Low Flow Kit.*
** *U.S. Patent No. 6,741,056*

AirLite Power Flexibility

The AirLite Sample Pump is highly flexible. Use disposable alkaline batteries for fast, ready deployment. Use rechargeable 1.5-volt AA batteries for economy. Rechargeable batteries will yield half the run time of disposable batteries. Choose the option best suited for your application.

AirLite Typical Run Times†

Mixed Cellulose (MCE) Filter 0.8-µm pore size

Filter Diameter	37 mm	37 mm	25 mm
Flow Rate	1 L/min	2 L/min	2 L/min
Duracell Standard	23.5	14.5	10.5
Rayovac Maximum	20.0	16.5	11.0
Walmart EverActive	24.0	16.0	10.5

Glass Fiber Filter

Filter Diameter	37 mm	37 mm	25 mm
Flow Rate	1 L/min	2 L/min	2 L/min
Energizer	29.5	18.0	18.5
Rayovac Maximum	26.5	23.5	19.5
Walmart EverActive	33.5	24.5	20.0

† *Run times in hours. Obtained using new pump and new alkaline batteries. Pump and battery performance may vary.*

Fast, Ready, and Flexible AirLite

Description	SKC Inc. Cat. No. (without timer)	SKC Inc. Cat. No. (with timer)	SKC Ltd. Cat. No. (without timer)	SKC Ltd. Cat. No. (with timer)
AirLite PumpΔ with 3 AA alkaline batteries and screwdriver set	**110-100**	**110-100-T**	**110-100**	**110-100-T**
Single Pump Kit-Dust/Particulate includes pumpΔ as described above, calidaptor (391-01), 1 meter (39 inches) of Tygon tubing, plastic IOM MultiDust Sampler (225-70A), 4 extra MultiDust cassettes (225-71A), 1 pack of 10 MultiDust foam discs (225-772), and 1 Step by Step Guide, in a durable carry case (224-98)			**110-100KP**	**110-100-TKP**
5-pack Pump Kit-High Flow includes 5 pumpsΔ as described above and filter cassette holders (225-1), in a Pelican carry case (224-907)	**110-100K5**	**110-100-TK5**		
5-pack Pump Kit-Dust/Particulate includes 5 each: pumpsΔ as described above, plastic IOM MultiDust Samplers (225-70A), 1-meter (39-inch) lengths of Tygon tubing; 10 extra MultiDust cassettes (225-71A); 1 pack of 10 MultiDust foam discs (225-772), 1 calidaptor (391-01), and 3 Step by Step Guides, in a durable carry case (224-97B)			**110-100K5P**	**110-100-TK5P**
5-pack Pump Kit-High/Low Flow includes 5 pumpsΔ as described above, filter cassette holders (225-1), All-in-One adjustable tube holders (224-27), and Type A protective tube covers (224-29A), in a Pelican case (224-907)	**110-100K5D**	**110-100-TK5D**		

Accessories	Cat. No.
Filter Cassette Holder, accommodates two or three-piece 25 or 37-mm cassettes with or without a cyclone, clips to a worker's collar, *see p. 118*	**225-1**
Low Flow Kit (5 to 500 ml/min) includes All-in-One adjustable tube holder and Type A protective tube cover, *see p. 38*	**210-500**
Protective Nylon Pump Pouch, black, with belt loop	**224-902**

Δ *Not intrinsically safe*

AirLite requires 1/4-inch ID tubing; see page 47.

Certification

CE

Disposable alkaline or reusable AA batteries offer flexibility

New model with timer

AirChek 3000 PC Programmable

- **Longer run times with NiMH battery — 12+ hours at 2 L/min, 30 inches water back pressure**
- **Advanced flow control from 1000 to 3250 ml/min**
  - Accurate internal flow sensor measures flow directly and acts as a secondary standard to maintain set flow
  - Thermal and pressure sensors maintain flow calibration by compensating for differences between the temperature and atmospheric pressure at calibration and during sampling
- **Convenient Low Flow Adapter Kit available for 5 to 500 ml/min**
- **Continuous sample volume calculations**
  - Flow rate, run time, volume, and flow fault are continuously recorded for accurate sample reporting
- **Battery status display**
- **Multi-tube sampling feature**
  - Save valuable time with simultaneous 2, 3, or 4-tube sampling (*see page 39*)
- **Protective features**
  - Rugged, impact-resistant case with cover-protected ports
  - Automatic flow fault shutdown and restart
  - Auto shut-off at low battery
- **Automatic CalChek calibration feature with chek-mate calibrator *(see page 41)***

Schedule it on a PC!

Combine AirChek® 3000, your PC, and DataTrac Software to easily create single or multiple sampling schedules that include delayed start, timed shutdown, and sequential sampling. Alternatively, a single schedule can be set manually using the pump's large integral keypad.

Sample and record it!

Start sampling with the click of a mouse or the press of a button. An internal flow sensor acts as a secondary standard to accurately maintain set flow. AirChek 3000 records flow rate, run time, sample volume, and flow fault throughout the sampling period. View values during sampling on the pump LCD or in pump history on a PC.

Download and report it!

Use your PC and DataTrac Software to download pump history, import data into your favorite software for IH lab reporting, or create a worker exposure profile for complete reporting. *Visit www.skcltd.com for details.*

Schedule, Sample, Download, and Report from Your PC

Certifications

CE Ex

IECEx ANZEx

Description	Voltage	SKC Ltd. Cat. No.
AirChek 3000 Pump with NiMH battery pack and tool		210-3311
Single Pump Kit-Basic includes pump as described above, single charger (223-240A), 1 meter (39 inches) of Tygon tubing, and 1 Step by Step Guide, in a durable carry case (224-98)	110-240 V	210-3311K
Single Pump Kit-Dust/Particulate includes pump as described above, single charger (223-240A), calidaptor (391-01), 1 meter (39 inches) of Tygon tubing, plastic IOM MultiDust Sampler (225-70A), 4 extra MultiDust cassettes (225-71A), 10 MultiDust foam discs (225-772), and 1 Step by Step Guide, in a durable carry case (224-98)	110-240 V	210-3311KP
Single Pump Kit-Gas/Vapour includes pump as described above, single charger (223-240A), 1 meter (39 inches) of Tygon tubing, All-in-One adjustable tube holder (224-27), tube breaker (800-01200), Type A protective tube cover (224-29A), and 1 Step by Step Guide, in a durable carry case (224-98)	110-240 V	210-3311KV
Single Pump Kit-Combined includes pump as described above and all media and accessories as described in the Single Gas/Vapour and the Single Dust/Particulate Kits, in a durable carry case (224-98)	110-240 V	210-3311KC
5-pack Pump Kit-Basic includes 5 pumps as described above, 5-station charger (223-109A), 5 one-meter (39-inch) lengths of Tygon tubing, and 3 Step by Step Guides, in a durable carry case (224-97A)	110-240 V	210-3311K5
5-pack Pump Kit-Dust/Particulate includes 5 each pumps as described above, plastic IOM MultiDust Samplers (225-70A), 5 one-meter (39-inch) lengths of Tygon tubing, 10 MultiDust foam discs (225-772), 10 extra MultiDust cassettes (225-71A), calidaptor (391-01), 5-station charger (223-109A), and 3 Step by Step Guides, in a durable carry case (224-97A)	110-240 V	210-3311K5P
5-pack Pump Kit-Gas/Vapour includes 5 each pumps as described above, All-in-One adjustable tube holders (224-27) and Type A protective tube covers (224-29A), 5 one-meter (39-inch) lengths of Tygon tubing, a 5-station charger (223-109A), tube breaker (800-01200), and 3 Step by Step Guides, in a durable carry case (224-97A)	110-240 V	210-3311K5V
5-pack Pump Kit-Combined includes 5 pumps as described above and all media and accessories as described in the 5-pack Gas/Vapour and the 5-pack Dust/Particulate kits, in one durable carry case (224-97A)	110-240 V	210-3311K5C
Accessories		
CalChek Communication Cable, *required for automatic calibration of AirChek TOUCH, AirChek 3000, and Leland Legacy Sample Pumps with chek-mate calibrator (see page 41)*		375-200
DataTrac Software for AirChek 3000, supplied on USB stick		877-91K

AirChek 3000 requires 1/4-inch ID tubing; see page 47.

Leland Legacy

Area or Personal High Flow Sample Pump

The SKC Leland Legacy® Sample Pump provides the high flows and long run times of a vacuum-style pump in a compact, portable, and battery-operated sampler. Leland Legacy is ideal for asthma studies in schools, unattended 24-hour PM10 and PM2.5 ambient air sampling, and higher flow respirable dust sampling with SKC PPI Samplers.*

- **High flows from 5 to 15 L/min**
- **24-hour run times with Li-Ion battery**
- **Highly accurate internal flow sensor acts as a secondary standard**
- **Flexible programing**
  - Manual three-button operation from large built-in keypad
  - PC programmability with DataTrac Software and your PC

* *Not suitable for applications requiring intrinsic safety or high back pressure compensation such as asbestos clearance monitoring*

Fast, Easy, and Automatic Calibration

Direct Communication with chek-mate Calibrator Using the CalChek Feature

Connect the Leland Legacy Sample Pump with CalChek Cable accessory to the new High Flow chek-mate Calibrator for accurate, automatic calibration without manual adjustments. *See details on page 41.*

Look for chek-mate and the CalChek Cable in ordering on page 31.

Childhood asthma studies

PM10 and PM2.5
See Leland Legacy in deployable systems on pages 32-33

Respirable dust — partner with 8 L/min PPI sampler. *See pages 130-132.*

Leland Legacy

24-hour PM Sampling with Impactors at Flows up to 10 L/min

Leland Legacy and Sioutas Impactor performance is U.S. EPA-ETV verified. Visit epa.gov/etv/vt-ams.html for more information.

Certifications

CE ETV performance verified with Sioutas Impactor

Description		Cat. No.
Leland Legacy Pump† with Li-Ion battery pack and screwdriver set, *requires charger; see kits or chargers below*		100-3002
Single Pump Kit† includes pump as described above and single charger, in a Pelican carry case	100-240 V	100-3002K
5-pack Pump Kit† includes 5 Leland Legacy pumps, one Take Charge 5 Multi-charger, and DataTrac Software, in a Pelican case	100-240 V	100-3002K5
Accessories		
Single Charger, for Li-Ion battery-powered pumps	100-240 V	223-241
Take Charge 5 Multi-charger, 5 stations, for Li-Ion battery-powered pumps	100-240 V	223-441
High Flow chek-mate Calibrator includes a 9-volt battery and NIST-traceable certificate; *see pages 40-41 for details*		375-50300N
Battery Charging Adapter, for charging batteries outside the pump		223-248
CalChek Communication Cable, for use with chek-mate calibrator, *see page 41*		375-200
DataTrac Software for Leland Legacy includes adapter cable; *software available via free download*		877-92
Replacement Battery Pack,† Li-Ion		P75692

† *Leland Legacy pumps contain Li-Ion batteries and are subject to special shipping regulations.*

DataTrac® Software for Leland Legacy®

Windows-based DataTrac Software for Leland Legacy sample pumps provides for maximum use of pump features and sample history download to PC for reporting. *See left for ordering.*

- Program/operate your pump
- Download sampling history from pump to PC
- Set up easy chain of custody sample sheets
- Manage data and produce reports

Leland Legacy requires 3/8-inch ID tubing; see page 47.

Deployable Sampler Systems

Ambient Air Kits for 24-hour Sampling

Deployable Systems Performance Profile

Flow Rate
10 L/min

Run Time
> 24 hrs (one battery charge)

Power
Rechargeable Li-Ion battery, 7.4 V, 12-Ah capacity, 89 Wh

Case Dimensions
18.5 x 14.1 x 6.9 in (47 x 36 x 18 cm)

System Weight
DPS: 13 lbs (5.9 kg)
DCS: 12.2 lbs (5.5 kg)

Certification
CE

- **One compact, portable case easily carried or shipped!**
- **Ideal for remote locations, indoor air sampling, and baseline surveys**
  - Pre-program automatic start and stop
  - 24-hour Li-Ion battery operation
  - Secure operation from within a heavy-duty lockable case
  - Quick-change battery packs
  - Low noise for indoors
- **Fast setup with modular components and quick-connect tubing**
- **System pump provides constant, accurate airflows**
  - Simple 3-button keypad for setting a single unattended sample run
  - Program for multiple runs with a PC and DataTrac for Leland Legacy Software

SKC Deployable Sampler Systems provide cost-effective ambient air sampling and are ideal for applications including fenceline, near-roadway, and remediation monitoring, baseline surveys, and indoor air studies. SKC offers two systems:

- **Deployable Particulate Sampler (DPS) System** for PM10 or PM2.5
- **Deployable Cartridge Sampler (DCS) System** for polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides, and associated particulates

Each system includes the fully programmable Leland Legacy Sample Pump, specially designed sampling head, and accessories for fast deployment and effective sampling; and it fits into one portable heavy-duty Pelican case. Partner either system with DataTrac Software for advanced scheduling options and record keeping, *see page 31.*

V Video | P PowerPoint | W Webinar | S Sampling Solution
Visit skcinc.com/Training

See Ordering Information on page 33.

Deployable Particulate Sampler (DPS) System

Ambient and Indoor PM10 or PM2.5 Sampling

Description		Cat. No.	Qty.
DPS System*# includes sample pump with connection case, charger (100-240 V), 2 external battery assemblies with adapters (packaged separately), IMPACT‡ sampling head, 2 filter cassettes, calibration adapter, rain cover for sampling head, 25 disposable impaction discs *(limited shelf-life)*, filter cassette opener, tubing with quick-connect fitting, and mounting bracket, in a heavy-duty lockable carry case	**PM10 Kit** **PM2.5 Kit**	**100-3901** **100-3903**	**ea** **ea**
Collection Filters for DPS System (not supplied with system) *Select a filter based on your application; required for sampling*			
Quartz Filters, 47 mm, Tissuquartz, 432 µm thick		**225-1823**	**25**
PTFE Filters,§ 47 mm, 2.0-µm pore size, with PMP support ring		**225-1747**	**50**
Sampling Heads/Replacement Parts			
IMPACT Sampler includes sampler inlet and body, calibration adapter, filter cassette, and rain cover for sampler; *requires collection media (see above) and impaction substrate (see below) sold separately*	**PM2.5** **PM10**	**225-392** **225-390**	**ea** **ea**
IMPACT Sampler Inlet Only, interchangeable on IMPACT body	**PM2.5** **PM10**	**P54204** **P54202**	**ea** **ea**
Impaction Discs, 37 mm, pre-oiled, ready to use, disposable, *required for sampling, limited shelf-life*		**225-395** **225-395A**	**25** **50**
Filter Cassette, *required for sampling*		**225-396**	**ea**
Accessories			
Petri Dish Slide, for filter transport		**225-2-01**	**100**
DataTrac for Leland Legacy Software includes USB cable; software available via free download, *see p. 31 for details*		**877-92**	**ea**

* *Provides data similar to Federal Reference Method samplers. The DPS System is not a U.S. EPA reference or equivalent method for compliance sampling.*

\# *System contains Li-Ion batteries and is subject to special shipping regulations.*

§ *Back pressure on PTFE filters may vary within the same lot.*

‡ *U.S. Patent No. 7,334,453*

Patented‡ IMPACT sampling head for DPS. For more information on IMPACT, see page 133.

Leland Legacy Sample Pump
The Power of the DPS and DCS Systems
See pages 30-31 for more information.

Deployable Cartridge Sampler (DCS) System

Ambient Sampling of PAHs, PCBs, Pesticides, and Associated Particulates

Description	Cat. No.
DCS System*# includes sample pump with connection case, charger (100-240 V), 2 external battery assemblies with adapters (packaged separately), sampling head, calibration adapter, rain cover for sampling head, sample tubing with quick-connect fitting, calibration tubing, and mounting bracket, in a heavy-duty lockable carry case	**100-3960**
Media Cartridges, *required, select based on application* Stainless steel cartridges containing media as described below, stainless steel support screens, and gaskets. Each cartridge is wrapped in aluminum foil and shipped in an aluminum can with lid	
Filter/PUF contains 41.3-mm length of PUF and a 47-mm quartz filter	**226-206**
Filter/PUF/XAD-2/PUF contains a 47-mm quartz filter and 2 grams of XAD-2 sorbent sandwiched between two 20.6-mm lengths of PUF	**226-207**
Accessories	
DataTrac for Leland Legacy Software includes USB cable; software available via free download, *see p. 31 for details*	**877-92**

* *Provides data similar to Federal Reference Method samplers. The DCS System is not a U.S. EPA reference or equivalent method for compliance sampling.*

\# *System contains Li-Ion batteries and is subject to special shipping regulations.*

Sampling head holds media cartridge for DCS.

QuickTake 30

Powered by Supercharged Lithium-Ion Battery

10 to 30 L/min constant flow...
for sampling with BioStage viable cascade impactor, spore trap cassettes, microvacuum cassettes, or other samplers that require flows up to 30 L/min within the back pressure range of the pump

It's compact and portable!
QuickTake® 30 weighs only 4.8 pounds (2.2 kg) and features an easy-grip handle for portability.

Reliable long run times...
with powerful Li-Ion battery *(see page 35)*

Easy operation...
with large keypad buttons, high-contrast digital display, front-mounted intake for fast media setup, and programmable timer

Versatile!
Sample with a spore trap cassette directly on the inlet, with tubing and impactor or cassette, or with BioStage mounted on pump *(with accessory)*

Programmable

Constant flow

Easy calibration

QuickTake 30 Sample Pump

Constant Flows for Dust, Mold, Bioaerosols, Asbestos, and More

10 to 30 L/min constant flow sample pump
- Maintains set flow throughout a sampling period for complete sample integrity
- Ideal for use with BioStage viable cascade impactor, spore trap cassettes such as VersaTrap, microvacuum cassettes, or other samplers that require flows up to 30 L/min

Long run times on a single battery charge
- AC charger/adapter for extended sampling
- Rechargeable Li-Ion battery pack

Compact and portable
- 9.3 x 8.4 x 3.5 inches (23.6 x 21.3 x 8.9 cm)
- Weighs only 4.8 pounds (2.2 kg)
- Handle for easy portability

Easy-to-use programmable timer for unattended sampling
- Select sample time presets or customize timer from 1 to 999 minutes
- Continuous run with manual shut-off
- Intermittent sampling
- Large, easy-to-use keypad

Easy to use
- Large keypad control
- End-of-cycle visible and audible alarms

High-contrast digital display

Low noise — average < 64 dBA at 3 feet
(37-mm, 0.8-µm MCE filter at 16.8 L/min)

QuickTake 30 with BioStage on mounting bracket

QuickTake 30 with VersaTrap cassette mounted on pump inlet

Use a QuickTake 30 with Asbestos cassette mounted on tripod

Description		Cat. No.
QuickTake 30 Sample Pump*# and Charger	100-240 V	228-9530
QuickTake 30 Sample Pump,*# Rotameter, and Charger	100-240 V	228-9530A
QuickTake 30 BioStage Pump*# Kit includes pump, charger, rotameter, BioStage, mounting bracket with inlet adapter, and calibration adapter, in a deluxe carry case	100-240 V	228-9530K
Accessories		
Charger/Adapter	100-240 V	223-245
Mounting Bracket for BioStage includes inlet adapter		228-9531
Rotameter, 3 to 30 L/min		320-100
Replacement Battery Pack,* Li-Ion		P75689
Replacement Filter/O-ring Set includes 5 filters and 1 O-ring		P40021
Tripod Stand, for cassette or BioStage Impactor		228-506

* *QuickTake sample pumps contain Li-Ion batteries and are subject to special shipping regulations.*
\# *Not CE marked*

QuickTake 30 requires 3/8-inch ID tubing; see page 47.

the QuickTake 30 Advantage!

- ☑ Maintains constant flow even when used with media that creates back pressure such as microvacuum cassettes *(see page 144)*
- ☑ A low-noise, battery-powered alternative to vacuum pumps

QuickTake 30 Applications and Typical Run Times§

- **14+ hours**
  – 37-mm, 0.8-µm MCE filter at 10 L/min
- **9+ hours — asbestos clearance**
  For maximum air volumes during asbestos clearance sampling, use QuickTake 30 with a 25-mm, 1.2-µm MCE filter at 10 L/min with fully charged battery and AC power to achieve 9+ hours of run time — a total air volume of 5400 liters
- **5 hours**
  – VersaTrap (spore trap cassette) at 15 L/min
- **4 hours**
  – BioStage (viable cascade impactor) at 28.3 L/min

§ *Results obtained using a new pump and new, fully charged battery. Pump and battery performance may vary.*

BioStage Impactor
see page 138

V Video P PowerPoint W Webinar S Sampling Solution
Visit skcinc.com/Training

Personal Sample Pump Battery Chargers

SKC PowerFlex Chargers

SKC PowerFlex® battery charging systems provide flexibility for your fleet of NiMH and NiCad-powered SKC personal sample pumps. Pump-specific cables allow connection and charging of batteries in different SKC personal pump models while using one PowerFlex charger! Instead of carrying several bulky wall cubes or charging units, you only need one lightweight charger and the appropriate cables. The 5-station PowerFlex can charge up to three different SKC pump models simultaneously. *See PowerFlex charger ordering (Cat. Nos. 223-1000 and -2000 and 223-1000 Series cables) in table at right.*

More Information

Battery life is based on battery chemistry, environmental conditions, and patterns of use. Learn more about

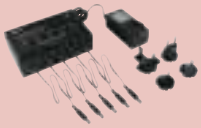
- SKC NiMH pump batteries in SKC Technical Note 1756 at skcinc.com/instructions/1756.pdf
- SKC Li-Ion pump batteries in SKC Technical Note 1918 at skcinc.com/instructions/1918.pdf

skcinc.com

5-station PowerFlex Carry Case

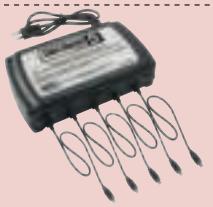
Includes padded shoulder strap and compartment for cables. Also included with single pump kits. *See page 46.*

Cat. No. 224-903

SKC Pump	Pocket Pump TOUCH	Universal XR	AirChek 52/Sidekick
			
Single Chargers (100-240 V)		 PowerFlex#** 223-2000 	 AirChek 52: PowerFlex#** 223-2000 
Cat. No.	Single Charger 220-300	For ATEX models: 223-203A	Sidekick: 223-203A
5-station Chargers (100-240 V)		 PowerFlex#** 223-1000 	 AirChek 52: PowerFlex#** 223-1000 
Cat. No.	5-port USB Hub 220-400 *Requires single charger cables* P75739	For ATEX models: 223-103A	Sidekick: 223-103A
Required PowerFlex Cable(s)			
Cat. No.	N/A	223-1002#	AirChek 52: 223-1004
Replacement Batteries†			
Cat. No.	P76303 (Li-Ion)‡	P21661MH (NiMH)# For ATEX models: P22419MTX	AirChek 52: P78011AMH (NiMH) Std. Sidekick: P78050MH Dlx & Int. Sidekick: P78051MTX
Battery Eliminators for Line Operation			
Cat. No.	220-300	223-325 (115 V)# 223-325B (230 V)# 223-305C — UK Plug 223-305B — Euro Plug	AirChek 52: 223-300 (115 V) Sidekick: 223-300C — UK Plug Sidekick: 223-300B — Euro Plug

 # For use with U.S.-produced pump models only; not compatible with EX or ATEX models
*** CE marked when used with the power supply provided by SKC; power supply is UL and cUL Listed for electrical safety*
† Replacing batteries with non-approved battery packs voids any warranty and intrinsic safety approvals.
‡ Li-Ion batteries are subject to special shipping regulations.

Fast Find! Charger Guide

AirChek TOUCH, Essential, or Connect	AirChek 3000	AirChek XR5000	Leland Legacy
			
*Choose charging cradles:** **Standard Cradle** **220-800**  **e-Cradle** *(for use with AirChek TOUCH only)* **220-900** 	 **223-240A**	 **223-241**	 **223-241**
*Choose a power supply:** **Single –** For use with 1 cradle **220-600**  **Multi –** For use with 2 to 5 cradles **220-700** 	 **223-109A**	 **Take Charge 5Δ** **223-441**	 **Take Charge 5Δ** **223-441**
N/A	**N/A**	**N/A**	**N/A**
P75718 (Li-Ion)‡	**P21030**	**P85004A (4-cell Li-Ion)‡ P85002A (2-cell Li-Ion)‡**	**P75692 (Li-Ion)‡**
See cradles and power supplies (above)	**223-330C - U.K. Plug 223-330B - Euro Plug**	**223-241**	**223-241**

‡ *Li-Ion batteries are subject to special shipping regulations.*
* *Cradle and power supply required; each sold separately*
† *Replacing batteries with non-approved battery packs voids any warranty and intrinsic safety approvals.*
Δ *Not CE approved*

About Li-Ion Battery Shipment

Rechargeable lithium-ion batteries for use with SKC sample pumps are subject to special shipping regulations. For more information, see SKC Technical Note 1921 at skcinc.com/instructions/1921.pdf.

ABOUT

Charging NiMH Batteries
Use SKC-approved PowerFlex chargers *(see page 36)* for charging nickel-metal hydride (NiMH) pump batteries. *For more information, go to skcinc.com/instructions/1756.pdf.*

Charging Li-Ion Batteries
SKC Li-Ion pump batteries must be charged using SKC-approved single and 5-station Li-Ion battery chargers *(see left for ordering)*. These chargers provide the smart circuitry required to keep Li-Ion batteries in optimum operating condition. *For more information on the characteristics of Li-Ion batteries, go to skcinc.com/instructions/1918.pdf.*

Tech Tips

- *Li-Ion is a "clean" system and only takes what it can absorb; therefore, Li-Ion batteries do not require the* ***continuous*** *"trickle" charge that other battery chemistries need. SKC Li-Ion battery chargers apply a trickle charge to fully charged batteries* ***only when the charger senses a drop in battery voltage*** *(e.g., self-discharge). Once full battery voltage is restored, the trickle charge shuts off.*
- *Li-Ion battery chargers can be plugged into AC power for extended sampling time.*

More Information
SKC Sample Pump Li-Ion Battery Pack Characteristics and Maintenance at skcinc.com/instructions/1918.pdf
skcinc.com

Single-tube Low Flow Sampling Accessories

Build a **single-tube low flow sampling train** in three easy steps: (1) select a pump, (2) select the pump-specific tube holder, and (3) select a protective tube cover (based on sorbent tube size, *see Sorbent Tube Selection Guide on pages 50-54*). Pocket Pump TOUCH holders are supplied with protective tube covers.

Step 1	Step 2	Step 3	
Pumps	**Tube Holders**	**Tube Covers**	
AirChek 52/Sidekick AirChek XR5000 AirChek TOUCH AirChek Connect AirChek Essential AirLite AirChek 3000	All-in-One Low Flow/Single Adjustable Tube Holder with built-in CPC Cat. No. .....224-27 	**A** (6-mm OD x 70-mm L) Cat. No. .....224-29A **B** (8-mm OD x 110-mm L) Cat. No. .....224-29B **C** (10-mm OD x 150-mm L) Cat. No. .....224-29C **D** (10-mm OD x 220-mm L) Cat. No. .....224-29D *Select desired tube from the Sorbent Tube Selection Guide on pp. 50-54. Match the letter indicated in the Tube Cover column in the Guide to the letter above.* ***See page 39 for specialty tube holders.***	
Universal XR Series	Adjustable Low Flow Tube Holder Cat. No. .....224-26-01 		
Pocket Pump TOUCH	Low Flow Tube Holder with cover (non-adjustable) Cat. No. 222-3-1 (A) *with* **A** (6-mm OD x 70-mm L) 222-3L-1 (B) *with* **B** (8-mm OD x 110-mm L) 222-3XL-1 (C) *with* **C** (10-mm OD x 150-mm L) 222-3XD-1 (D) *with* **D** (10-mm OD x 220-mm L) 		

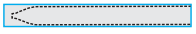
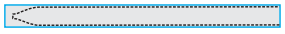
SKC Tube Breaker

The all-in-one SKC Tube Breaker opens glass sorbent tubes cleanly and safely. Constructed of sturdy stainless steel, the SKC Tube Breaker can accommodate 6, 7, 8, and 10-mm OD tubes; there's no need to carry different size breakers. The heavy-duty cap rotates to expose the desired size opener and to retain glass tips to be discarded.

Cat. No. 226-03-055

Multiple-tube Low Flow Sampling Accessories

Build a **multiple-tube low flow sampling train** in four easy steps: (1) select a pump, (2) select the constant pressure controller (if pump requires it), (3) select a tube holder, and (4) select protective tube covers (based on sorbent tube size, *see Sorbent Tube Selection Guide on pages 50-54*).

Step 1	Step 2	Step 3	Step 4	
Pumps	**Constant Pressure Controller (CPC)**	**Adjustable Multiple-tube Low Flow Holders**	**Tube Covers**	
AirChek 52/Sidekick **AirChek XR5000** **AirChek Connect** **AirChek Essential** **AirChek TOUCH** **AirChek 3000**	**CPC** **Cat. No.**.....**224-26-CPC** 	**2 tubes (Dual)** **Cat. No.**.....**224-26-02**  **3 tubes (Tri)** **Cat. No.**.....**224-26-03**  **4 tubes (Quad)** **Cat. No.**.....**224-26-04** 	**A** (6-mm OD x 70-mm L) **Cat. No.**.....**224-29A**  **B** (8-mm OD x 110-mm L) **Cat. No.**.....**224-29B**  **C** (10-mm OD x 150-mm L) **Cat. No.**.....**224-29C**  **D** (10-mm OD x 220-mm L) **Cat. No.**.....**224-29D**  *Select desired tube from the Sorbent Tube Selection Guide on pages 50-54. Match the letter indicated in the Tube Cover column in the Guide to the letter above.* ***See below for specialty tube holders.***	 
Pocket Pump TOUCH **AirLite**	**CPC** **Cat. No.**.....**224-26CPC-10** 			
Universal Series	**None required** (pump has built-in regulator)			

Specialty Tube Holders

For Sorbent Tube Sampling ≥ 1 L/min Without Low Flow Accessories

OVS Tube Holder

The OVS Tube Holder accommodates the 13-mm diameter of SKC OVS Tubes.

OVS Tube Holder includes fitting with durable protective cover, 3 feet of tubing, and collar clip. *Do not use an Adjustable Low Flow Holder*
Cat. No. **224-29V**

Low-volume PUF Tube Holder

The Low-volume PUF Tube Holder accommodates the 22-mm diameter and 100-mm length of SKC Low-volume PUF Tubes.

Low-volume PUF Tube Holder includes fitting with durable protective cover, 3 feet of tubing, and collar clip. *Do not use an Adjustable Low Flow Holder*
Cat. No. **224-29P**

16-mm Diameter Tube Holder

Accommodates the 16-mm diameter of SKC Sorbent Tubes Cat. No. 226-142 and 226-177 *(shown below right)*.

16-mm Diameter Tube Holder includes fitting with durable protective cover, 3 feet of tubing, and collar clip. *Do not use an Adjustable Low Flow Holder*
Cat. No. **224-29H**

NEW High Flow Model

SKC chek-mate® Calibrator

- **Three models available**
  - High Flow: 5 to 30 L/min
  - Medium Flow: 0.50 to 5 L/min
  - Low Flow: 20 to 500 ml/min
- **CalChek capability in medium and high flow models provides direct communication to CalChek-ready pumps for automatic calibration**
- **Certified volumetric accuracy is 1% of reading for ranges of 5 to 30 L/min (high flow), 750 to 5000 ml/min (medium flow), and 50 to 500 ml/min (low flow)**
  - 2.5% accuracy outside of above ranges
- **Built-in sensors adjust for changes in temperature and atmospheric pressure**
- **Certified to a NIST or UKAS national standard in an ISO 17025 calibration laboratory**
  - NIST or UKAS-traceable calibration certificate supplied
- **Sleek design for calibration anywhere, anytime**
  - 7 x 3.3 x 1.3 inches (18 x 8.3 x 3.3 cm)
  - Only 8.3 ounces (236 grams)
  - Compact for handheld use
- **9-volt alkaline battery operation**
  - Auto shut-off feature
- **No moving parts, use in any orientation**
- **Internal filter protects components from dust**

Certifications

CE RoHS

Low flow chek-mate shown with Pocket Pump TOUCH sample pump

Best Practice

Calibrate pump flowmeters annually to a national standard using an ISO 17025-accredited calibration laboratory. *See pages 44-45 or skcinc.com/skccal for details.*

Long barbed fitting securely holds tubing

Moving-average flow reading available continuously on large backlit display

Easy one-button operation

Sleek, lightweight — 8.3 ounces (236 grams)

CalChek®
Automatic Calibration

Fast, Easy, and Accurate

- **No manual adjustments needed**
- **Calibrate at a single flow point or across a range of flows**
- **Document calibration with DataTrac Software and your PC**

The patented* CalChek feature allows direct communication between medium and high flow chek-mate Calibrators and CalChek-ready AirChek TOUCH, AirChek 3000, and Leland Legacy sample pumps. Connect chek-mate directly to the AirChek 3000 or Leland Legacy pump or to a cradle containing an AirChek TOUCH pump, set pump flow, and let CalChek take it from there.

CalChek Communication Cable, *required for automatic calibration of AirChek TOUCH, Airchek 3000, and Leland Legacy sample pumps*

Cat. No. 375-200

** U.S. Patent Nos. 6,227,031 and 6,363,769*

NEED ANNUAL CALIBRATION?

SKC CAL

See pages 44-45 or visit skcinc.com/skccal

Description	Flow Range	Cat. No.
High Flow chek-mate Calibrator with CalChek includes a 9-volt alkaline battery		
with NIST-traceable calibration certificate		375-50300N
with UKAS-traceable calibration certificate	5 to 30 L/min	375-50300
Medium Flow chek-mate Calibrator with CalChek includes a 9-volt alkaline battery		
with NIST-traceable calibration certificate		375-0550N
with UKAS-traceable calibration certificate	0.50 to 5 L/min	375-0550
Low Flow chek-mate Calibrator includes a 9-volt alkaline battery		
with NIST-traceable calibration certificate		375-00205N
with UKAS-traceable calibration certificate	20 to 500 ml/min	375-00205
Accessories		
CalChek Cable, *required for automatic calibration of AirChek TOUCH, AirChek 3000, and Leland Legacy Sample Pumps*		375-200
Pulsation Dampener, for use with Cat. Nos. 375-0550N and 375-0550, *required for CalChek Full Calibration of AirChek TOUCH Sample Pump*		375-100
Calibration Service, NIST, *see pages 44-45 for details*		

Soap Film Flowmeters

SKC offers two models of classic soap film flowmeters:

- **Model 303** provides calibration for low flow pumps typically used for sorbent tube sampling
- **Model 311** provides calibration for higher flow pumps typically used for filter sampling

Both flowmeters are calibrated to within ± 2% of the volumes marked on the flowmeter and are supplied with a certificate of calibration. The smaller Model 303 offers a convenient carry case for easy transport.

Laboratory Film Flowmeter
Cat. No. 311-1000

Description	Meas. Range (ml/min)	Cat. No.
Laboratory Film Flowmeter Kit includes precision glass buret, film solution, operating instructions, adapter for vacuum or pressure, aluminum tripod stand, and calibration certificate	300 to 3000	**311-1000**
Portable Field Flowmeter Kit includes precision glass buret, film solution, operating instructions, carry case, and calibration certificate	5 to 500	**303**
Calibration Accessories		
Film Solution, 1 pint (473 ml)		**302-4011**

Calibration Adapters

Use the guide below to find the calibration adapter or jar required to calibrate your SKC sampler.

For SKC sampler	You need
Disposable PPIs	**Disposable PPI Calibration Adapter** Cat. No. 225-389 
Reusable PPIs GS Cyclones Low Volume PUF Tubes	**Calibration Jar, Standard** Cat. No. 225-111 
Devices up to 8-inch length x 3.25-inch diameter	**Calibration Jar, Large** Cat. No. 225-112 
Aluminum Cyclones (25 and 37 mm)	**Calibration Adapter for Aluminum Cyclone** Cat. No. 225-01-03 
Button Sampler IFV Pro Sampler	**Calibration Adapter for Button Sampler and IFV Pro Sampler** Cat. No. 225-361 

For SKC sampler	You need
IMPACT Sampler	**Calibration Adapter for IMPACT Sampler** Cat. No. 225-394 
IOM Sampler	**IOM Calibration Adapter** Cat. No. 391-01 
PEM Sampler	**PEM Calibration Adapter** Cat. No. 761-202 
PMI Sampler	**PMI Calibration Adapter** Cat. No. 225-358 
BioStage Impactor	**Calibration Adapter for BioStage** Cat. No. P33100 

Economical Field Rotameters

- Easy-to-read scales
- Provisions for panel mounting
- Ball type
- Lightweight, rugged, and portable

Measuring Range (L/min)	Scale (Inches)	Accuracy*	Cat. No.
0.05 to 0.5	2	5%	320-2A05
0.1 to 1†	4	3%	320-4A1
0.4 to 5	4	3%	320-4A5
2 to 20	4	3%	320-4A20L#
4 to 50	4	3%	320-440
3 to 30	4	3%	320-530
3 to 30	4	3%	320-100‡

* *Full scale*
† *Product scale is marked in CCM (cc/min), which is equivalent to ml/min.*
‡ *Fittings adapted for QuickTake 30 sample pump*
\# *Fittings adapted for use with BioLite*

320 Series

Standard Rotameters

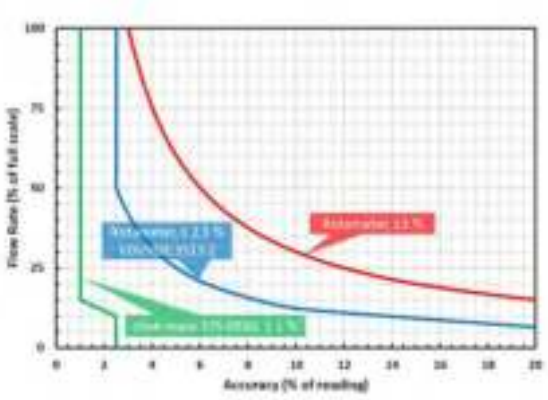
- 100-mm scale
- Steel base plate/stand
- Float type
- NIST certificate available; contact SKC

Measuring Range (L/min)Δ	Scale (mm)	Accuracy	Cat. No.
0.02 to 0.25	100	2.5%	393-002025
0.3 to 3.4	100	2.5%**	393-0334
0.6 to 5	100	2.5%**	393-0650
1 to 13	100	2.5%**	393-1130
2 to 26	100	2.5%**	393-2260
Accessories			
Calidaptor, for hands-free IOM calibration			391-01
Cowled Head Adapter			391-05

** *Full scale-VDI/VDE Standard 3513/2:2008*
Δ *Calibrated at 68 F (20 C) and 1 atmosphere*

393 Series

About Standard and Field Rotameter Accuracy vs. chek-mate Calibrator



See pages 40-41 for chek-mate calibrators and pages 44-45 for calibration/certification services.

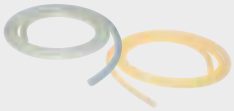
Pneumatic Test Kit

The Pneumatic Test Kit is an all-in-one kit for testing sample pump flow range compensation. The kit includes a rotameter that measures 1 to 5 L/min, a valve, and a magnehelic gauge that reads from 0 to 80 inches water back pressure. Mounted in heavy-duty casing

Cat. No. 224-6580

See pages 44-45

For the chek-mate Calibrator
see pages 40-41



For Tubing
see page 47

SKC CAL Confidence in

Gas flow devices, such as sample pump flowmeters, are only as accurate as their calibration. SKC CAL Service performs and documents calibration for your gas flow devices to maintain the integrity of your air monitoring programs and to stay in compliance with quality management systems.

- **ISO/IEC 17025:2005-accredited laboratory**
- **NIST-traceable standard piston provers and other instruments used in accordance with ISO/IEC 17025:2005**
- **Certified calibration staff**
- **Calibration services and certificate of traceability available for most types of flowmeters**
  - Film flowmeters (bubble burettes)
  - Mass flowmeters
  - Electronic calibrators (e.g., Accuflow, chek-mate, Defender, DC-Lite, Gilibrator, UltraFlo, DigiCal, and others)
- **Choose from two service levels: NIST or ISO**
- **Fast service**
- **Reasonable prices**

PJLA Calibration
Accreditation No. 88818

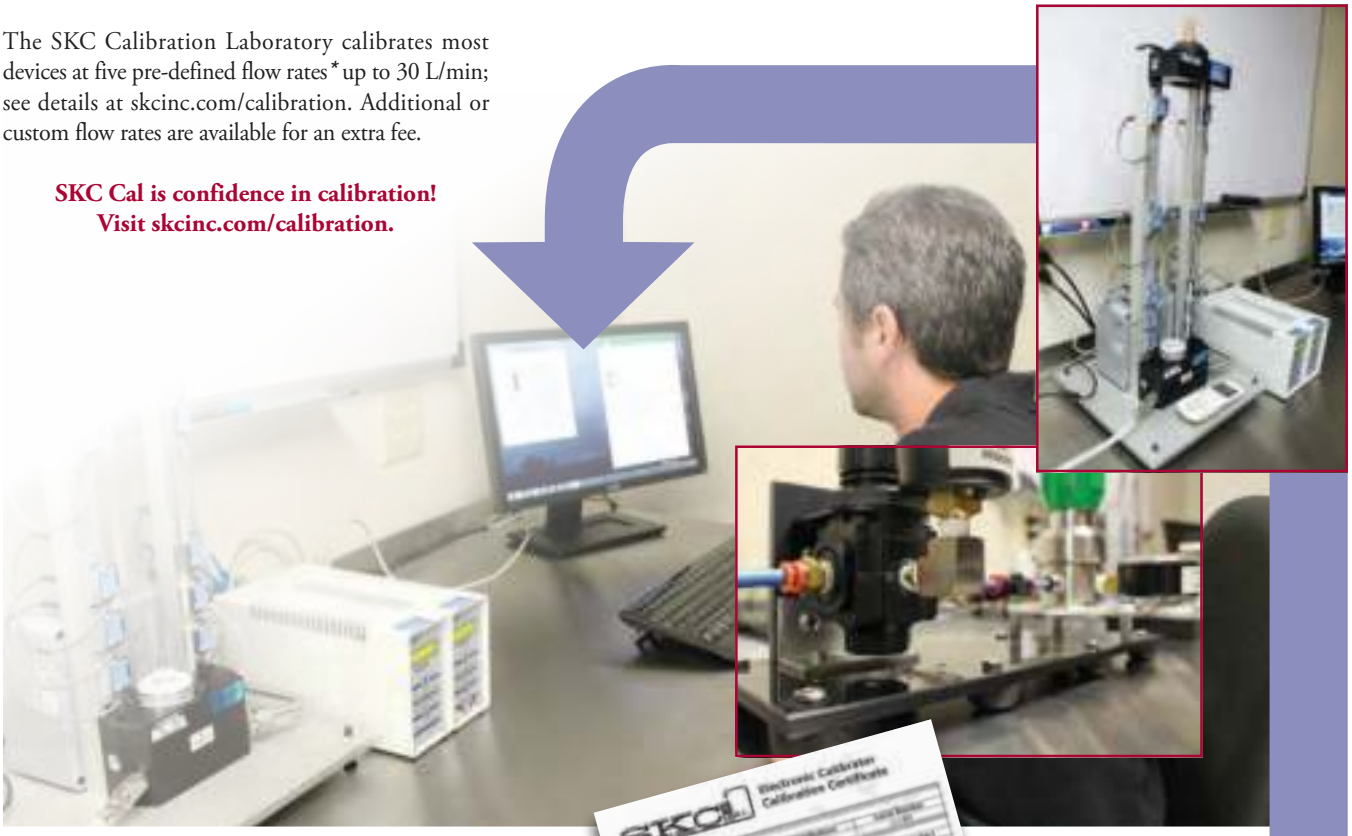
ilac-MRA

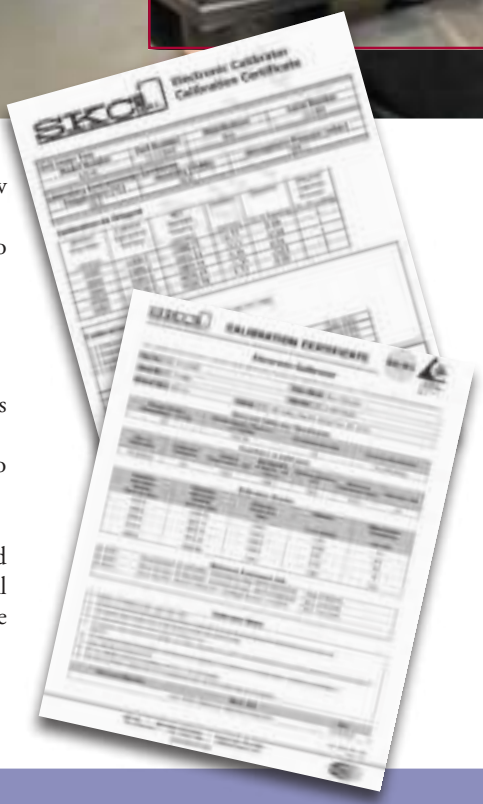
Gas Flow Device Calibration

Calibration of Pump Flowmeters

The SKC Calibration Laboratory calibrates most devices at five pre-defined flow rates* up to 30 L/min; see details at skcinc.com/calibration. Additional or custom flow rates are available for an extra fee.

SKC Cal is confidence in calibration!
Visit skcinc.com/calibration.





Level 1: NIST-traceable Service

Standard calibration of gas flow devices used for pump flow rate measurements. Service includes:

- Device calibration at 5 pre-defined flow rates* to a NIST-traceable standard
- Certificate that includes flow rate deviations

Level 2: ISO/IEC 17025:2005 Service

This premium service is designed for devices used as standards in calibration labs. Service includes:

- Device calibration at 5 pre-defined flow rates* to a NIST-traceable standard
- Certificate that includes flow rate deviations
- Reporting of measurement uncertainty (associated with all testing parameters, including environmental conditions) for each flow rate deviation (not available for Defender 520 and 530 at this time)

* *Dual-ball rotameters comprise two separate internal rotameters; therefore, they are calibrated at 12 flow rates.*

and Certification Services

Soft-sided nylon case Cat. No. 224-903 standard in single pump kits

Protective and noise-reducing pump pouches Cat. Nos. 224-95A, 224-96A, and 224-96C

Noise-reducing pump pouch Cat. No. 224-89

Hard-sided Pelican case Cat. No. 224-901 alternative case for single pump kits

Hard-sided Pelican case Cat. No. 224-905

Hard-sided Pelican case Cat. No. 224-912

Pump Sampling Accessories

Tripod Stand

Sturdy stand telescopes to 5 feet and holds sampling media securely for breathing zone measurements. Ideal for asbestos and bioaerosol sampling. *Stand does not hold a pump.*

Description	Cat. No.
Tripod, for cassette or BioStage Impactor	228-506

Pump Cases and Protective Pouches

Description		Cat. No.
5-pack Pump Kit Carry Cases, Pelican, watertight, airtight, dustproof, and crushproof, equipped with foam for complete equipment protection		
AirChek TOUCH, Connect, or Essential, on wheels for easy transport		224-914
AirChek 3000, AirChek 52/Sidekick, AirLite, or XR5000, on wheels for easy transport		224-907
AirChek 3000, AirChek 52/Sidekick, or XR5000 Deluxe Kit, on wheels for easy transport		224-910
Leland Legacy, on wheels for easy transport		224-905
Pocket Pump TOUCH (Pelican Air)		224-915
Universal XR Series		224-908
Single Pump Kit Carry Cases, for AirChek Series, Pocket Pump TOUCH, and Universal		
Pelican *(shown at left)*		224-901
Nylon with shoulder strap *(shown above left),* also used for 5-station PowerFlex		224-903
Single Pump Kit Carry Case, for Leland Legacy		
Pelican		224-912
Protective Pump Pouches, for personal sampling, designed for personal comfort with adjustable waist belt, and shoulder strap		
Universal XR	**Black**	224-87
	Red *(shown above left)*	224-95A
AirChek 3000, 52/Sidekick, or XR5000‡	**Black**	224-88
	Red *(shown above left)*	224-96A
AirLite	**Black, with belt loop (no shoulder or waist strap)**	224-902
AirChek TOUCH, Connect, or Essential	**Black**	224-912
Noise-reducing Pump Pouches, reduce noise level from 62.5 to 55 dBA*		
AirChek 3000, XR5000 (4-cell), or 52/Sidekick	**Black *(shown above left)***	224-96C
XR5000 (2-cell)	**Black**	224-913
Leland Legacy, reduces noise level from 62.5 to 52 dBΔ	**Black**	224-89
Waist Belt, extends up to 48 inches		224-12

‡ *High-power Li-Ion model only*

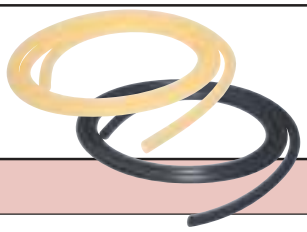
* *Measured at 39 inches (1 meter) from an AirChek 52 pump running at 2 L/min with 37-mm, 0.8-µm MCE cassette*

Δ *Measured at 39 inches (1 meter) from a Leland Legacy pump operating at 10 L/min without media*

Tubing for Air Sampling

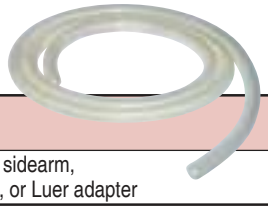
Tygon

Description	Applications	Diameter Inches (mm) ID	Diameter Inches (mm) OD	Cat. No.	Length in Feet (meters)
Tygon	Sampling trains	3/16 (4.76)	5/16 (7.94)	**225-1346**	**10 (3)**
Tygon	Sampling trains; fits over impinger sidearm, impinger inlet, filter cassette outlet, or Luer adapter	1/4 (6.35)	3/8 (9.53)	**225-13-4A** **225-13-4** **225-1345**	**3.3 (1)** **10 (3)** **50 (15.2)**
Tygon	Sampling trains; for calibrating QuickTake pumps	3/8 (9.53)	1/2 (12.7)	**225-1351** **225-1352**	**10 (3)** **50 (15.2)**
Tygon	For calibrating DPS and DCS	5/16 (7.94)	9/16 (14.29)	**225-1349**	**10 (3)**



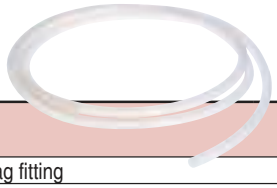
Latex Rubber

Description	Applications	Diameter Inches (mm) ID	Diameter Inches (mm) OD	Cat. No.	Length in Feet (meters)
Latex Rubber, black	Sampling trains	3/16 (4.76)	5/16 (7.94)	**226-03-003**	**12 (3.7)**
Latex Rubber, black	Sampling trains; fits over impinger sidearm, impinger inlet, filter cassette outlet, or Luer adapter	1/4 (6.35)	3/8 (9.53)	**226-03-004**	**12 (3.7)**
Latex Rubber, amber	Sampling trains; fits over impinger sidearm, impinger inlet, filter cassette outlet, or Luer adapter	1/4 (6.35)	3/8 (9.53)	**225-1347**	**10 (3)**



Polyurethane

Description	Applications	Diameter Inches (mm) ID	Diameter Inches (mm) OD	Cat. No.	Length in Feet (meters)
Polyurethane, reinforced to prevent kinking	Sampling trains; fits over impinger sidearm, impinger inlet, filter cassette outlet, or Luer adapter	1/4 (6.35)	15/32 (11.9)	**225-1350**	**10 (3)**



PTFE†

Description	Applications	Diameter Inches (mm) ID	Diameter Inches (mm) OD	Cat. No.	Length in Feet (meters)
PTFE	Inert for bag sampling; fits over bag fitting	3/16 (4.76)	1/4 (6.35)	**231-9-23**	**10 (3)**
PTFE	Inert for bag sampling; fits inside bag fitting	1/16 (1.59)	1/8 (3.18)	**231-9-21**	**10 (3)**
PTFE	Inert for bag sampling; fits Vac-U-Chamber sample inlet	1/4 (6.35)	5/16 (7.94)	**231-937** **231-924**	**10 (3)** **50 (15.2)**

† *PTFE tubing is not suitable for particulate sampling because static effect can cause sample loss in the tubing.*

Tubing Accessories

Tubing Accessories	Cat. No.	Qty.
PVC Adapters, Luer taper connects to 1/4-inch ID tubing	**225-13-2** **225-132A**	**10** **250**
Spring Tubing Support, for use with 5/16-inch OD flexible tubing to prevent kinking	**225-1348**	**5**
Tubing, Collar Clip, and Cable Ties	**225-13-8**	**ea**
Collar Clip and Cable Ties only	**225-13-6**	**10**

SKC Quality Sorbent Tubes

SKC was the first to bring the NIOSH sorbent tube design to the commercial market over 45 years ago.

SKC leads in sorbent tube research to make quality sorbent tubes available for protecting workers and public health.

Over 100 SKC Sorbent Tubes are available for standard and specialty applications. SKC also manufactures custom sorbent tubes to your specifications.

Look for the SKC name when choosing sorbent tubes. SKC brings to you over 45 years of expertise, the support of experienced scientists, low-background sorbents, quality manufacturing, QC data online, repeatable performance, and accurate sampling.

SKC Sorbent Tubes — made for NIOSH, OSHA, EPA, ASTM, and HSE methods.

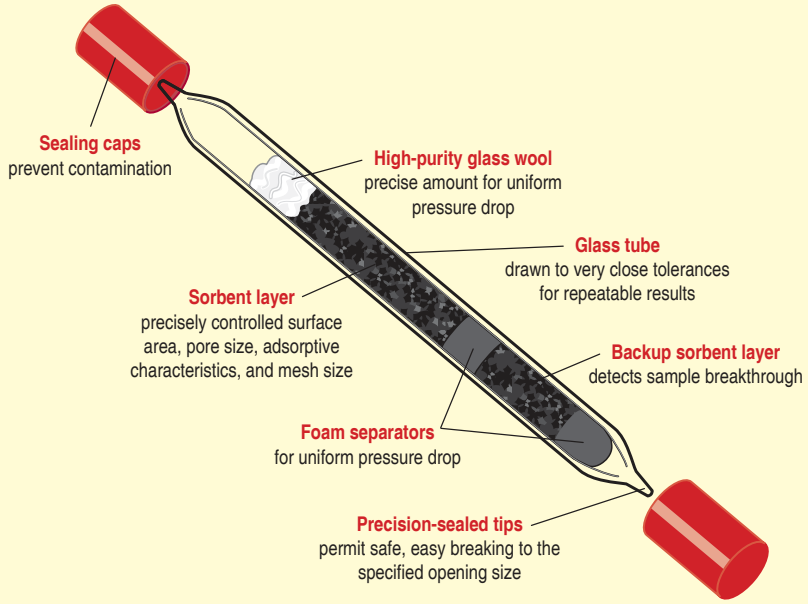
See the **SKC** story

skcinc.com

SKC Quality Sorbent Tubes

First and Still the Best Since 1973

- **Meet NIOSH, OSHA, ASTM, EPA, and HSE specifications**
  - Your single source for U.S. and UK methods
- **Made with high-quality, low-background sorbents**
- **SKC thorough quality control ensures sorbents and tubes meet high standards**
  - Accurate sorbent weights
  - Consistent method-specified mesh size and separators
  - Uniform back pressure
  - Accurate, repeatable results
- **Large batch production of Anasorb® CSC Lot 2000 charcoal to ensure availability for many years**
- **Validation of reliability**
  - Specified in OSHA, NIOSH, ASTM, EPA, and HSE methods
  - Used by health and safety professionals around the world for compliance and consulting
- **Sorbent background certification available online** *(see below)*
- **Technical support from scientists**
- **Hundreds of sorbent tubes for standard and specialty applications delivered quickly from stock**



Seeing is Believing!

Sorbent background certificates are available.
Visit skcinc.com/certificates.

Anasorb

A Trademark of Quality

In 1973, SKC made the first commercial sorbent tube. Since then, SKC has led advancements in sorbent tube technology. To more easily identify SKC proprietary sorbents in air sampling methods, the registered trademark "Anasorb" is used for SKC proprietary sorbents of all types.

Sorbent Equivalencies

Anasorb	Equivalent Sorbent
708	Chromosorb 108
727	Chromosorb 106
C300	Hydrar, Carulite
CSC	None
747	None
GCB1	Carbotrap B (20/40) Carbopack B (60/80)
GCB2	Carbotrap C (20/40) Carbopack C (60/80)

For Sample Pumps
see pages 7-29

Attention history buffs!
Enjoy our narrated History of Sorbent Tube Sampling PowerPoint presentation.

V Video | P PowerPoint | W Webinar | S Sampling Solution

Visit skcinc.com/Training

Sorbent Tube Selection Guide

To select a tube for a specific compound, refer to the SKC Sampling Guide on catalog pages 174-243 or search the online Sampling Guides at skcinc.com for methods and required sorbent tubes.

Cat. No.	Sorbent *(treatment)*	Size (mm) OD x L	Sections	Sorbent (mg)	Ends	Separators	Tube Cover	Qty.
226-01 226-01A 226-01-BULK	Anasorb CSC, Coconut Charcoal Anasorb CSC, Coconut Charcoal Anasorb CSC, Coconut Charcoal	6 x 70 6 x 70 6 x 70	2 2 2	100/50 100/50 100/50	GS GS GS	F F W F F W F F W	A A A	50 10 1000
226-01GWS	Anasorb CSC, Coconut Charcoal	6 x 70	2	100/50	GS	W W W	A	50
226-09 226-09-BULK	Anasorb CSC, Coconut Charcoal Anasorb CSC, Coconut Charcoal	8 x 110 8 x 110	2 2	400/200 400/200	GS GS	F W W F W W	B B	50 1000
226-09-02	Anasorb CSC, Coconut Charcoal	8 x 150	3	350/350/350	GS	W W W W	C	50
226-10	Silica Gel	6 x 70	2	150/75	GS	F W W	A	50
226-10-03	Silica Gel *(specially cleaned)*	7 x 110	2	400/200	GS	W W G W	B	50
226-10-04	Silica Gel	8 x 110	2	300/150	GS	W W W	B	50
226-10-06	Silica Gel *(sulfuric acid)*	6 x 70	2	200/100	GS	W W W	A	50
226-15	Silica Gel	8 x 110	2	520/260	GS	F W W	B	50
226-15GWS	Silica Gel	8 x 110	2	520/260	GS	W W W	B	50
226-16	Anasorb CSC, Coconut Charcoal	10 x 110	2	800/200	GS	F W W	C	50
226-16-02	Anasorb CSC, Coconut Charcoal	10 x 160	2	1800/200	GS	F W W	D	50
226-17-1A	Anasorb C300†	6 x 70	1	200	GS	W W	A	50
226-17-3A	Anasorb C300†	8 x 110	1	500	GS	W W	B	50
226-22	Silica Gel	10 x 110	2	1040/260	GS	F W W	C	50
226-23	XAD-2 *(octanoic acid)*	6 x 70	2	100/50	GS	W W W	A	50
226-25	Anasorb CSC, Coconut Charcoal Anasorb CSC, Coconut Charcoal	8 x 110 8 x 110	1 1	400 200	GS	W W W W	D	50 sets
226-27	XAD-2 *(2-hydroxymethyl piperidine)*	8 x 110	2	450/225	GS	W W W	B	20
226-29	Anasorb 747 *(sulfuric acid)*	8 x 110	2	500/250	GS	W W W	B	50
226-30	XAD-2	7 x 70	2	80/40	GS	W W W	B	50
226-3002A	XAD-2 XAD-2	10 x 110 10 x 110	1 1	600 300	GS	W W W W	D	10 sets
226-30-03	XAD-2	8 x 110	2	100/30	GS	W W W	B	50
226-30-04	XAD-2	8 x 110	2	100/50	GS	W W W	B	50
226-30-05	XAD-2	8 x 110	2	150/75	GS	W W W	B	50
226-30-06	XAD-2	8 x 110	2	400/200	GS	W W W	B	50
226-30-07	XAD-2 *(p-anisidine)*	8 x 110	2	100/50	GS	W W W	B	20
226-30-08	Anasorb 708	6 x 70	1	100	GS	W W	A	50
226-30-16*(OVS) 226-30-16A*(OVS)	XAD-2/Glass Fiber filter XAD-2/Glass Fiber filter	13→8 x 75 13→8 x 75	2 2	270/140 270/140	GO GO	F F G T F F G T	V V	10 50
226-30-18	XAD-2 *(naphthylisothiocyanate)*	6 x 70	2	80/40	GS	W W W	A	50
226-35	Tenax TA	6 x 70	2	30/15	GS	F W W	A	50
226-35-01	Tenax TA	6 x 70	2	20/10	GO	W W W	A	50
226-35-03	Tenax TA	8 x 110	2	100/50	GS	W W W	B	50
226-35031	Tenax TA	8 x 110	2	100/50	GS	W W W	B	10

* *Limited shelf-life; contact SKC for more information* † *Anasorb C300 is equivalent to Hydrar and Carulite.*

TUBE ENDS: GS: *Glass Sealed* ***GO:*** *Glass Open*
SEPARATORS: W: *Glass Wool* ***G:*** *Glass Fiber Filter* ***F:*** *Foam* ***T:*** *PTFE Ring*

For compliance sampling, use tubes as specified in a validated sampling method. It is the user's responsibility, employing a suitable method, to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before use. The user should adjust the sampling parameters for specific conditions and evaluate tubes under conditions of use to ensure that the desired results will be obtained.

the SKC Advantage!

- **Over 45 years of proven performance!** Produced the first commercial sorbent tube
- **Validation and reliability** SKC tubes are specified and used by OSHA, NIOSH, EPA, ASTM, and HSE, and health and safety professionals around the globe for compliance and consulting.
- **High-quality, low-background sorbents**
- **Consistent method-specified mesh size and separators** maintain uniform back pressure and breakthrough volumes.
- **Large batch production** Anasorb CSC Lot 2000 charcoal will be available for many years.
- **Sorbent background certification available online**
- **Backup sorbent layer** for breakthrough indication
- **Technical backup** SKC technical experts provide fast, accurate answers to your questions.
- **Easy-off "hat" caps on specialty tubes**

For tube holders and accessories see pages 38-39

Sorbent Tube Selection Guide

To select a tube for a specific compound, refer to the SKC Sampling Guide on catalog pages 174-243 or search the online Sampling Guides at skcinc.com for methods and required sorbent tubes.

Cat. No.	Sorbent *(treatment)*	Size (mm) OD x L	Sections	Sorbent (mg)	Ends	Separators	Tube Cover	Qty.
226-36	JXC Charcoal	8 x 150	2	630/315	GS	F W W	C	50
226-37	Anasorb CSC, Coconut Charcoal Anasorb CSC, Coconut Charcoal	8 x 110 8 x 110	1 1	400 200	GS	F W F W	D	50 sets
226-39	Florisil	6 x 70	2	100/50	GS	W W W	A	50
226-39-02	Florisil	8 x 110	2	400/200	GS	W W W	B	50
226-40A	Molecular Sieve *(triethanolamine)* Oxidizer Molecular Sieve *(triethanolamine)*	7 x 70 7 x 110 7 x 70	1 1 1	400 400 600	GS GS GS	W W W W W W	D	10 sets
226-40-02	Molecular Sieve *(triethanolamine)*	7 x 110	2	400/200	GS	W W W	B	50
226-42	Silica Gel *(sulfuric acid)*	8 x 110	2	200/200	GS	W W W	B	50
226-42-02	Firebrick (gas chrom-R) *(sulfuric acid)*	7 x 70	1	300	GS	W W	B	50
226-44	Drying Tube	6 x 70	1	250	GS	W W	—	50
226-44-02	Drying Tube	10 x 160	1	900	GS	W W	—	50
226-47-01	Silica Gel	6 x 70	2	100/50	GS	W W W	A	50
226-48	Silica Gel	7 x 110	2	150/150	GS	W W W	B	50
226-49-102	Chromosorb 102	6 x 70	2	66/33	GS	W W W	A	50
226-49-106	Chromosorb 106	6 x 70	2	75/37	GS	W W W	A	50
226-49-108	Anasorb 708	6 x 70	2	75/37	GS	W W W	A	50
226-51	Silica Gel	6 x 70	2	100/50	GS	F W W	A	50
226-53	Silica Gel *(sulfuric acid)*	6 x 70	2	150/75	GS	W W W	A	50
226-54	XAD-2 *(2-hydroxymethyl piperidine)*	6 x 70	2	45/23	GS	W W W	A	20
226-55	Silica Gel *(sodium hydroxide)*	7 x 70	2	150/75	GS	W W W	B	20
226-56 (OVS)	Tenax TA/Glass Fiber filter	13→8 x 75	2	140/70	GO	F F G T	V	10
226-57 (OVS)	XAD-7/Glass Fiber filter	13→8 x 75	2	200/100	GO	F F G T	V	10
226-57A (OVS)	XAD-7/Glass Fiber filter	13→8 x 75	2	200/100	GO	F F G T	V	50
226-58* (OVS)	XAD-2/Quartz filter	13→8 x 75	2	270/140	GO	F F Q T	V	10
226-58A* (OVS)	XAD-2/Quartz filter	13→8 x 75	2	270/140	GO	F F Q T	V	50
226-59-03	Porapak-Q	6 x 70	2	78/39	GS	W W W	A	50
226-61	Silica Gel/Charcoal *(charcoal treated with sodium hydroxide)*	10 x 210	3	750/1250/250	GS	W W R W	D	50
226-67	Anasorb CSC, Coconut Charcoal *(potassium hydroxide)*	6 x 70	2	100/50	GS	W R W W	A	50
226-68	JXC Charcoal, Drierite *(hydroquinone)*	8→6 x 160	3	1600/160/110	GS	W W W W	D	20
226-70A	Silica Gel *(p-methoxyphenol)*	8 x 150	2	1200/600	GS	W W W	C	10
226-73	Anasorb CSC, Coconut Charcoal *(t-butylcatechol)*	6 x 70	2	100/50	GS	W W W	A	50
226-75	Anasorb 727¥	8 x 110	2	300/150	GS	W W W	B	20
226-80	Anasorb 747 *(potassium hydroxide)*	6 x 70	2	100/50	GS	F W W	A	50
226-81A	Anasorb 747	6 x 70	2	140/70	GS	F W W	A	20

Save

Save

* *Limited shelf-life; contact SKC for more information* ¥ *Anasorb 727 is equivalent to Chromosorb 106.*

TUBE ENDS: GS: *Glass Sealed* ***GO:*** *Glass Open*
SEPARATORS: W: *Glass Wool* ***G:*** *Glass Fiber Filter* ***F:*** *Foam* ***T:*** *PTFE Ring* ***Q:*** *Quartz Filter* ***R:*** *Glass Spacer*

For compliance sampling, use tubes as specified in a validated sampling method. It is the user's responsibility, employing a suitable method, to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before use. The user should adjust the sampling parameters for specific conditions and evaluate tubes under conditions of use to ensure that the desired results will be obtained.

New Options in NO/NO_2 Sampling

Cat. No. 226-40, the standard in OSHA Method ID-190 and NIOSH 6014, is now Cat. No. 226-40A! This new three-tube sampling train contains a new oxidizer developed and validated by SKC to replace the discontinued original oxidizer *(see left)*. Even more exciting is the **availability of the three sorbent sections in a single 10 x 110-mm glass tube.** The single tube option is available as Cat. No. 226-182 *(see page 53). See the validation report at skcinc.com.*

For Sample Pumps
see pages 7-29

Sorbent Tube Selection Guide

To select a tube for a specific compound, refer to the SKC Sampling Guide on catalog pages 174-243 or search the online Sampling Guides at skcinc.com for methods and required sorbent tubes.

Cat. No.	Sorbent *(treatment)*	Size (mm) OD x L	Sections	Sorbent (mg)	Ends	Separators	Tube Cover	Qty.
226-82	Anasorb 747 Anasorb 747	8 x 110 8 x 110	1 1	400 200	GS	F W F W	D	20 sets
226-83	Anasorb 747	8 x 110	2	400/200	GS	F W W	B	50
226-84	Anasorb 747	10 x 110	2	800/200	GS	F W W	C	20
226-92	Polyurethane Foam (PUF)	22 x 100	1	76 mm	GO	—	P	ea
226-93	XAD-4	7 x 70	2	80/40	GS	W W W	B	50
226-94	XAD-7	6 x 70	2	60/30	GS	W W W	A	50
226-95	XAD-7	6 x 110	2	100/50	GS	W W W	B	50
226-96	XAD-7 *([NBD] chloride)*	8 x 110	2	100/50	GS	W W W	B	50
226-97	XAD-7 *(specially cleaned)* XAD-7 (2 tubes)	8 x 110 8 x 110 (2)	1 1	175 175 (2)	GS	W G W W W	—	20 sets
226-98	XAD-7 *(phosphoric acid)*	6 x 70	2	80/40	GS	W W W	A	50
226-99 (OVS)	Silica Gel/Glass Fiber filter	13→8 x 75	2	520/260	GO	F F G T	V	10
226-106A	Chromosorb 102	8 x 110	2	200/100	GS	W W W	B	20
226-107	Chromosorb 102	8 x 110	2	100/50	GS	W W W	B	50
226-110	Chromosorb 106	7 x 70	2	100/50	GS	W W W	B	50
226-111A	Chromosorb 106	10 x 150	2	600/300	GS	W W W	C	10
226-114	Porapak-P	6 x 110	2	100/50	GS	F W W	B	50
226-115	Porapak-Q	6 x 110	2	150/75	GS	W W W	B	50
226-116A	Porapak-T Porapak-T	6 x 40 6 x 40	1 1	75 25	GO	W W W W	B	10 sets
226-117	XAD-2 *(2-hydroxymethyl piperidine)*	6 x 110	2	150/75	GS	W W W	B	20
226-118	XAD-2 *(2-hydroxymethyl piperidine)*	6 x 110	2	120/60	GS	W W W	B	20
226-119 226-119A 226-119-7	High-purity Silica Gel with low background *(2,4-dinitrophenylhydrazine)*	6 x 110 6 x 110 7 x 110	2 2 2	300/150 300/150 300/150	GS GS GS	W W W W W W W W W	B B B	20 100 20
226-120	High-purity Silica Gel with low background *(2,4-dinitrophenylhydrazine)* with built-in ozone scrubber	8 x 115	3	1500/300/150	GS	W W W W	D	20

TUBE ENDS: ***GS:*** *Glass Sealed* ***GO:*** *Glass Open*
SEPARATORS: ***W:*** *Glass Wool* ***G:*** *Glass Fiber Filter* ***F:*** *Foam* ***T:*** *PTFE Ring*

For compliance sampling, use tubes as specified in a validated sampling method. It is the user's responsibility, employing a suitable method, to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before use. The user should adjust the sampling parameters for specific conditions and evaluate tubes under conditions of use to ensure that the desired results will be obtained.

Tech Tips

- *Breakthrough is indicated when there is ≥ 25% contamination in the backup layer of sorbent. It can also mean the sorbent tube was inserted into the tube holder in the wrong direction. Always insert the tube into the holder with the arrow on the tube pointing toward the tube holder. If no arrow is printed on the tube, insert the end of the tube with the smallest sorbent section (backup section) into the tube holder.*

- **Q:** ***Is it possible to increase the flow rate of a method to lower the detection limit?***
  A: *NIOSH recommends not exceeding the method-stated maximum flow rate. Instead, sample for a longer period and monitor closely for breakthrough.*

V Video | P PowerPoint | W Webinar | S Sampling Solution
Visit skcinc.com/Training

Sorbent Tube Selection Guide

To select a tube for a specific compound, refer to the SKC Sampling Guide on catalog pages 174-243 or search the online Sampling Guides at skcinc.com for methods and required sorbent tubes.

Cat. No.	Sorbent *(treatment)*	Size (mm) OD x L	Sections	Sorbent (mg)	Ends	Separators	Tube Cover	Qty.
226-124	PUF/Tenax TA/PUF	22 x 100	3	3 cm/750 mg/ 3 cm	GO	—	P	**ea**
226-126	PUF/Glass Fiber filter	22 x 100	1	76 mm	GO	F S G N	P	**ea**
226-129	PUF/XAD-2/PUF	65 x 125	3	50 mm/10 gm/ 25 mm	GO	—	—	**ea**
226-131	PUF	65 x 125	1	75 mm	GO	—	—	**ea**
226-134	Tenax TA	16 x 125	1	1.6 gm	GO	W W	—	**ea**
226-142	Carbon Beads/PTFE filter *(carbon beads treated with potassium hydroxide)*	16→8 x 85	2	100/50	GO	W W W T T	H	**5**
226-143	PUF/XAD-2/PUF	22 x 100	3	3 cm/1500 mg/ 3 cm	GO	—	P	**ea**
226-153	XAD-2 *(di-n-butylamine)*	8 x 110	2	400/200	GS	W W W	B	**20**
226-165A	Silica Gel *(mercuric cyanide)*	6 x 110	2	300/150	GS	W W W	B	**20**
226-170	XAD-4	6 x 70	1	120	GS	W W	A	**20**
226-175	XAD-4	8 x 150	2	400/200	GS	W W W	C	**20**
226-176	Silica Gel *(hydrochloric acid)*	10 x 150	3	700/150/150	GS	W W W W	C	**20**
226-177*	Silica Gel *(silver nitrate)*/Glass Fiber filter *(sodium carbonate/glycerol)*	16→8 x 85	2	200/200	GO	T T T W W	H	**5**
226-178	Anasorb 747 *(hydrobromic acid)*	6 x 70	2	100/50	GS	W W W	A	**20**
226-182 **226-182A**	Molecular Sieve *(triethanolamine)* and oxidizer	10 x 110	3	400/800/400	GS	W W W W	C	**50** **10**
226-183	Silica Gel *(specially washed and baked)/Glass Fiber filter*	7 x 110 7 x 110	1 1	600 600	GS	W G W W G W	D	**20 sets**
226-184	Chromosorb 106/ Chromosorb 106/ Sodium Sulfate	8 x 150	3	150/300/1000	GS	W W W W	D	**50**

* *Limited shelf-life; contact SKC for more information*

TUBE ENDS: GS: *Glass Sealed* ***GO:*** *Glass Open*
SEPARATORS: W: *Glass Wool* ***G:*** *Glass Fiber Filter* ***F:*** *Foam* ***T:*** *PTFE Ring* ***S:*** *Screen* ***N:*** *Nylon Ring*

For compliance sampling, use tubes as specified in a validated sampling method. It is the user's responsibility, employing a suitable method, to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before use. The user should adjust the sampling parameters for specific conditions and evaluate tubes under conditions of use to ensure that the desired results will be obtained.

SKC Bulk Sorbents for Laboratory QA/QC Requirements

- *Undergo extensive cleaning procedures to ensure low backgrounds*
- *Meet stringent specifications for environmental applications*

Sorbent	Mesh Size	Amount (grams)	Cat. No.
Anasorb 747	20/40	100	**P226200**
Anasorb C300	20/40	100	**P226171**
Anasorb CSC	20/40	100	**P2260101**
Anasorb GCB1	20/40	10	**P226128**
	60/80	10	**P226132**
Anasorb GCB2	20/40	10	**P226127**
Anasorb JXC	20/40	100	**P2263601**
Silica Gel	20/40	100	**P22610**
Tenax GR	20/35	10	**P226124**
Tenax TA	35/60	10	**P226125**
	20/35	10	**P226126**
XAD-2	20/60	100	**P226201**

Best Practice

▶ Maintain the sorbent tube in a vertical position when sampling. This position will prevent sorbent from falling away from the tube wall and creating a small channel through which air would pass without contaminants adsorbing onto the sorbent.

16-mm Diameter Tube Holder

Accommodates the 16-mm diameter of SKC Sorbent Tubes Cat. Nos. 226-142 and 226-177

16-mm Diameter Tube Holder includes fitting with durable protective cover, 3 feet of tubing, and collar clip. *Do not use an Adjustable Low Flow Holder*
Cat. No. 224-29H

For Sample Pumps
see pages 7-29

Sorbent Tube Selection Guide

To select a tube for a specific compound, refer to the SKC Sampling Guide on catalog pages 174-243 or search the online Sampling Guides at skcinc.com for methods and required sorbent tubes.

Cat. No.	Sorbent *(treatment)*	Size (mm) OD x L	Sections	Sorbent (mg)	Ends	Separators	Tube Cover	Qty.
226-186	Oxidizer	7 x 110	1	800	GS	W W	B	**20**
226-188	Silica Gel *(2,4-dinitrophenylhydrazine)*	10 x 110	2	800/200	GS	W W W	C	**20**
226-191	Silica Gel *(o-phenylenediamine)*	8 x 110	2	520/260	GS	W W W	B	**50**
226-192	XAD-2/XAD-2/Anasorb CSC	8 x 110	3	50/100/150	GS	W W W W	B	**50**
226-193-UC	Silica Gel *(MTSO)*	7 x 110	1	800	GS	W W	B	**20**
226-196	Anasorb CSC, Coconut Charcoal *(t-butylcatechol)*	8 x 110	2	400/200	GS	W W W	B	**20**
226-199-UC	Silica Gel *(MTSO)*	8 x 110	2	800/200	GS	W G W	B	**20**
226-210	Soda Lime	7 x 110	2	600/200	GS	W W W	B	**50**
226-211	XAD-7	8 x 110	2	175/175	GS	W W W	B	**20**
226-213	XAD-2 *(p-anisidine)*	8 x 110	2	200/100	GS	W W W	B	**20**
226-214	XAD-2 *(naphthylisocyanate)*	8 x 110	2	200/100	GS	W W W	B	**20**
226-330‡∞	Anasorb GCB2/GCB1/Carbosieve S-III	6 x 115	3	250/150/100	GO	W W W W	N/A	**ea**
226-339‡§∞	Tenax TA	1/4 x 3-1/2 in	1	100	GO	W W	N/A	**ea**
226-340‡§∞	Tenax TA	1/4 x 3-1/2 in	1	100	SS	S W W S	N/A	**ea**
226-341‡§∞	Carbosieve S-III	1/4 x 3-1/2 in	1	100	SS	S W W S	N/A	**ea**
226-345‡§∞	Tenax GR/Anasorb GCB1	1/4 x 3-1/2 in	2	125/120	GO	W W W	N/A	**ea**
226-346‡§∞	Anasorb GCB1/Carbosieve S-III	1/4 x 3-1/2 in	2	175/80	GO	W W W	N/A	**ea**
226-347‡§∞	Anasorb GCB2/GCB1/Carbosieve S-III	1/4 x 3-1/2 in	3	120/125/105	GO	W W W W	N/A	**ea**
226-348‡§∞	Tenax GR/Anasorb GCB1	1/4 x 3-1/2 in	2	175/150	SS	O S W S O	N/A	**ea**
226-349‡§∞	Anasorb GCB1/Carbosieve S-III	1/4 x 3-1/2 in	2	280/165	SS	S W S	N/A	**ea**
226-350‡§∞	Anasorb GCB2/GCB1/Carbosieve S-III	1/4 x 3-1/2 in	3	210/140/165	SS	S W W W S	N/A	**ea**
226-356‡§∞	Anasorb GCB1	1/4 x 3-1/2 in	1	400	SS	S W W S	N/A	**ea**
226-357‡§∞	Tenax TA	1/4 x 3-1/2 in	1	250	SS	S W W S	N/A	**ea**
226-358‡§∞	Chromosorb 106	1/4 x 3-1/2 in	1	350	SS	S W W S	N/A	**ea**
226-360‡§∞	Tenax TA	1/4 x 3-1/2 in	1	250	GO	W W	N/A	**ea**
226-363‡§∞	Carbopack X	1/4 x 3-1/2 in	1	400	SS	S W W S	N/A	**ea**

‡ *Tubes are chemically conditioned before shipping; use within 6 months or recondition, restocking fee applies.* ∞ *Available unconditioned, see page 59*
§ *Each tube has a flow direction arrow and unique number.*

TUBE ENDS: GS: *Glass Sealed* ***GO:*** *Glass Open* ***SS:*** *Stainless Steel Open*
SEPARATORS: W: *Glass Wool* ***G:*** *Glass Fiber Filter* ***S:*** *Screen* ***O:*** *Other*

For compliance sampling, use tubes as specified in a validated sampling method. It is the user's responsibility, employing a suitable method, to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before use. The user should adjust the sampling parameters for specific conditions and evaluate tubes under conditions of use to ensure that the desired results will be obtained.

Good Practice

Store and prepare sampling media in solvent-free environments.

Tube Breakers

Description	Cat. No.
Tube Breaker, stainless steel, for 6, 7, 8, and 10-mm OD tubes 	226-03-055
Tube Scorer/ Breaker, for 6-mm OD tubes; scores and breaks end tips off glass tubes, leaving a clean, smooth opening 	800-01200

For Thermal Desorption Tubes conditioned by SKC or your lab
see page 59

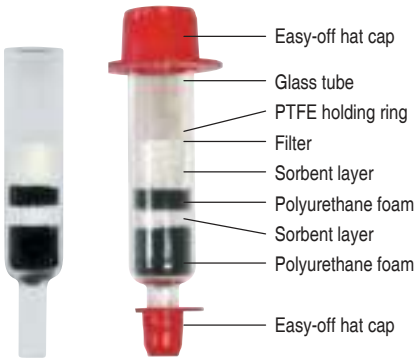
SKC IFV Pro Sampler for Mixed-phase Contaminants

ACGIH has assigned a TLV with the Inhalable Fraction and Vapor (IFV) designation to over 50 compounds that can be found in mixed phases including pesticides, diesel fuel, cresol, and maleic anhydride. The SKC IFV Pro Sampler features an IOM-style inlet for collection of the inhalable fraction onto 25-mm filters and uses sorbent tubes for collection of the vapor phase at a flow rate of 1 L/min. *See page 127 for more information.*

OSHA Versatile Sampler (OVS) Tubes

For Sampling Pesticides, Explosives, and Glycols

- Sorbent and filter combined in one tube to meet NIOSH and OSHA method specifications
- Collect aerosols and vapors simultaneously
- Low backgrounds ensure sample reliability
- Available with a variety of sorbents
- Easy-off hat caps



OSHA designed OSHA Versatile Sampler (OVS) Tubes to overcome the inconveniences of earlier methods. OVS Tubes contain a filter to trap aerosols and a two-section sorbent bed to adsorb vapors in one specially constructed glass tube. Only cleaned and verified materials are used in OVS Tubes to ensure low background interference. A flow rate of 1 L/min provided by a personal sample pump is typically used to obtain volumes ranging from 60 to 480 liters. Samples are solvent extracted and analyzed by GC or HPLC with detector.

For mixed-phase sampling using a true inhalable sampler that meets ISO 7708/CEN, see IFV Pro at right.

Application — Method	Sorbent (mg)	Filter	Cat. No.	Qty.
Pesticides — OSHA 62, 63, 67, 70, 74, OSHA CSI	XAD-2 (270/140)	Glass Fiber	**226-30-16**	**10**
Organotin Compounds* — OSHA CSI			**226-30-16A**	**50**
Pesticides, organophosphorus — NIOSH 5600, 5601, 5602	XAD-2 (270/140)	Quartz Fiber	**226-58**	**10**
			226-58A	**50**
Explosives (trinitrotoluene [TNT] and dinitrotoluene [DNT]) — OSHA 44 **Phthalate Esters —** OSHA 104 **Acrylates and Benzophenone —** Non-agency method†	Tenax TA (140/70)	Glass Fiber	**226-56**	**10**
Caprolactam Vapor — OSHA CSI	XAD-7 (200/100)	Glass Fiber	**226-57**	**10**
Glycols — NIOSH 5523			**226-57A**	**50**
Kathon® 886 Biocide — Non-agency method‡	Silica gel (520/260)	Glass Fiber	**226-99**	**10**
Accessories				
OVS Tube Holder includes 3 feet (0.9 meter) of tubing and collar clip, *see details on p. 39*			**224-29V**	**ea**
OVS Calibration Adapter Kit includes tubing and calibration adapter			**224-31**	**ea**

* *Methyl tin mercaptide, stannous-2-ethyl hexanoate, butyltin trichloride* † *See Ref. 39 on page 245.* ‡ *See Ref. 55 on page 245.*

IFV Pro Sampler

Simultaneous Inhalable and Vapor Sampling

- Designed for ACGIH TLVs with IFV designation
- IOM-style inlet sized for 1 L/min flow for true inhalable sampling
- Collects vapor phase on a variety of sorbents following published methods
- Meets European Standard 13936

Sample challenging mixed-phase contaminants such as pesticides, polyaromatic hydrocarbons (PAHs), inorganic acids, and explosives with the IFV Pro Sampler.

See page 127 for details.

For Sample Pumps
see pages 7-15 and 20-29

Low-volume PUF Tubes

For Sampling Semi-volatiles from 1 to 5 L/min

- Meet specifications of EPA Method TO-10A, EPA IP-8, and ASTM D4861
- For sampling up to 24 hours
- Custom PUF/sorbent combinations available
- Precleaned and ready to use

Sample Time:	*4 to 24 hours*
Sample Rate:	*1 to 5 L/min*
Sample Pump:	*XR Series, AirChek Series, or Leland Legacy*

SKC Low-volume PUF Tubes contain polyurethane foam (PUF) or PUF/sorbent combinations that meet the specifications of EPA and ASTM indoor and ambient air sampling methods for designated contaminants found in homes, public buildings, and offices. The methods specify the use of a sample pump, operating at a flow rate of 1 to 5 L/min, to draw air through the PUF tube to sample concentrations as low as 0.001 mg/m^3. Collection times vary from 4 to 24 hours. *See pages 10-15 and 20-31 for sample pump information.*

Replacement Parts

Replacement PUFs for Cat. No. 226-92 Uncleaned, 76-mm length **Cat. No. P22692**..... **pk/20** Cleaned, 76-mm length **Cat. No. P22692C**..... **pk/10**
Replacement Glass Precleaned and ready to use **Cat. No. P22692G**.....**ea**

24-hour Sampling?

Use Low-volume PUF Tubes with the Leland Legacy Sample Pump at 5 L/min
see pages 30-31

Low-volume PUF Tubes

Methods	Compounds	Sorbent (Amount)	Cat. No.
EPA TO-10A, IP-8	Organochlorine and organophosphorus pesticides, carbamate, pyrethrin, triazine, and urea pesticides	PUF (76 mm)	
ASTM D4861	Organochlorine and organophosphorus pesticides and PCBs		**226-92**
ASTM D4861	Organochlorine and organophosphorus pesticides and PCBs	PUF/Tenax/PUF (30 mm/750 mg/30 mm)	
EPA TO-10A	Organochlorine and organophosphorus pesticides, carbamate, pyrethrin, triazine, and urea pesticides		**226-124**
Custom	Pesticides, PCBs, and PAHs	PUF/XAD-2/PUF (30 mm/1500 mg/30 mm)	**226-143**
Custom	Pesticides, PCBs, and PAHs	PUF/Glass Fiber filter (76 mm)	**226-126**
Accessories			
Tube Holder for Low-volume PUF Tubes, *see p. 39 for details*			**224-29P**
Multi-purpose Calibration Jar, *see p. 120 for details*			**225-111**

Note: *PUF tubes used in the Statements of Work for Superfund sites must be used and analyzed within 14 days of being cleaned.*

High-volume PUF Tubes

For Sampling Semi-volatiles from 220 to 280 L/min

SKC High-volume PUF and PUF/sorbent combination tubes are designed for use with high-volume samplers to meet EPA and ASTM method specifications for ambient air sampling. Applications include sampling organochlorine pesticides, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs).

Combination PUF/XAD-2 sorbent tube
- Meets EPA Method 600/8-80-038 specifications
- Contains cleaned XAD-2 sorbent between two PUFs
- XAD-2 sorbent improves volatile component extraction during analysis

PUF-only sorbent tube
- Meets ASTM D6209, EPA IP-7, TO-4A, TO-9A, and TO-13A
- Packed with precleaned PUF for low background

SKC High-volume PUF Tubes are cleaned and ready to use.

High-volume PUF Tubes

Methods	Compounds	Sorbent (Amount)	Cat. No.
EPA 600/8-80-038	Organochlorine pesticides, PCBs	PUF/XAD-2/PUF (50 mm/10 gm/25 mm)	
Non-agency‡	Nonpolar organic compounds		**226-129**
EPA IP-7, TO-4A, TO-9A, TO-13A	Organochlorine pesticides, dioxins and furans, PCBs, PAHs	PUF (75 mm)	
ASTM D6209	Polycyclic aromatic hydrocarbons		**226-131**

Note: *PUF tubes used in the Statements of Work for Superfund sites must be used and analyzed within 14 days of being cleaned.*
‡ See Non-agency Method 38 on page 245.

Deployable System for sampling PAHs, PCBs, pesticides, and associated particulate at 10 L/min
see pages 32-33

Replacement Parts

Description		Cat. No.	Qty.
Replacement PUF for Cat. No. 226-129, uncleaned	25-mm length	**P226129A**	**10**
	50-mm length	**P226129B**	**10**
Replacement PUF for Cat. No. 226-131, 75-mm length	Uncleaned	**P226131**	**10**
	Cleaned	**P226131C**	**10**
Glass Cartridge with support screens for Cat. No. 226-129 or 226-131		**P226129C**	**ea**

Quartz Filters for High-volume PUF Sampling

Description	Cat. No.	Qty.
QM-A, high-purity microfibers, 450-µm thickness, 102-mm diameter	**225-1808**	**100**

Custom
SORBENT TUBES

Trust SKC's 45+ Years in Sorbent Media

Our chemists, product design specialists, technicians, and QA professionals are here to build the custom sorbent media you need for in-house methods and SOPs.

- Precision manufacturing
- Stringent quality control
- Technical support from our team of scientists
- Competitive prices

Visit skcinc.com/custom, or contact SKC for a quote.

Thermal Desorption Tubes

For Active Sampling of ppb-level VOCs in Ambient or Indoor Air

SKC offers single and multiple-bed thermal desorption tubes that meet EPA Method TO-17 requirements. All SKC thermal desorption tubes are sealed with PTFE end caps and marked with a permanent serial number. SKC offers both **thermally conditioned** tubes for immediate use or **unconditioned (UP)** tubes for thermal conditioning by your laboratory as needed.

Swagelok Fittings available, see below left for ordering

Perkin Elmer or Markes International Thermal Desorber Tubes

*Available in **glass or stainless steel,** these tubes measure ¼-inch OD x 3 ½-inch length (6.35-mm OD x 88.9-mm length). Sold in packs of 1.*

Method	Sorbent	SS Conditioned Cat. No.	SS Unconditioned Cat. No.	Glass Conditioned Cat. No.	Glass Unconditioned Cat. No.
ASTM D6196	Anasorb GCB1*	226-356	226-356-UP	—	—
ASTM D6196; MDHS 72	Tenax TA	226-357	226-357-UP	226-360	226-360-UP
ASTM D6196; MDHS 72	Chromosorb 106	226-358	226-358-UP	—	—
EPA TO-1, IP-1B	Tenax TA	226-340	226-340-UP	226-339	226-339-UP
EPA TO-2	Carbosieve S-111	226-341	226-341-UP	—	—
EPA TO-17	Anasorb GCB1*/Carbosieve S-111	226-349	226-349-UP	226-346	226-346-UP
EPA TO-17, NIOSH 2549	Anasorb GCB2*/Anasorb GCB1*/ Carbosieve S-111	226-350	226-350-UP	226-347	226-347-UP
EPA TO-17	Tenax GR/Anasorb GCB1*	226-348	226-348-UP	226-345	226-345-UP

Perkin Elmer or Markes International Thermal Desorber Tubes with Carbopack X

*Select tubes with Carbopack X sorbent for superior recovery of very volatile compounds. Available in **stainless steel,** these tubes measure ¼-inch OD x 3 ½-inch length (6.35-mm OD x 88.9-mm length).*

Method	Sorbent		Cat. No.	Qty.
—	Carbopack X	Conditioned	226-363	ea
		Unconditioned	226-363-UP	ea

Screening Tubes (Dynatherm Thermal Desorber)

*Available in **glass,** these tubes measure 0.24-inch OD x 4.5-inch length (6-mm OD x 115-mm length).*

Method	Sorbent		Cat. No.	Qty.
EPA IP 1B, NIOSH 2549	GCB2*/GCB1*/Carbosieve S-111	Conditioned	226-330	ea
		Unconditioned	226-330-UP	ea

* *Anasorb GCB1 is equivalent to Carbopack B; Anasorb GCB2 is equivalent to Carbopack C.*

Accessories

Description	Cat. No.	Qty.
Glass Transport Tubes, for 3 1/2-inch (88.9-mm) length tubes	226-300	5
PTFE Ferrules, set of 2	P30121	ea
Swagelok Fittings, for 1/4-inch (6.35-mm) OD tubes, set of 2	P50291	ea

Best Practice

Condition thermal desorption tubes before each use. This ensures sorbent background levels are suitable for ppb-level measurements.

See Passive Thermal Desorption Tubes on pages 98-99

Traps for Volatile Organic Sampling Trains (VOSTs)

VOSTs are specified by U.S. EPA 0031 in SW-846 for sampling VOCs in gaseous effluent from stationary emission sources such as hazardous waste incinerators. SKC VOST traps meet method specifications, are tested for background and pressure drop, and feature Swagelok fittings and PTFE ferrules. Traps are **not** supplied thermally conditioned. *See note below.*

Method	Sorbent (gm)	Description	Cat. No.	Qty.
EPA 0031	Tenax TA, 35/60 mesh (1.6)	Glass open, 16-mm OD x 125-mm L	226-134†	ea

† *Limited shelf-life* ***Note:*** *VOST traps must be conditioned prior to use. Use and analyze within 14 days of conditioning.*

For Sample Pumps, see pages 7-29

SKC Sample Bags

SKC Sample Bags
SKC sample bags are constructed of high-quality films with evenly sealed leak-free seams and high-quality bag fittings.

Make the Best Choice!
SKC publishes performance data on its bag films to equip you with the knowledge you need to make the best choice. See skcinc.com/instructions/1805.pdf for information.

Custom Bags
SKC will create the bags you need! Select the film, fitting, bag dimensions, and more!

SKC – The Best Choice in Sample Bags

Choose from over 60 combinations, in stock and available immediately

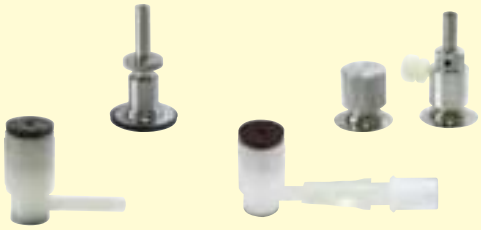
High-quality bag films

- ❑ **Tedlar,** *see pages 62-63*
- ❑ **Standard FlexFoil,** *see page 64*
- ❑ **FlexFoil PLUS,** *see page 65*

Need help in choosing the right bag material? Visit **skcinc.com.**

Bag fittings designed for your application

- ❑ **Single Polypropylene** combined hose/valve and septum
- ❑ **Single Stainless Steel** combined hose/valve and septum
- ❑ **Dual Stainless Steel** separate hose/valve and septum
- ❑ **Breath-gas Analysis,** in stainless steel or polypropylene with mouthpiece



Sample pumps optimized for bag sampling

- ❑ **Pocket Pump TOUCH —** programmable, touch screen, and intrinsically safe. *See page 18 and/or page 67*
- ❑ **Grab Air —** economy with fixed 1 L/min flow rate. *See page 66*

Need a custom bag?

Choose your film, fitting, size, and more for your application.

Submit your specifications for SKC Custom Bags at **skcinc.com/custom.**

Classic Tedlar Bags for VOCs

The Flexibility of Dual Stainless Steel Fittings

- Industry standard Tedlar film offers good stability for VOCs and some sulfur compounds
- Dual stainless steel fittings provide complete sampling flexibility
  - Bags are configured with one hose/valve fitting and one septum fitting
- Reliable, inert stainless steel fitting construction prevents leakage
- Stocked in a variety of sizes; custom bags available
- Breath-gas analysis bags for BEIs based on end-exhaled air for medical applications *(see left)*

Performance Profile

Background
Moderately low VOC

Stability
Good for VOCs, some sulfur compounds (including H_2S), CO, CO_2, methane, and SF_6

Thickness
2 mil

Sample Pump
Grab Air or Pocket Pump TOUCH, *see pp. 66-67*

ABOUT

Applications for Breath-gas Analysis Bags

Breath-gas Analysis Bags are designed for sanitary, effective capture of human exhaled air for several applications, including:

- **ACGIH Biological Exposure Indices (BEIs)** determined by end-exhaled air for methyl chloroform, tetrachloroethylene, and trichloroethylene
- **NIOSH Method 3704 for perchloroethylene** with collection of exhaled air into Tedlar bags for analysis by GC/PID
- **Collection of human breath to be analyzed for VOCs or volatile sulfur compounds (VSCs),** possible biomarkers for some diseases

SKC Breath-gas Analysis Bags are offered in Tedlar and FlexFoil PLUS *(see below right and page 65).*

For PTFE Tubing
see page 66

More Information
SKC Bag Stability Report –
skcinc.com/instructions/1805.pdf
skcinc.com

Tedlar Bags with Dual Stainless Steel Fittings

Maximum Capacity (liter)	Cat. No.	Qty.	Fittings
1	231-01 231-01A	10 ea	
3	231-03	10	
5	231-05 231-05A	10 ea	
10	231-10	10	
25	231-25	5	
50	231-50	5	
75	231-75	5	
100	231-100	3	
Replacement Septa	231-9-04	10	

Tedlar Bag with Stainless Steel Breath-gas Analysis Fitting

Description	Cat. No.	Qty.	Fitting
Tedlar Sample Bags, 1 liter, each with stainless steel fitting and individually packaged clean mouthpiece, *see above left*	249-01	5	

Classic Tedlar Bags for VOCs

Convenient and Economical Single Polypropylene Fitting

- **Single polypropylene fitting**
  - Combines the septum and hose/valve into one fitting
- **An industry standard!**
- **Economical**
- **Single lightweight fitting provides easy bag handling**
- **Stocked in a variety of sizes; custom bags available**

Most Popular Bag!

Performance Profile

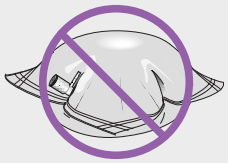
Background
Moderately low VOC

Stability
Good for VOCs, some sulfur compounds (including H_2S), CO, CO_2, methane, and SF_6

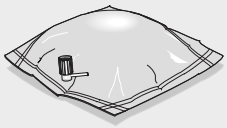
Thickness
2 mil

Sample Pump
Grab Air or Pocket Pump TOUCH, *see pp. 66-67*
Also see the Vac-U-Chamber on pp. 68-69.

Tech Tips



Incorrect inflation



Correct inflation

For Bag Sampling Pumps
see pages 66-67

For Vac-U-Chamber
see pages 68-69

Tedlar Bags with Single Polypropylene Fitting

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
0.5	232-02	10	
1 *(Fits small Vac-U-Chamber Cat. No. 231-940)*	232-01 232-01A	10 ea	
3	232-03 232-03A	10 ea	
5	232-05 232-05A	10 ea	
8 *(Fits large Vac-U-Chamber Cat. No. 231-939)*	232-939	10	
10 *(Fits extra-large Vac-U-Chamber Cat. No. 231-944)*	232-10 232-10A	10 ea	
25 *(Fits jumbo Vac-U-Chamber Cat. No. 231-946)*	232-25	5	
50	232-50	5	
75	232-75	5	
100	232-100	3	
Replacement Septa	232-01-RS	10	

Tedlar Bag with Polypropylene Breath-gas Analysis Fitting

Description	Cat. No.	Qty.	Fitting
Tedlar Sample Bags, 1 liter, each with polypropylene fitting, fitting adapter, and individually packaged clean mouthpiece, *see About on p. 62*	249-01-PP	5	

Standard FlexFoil Sample Bags

Superior Bag for Sulfur Compounds and Low Molecular Weight Gases

ABOUT

Standard FlexFoil Applications

- CO_2 — OSHA Method ID-172
- CO_2 — NIOSH 6603
- CO — OSHA ID-210‡
- Sulfur compounds
- Indoor air studies (CO, CO_2, SF_6)

‡ *OSHA ID-210 specifies 5-layer foil bags. SKC 4-ply FlexFoil bags hold 100 ppm CO for 5 days without loss. See skcinc.com/instructions/1706.pdf for more information.*

- **Effectively retain hydrogen sulfide for 48 hours!**
- **Strong, flexible, evenly sealed seams**
- **Lightproof and moistureproof**
  - Excellent for light-sensitive compounds
- **Choice of all-in-one polypropylene or stainless steel hose/valve and septum fittings**
- **Stocked in a variety of sizes**
- **Custom bags available**

Performance Profile

Background
Moderate to high VOC and low sulfur

Stability
Good for CO, CO_2, methane, hydrogen, and SF_6
Good 48-hour stability for H_2S, hydrogen, carbonyl sulfide, and methyl and ethyl mercaptan

Thickness
4 ply (5 mil)

Sample Pump
Grab Air or Pocket Pump TOUCH, *see pp. 66-67*
Also see the Vac-U-Chamber on pp. 68-69.

More Information

SKC Bag Stability Report –
skcinc.com/instructions/1805.pdf
skcinc.com

Standard FlexFoil® Bags with Single Polypropylene Fitting

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
1 *(Fits small Vac-U-Chamber Cat. No. 231-940)*	262-01 262-01A	10 ea	
3	262-03 262-03A	10 ea	
5	262-05	10	
8 *(Fits large Vac-U-Chamber Cat. No. 231-939)*	262-08	10	
10 *(Fits extra-large Vac-U-Chamber Cat. No. 231-944)*	262-10	10	
25 *(Fits jumbo Vac-U-Chamber Cat. No. 231-946)*	262-25	5	
50	262-50	5	
Replacement Septa	236-01-RS	10	

Standard FlexFoil Bags with Single Stainless Steel Fitting

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
1	263-01 263-01A	10 ea	
3	263-03 263-03A	10 ea	
5	263-05	10	
10	263-10	10	
25	263-25	5	
50	263-50	5	
Replacement Septa	233-01-RS	10	

FlexFoil PLUS Sample Bags

Specially Cleaned for Low ppm to High ppb-Level VOCs

- All the benefits of Standard FlexFoil — PLUS detection and good storage stability for low ppm to high ppb-level VOCs
- Strong, flexible, evenly sealed seams
- Lightproof and moistureproof
  - Excellent for light-sensitive compounds
- Choice of all-in-one polypropylene or stainless steel hose/valve and septum fittings
- Stocked in a variety of sizes; custom bags available
- Breath-gas analysis bags are available in FlexFoil PLUS

Performance Profile

Background
Low VOC and sulfur *(specially cleaned)*

Stability
Good for low ppm to high ppb-level VOCs
Good for CO, CO_2, methane, hydrogen, and SF_6
Good 48-hour stability for H_2S, hydrogen, carbonyl sulfide, and methyl and ethyl mercaptan

Thickness
4 ply (5 mil)

Sample Pump
Grab Air or Pocket Pump TOUCH, *see pp. 66-67*
Also see the Vac-U-Chamber on pp. 68-69.

ABOUT FlexFoil PLUS Sample Bag Applications

- Biogas and landfill gas (LFG) sampling
- Sampling low-level VOCs
- Pollution level monitoring
- Site sampling/mobile surveys
- Breath analysis
- Calibration gas transfer
- Calibration mixtures
- Leak/spill exposure assessment

More Information
SKC Bag Stability Report – skcinc.com/instructions/1805.pdf
skcinc.com

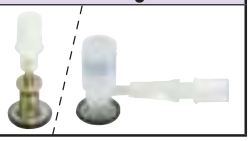
FlexFoil PLUS Bags with Single Polypropylene Fitting

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
1 *(Fits small Vac-U-Chamber Cat. No. 231-940)*	252-01 252-01A	10 ea	
3	252-03 252-03A	10 ea	
5	252-05	10	
8 *(Fits large Vac-U-Chamber Cat. No. 231-939)*	252-08	10	
10 *(Fits extra-large Vac-U-Chamber Cat. No. 231-944)*	252-10	10	
25 *(Fits jumbo Vac-U-Chamber Cat. No. 231-946)*	252-25	5	
50	252-50	5	
Replacement Septa	236-01-RS	10	

FlexFoil PLUS Bags with Single Stainless Steel Fitting

Maximum Capacity (liter)	Cat. No.	Qty.	Fitting
1	253-01 253-01A	10 ea	
3	253-03 253-03A	10 ea	
5	253-05	10	
10	253-10	10	
25	253-25	5	
50	253-50	5	
Replacement Septa	233-01-RS	10	

FlexFoil PLUS Bags with Breath-gas Analysis Fitting

Description	Cat. No.	Qty.	Fitting
FlexFoil PLUS Sample Bags, 1 liter, each with individually packaged clean mouthpiece *See About on p. 62 and at right for details.*			
Stainless steel fitting	269-01	5	
Polypropylene fitting	269-01-PP	5	

ABOUT Breath-gas Bag Applications

- ACGIH BEIs for end-exhaled air
- Metabolic status determination
- Asthma detection by exhaled nitric oxide
- Lung cancer detection
- Diabetes detection
- Fructose malabsorption with hydrogen breath test
- *Helicobacter pylori (H. pylori)* with urea breath test
- Organ rejection detection
- Carbon monoxide poisoning detection
- Smoking cessation evaluation
- NIOSH Method 3704 for perchloroethylene in exhaled breath

Easy sampling for breath-gas analysis

Grab Air Sample Pump — 1 L/min

Economy Pump for Filling Bags

- 9-volt alkaline battery for approximately 1000 liters of volume on one battery
- Low battery indicator
- Fixed 1 L/min flow rate

The SKC Grab Air Sample Pump is an economical choice for grab-and-go bag sampling when intrinsic safety is not required. Grab Air operates at a fixed flow rate of 1 L/min for up to 1000 liters of volume on one 9-volt battery. Simply attach a sample bag to the outlet port and turn on the pump. Simple, quick, economical — Grab Air.

Description	Cat. No.
Grab Air Pump with 9-volt alkaline battery	222-2301
Grab Air Hazmat Kit includes pump as described above, 3 feet of 3/16-inch (4.76-mm) ID PTFE tubing, and ten 1-liter Tedlar bags with single polypropylene fitting Cat. No. 232-01	222-2111

PTFE Tubing

Inert Tubing for Bag Sampling

- Heat and corrosion resistant
- Chemically inert
- Strong

Chemically inert SKC PTFE tubing is ideal for bag sampling to prevent sample loss through adsorption to the tubing's inner surface. SKC offers PTFE tubing with different diameters to fit over or inside bag fittings.

Tech Tips

- *Use only PTFE tubing for bag sampling to prevent sample loss through adsorption to the tubing's inner surface.*
- *PTFE tubing can be used at temperatures up to 500 F (260 C).*

PTFE Tubing	Cat. No.	Length
Fits over all SKC bag fittings, Grab Air pump exhaust, and into Pocket Pump TOUCH Quick-connect Adapter 3/16-inch (4.76-mm) ID, 1/4-inch (6.35-mm) OD	231-9-23	10 ft
Fits inside bag fitting 1/16-inch (1.59-mm) ID, 1/8-inch (3.18-mm) OD	231-9-21	10 ft
Fits Vac-U-Chamber sample inlet 1/4-inch (6.35-mm) ID, 5/16-inch (7.94-mm) OD	231-937 231-924	10 ft 50 ft

Pocket Pump® TOUCH — 20 to 500 ml/min

Programmable Pump for Bag Sampling

- Quick-connect accessory on exhaust port provides easy and secure bag sampling
- Constant flows from 20 to 500 ml/min — also suitable for sorbent tube sampling and other low flow applications *(see pages 18-19)*
- Easy touch screen operation
- Intrinsically safe

Certifications

CE 0539 intrinsically safe IECEx

Description	Cat. No.
Pocket Pump TOUCH with Li-Ion battery pack, *requires Pocket Pump TOUCH charger* *See Quick-connect Adapter below for sampling with rigid PTFE 1/4-inch OD tubing*	220-1000TC
Pocket Pump TOUCH Single Charger	220-300

For more information on bag sampling trains, visit skcinc.com/Training.

Quick-connect Accessory for Secure Bag Sampling

- Rugged metal
- Easy installation on pump exhaust
- Holds rigid PTFE 1/4-inch OD tubing securely
- Simply press to release tubing

The Quick-connect Adapter accessory makes bag sampling with Pocket Pump TOUCH fast, easy, and secure. The Quick-connect Adapter threads into the pump exhaust port and securely holds rigid PTFE 1/4-inch OD tubing during sampling. When sampling is complete, a quick press of the adapter flange releases the tubing.

Cat. No. 220-200

For negative pressure sample collection
see pages 68-69

Vac-U-Chamber

Eliminates Pump Contamination During Bag Sampling

- **Allows direct filling of air sample bags**
  - Uses negative pressure provided by most personal air sample pumps
  - Designed to contain SKC sample bags
- **Rugged and airtight construction**
  - Will not collapse under vacuum
- **Available in several sizes, including extra large for EPA Method 0040**
- **Protects sample and pump from contamination**
  - Sample does not pass through the pump
  - Sample contacts only inert tubing and bag
- **Sample line extends from contaminant source through case to bag**

For Convenient, Reliable Bag Sampling

The SKC Vac-U-Chamber is a rigid air sample box that allows sample bags to be filled directly by using negative pressure provided by most personal air sample pumps. Because the sample does not pass through the pump, both sample and pump contamination are eliminated. All surfaces in contact with the sample are constructed of inert materials. The Vac-U-Chamber's rigid walls will not collapse under vacuum conditions.

Vapor Intrusion Monitoring

Soil Gas Sampling for Vapor Intrusion Evaluations

Soil gas sampling can identify underground contamination and trace the source, extent, and movement of pollutants.

U.S. EPA Standard Operating Procedure (SOP) 2042 for Soil Gas Sampling specifies sample bags as containers inside an airtight chamber (e.g., Vac-U-Chamber). A sample pump creates negative pressure in the chamber, which causes soil gas to enter into the bag directly. Samples are analyzed in the field with direct-reading instruments and/or in a qualified laboratory.

Vac-U-Chamber

Multiple Sizes Available for Your Applications

Applications

- U.S. EPA Method 18 (VOCs — industrial sources)
- U.S. EPA 0040 (POHCs — stationary sources)
- Soil gas/vapor sampling
  - U.S. EPA SOP 2042
- Indoor air remediation system monitoring petroleum constituents (U.S. EPA SOPs 2102, 2103, and 2104)
- Groundwater testing
- Stack sampling
- Ventilation studies
- Hazmat testing

Small Vac-U-Chamber for 1-liter Bags

Description		Cat. No.	Qty.
Complete Vac-U-Chamber Kit includes Standard AirChek XR5000 sample pump, single charger, small Vac-U-Chamber, and 10 Tedlar sample bags Cat. No. 232-01	100-240 V	210-4124	ea
Small Vac-U-Chamber only with polypropylene fittings (supplied without pump), suitable for use with SKC 1-liter sample bags below		231-940	ea
1-liter Sample Bags with single polypropylene fitting, for use with small Vac-U-Chamber Cat. No. 231-940	Tedlar	232-01	10
	FlexFoil PLUS	252-01	10
	Standard FlexFoil	262-01	10

Large Vac-U-Chamber for 8-liter Bags

Description		Cat. No.	Qty.
Complete Vac-U-Chamber Kit includes Standard AirChek XR5000 sample pump, single charger, large Vac-U-Chamber, and 10 Tedlar sample bags Cat. No. 232-939	100-240 V	210-4115	ea
Large Vac-U-Chamber only with stainless steel fittings (supplied without pump), suitable for use with SKC 8-liter sample bags below		231-939	ea
8-liter Sample Bags with single polypropylene fitting, for use with large Vac-U-Chamber Cat. No. 231-939	Tedlar	232-939	10
	FlexFoil PLUS	252-08	10
	Standard FlexFoil	262-08	10

Extra-large Vac-U-Chamber for 10-liter Bags

Description		Cat. No.	Qty.
Extra-large Vac-U-Chamber only with stainless steel fittings (supplied without pump), suitable for use with SKC 10-liter sample bags below		231-944	ea
10-liter Sample Bags with single polypropylene fitting, for use with extra-large Vac-U-Chamber Cat. No. 231-944	Tedlar	232-10	10
	FlexFoil PLUS	252-10	10
	Standard FlexFoil	262-10	10

Jumbo Vac-U-Chamber for 25-liter Bags

Description		Cat. No.	Qty.
Jumbo Vac-U-Chamber only with stainless steel fittings (supplied without pump), suitable for use with SKC 25-liter sample bags below		231-946	ea
25-liter Sample Bags with single polypropylene fitting, for use with jumbo Vac-U-Chamber Cat. No. 231-946	Tedlar	232-25	5
	FlexFoil PLUS	252-25	5
	Standard FlexFoil	262-25	5

Best Practice

For best results, do not reuse sample bags. This prevents the risk of "carry over" from the previous sample.

Reference: McGarvey, L.J., Shorten, C.V., "The Effects of Adsorption on the Reusability of Tedlar Air Sample Bags," AIHA Journal, V. 61, May/June 2000, pp. 375-380

For Sample Pumps, see pages 20-21

More Information

skcinc.com

Search "Vac-U-Chamber"

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Visit skcinc.com/Training

Custom Coated Filters

- Choose filter materials
- Specify filter pore size and diameter
- Choose support pad material
- Strict QC for consistent, accurate coating
- Available as filters only or preloaded in ready-to-use cassettes

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SKC Chemically Coated Filters

Meet Agency Method Specifications

- Ready to use
- Convenient personal sampling
- Small package sizes for short shelf-life products

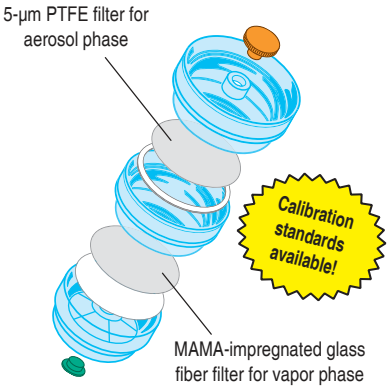
SKC Coated Filters make sampling reactive compounds safe and simple by eliminating the inconveniences of wet chemistry sampling with impingers and producing a stable compound for storage and analysis. SKC Coated Filters are easy to use: insert the cassette into an SKC Filter Cassette Holder, clip to the worker's collar, and connect to a personal sample pump. Certificates of Compliance are available; visit skcinc.com/certificates.

See SKC Coated Filter ordering on page 71.

ISO-CHEK

Simultaneous and Separate Collection of Isocyanate Phases

- Accurately samples diisocyanates: HDI, MDI, IPDI, HMDI, 2,4-TDI, and 2,6-TDI
- Meets ASTM D5932 (2,4 and 2,6-TDI), D6561 (HDI), and D6562 (HDI)
- Simultaneously traps and separates both monomers and oligomers at point of collection
- Decreases sample preparation and analysis time by 40%
- Highly stable – does not require low temperature storage/transport
- Provides detection limits below current regulated exposure levels
- Requires only a 15-minute sample time
- Round-robin proficiency testing for ISO-CHEK labs – visit skcinc.com/lab



Exploded view of ISO-CHEK Filter Cassette (Cassette in image is tinted for clarification.)

Description	Cat. No.	Qty.
ISO-CHEK Sampling System with Derivatizing Reagent,*† preloaded clear cassettes and jars of Derivatizing Solution (MOPIP in toluene)	225-9023 225-9023A	4 10
ISO-CHEK Cassettes,* preloaded clear cassettes for isocyanates, *requires Derivatizing Solution; see below*	225-9022 225-9022A	12 36

Accessories	Cat. No.	Qty.
Derivatizing Solution,*† 5 ml of MOPIP in toluene, in jars	225-9050	12
Jars, 37 mm with PTFE-lined cap	225-8377	36
Calibration Standard,‡ MAMA-HDI, 1 gram	225-9053	ea
Calibration Standard,‡ MAMA-IPDI, 1 gram	225-9054	ea
Calibration Standard,‡ MAMA-MDI, 1 gram	225-9062	ea
Calibration Standard,‡ MAMA-2,4-TDI and 2,6-TDI, 1 gram	225-9052	ea
Calibration Standard Set,‡ HDI, MDI, IPDI, 2,4-TDI, 2,6-TDI, 1 gram each	225-9055	set
Packaging Kit, materials for shipping 10 packages of 10 samplers and jars	225-9059	ea

* *Limited shelf-life* † *Hazmat shipping charges for air shipments only, ground shipments exempt*
‡ *Limited shelf-life, freezer storage recommended; refrigerated shipping not required*

Coated Filter Selection Guide

Chemical	Method	Preloaded Filter; Coating (in 37-mm cassettes)	Cat. No.*	Qty.
Acetic anhydride	OSHA 82	2 Glass Fiber filters; 1-(2-pyridyl) piperazine	225-9009 §	10
Acetic anhydride	OSHA 102	2 Glass Fiber filters; veratrylamine and di-n-octyl phthalate	225-9010 §	10
4-Aminobiphenyl	OSHA 93	2 Glass Fiber filters; sulfuric acid	225-9004	10
Aniline	NIOSH 2017 ¥	2 Glass Fiber filters; sulfuric acid	225-9004 ¥	10
Arsenic, volatile compounds	OSHA ID-1006	1 MCE filter and plastic pad; untreated and 1 cellulose support pad; sodium carbonate	225-9001	10
Benzidine	OSHA 65	2 Glass Fiber filters; sulfuric acid	225-9004	10
Bromine, chlorine	NIOSH 6011	1 **25-mm** PTFE pre-filter and polypropylene support; 1 **25-mm** specially cleaned silver membrane and polypropylene support **(in 25-mm cassette)**	225-9006	5
Crotonaldehyde	OSHA 81	2 Glass Fiber filters; 2,4-dinitrophenylhydrazine and phosphoric acid	225-9019 §	10
o-Dianisidine	OSHA 71	2 Glass Fiber filters; sulfuric acid	225-9004	10
3,3'-Dichlorobenzidine	OSHA 65	2 Glass Fiber filters; sulfuric acid	225-9004	10
Diisocyanates (HDI; 2,6-TDI; 2,4-TDI)	ASTM D5836 Δ OSHA 42	1 Glass Fiber filter and cellulose support; 1-(2-pyridyl)piperazine	225-9013 §† 225-9002 §	10 10
Diphenylamine	OSHA 78	2 Glass Fiber filters; sulfuric acid	225-9004	10
Fluorides	OSHA ID-110 NIOSH 7902 ASTM D4765	1 MCE filter and plastic pad; untreated and 1 cellulose support pad; sodium carbonate	225-9001 #	10
Fluorides, particulate	NIOSH 7906	2 Nitrocellulose filters; 1 coated with sodium carbonate, 1 uncoated	225-9031	10
Glutaraldehyde	OSHA 64	2 Glass Fiber filters; 2,4-dinitrophenylhydrazine and phosphoric acid	225-9003 §	10
Glyoxal	For IFV	2 **25-mm** Glass Fiber filters; 2,4-dinitrophenylhydrazine *(filters only, in jar)*	225-9036 §	10
Hydrazine	OSHA 108	2 Glass Fiber filters; sulfuric acid	225-9012	10
Hydrofluoric acid	NIOSH 7906	2 Nitrocellulose filters; 1 coated with sodium carbonate, 1 uncoated	225-9031	10
Hydrogen bromide	NIOSH 7907	2 Quartz filters (R-100); 1 coated with sodium carbonate, 1 uncoated	225-9032	10
Hydrogen chloride	NIOSH 7907	2 Quartz filters (R-100); 1 coated with sodium carbonate, 1 uncoated	225-9032	10
Hydrogen peroxide	OSHA 1019	2 **25-mm** Quartz filters (R-100); titanium oxysulfate hydrate **(in 25-mm cassette)**	225-9030	10
Isocyanates	ASTM Methods	1 PTFE filter; 1 Glass Fiber filter impregnated with MAMA (ISO-CHEK Sampling System, *see p. 70)*	225-9022 225-9022A	12 36
Isocyanates (HDI; 2,6-TDI; 2,4-TDI)	ASTM D5836 Δ OSHA 42	1 Glass Fiber filter and cellulose support; 1-(2-pyridyl)piperazine	225-9013 §† 225-9002 §	10 10
Isocyanates (HDI, MDI, TDI, IPDI, HDI-BT, HDI-IC)	OR-OSHA 1010	1 **13-mm** Glass Fiber filter; MAMA **(in 13-mm Swinnex holder)** *(also requires impinger)*	225-9029 §	5
Isocyanates, organic	MDHS 25/3 (UK)	1 **25-mm** A/E Glass Fiber filter; methoxyphenyl piperazine *(filters only, in jar)*	Special order §	
n-Isopropylaniline	OSHA 78	2 Glass Fiber filters; sulfuric acid	225-9004	10
Maleic anhydride	OSHA 86	2 Glass Fiber filters; veratrylamine	225-9021 §	10
Maleic anhydride	For IFV	1 **25-mm** Glass Fiber filter; veratrylamine *(filters only, in jar)*	225-9028 §	10
Mercaptans (methyl-, ethyl-, n-butyl-, phenyl-)	NIOSH 2542 OSHA 26	1 Glass Fiber filter; mercuric acetate	225-9007 §	10
4,4'-Methylene bis (2-chloroaniline) (MOCA)	OSHA 71	2 Glass Fiber filters; sulfuric acid	225-9004	10
4,4'-Methylene bis (phenyl isocyanate) (MDI)	OSHA 47	1 Glass Fiber filter and cellulose support; 1-(2-pyridyl)piperazine	225-9013 §† 225-9002 §	10 10
4,4'-Methylenedianiline	OSHA 57 NIOSH 5029	2 Glass Fiber filters; sulfuric acid	225-9004	10
1-Naphthylamine, 2-naphthylamine	OSHA 93	2 Glass Fiber filters; sulfuric acid	225-9004	10
Nitric acid	NIOSH 7907	2 Quartz filters (R-100); 1 coated with sodium carbonate, 1 uncoated	225-9032	10
Nitrobenzene	NIOSH 2017 ¥	2 Glass Fiber filters; sulfuric acid	225-9004 ¥	10
Ozone	OSHA ID-214	2 Glass Fiber filters; nitrite-impregnated	225-9014 §	10
Peracetic Acid (PAA)	OSHA PV2321	1 **25-mm** Quartz filter (R-100); titanium oxysulfate hydrate **(in 25-mm cassette)**	225-9037 •	10
Phenylenediamine (o-, m-, p-)	OSHA 87	2 Glass Fiber filters; sulfuric acid	225-9004	10
Phosphine	OSHA 1003	1 Glass Fiber filter; 1 polyester filter coated with mercuric chloride	225-9018 †§	10
Phosphoric acid	NIOSH 7908	1 Quartz filter (Tissuquartz)	225-9033	10
Phthalic anhydride	OSHA 90	2 Glass Fiber filters, veratrylamine	225-9034 §	10
Sulfur dioxide	NIOSH 6004 (modified)	1 MCE pre-filter and support/1 cellulose filter and support; sodium carbonate	225-9005	10
Sulfuric acid	NIOSH 7908	1 Quartz filter (Tissuquartz)	225-9033	10
2,4-Toluenediamine	OSHA 65	2 Glass Fiber filters; sulfuric acid	225-9004	10
2,6-Toluenediamine	OSHA 65	2 Glass Fiber filters; sulfuric acid	225-9004	10
o-Tolidine	OSHA 71	2 Glass Fiber filters; sulfuric acid	225-9004	10
Toluene-2,4-diisocyanate and toluene-2,6-diisocyanate	For IFV	1 **25-mm** Glass Fiber filter; 1-(2-pyridyl)piperazine *(filters only, in jar)*	225-9035 §	10
o-Toluidine	NIOSH 2017 ¥	2 Glass Fiber filters; sulfuric acid	225-9004 ¥	10
Toluidine (o-, m-, p-)	OSHA 73	2 Glass Fiber filters; sulfuric acid	225-9004	10
Trimellitic anhydride	OSHA 98	2 Glass Fiber filters; veratrylamine and di-n-octyl phthalate	225-9010 §	10
Valeraldehyde	OSHA 85	3 Glass Fiber filters; 2,4-dinitrophenylhydrazine and phosphoric acid	225-9020 §	10
m-Xylenediamine (m-XDA, p-XDA)	OSHA 105	2 Glass Fiber filters; sulfuric acid	225-9004	10

* *Coated filters have a limited shelf-life.*
† *Custom order due to very limited shelf-life*
Δ *ASTM D5836 and D5932 for 2,4-TDI, 2,6-TDI only*
§ *Storage below 39.2 F (4 C) required*
¥ *Also requires Sorbent Tube Cat. No. 226-15, see page 50*
\# *Collects both vapor and aerosol phases of fluorides*
• *Requires impinger and impinger trap containing sorbent. See method.*

Glass Midget Impingers

Collection of Airborne Hazards into Liquids

Tech Tips

▶ *Use a trap with impingers to prevent impinger liquid from being drawn into the sample pump. Solid sorbent may be added to a trap when using a volatile collection liquid to protect the pump from vapors. See options below.*

Glass Trap Cat. No. 225-22

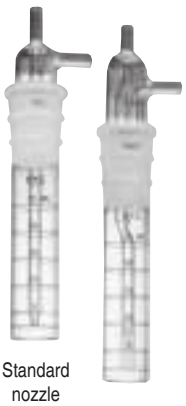
Plastic Trap Cat. No. 225-22-01

SKC 25-ml capacity Pyrex® glass midget impingers feature graduations that are accurate to within ± 0.5 ml per increment. Serial numbers on both sections of each impinger assist with sample identification and proper part matching. SKC offers three types of glass midget impingers for your applications.

Standard Midget Impinger contains a precisely placed standard nozzle to ensure proper collection.

Special Midget Impinger with Fritted Nozzle increases contact between the air sample and collection liquid. Many NIOSH and OSHA procedures call for this impinger.

Spill-resistant Midget Impinger with Standard Nozzle features an outlet side arm that extends midway down the impinger with capacity for all liquid in the impinger.



Standard nozzle

Fritted nozzle

Glass Impinger Holders

Impingers and traps may be mounted in a holder directly on a sample pump for area sampling or placed in a holster that clips near a worker's breathing zone.

Impinger in personal holster

Impinger in single holder on AirChek 52 Sample Pump

Impinger and trap in double holder on AirChek TOUCH Sample Pump

Glass Midget Impinger	Cat. No.
Standard Midget, 25 ml, standard nozzle	**225-36-1**
Special Midget, 25 ml, fritted nozzle, 170 to 220-micron frit	**225-36-2**
Spill-resistant Midget, 25 ml, standard nozzle	**225-36-4**
Spill-resistant Midget, 25 ml, fritted nozzle, 170 to 220-micron frit	**225-36-5**
Glass Midget Impinger Accessories	
Trap for Midget Impingers, glass trap for area sampling, can be used with or without sorbent, *see above left photo*	**225-22**
In-line Plastic Traps with sorbent to remove vapors, pk/3, *see photo at left*	**225-22-01**
Replacement Trap Sorbent, 200 grams, to remove vapors, for use in Cat. Nos. 225-22 and 225-22-01	**225-22-02**
Holster,* polyester, with a clip for attaching to clothing, *shown above*	**225-20**
Holders,* for attaching to air sample pump	
Single,* stainless steel, for 1 impinger or 1 trap, *for use with AirChek 52 or Universal XR pumps, shown above*	
Double,* stainless steel, for 2 impingers or impinger and trap, *for use with AirChek 52 or Universal XR pumps*	**225-20-01**
Double,* stainless steel, for 2 impingers or impinger and trap, *for use with AirChek TOUCH pumps, shown above*	**225-20-02**
	225-20-03

* *Not suitable for PFA impingers*

PFA Midget Impingers

Unbreakable Alternative for Collection into Liquids

Savillex semi-opaque single-piece PFA impingers are nearly unbreakable and feature a threaded lid for secure sampling. With a 60-ml reservoir, these PFA impingers allow for a greater volume of liquid to be used when needed. SKC offers PFA impingers in two different port configurations. PFA tube bends are available for connecting impingers. All PFA impingers include ferrule nuts to provide a leak-tight seal.

60-ml PFA Impinger with molded transfer cap
features a vertical port and a side port for horizontal connections.

60-ml PFA Impinger with port transfer cap
includes two vertical ports for close assembly of a sampling train.

PFA Impinger Holders

Impingers and traps may be mounted in a holder directly on a sample pump for area sampling or placed in a holster that clips near a worker's breathing zone.

Impinger in personal holster

Impinger in single holder on AirChek 52 Sample Pump

PFA Midget Impinger	Cat. No.
Impinger with 1-piece Molded Transfer Cap, 60-ml capacity, with a 1/4-inch vertical port and a 1/4-inch side port for horizontal connections; includes ferrule nuts	225-0020
Impinger with Port Transfer Cap, 60-ml capacity, with 2 vertical 1/4-inch ports for close assembly of sampling train; includes ferrule nuts	225-0021
PFA Midget Impinger Accessories	
Single Holder for PFA Impinger,† stainless steel, attaches to sample pump, *shown above*	225-0026
Holster for PFA Impinger,† polyester, with a clip for attaching to clothing, *shown above*	225-0027
In-line Plastic Traps with sorbent to remove vapors, pk/3, *shown at right*	225-22-01
Replacement Trap Sorbent, 200 grams, to remove vapors, *for use in Cat. Nos. 225-22 and 225-22-01*	225-22-02
180-degree PFA Tube Bend, 1/4-inch diameter x 8-inch length, used to connect 2 PFA impingers, *for use with Cat. No. 225-0021 only*	225-0022
90-degree PFA Tube Bend, 1/4-inch diameter x 6-inch length, used to connect 2 PFA impingers, *for use with Cat. No. 225-0021 only*	225-0023

† *Not suitable for glass impingers*

ABOUT

Perfluoroalkoxy alkane
Perfluoroalkoxy alkane (PFA, a fluoropolymer) material is desirable for its inertness to virtually all industrial chemicals and solvents, excellent heat resistance, and use in cryogenic applications. Impingers made of PFA are nearly unbreakable, making them ideal for industrial hygiene applications.

Plastic Trap Cat. No. 225-22-01

The GV110 Piston Pump

A Single Stroke of Genius for Sampling with Detector Tubes

Tech Tips

- *To ensure optimum accuracy, check all detector tube hand pumps for leaks on a regular basis.*

GV700 One-hand Pump Operation
The GV700 One-hand Adapter threads onto the GV110 pump to provide convenient one-hand pump operation. The tube holder mounts onto the adapter. The adapter features a slide valve that opens and closes at the push of a button. Closing the valve prevents airflow into the pump and allows the user to pull back the pump handle without taking a sample. After an open tube has been inserted into the tube holder, the sample is taken by opening the valve with another push of the button. The adapter can be left in the open position to allow normal use of the pump. It's simple, accurate, and reliable just like the GV110 pump. *See below right for ordering information.*

- **Built-in stroke counter tracks up to 10 strokes**
- **Handle lockable in full-stroke position to draw 100 ml of air or half-stroke position to draw 50 ml of air**
- **Flow finish indicator ensures precise sample volumes**
- **Contoured shape and soft elastomer-covered body for a secure, comfortable grip**
- **Weighs only 9.4 ounces (0.27 kg)**
- **Integral tube tip breaker and tip storage bin**
- **Simple, always ready, and intrinsically safe**
- **Large Gastec Detector Tube inventory available immediately**
- **Factory-trained product specialists for support**

The Gastec GV110 precision piston pump offers simple, accurate syringe-like technology for gas and vapor measurements. Designed for use with Gastec grab sample detector tubes, one complete stroke draws a 100-ml air sample. A flow finish indicator shows completion of full or half strokes, while the built-in stroke counter eliminates the risk of miscounting. An integral tube tip breaker and tip storage bin add convenience. The GV110 pump and several boxes of tubes can be transported easily in the semi-rigid carry case with adjustable case strap that can be worn over the shoulder or secured to a belt.

For Gastec Passive Color Dosimeter Tubes
see page 97

Description	Cat. No.
GV110 Deluxe Pump Kit includes GV110 Piston Pump, semi-rigid carry case with strap, lubricant, and 3 tube holder O-rings	**810-GV110**
Accessories	
Lubricant	**810-1002**
Shoulder Bag Carry Case	**810-815**
GV700 One-hand Adapter, *see above left for more information*	**810-GV700**

Grab Sample Tubes for GV110 Piston Pump

Gas or Vapor to be measured	Measuring Range (ppm)	Cat. No.	Tests
Acetaldehyde	5 - 750	810-92*	10
Acetaldehyde	2.5 - 100	810-92M*	10
Acetaldehyde	1 - 20	810-92L*	10
Acetic acid	1 - 100	810-81	10
Acetic acid	0.125 - 25.0	810-81L*	10
Acetic anhydride	0.6 - 15	810-81	10
Acetic anhydride	0.15 - 6	810-81L*	10
Acetone	0.05 - 2%	810-151	10
Acetone	50 - 12000	810-151L*	10
Acetone cyanohydrin	2.5 - 60	810-12L	10
Acetonitrile	3 - 180	810-52	10
Acetylene	0.05 - 4%	810-171	10
Acetylene	0.075 - 3.6%	810-103	9
Acetylene	32.5 - 1040	810-172	10
Acetylene dichloride (*see 1,2-dichloroethylene*)			
Acid gases	1 - 80	810-80	10
Acrolein	3.3 - 800	810-93	10
Acrylic acid	2 - 50	810-81	10
Acrylic acid	0.45 - 18	810-81L*	10
Acrylonitrile	2 - 360	810-191	5
Acrylonitrile	0.1 - 18	810-191L	5
Acrylonitrile	600 - 14400	810-102L	10
Aliphatic hydrocarbons	6 - 3000	810-140	10
Allyl amine	8.5 - 170	810-180	10
Allyl amine	0.4 - 8	810-180L	10
Allyl isothiocyanate	5 - 200	810-149	10
Allyl chloride	0.1 - 3.4%	810-101L	10
Allyl chloride	3.2 - 48	810-131L	5
Amines	5 - 100	810-180	10
Amines	0.5 - 10	810-180L	10
2-Aminoethanol (*see ethanolamine*)			
Ammonia	0.2 - 32%	810-3H	10
Ammonia	0.05 - 3.52%	810-3HM	10
Ammonia	10 - 1000	810-3M	10
Ammonia	2.5 - 200	810-3LA	10
Ammonia	0.5 - 78	810-3L	10
Ammonia	1.5 - 30	810-180	10
Amyl acetate	10 - 200	810-147	10
Aniline	1.25 - 60	810-181	10
Arsine	0.04 - 10	810-19LA	10
Aromatic hydrocarbons	0.4 - 200	810-120	10
Benzaldehyde	4 - 92	810-91L	10
Benzene	2 - 312	810-121S	5
Benzene	2.5 - 120	810-121	10
Benzene	1 - 100	810-121SL	5
Benzene	0.1 - 65	810-121L	5
Benzene	0.2 - 66	810-121SP	5
Benzene	0.03 - 0.6%	810-171	10
Benzyl bromide	10 - 100	810-136L	5
Benzyl chloride	1.6 - 20	810-132L	10
Boron trichloride	2.25 - 54	810-12L	10
Bromine	0.05 - 0.8	810-8LA	10
Bromochloromethane (*see chlorobromomethane*)			
Bromoform	1 - 50	810-136L	5

Gas or Vapor to be measured	Measuring Range (ppm)	Cat. No.	Tests
1,3-Butadiene	50 - 800	810-174	10
1,3-Butadiene	2.5 - 100	810-174L	10
1,3-Butadiene	0.5 - 5	810-174LL*	5
Butane	25 - 1400	810-104	10
Butane	0.035 - 1.68%	810-103	9
1-Butanol	10 - 150	810-114	10
2-Butanol	5 - 150	810-115	10
2-Butanone (*see methyl ethyl ketone [MEK]*)			
Butyl acetate	0.05 - 0.8%	810-142	10
Butyl acetate	10 - 300	810-142L	10
tert-Butyl alcohol	500 - 12000	810-102L	10
Butyl acrylate	7 - 210	810-142L	10
Butylamine	8 - 160	810-180	10
Butylamine	0.55 - 11	810-180L	10
tert-Butylamine	5.5 - 110	810-180	10
n-Butyl bromide	24 - 360	810-136H	5
n-Butyl bromide	10 - 100	810-136L	5
n-Butyl bromide	1 - 43.2	810-136LA	5
Butyl mercaptan	0.16 - 12.8	810-70L	10
tert-Butyl mercaptan	2.5 - 150 mg/m^3	810-75	10
tert-Butyl mercaptan	1.25 - 250 mg/m^3	810-75N	10
tert-Butyl mercaptan	0.5 - 30 mg/m^3	810-75L*	10
tert-Butyl mercaptan	0.5 - 39 mg/m^3	810-75LN*	10
tert-Butyl mercaptan	1 - 15 mg/m^3	810-77*	5
tert-Butyl mercaptan	0.1 - 8	810-70L	10
Butyric acid	0.325 - 13	810-81L	10
Butyronitrile	6 - 180	810-191L	5
Carbon dioxide	2.5 - 40%	810-2HH	10
Carbon dioxide	0.5 - 20%	810-2H	10
Carbon dioxide	0.13 - 6%	810-2L	10
Carbon dioxide	300 - 5000	810-2LL	10
Carbon dioxide	100 - 4000	810-2LC	10
Carbon disulphide	20 - 4000	810-13M	5
Carbon disulphide	0.63 - 100	810-13	5
Carbon disulphide	0.1 - 8.1	810-13L	5
Carbon monoxide	1 - 50%	810-1HH	10
Carbon monoxide	0.1 - 10%	810-1H	10
Carbon monoxide	0.05 - 4%	810-1M	10
Carbon monoxide	25 - 2000	810-1LM	10
Carbon monoxide	2.5 - 2000	810-1L	10
Carbon monoxide	8 - 1000	810-1LA	10
Carbon monoxide	5 - 600	810-1LK	10
Carbon monoxide	5 - 100	810-1LKC	5
Carbon monoxide	5 - 50	810-1LL	10
Carbon monoxide	1 - 30	810-1LC	10
Carbon tetrachloride	0.5 - 60	810-134*Δ	5
Carbon tetrachloride	0.25 - 11	810-134L*Δ	5
Carbonyl chloride (*see phosgene*)			
Carbonyl sulphide	5 - 200	810-21*	5
Carbonyl sulphide	2 - 125	810-21LA*	5
Chlorine	0.25 - 10%	810-8HH	10
Chlorine	25 - 1000	810-8H	10
Chlorine	0.1 - 16	810-8LA	10
Chlorine	0.025 - 2	810-8LL*Δ	10
Chlorine	0.7 - 14	810-80	10

* *Store tubes at 33 to 40 F (> 0 to 4.4 C)*
Δ *One-year shelf-life*

Tech Tips

- *Detector tubes are factory calibrated for a specific flow dynamic provided by a system's pump. Always use detector tubes with the pump specified by the manufacturer. Interchanging brands of pumps and tubes can significantly reduce accuracy.*
- *Gastec grab sample detector tubes can be used at temperatures from 32 to 104 F (0 to 40 C). For higher temperature applications, see the Hot Probe at skcinc.com.*

For Gastec Passive Color Dosimeter Tubes
see page 97

Grab Sample Tubes for GV110 Piston Pump

Gas or Vapor to be measured	Measuring Range (ppm)	Cat. No.	Tests
Chlorine dioxide	0.1 - 10	810-23M	10
Chlorine dioxide	0.025 - 1.2	810-23L*Δ	10
Chlorine dioxide	45 - 450	810-8H	10
Chlorine dioxide	0.3 - 4.8	810-8LA	10
Chlorobenzene	2 - 500	810-126	10
Chlorobenzene	0.5 - 43	810-126L*	10
Chlorobromomethane	22 - 110	810-135	5
Chlorobromomethane	18 - 270	810-136H	5
Chlorobromomethane	11 - 110	810-136L	5
Chlorobromomethane	0.7 - 12.6	810-136LA	5
Chlorocyclohexane	50 - 1200	810-102L	10
Chlorodifluoromethane (R22)	0.1 - 2.4%	810-51H ‡	5
Chlorodifluoromethane (R22)	25 - 1000	810-51 ‡	5
Chlorodifluoromethane (R22)	2.5 - 135	810-51L ‡	5
1-Chloro-2,3-epoxy propane (*see epichlorohydrin*)			
2-Chloroethanol (*see ethylene chlorohydrin*)			
Chloroethylene (*see vinyl chloride*)			
Chloroform	4 - 400	810-137	5
Chloroform	0.5 - 30	810-137LA*Δ	5
Chloroform	0.3 - 4.5	810-137LL*Δ	5
Chloropicrin	2.5 - 60	810-134	5
Chloropicrin	0.28 - 5.5	810-134L	5
Chloropicrin	0.045 - 22	810-233Δ	5
2-Chloro-1,1,1,2-tetrafluoroethane (R124)	45 - 1800	810-51‡	5
m-Cresol	1 - 25	810-61*	10
o-Cresol	0.4 - 62.5	810-61*	10
p-Cresol	1 - 25	810-61*	10
Cumene	2 - 100	810-122L	10
Cyclohexane	0.015 - 1.2%	810-102H	10
Cyclohexane	60 - 1440	810-102L	10
Cyclohexanol	5 - 100	810-118	10
Cyclohexanone	2 - 75	810-154*	10
Cyclohexanone	10 - 470	810-91L	10
Cyclohexene	0.05 - 0.8%	810-151	10
Cyclohexylamine	7 - 140	810-180	10
Cyclohexylamine	0.5 - 10	810-180L	10
Cymene	5.6 - 224	810-141L	10
n-Decane	200 - 6000	810-105	10
Diacetone alcohol	2.5 - 100	810-154	10
Diacetyl	25 - 1500	810-92	10
1,2-Diaminoethane (*see ethylenediamine*)			
Diborane	0.02 - 5	810-22	10
1,1-Dibromoethane	7 - 70	810-136L	5
1,2-Dibromoethane (*see ethylene dibromide*)			
Dibromomethane	5 - 50	810-136L	5
Di-n-butylamine	5 - 100	810-180	10
Di-n-butylamine	0.4 - 8	810-180L	10
m-Dichlorobenzene	2.5 - 300	810-127	10
o-Dichlorobenzene	2.5 - 300	810-127	10
p-Dichlorobenzene	2.5 - 300	810-127	10

* *Store tubes at 33 to 40 F (> 0 to 4.4 C)*
Δ *One-year shelf-life*

Gas or Vapor to be measured	Measuring Range (ppm)	Cat. No.	Tests
Dichlorodifluoromethane (R12)	325 - 7800	810-51H‡	5
Dichlorodifluoromethane (R12)	11 - 440	810-51‡	5
Dichlorodifluoromethane (R12)	1.8 - 97.2	810-51L‡	5
1,1-Dichloroethane	90 - 450	810-135	5
1,2-Dichloroethane	1 - 39	810-232	5
1,1-Dichloroethylene (*see vinylidene chloride*)			
1,2-Dichloroethylene	5 - 250	810-139*	10
1,2-Dichloroethylene	80 - 800	810-132HA	10
1,2-Dichloroethylene	0.375 - 6	810-132LL	10
1,1-Dichloro-1-fluoroethane (R141b)	10 - 1000	810-51‡	5
1,1-Dichloro-1-fluoroethane (R141b)	1.1 - 22	810-51L‡	5
Dichloromethane (*see methylene chloride*)			
Dichloropentafluoropropane (R225)	20 - 800	810-51‡	5
Dichloropentafluoropropane (R225)	1.4 - 28	810-51L‡	5
1,2-Dichloropropane (*see propylene dichloride*)			
1,3-Dichloropropene	45 - 450	810-132HA	10
1,3-Dichloropropene	0.5 - 10	810-131LA	5
1,2-Dichloro-1,1,2,2-tetrafluoroethane (R114)	475 - 11400	810-51H‡	5
1,2-Dichloro-1,1,2,2-tetrafluoroethane (R114)	20 - 800	810-51‡	5
1,2-Dichloro-1,1,2,2-tetrafluoroethane (R114)	1.8 - 97.2	810-51L‡	5
2,2-Dichloro-1,1,1-trifluoroethane (R123)	14 - 1600	810-51‡	5
2,2-Dichloro-1,1,1-trifluoroethane (R123)	1.4 - 28	810-51L‡	5
Dichlorvos	0.11 - 1.8	810-132LL	10
Diethylamine	5.5 - 110	810-180	10
Diethylamine	0.45 - 9	810-180L	10
Diethylaminoethanol	0.6 - 12	810-180L	10
Diethyl benzene	2 - 150	810-122L	10
Diethylenetriamine	0.95 - 19	810-180L	10
Diethylethanolamine	6 - 120	810-180	10
Diethyl ether (*see ethyl ether*)			
Diisobutylene	45 - 540	810-121	10
Diisobutyl ketone	0.2 - 1%	810-102L	10
Diisobutyl ketone	0.58 - 29	810-91L	10
Diisopropylamine	5 - 100	810-180	10
Diisopropylamine	0.3 - 6	810-180L	10
Diisopropyl benzene	10 - 400	810-141L	10
N,N-Dimethylacetamide	1.5 - 240	810-184	10
Dimethylamine	1.2 - 19.2%	810-3H	10
Dimethylamine	5.5 - 110	810-180	10
Dimethylamine	0.45 - 9	810-180L	10
2-Dimethylaminoethanol	0.65 - 13	810-180L	10

‡ *Pyrotec tube requires Pyrotec Pyrolyzer Cat. No. 810-840; see page 81.*

Grab Sample Tubes for GV110 Piston Pump

Gas or Vapor to be measured	Measuring Range (ppm)	Cat. No.	Tests
Dimethylaminopropylamine	8 - 160	810-180	10
Dimethylaminopropylamine	0.6 - 12	810-180L	10
N,N-Dimethylaniline	2.5 - 30	810-181	10
Dimethylbenzene (*see xylene*)			
Dimethyl disulphide	0.3 - 6	810-53	5
Dimethylethanolamine	6.5 - 130	810-180	10
N,N-Dimethylethylamine	4 - 80	810-180	10
N,N-Dimethylethylamine	0.3 - 6	810-180L	10
N,N-Dimethyl formamide	0.8 - 90	810-183	10
2,6-Dimethyl-4-heptanone (*see diisobutyl ketone*)			
Dimethylhydrazine	0.1 - 2	810-185	10
Dimethyl sulphide	0.15 - 10	810-53	5
Dimethyl sulphide	1 - 15 mg/m³	810-77	5
1,4-Dioxane	25 - 140	810-159	10
1,4-Dioxane	0.1 - 6%	810-163	10
Dipropylamine	4 - 80	810-180	10
Dipropylamine	0.35 - 7	810-180L	10
Divinyl benzene	1 - 15	810-124L	10
Divinyl methoxysilane	6.5 - 25	810-113L	10
Enflurane (2-chloro-1,1,2-trifluoroehtyl difluoromethyl ether)	100 - 1230	810-51‡	5
Enflurane (2-chloro-1,1,2-trifluoroehtyl difluoromethyl ether)	25 - 145	810-51L‡	5
Epichlorohydrin	1.2 - 120	810-163L	5
1,2-Epoxypropane (*see propylene oxide*)			
Ethanethiol (*see ethyl mercaptan*)			
Ethanol	0.01 - 7.5%	810-112	10
Ethanol	50 - 2000	810-112L	10
Ethyl alcohol (*see ethanol*)			
Ethanolamine	1.95 - 39	810-180L	10
Ethyl acetate	0.1 - 1.5%	810-141	10
Ethyl acetate	20 - 800	810-141L	10
Ethyl acrylate	8 - 320	810-141L	10
Ethylamine	5 - 100	810-180	10
Ethylamine	0.45 - 9	810-180L	10
Ethyl benzene	11 - 330	810-122	10
Ethyl benzene	1 - 70	810-122L	10
p-Ethyl benzylchloride	2.5 - 50	810-131LA	5
Ethyl bromide	2.5 - 200	810-136L	5
Ethyl chloroformate	7 - 140	810-131LA	5
Ethyl chloride	15 - 150	810-138	5
Ethylene	25 - 1680	810-172	10
Ethylene	0.2 - 100	810-172L	10
Ethylene	0.35 - 16.8%	810-103	9
Ethylene	0.1 - 2%	810-171	10
Ethylene chlorohydrin	80 - 200	810-111L	10
Ethylenediamine	14 - 280	810-180	10
Ethylenediamine	0.9 - 18	810-180L	10
Ethylene dibromide	14 - 210	810-136H	5
Ethylene dibromide	8 - 80	810-136L	5
Ethylene dichloride	1 - 39	810-232	5
Ethylene dichloride	400 - 2000	810-135	5

* *Store tubes at 33 to 40 F (> 0 to 4.4 C)*
Δ *One-year shelf-life*

Gas or Vapor to be measured	Measuring Range (ppm)	Cat. No.	Tests
Ethylene dichloride	104 - 1040	810-135L	5
Ethylene glycol	10 - 100 mg/m³	810-165L*Δ	5
Ethylene glycol monobutyl ether	200 - 1000	810-113L	10
Ethylene glycol monobutyl ether	60 - 400	810-113LL	10
Ethylene glycol monoethyl ether	110 - 1000	810-113L	10
Ethylene glycol monoethyl ether	46 - 460	810-113LL	10
Ethylene glycol monomethyl ether	75 - 760	810-113L	10
Ethylene glycol monomethyl ether	44 - 440	810-113LL	10
Ethylene glycol monomethyl ether acetate (*see 2-methoxyethyl acetate*)			
Ethylene oxide	0.05 - 3%	810-163	10
Ethylene oxide	0.4 - 350	810-163L*Δ	5
Ethylene oxide	0.1 - 10	810-163LL*Δ	5
Ethyl ether	0.04 - 1%	810-161	10
Ethyl ether	10 - 1200	810-161L	10
Ethylidene chloride (*see 1,1-dichloroethane*)			
Ethyl mercaptan	0.5 - 120	810-72	10
Ethyl mercaptan	0.2 - 75	810-72L	10
Ethyl mercaptan	0.15 - 57.5	810-72LN	10
Ethyl mercaptan	0.5 - 120	810-70	10
Ethyl mercaptan	0.1 - 8	810-70L	10
Ethyl mercaptan	100 - 3800	810-71H	10
N-Ethyl morpholine	5 - 100	810-180	10
N-Ethyl morpholine	0.3 - 6	810-180L	10
Fluorine	0.5 - 50	810-17	10
Fluorotrichloromethane (see trichlorofluoromethane [R11])			
Formaldehyde	8 - 6400	810-91M*	10
Formaldehyde	2 - 100	810-91	5
Formaldehyde	0.1 - 40	810-91L*Δ	10
Formaldehyde	0.05 - 1	810-91LL*Δ	10
Formic acid	5.2 - 130	810-81	10
Formic acid	0.5 - 20	810-81L	10
Furfural	2 - 30	810-154	10
Gasoline (petrol)	0.015 - 1.2%	810-101	10
Gasoline (petrol)	30 - 2000	810-101L	10
Gasoline (petrol)	0.1 - 2%	810-1M	10
Halothane (2-bromo-2-chloro-1,1,1-trifluoroethane)	800 - 6400	810-51H‡	5
Halothane (2-bromo-2-chloro-1,1,1-trifluoroethane)	240 - 960	810-51‡	5
Halothane (2-bromo-2-chloro-1,1,1-trifluoroethane)	3 - 60	810-51L‡	5
Heptane	0.015 - 1.2%	810-101	10
Heptane	30 - 2000	810-101L	10
Heptane	0.035 - 1.68%	810-103	9
Heptane	90 - 2700	810-105	10
Hexamethylenediamine	1.55 - 31	810-180L	10
Hexane	0.015 - 1.2%	810-102H	10

‡ *Pyrotec tube requires Pyrotec Pyrolyzer Cat. No. 810-840; see page 81.*

Tech Tips

- *Use detector tubes for screening and field surveys. Use validated methods for compliance sampling.*
- ***For detector tube reading:***
  - *When the end of the color change layer is flat, read the value at the end of the layer.*
  - *When the end of the color change layer is slanted, read the value in the middle of the slant.*
  - *When the demarcation of the color change layer is pale, read the value in the middle between the dark layer end and pale layer end.*
- ***To aid reading results:***
  - *Hold the tube against a light background.*
  - *Compare the tube against an unused tube from the same box.*

Grab Sample Tubes for GV110 Piston Pump

For the GV110 Piston Pump
see page 74

Gas or Vapor to be measured	Measuring Range (ppm)	Cat. No.	Tests
Hexane	4 - 1200	810-102L	10
Hexane	0.025 - 1.2%	810-103	9
Hexane	80 - 2400	810-105	10
Hexone (*see methyl isobutyl ketone*)			
2-Hexyl alcohol	60 - 2400	810-141L	10
Hexylamine	9 - 180	810-180	10
Hexylamine	0.65 - 13	810-180L	10
Hydrazine	0.05 - 2	810-185	10
Hydrocarbons (higher class)	100 - 3000	810-105	10
Hydrocarbons (lower class)	0.05 - 2.4%	810-103	9
Hydrogen	0.5 - 2%	810-30	10
Hydrogen bromide	0.8 - 16	810-15L	10
Hydrogen chloride	50 - 5000	810-14R	10
Hydrogen chloride	10 - 1000	810-14M	10
Hydrogen chloride	0.2 - 76	810-14L	10
Hydrogen chloride	8 - 160	810-80	10
Hydrogen chloride	1.5 - 30%	810-8HH	10
Hydrogen cyanide	0.05 - 1.6%	810-12H	10
Hydrogen cyanide	17 - 2400	810-12M	10
Hydrogen cyanide	0.5 - 150	810-12L	10
Hydrogen cyanide	0.2 - 10	810-12LL	10
Hydrogen fluoride	0.25 - 100	810-17	10
Hydrogen fluoride	0.09 - 72	810-17L	10
Hydrogen fluoride	0.05 - 24	810-17LL	10
Hydrogen peroxide	0.5 - 10	810-32	10
Hydrogen sulphide	1 - 40%	810-4HT	10
Hydrogen sulphide	0.25 - 20%	810-4HP	10
Hydrogen sulphide	0.1 - 4%	810-4HH	10
Hydrogen sulphide	10 - 4000	810-4H	10
Hydrogen sulphide	25 - 1600	810-4HM	10
Hydrogen sulphide	12.5 - 500	810-4M	10
Hydrogen sulphide	1 - 240	810-4L	10
Hydrogen sulphide	0.25 - 120	810-4LL	10
Hydrogen sulphide	1 - 40	810-4LK	10
Hydrogen sulphide	0.5 - 12	810-4LB	10
Hydrogen sulphide	0.05 - 4	810-4LT*	10
Hydrogen sulphide	SO_2: 0.25 - 20 H_2S: 1.25 - 120	810-45S	5
Hydrogen sulphide + Sulphur dioxide (total quantification)	0.02 - 8%	810-45H	10
4-Hydroxy-4-methyl-2-pentanone (see diacetone alcohol)			
Iodine	0.2 - 12	810-9L	10
Iodine	0.12 - 2.4	810-80	10
Isoamyl acetate	10 - 200	810-148	10
Isoamyl alcohol	5 - 300	810-117	10
Isobutane	0.035 - 1.68%	810-103	9
Isobutane	55 - 3080	810-104	10
Isobutene	0.07 - 2.2%	810-101L	10
Isobutyl acetate	10 - 300	810-144	10
Isobutyl acrylate	2.6 - 78	810-142L	10
Isobutyl alcohol	4 - 150	810-116	10
Isooctane	0.027 - 0.54%	810-101	10
Isopentane	0.045 - 2.16%	810-103	9

* *Store tubes at 33 to 40 F (> 0 to 4.4 C)*

Gas or Vapor to be measured	Measuring Range (ppm)	Cat. No.	Tests
Isopentyl acetate (*see isoamyl acetate*)			
Isopentyl alcohol (*see isoamyl alcohol*)			
Isophorone	2 - 30	810-154	10
Isopropyl acetate	10 - 500	810-146	10
Isopropyl alcohol	0.02 - 5.0%	810-113	10
Isopropyl alcohol	20 - 800	810-113L	10
Isopropyl alcohol	20 - 460	810-113LL	10
Isopropyl amine	5.5 - 110	810-180	10
Isopropyl amine	0.45 - 9	810-180L	10
Isopropyl ether	18 - 720	810-141L	10
Isopropyl ether	0.018 - 0.45%	810-161	10
Isopropyl mercaptan	10 - 240	810-70	10
Isovaleric acid	2 - 50	810-81	10
Isovaleric acid	0.38 - 15	810-81L	10
LPG (liquified petroleum gas)	0.02 - 0.8%	810-100A	10
Maleic anhydride	0.8 - 20	810-81	10
Mercaptans	0.5 - 120	810-70	10
Mercaptans	0.1 - 8	810-70LN	10
2-Mercaptoethanol	0.5 - 7.5	810-75L	10
Mercury vapor	0.05 - 13.2 mg/m³	810-40	10
Mesityl oxide	27 - 1080	810-141L	10
Methacrylic acid	1.8 - 45	810-81	10
Methacrylic acid	0.35 - 14	810-81L	10
Methacrylonitrile	0.2 - 32	810-192	5
Methaldehyde	0.065 - 3.25	810-91L	10
Methanethiol (*see methyl mercaptan*)			
Methanol	0.002 - 4.5%	810-111	10
Methanol	20 - 1000	810-111L	10
Methanol	2 - 56	810-111LL	10
2-Methoxyethyl acetate	300 - 1300	810-113L	10
1-Methoxy-2-propanol	26 - 260	810-113LL	10
Methyl alcohol (*see methanol*)			
Methyl acrylate	8 - 320	810-141L	10
2-Methyl allyl chloride	2.8 - 55	810-131LA	5
Methylamine	5 - 100	810-180	10
Methylamine	0.5 - 10	810-180L	10
N-Methyl aniline	3.5 - 42	810-181	10
Methyl bromide	10 - 600	810-136H	5
Methyl bromide	2.5 - 200	810-136L	5
Methyl bromide	1 - 36	810-136LA	5
Methyl bromide	0.1 - 3	810-136LL	5
2-Methyl-3-butenenitrile	0.4 - 12	810-191L	5
Methyl chloride	12 - 480	810-51‡	5
Methyl chloride	1.6 - 86.4	810-51L‡	5
Methyl chloroform (*see 1,1,1-trichloroethane*)			
Methyl chloroformate	58 - 1160	810-131LA	5
Methylcyclohexane	0.04 - 0.84%	810-102H	10
Methylcyclohexanol	5 - 100	810-119	10
Methylcyclohexanone	2 - 100	810-155*	10
Methylene chloride	20 - 500	810-138	5
Methylene chloride	4 - 150	810-138L	5
Methylene chloride	1 - 54	810-51L	5

‡ *Pyrotec tube requires Pyrotec Pyrolyzer Cat. No. 810-840; see page 81.*

Grab Sample Tubes for GV110 Piston Pump

Gas or Vapor to be measured	Measuring Range (ppm)	Cat. No.	Tests
Methylene iodide	0.22 - 22	810-121L	5
Methyl ether	0.034 - 0.85%	810-161	10
Methyl ethyl ketone	0.02 - 0.6%	810-152	10
Methyl ethyl ketone	10 - 384	810-152L*	5
Methyl ethyl ketone	21 - 1680	810-151L	10
Methyl hydrazine	0.6 - 12	810-185	10
Methyl iodide	100 - 34800	810-230H	10
Methyl iodide	0.5 - 108	810-230*	10
Methyl iodide	0.32 - 32	810-121L	5
Methyl isobutyl ketone	0.05 - 0.6%	810-153	10
Methyl isobutyl ketone	2.5 - 130	810-153LΔ	10
Methyl isothiocyanate	50 - 400	810-141L	10
Methyl mercaptan	20 - 2700	810-71H	10
Methyl mercaptan	0.25 - 140	810-71	10
Methyl mercaptan	0.35 - 84	810-70	10
Methyl mercaptan	0.1 - 8	810-70L	10
Methyl methacrylate	10 - 500	810-149	10
N-Methyl morpholine	5 - 100	810-180	10
N-Methyl morpholine	0.3 - 6	810-180L	10
4-Methyl pyridine	0.38 - 10.5	810-182	10
N-Methyl pyrrolidone	13.5 - 270	810-180	10
Monochlorobenzene (*see chlorobenzene*)			
Morpholine	9 - 180	810-180	10
Morpholine	0.5 - 10	810-180L	10
Naphthalene	0.5 - 14	810-60	10
Nitric acid	0.1 - 40	810-15L	10
Nitric acid	5 - 100	810-80	10
Nitroethane	4 - 240	810-52	10
Nitrogen dioxide	0.5 - 125	810-9L	10
Nitrogen dioxide	2.5 - 200	810-10	5
Nitrogen dioxide	0.2 - 4	810-80	10
Nitrogen dioxide	0.5 - 30	810-52	10
Nitrogen oxide	2.5 - 200	810-10	5
Nitrogen oxides	50 - 2500	810-11HA	10
Nitrogen oxides	5 - 625	810-11S	10
Nitrogen oxides	0.04 - 16.5	810-11L	10
Nitromethane	5 - 300	810-52‡	10
1-Nitropropane	4.2 - 252	810-52‡	10
2-Nitropropane	3.7 - 222	810-52‡	10
Nitrotrichloromethane (*see chloropicrin*)			
Nonane	130 - 3900	810-105	10
Octane	0.036 - 0.72%	810-101	10
Octane	100 - 3000	810-105	10
Oxygen	3 - 24%	810-31B	5
Ozone	4 - 400	810-18M	10
Ozone	0.025 - 6	810-18L	10
Pentachloroethane	40 - 500	810-133L	10
1,3-Pentadiene	250 - 4000	810-174	10
1,3-Pentadiene	42.5 - 850	810-174L	10
Pentamethylenediamine	0.75 - 15	810-180L	10
n-Pentane	30 - 1680	810-104	10
n-Pentane	0.0375 - 1.8%	810-103	9
2-Pentenenitrile	0.5 - 15	810-193	5
2-Pentenenitrile	0.24 - 7.2	810-191L	5
3-Pentenenitrile	0.4 - 12	810-191L	5

* *Store tubes at 33 to 40 F (> 0 to 4.4 C)*

Δ *One-year shelf-life*

Gas or Vapor to be measured	Measuring Range (ppm)	Cat. No.	Tests
Pentyl acetate (*see amyl acetate*)			
Perchloroethylene (*see tetrachloroethylene*)			
Petroleum benzine	0.5 - 28 mg/L	810-106	10
Petroleum distillates (*see gasoline [petrol]*)			
Petroleum ether	0.5 - 28 mg/L	810-106	10
Petroleum naphtha	0.5 - 28 mg/L	810-106	10
Phenol	0.4 - 187	810-60*	10
Phenylethylene (*see styrene*)			
Phosgene	0.05 - 20	810-16*	10
Phosphine	200 - 5500	810-7H	10
Phosphine	2.5 - 1000	810-7J	10
Phosphine	2.5 - 100	810-7	10
Phosphine	0.15 - 5	810-7L	10
Phosphine	0.05 - 9.8	810-7LA	10
a-Pinene	95 - 1140	810-121	10
Polytec I	Qualitative	810-107	10
Polytec II	Qualitative	810-25	10
Polytec III	Qualitative	810-26	10
Polytec IV	Qualitative	810-27	10
Polytec V	Qualitative	810-28	10
Propane	0.05 - 2.4%	810-103	9
Propionaldehyde	0.76 - 38	810-91L	10
Propionaldehyde	24 - 1880	810-151L	10
Propionic acid	3 - 75	810-81	10
Propionic acid	0.25 - 10	810-81L	10
Propionitrile	50 - 1200	810-191	5
Propyl acetate	20 - 500	810-145	10
Propyl alcohol	0.04 - 2.5%	810-113	10
Propyl alcohol	130 - 560	810-113L	10
Propyl alcohol	55 - 170	810-113LL	10
Propylamine	6 - 120	810-180	10
Propylamine	0.5 - 10	810-180L	10
n-Propyl bromide	1 - 18	810-136LA	5
Propylene	0.02 - 0.8%	810-100A	10
Propylene dichloride	40 - 800	810-131LA	5
Propylene imine	5.5 - 110	810-180	10
Propylene imine	0.35 - 7	810-180L	10
Propylene oxide	0.065 - 3.9%	810-163	10
Propylene oxide	1 - 100	810-163L	5
Propyl mercaptan	22.5 - 540	810-70	10
Propyl mercaptan	0.12 - 9.6	810-70L	10
Pyridine	0.2 - 35	810-182	10
Stoddard solvent	50 - 8000 mg/m³	810-128	10
Styrene	10 - 1500	810-124	10
Styrene	2 - 100	810-124L	10
Styrene	0.15 - 2.3%	810-153	10
Sulphur dioxide	0.05 - 8%	810-5H	10
Sulphur dioxide	20 - 3600	810-5M	10
Sulphur dioxide	1.25 - 200	810-5L	10
Sulphur dioxide	0.5 - 60	810-5LA	10
Sulphur dioxide	0.1 - 25	810-5LC	10
Sulphur dioxide	0.05 - 10	810-5LB	10
Sulphur dioxide	SO_2: 0.25 - 20 H_2S: 1.25 - 120	810-45S	5

‡ *Pyrotec tube requires Pyrotec Pyrolyzer Cat. No. 810-840; see page 81.*

Tech Tips

- *Gastec grab sample detector tubes can be used at temperatures from 32 to 104 F (0 to 40 C). For higher temperature applications, see the Hot Probe at skcinc.com.*
- *Do not enter closed spaces without confirming safety. When sampling in closed spaces, determine concentration remotely by using an extension hose or probe connected to the detector tube system. Visit skcinc.com.*

Grab Sample Tubes for GV110 Piston Pump

Gas or Vapor to be measured	Measuring Range (ppm)	Cat. No.	Tests
Sulphur dioxide	1.5 - 30	810-80	10
Sulphur dioxide + hydrogen sulphide (total quantification)	0.02 - 8%	810-45H	10
Sulphuric acid	0.5 - 5 mg/m^3	810-35	10
1,1,2,2-Tetrabromoethane	0.92 - 9.2	810-135L	5
1,1,2,2-Tetrachloro-1,2-difluoroethane (R112)	125 - 3000	810-51H‡	5
1,1,2,2-Tetrachloro-1,2-difluoroethane (R112)	7 - 280	810-51‡	5
1,1,2,2-Tetrachloro-1,2-difluoroethane (R112)	1 - 54	810-51L‡	5
1,1,2,2-Tetrachloroethane	2 - 30	810-131L	5
Tetrachloroethylene	7 - 900	810-133HA*	10
Tetrachloroethylene	2 - 250	810-133M*	10
Tetrachloroethylene	1 - 75	810-133L*	10
Tetrachloroethylene	0.1 - 9	810-133LL*	10
Tetrachloroethylene	0.075 - 1.5%	810-132HH	10
Tetrachloromethane (*see carbon tetrachloride*)			
Tetrahydrofuran	20 - 800	810-159	10
Tetrahydrofuran	5 - 232	810-159L*Δ	10
Tetrahydrofuran	0.056 - 1.4%	810-161	10
Tetrahydrothiophene	10 - 200	810-76H	5
Tetrahydrothiophene	10 - 100 mg/m^3	810-76M	5
Tetrahydrothiophene	1 - 10	810-76	5
Tetramethylenediamine	8.5 - 170	810-180	10
Tetramethylenediamine	0.8 - 16	810-180L	10
Thionyl chloride	1.44 - 21.6	810-5LA	10
Toluene	5 - 690	810-122	10
Toluene	1 - 100	810-122L	10
Toluene	0.02 - 0.8%	810-161	10
Toluol (*see toluene*)			
o-Toluidine	5 - 60	810-181	10
Trichloroacetic acid	1 - 37.5	810-15L	10
1,2,4-Trichlorobenzene	0.65 - 13	810-131LA	5
1,1,1-Trichloroethane (methyl chloroform)	100 - 2000	810-135	5
1,1,1-Trichloroethane (methyl chloroform)	6 - 900	810-135L	5
1,1,1-Trichloroethane (methyl chloroform)	0.06 - 1.2%	810-171	10
1,1,2-Trichloroethane	220 - 750	810-135	5
Trichloroethylene	0.05 - 2.5%	810-132HH	10
Trichloroethylene	20 - 1300	810-132HA*	10
Trichloroethylene	2 - 250	810-132M*	10
Trichloroethylene	1 - 70	810-132L*	10
Trichloroethylene	0.125 - 8.8	810-132LL*	10
Trichlorofluoromethane (R11)	275 - 6600	810-51H‡	5

Gas or Vapor to be measured	Measuring Range (ppm)	Cat. No.	Tests
Trichlorofluoromethane (R11)	8 - 320	810-51‡	5
Trichlorofluoromethane (R11)	0.8 - 43.2	810-51L‡	5
Trichloromethane (*see chloroform*)			
Trichloronitromethane (*see chloropicrin*)			
1,2,3-Trichloropropane	36 - 360	810-135L	5
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	250 - 6000	810-51H‡	5
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	10 - 400	810-51‡	5
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	1 - 54	810-51L‡	5
1,1,1-Trichloro-2,2,2-trifluoroethane (R113a)	200 - 4800	810-51H‡	5
1,1,1-Trichloro-2,2,2-trifluoroethane (R113a)	10 - 400	810-51‡	5
1,1,1-Trichloro-2,2,2-trifluoroethane (R113a)	0.8 - 43.2	810-51L‡	5
Triethylamine	4.5 - 90	810-180	10
Triethylamine	0.3 - 6	810-180L	10
Trimethylamine	25 - 250	810-3M	10
Trimethylamine	3.5 - 70	810-180	10
Trimethylamine	0.25 - 5	810-180L	10
Trimethyl benzene	10 - 300	810-123	10
Valeric acid	0.38 - 15	810-81L	10
Vinyl acetate	5 - 250	810-143	5
Vinyl acetate	0.06 - 0.9%	810-141	10
Vinyl benzene (*see styrene*)			
Vinyl chloride	0.025 - 2%	810-131*	10
Vinyl chloride	0.25 - 54	810-131LA*	5
Vinyl chloride	0.1 - 6.6	810-131L*	5
Vinyl chloride	0.25 - 70	810-131LB*	10
Vinyl cyanide (*see acrylonitrile*)			
Vinylidene chloride	0.4 - 40.6	810-130L*	5
Vinyl trimethoxysilane	6.5 - 25	810-113L	10
Water vapor	0.5 - 32 mg/L	810-6	10
Water vapor	0.05 - 2 mg/L	810-6L	10
Water vapor	3 - 100 LB/MMCF	810-6LP	10
Water vapor	2 - 10 LB/MMCF	810-6LLP	10
Xylene	5 - 625	810-123	10
Xylene	2 - 200	810-123L	10
Xylene	0.1 - 1.2%	810-100A	10
Xylene	2 - 200	810-122L	10

* *Store tubes at 33 to 40 F (> 0 to 4.4 C)*
Δ *One-year shelf-life*
‡ *Pyrotec tube requires Pyrotec Pyrolyzer Cat. No. 810-840; see page 81.*

Gastec Sampling Accessories for GV110 Piston Pump

Extension Hoses

Hoses easily screw onto the GV110 Gas Sampling Pump to enable remote sampling, and are constructed of synthetic rubber for rugged durability. Narrow ½-inch (1.3-cm) diameter easily fits into tight spaces.

The convenient hose design eliminates the need to factor in hose line air volume when sampling. Sample results can be read directly from the detector tube without additional calculations, charts, or tables.

Includes hose with pump adapter and instructions

5 meter.....**Cat. No. 810-351A-5**
10 meter.....**Cat. No. 810-351A-10**
30 meter.....**Cat. No. 810-351A-30**

Hot Probe

For sampling extremely hot gases, such as those found in flues and smokestacks. When used with the Gastec Gas Sampling Pump, the Hot Probe quickly cools gases as hot as 600 C (1112 F) to ambient temperature. The Hot Probe can be held in any direction and used in hard-to-reach spaces.

Includes Hot Probe with manual

Cat. No. **810-340**

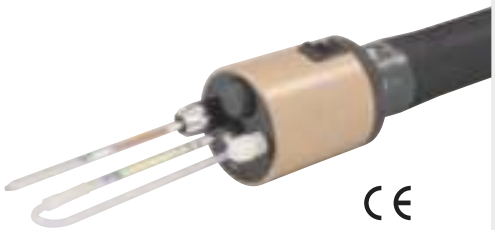
Hot Probe Holder

Cat. No. **810-345A**

Extension Pole

For use with GV100 and GV110 pumps. Extends to 2.8 meters

Cat. No. **810-350BP-2**



Pyrotec Pyrolyzer

Gastec Pyrotec Pyrolyzer System for measuring chlorofluorocarbons is ready to use in seconds — no tools required. Its compact, lightweight design makes it easy to transport and use anytime, anywhere. The pyrolyzer's high-impact plastic construction is corrosion-resistant and rugged. Powered by AA disposable batteries

Includes Pyrotec Pyrolyzer, 4 AA batteries, tube protector, U tube, clamping nut, and instructions. For use with the Gastec Gas Sampling Pump

Cat. No. **810-840**

Gastec Tube Handbook

Easy-to-read reference for the occupational health and safety professional

Cat. No. **810-GV100SH**

Deluxe Tube Tip Breaker

Safely scores and breaks detector tube tips; holds approximately 260 tips

Cat. No. **810-722**

For Gastec Passive Color Dosimeter Tubes
see page 97

SKC Passive Samplers

Passive Samplers for New Applications and Methods

SKC provides a variety of passive samplers to meet OSHA and EPA methods, including charcoal-based samplers, chemically coated sorbents, paper tape media, and specialty sorbents for thermal desorption. In addition to validations in agency methods, SKC research chemists have performed in-house validations of passive samplers to meet customer requirements in health care, hydraulic fracturing, general industry, landfills, ambient air, and more.

webinar

skcinc.com

Passive Samplers
skcinc.com/Training

VOC 575

Industrial Hygiene Sampling of ppm-Level Organic Vapors

See pages 84-85

UME^{X} 100

Industrial Hygiene, Environmental, and Indoor Air Sampling of Formaldehyde/Other Aldehydes

See page 94

UME^{X} 200

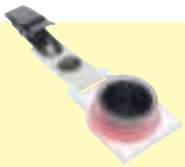
Industrial Hygiene or Environmental Sampling of Nitrogen Dioxide/Sulfur Dioxide

See page 95

UME^{X} 300

Industrial Hygiene and Environmental Ammonia Sampling

See page 95



Elemental Mercury Passive Sampler

Full-shift Industrial Hygiene Sampling and Extended Environmental Sampling

See page 96

Hydrogen Cyanide Passive Sampler

Accurate Determination of Personal Exposure

See page 96

Passive Thermal Desorption Tubes

Extended ppb-Level Environmental Sampling of Benzene, Other VOCs, and SVOCs

See pages 98-99

ULTRA Thermal Desorption Passive Sampler

Environmental Sampling of Sub-ppb Level VOCs and SVOCs

See pages 100-101

VOC 575 Series

Top Reasons to Choose VOC Chek 575

✓Capacity
- More than twice the sorbent found in other samplers

✓Sample time
- More sorbent means longer sample times for 8 hours or more for most compounds

✓Cost
- More sorbent in a single layer and one sampler for an 8-hour shift means fewer analyses

✓STEL Sampling for some compounds

✓Defensible
- Documented performance in OSHA diffusive methods and SKC online research reports

✓Easy 3-step sampling!

Remove front cap.

Clip in worker's breathing zone to sample.

Cap and record information.

Passive Samplers

for ppm-Level Organic Vapors

Rugged sampler, Simple design

OSHA Active/Passive Method Cross-reference

Compound	Active Method	Tube Cat. No.	Passive Method	Sampler Cat. No.
Benzene	OSHA 1005	226-01	OSHA 1005	575-002
Butyl acetates	OSHA 1009	226-01	OSHA 1009	575-002
MEK/MIBK	OSHA 16 (MEK)	226-10	OSHA 1004	575-002
Styrene	OSHA 89	226-73	OSHA 1014	575-006
Toluene	OSHA 111	226-81A or 226-01	OSHA 111	575-002
Trichloroethylene/ tetrachloroethylene	OSHA 1001	226-01	OSHA 1001	575-002
Trimethylbenzene	OSHA 1020	226-01	OSHA 1020	575-002
Xylenes/ethylbenzene	OSHA 1002	226-01	OSHA 1002	575-002

VOC Chek 575 Series Passive Samplers

Passive Sampler for:	Sorbent	Cat. No.	Qty.
Organic vapors	Charcoal Lot 2000, 350 mg	**575-001†**	**5**
		575-001A	**25**
Organic vapors	Anasorb 747, 500 mg	**575-002†**	**5**
		575-002A	**25**
Ethylene oxide	Anasorb 747 treated with hydrobromic acid, 500 mg	**575-005†**	**5**
		575-005A	**25**
Styrene	Anasorb 747 treated with tert-butyl catechol, 500 mg	**575-006**	**5**
Methanol	Anasorb 747, 500 mg, includes secondary diffusion barrier	**575-007**	**5**

† *Larger quantity packages are available. Contact SKC.*

Attention Laboratory Customers!

Ask for the *VOC Chek 575 Series Passive Sampler Laboratory Reference Guide* containing critical sampling and analysis details. **Email your request to skctech@skcinc.com.**

SKC VOC Chek 575 Passive Samplers are listed in OSHA passive methods!

See the VOC Chek 575 Series Selection Guide pages 87-93

V Video | P PowerPoint | W Webinar | S Sampling Solution

Visit skcinc.com/Training

VOC 575 Passive Samplers

Targeted Compounds

- Validated sampling rates
- Lightweight, miniature — convenient for workers to wear in any industry
- Easy to use and analyze

Siloxanes
SKC validated method

VOC Chek 575 Passive Sampler
Cat. No. 575-001

See page 85 for ordering.

Ethylene Oxide (EtO)
Same sorbent as active OSHA Method 1010
Fully validated for 15-min and 8-hr sampling

VOC Chek 575 Passive Sampler
Cat. No. 575-005

See page 85 for ordering.

Anesthetic Gases
Halothane, isoflurane, desflurane, enflurane, sevoflurane
Easy wear for health care workers

VOC Chek 575 Passive Sampler
Cat. No. 575-002

See page 85 for ordering.

Methanol
Validated for 15-min and 8-hr sampling
Ideal for the fracking industry

VOC Chek 575 Passive Sampler
Cat. No. 575-007

See page 85 for ordering.

Visit skcinc.com/reports for passive (diffusive) sampler validation reports.

Siloxanes are Health and Equipment Hazards

Currently, air quality standards do not regulate siloxanes, and no state or federal promulgated methods exist for sampling and analysis. However, several non-agency methods exist to address known health and equipment issues. Siloxanes, such as octamethylcyclotetrasiloxane (D4), pose health hazards. The Globally Harmonized System (GHS) has classified D4 as suspected to cause reproductive toxicity. Recently, the European Chemical Agency (ECHA) added D4, D5, and D6 to its Candidate List of Substances of Very High Concern (SVHC). These persistent, bioaccumulative, and toxic siloxanes are contained in cleaners, polishes, waxes, cosmetics, and personal care products. In landfills, siloxanes volatilize into biogas. When biogas is combusted, siloxanes convert to sand that then becomes deposited in combustion equipment and causes failure.

VOC Chek 575 Series Selection Guide

ppm-Level Sampling of Organic Vapors

SKC VOC Chek 575 Series Passive Samplers are available with sorbents such as activated carbon and Anasorb 747 that strongly retain the collected compounds and require solvent extraction for laboratory analysis.

Use the following guide to locate target compounds and get an overview of critical sampling parameters along with the SKC catalog number of the recommended SKC VOC Chek 575 Series Passive Sampler.

Validation Levels

See the Validation Level column in this guide to determine the level of scientific testing. For online research reports, go to skcinc.com/reports. Click the publication number that corresponds to the number in the Research Report column in this guide.

Full – Stringent NIOSH testing protocol has been applied to verify sampler desorption efficiency, sampling rate, capacity, and the effects of relative humidity, temperature, concentration, reverse diffusion, and storage on accuracy.

Bi-level – NIOSH testing protocol has been applied to the most volatile member of a related (homologous) series of chemicals; therefore, related less volatile series members require only partial validation *(described below)* to achieve the same level of sampling accuracy. *See Guild et al. (http://doi.org/cjzqd7) or request a copy from SKC.*

Partial – NIOSH testing protocol has been applied to verify sampling rate, desorption efficiency, and storage stability.

(Not validated) Calculated – This calculation of a sampling or uptake rate uses the diffusion coefficient of a specific chemical (D) and the cross-sectional area (A) and length (L) of the sampler's diffusion path (based on sampler geometry).

OSHA – Sampler has been validated by OSHA and is referenced in a published OSHA method.

Note To Labs

SKC Universal Desorption Solvent

Money-saving Single-solvent Option

SKC Universal D-solvent (10% 1-propanol in CS_2) simplifies desorption of polar compounds as efficiently as a solvent mix, but without the expense. SKC continues to add more compounds to its Universal D-solvent list. Visit skcinc.com, and look for SKC Passive Sampling Guide. Search for the compound of interest.

Chemical Hazard	Validation Level	Research Report	OSHA PELs Δ TWA (ppm)	OSHA PELs Δ CLG/STEL (ppm)	Sampling Rate (ml/min)	Sampling Time Min (min)	Sampling Time Max (hrs)	Analytical Method	DE % Std. §	DE % Universal	SKC VOC Chek 575 Cat. No.
Acetic acid	Calculated		10	15 #	19.6			GC-FID	99.2		575-001
Acetic acid	Calculated		10	15 #	19.6			GC-FID	107.9		575-002
Acetoin (acetyl methyl carbinol)	Calculated				14.9			GC-FID			575-001 or 575-002
Acetone	Full	1303	1000		15.2	60	8	GC-FID	90.2	105.0	575-002
Acetone	Full	1303	1000		20.3	15	4	GC-FID	90.2		575-002
Acetonitrile	Calculated		40		22.4			GC-FID	103		575-001
Acetonitrile	Calculated		40		22.4			GC-FID	108	99.4	575-002
Acetyl methyl carbinol (acetoin)	Calculated				14.9			GC-FID			575-001 or 575-002
Acrylonitrile	Full		2	10 C	20.4	15	8	GC-FID	81		575-002
Allyl alcohol	Calculated		2	4 #	18.4			GC-FID	64		575-001
Allyl alcohol	Calculated		2	4 #	18.4			GC-FID	76		575-002
Allyl chloride	Calculated		1	2 #	17.8			GC-FID	95.1		575-001
Allyl chloride	Calculated		1	2 #	17.8			GC-FID	101.3		575-002
n-Amyl acetate	Calculated		100		11.7			GC-FID	93.5		575-001
n-Amyl acetate	Calculated		100		11.7			GC-FID	96		575-002
sec-Amyl acetate (2-pentyl acetate)	Calculated		125		11.8			GC-FID			575-001
n-Amyl alcohol	Calculated				13.9			GC-FID	87.3		575-001
n-Amyl alcohol	Calculated				13.9			GC-FID	100.6		575-002
t-Amyl methyl ether (methyl tert-amyl ether)	Bilevel	1355			13.1	30	8	GC-FID	99		575-001
Benzene	Full	1312	1	5	16	15	8	GC-FID	93.5		575-001
Benzene	OSHA 1005		1	5	17.1	15	8	GC-FID	93.6	96	575-002
Benzotrifluoride (trifluoromethyl benzene; OXSOL 2000)	Bilevel		100 ◊		13.3	15	8	GC-FID	106		575-001
Benzotrifluoride (trifluoromethyl benzene; OXSOL 2000)	Bilevel		100 ◊		13.3	15	8	GC-FID	107		575-002
Benzyl acetate	Calculated		10		11.3			GC-FID	91.2		575-002
Benzyl chloride	Calculated		1	1 C	12.9			GC-FID	98.7		575-001
Benzyl chloride	Calculated		1	1 C	12.9			GC-FID	98.9		575-002

See page 244 for abbreviations.

Selection Guide

VOC 575 Passive Samplers

Chemical Hazard	Validation Level	Research Report	OSHA PELs Δ TWA (ppm)	OSHA PELs Δ CLG/STEL (ppm)	Sampling Rate (ml/min)	Sampling Time Min (min)	Sampling Time Max (hrs)	Analytical Method	DE % Std. §	DE % Universal	SKC VOC Chek 575 Cat. No.
Bromobenzene	Calculated				13.8			GC-FID			575-001
Bromodichloromethane (dichlorobromomethane)	Calculated				16.1			GC-FID			575-001
Bromoethane (ethyl bromide)	Calculated		200	250 #	18.5			GC-FID			575-001
Bromoform	Calculated		0.5		15.2			GC-FID			575-001
Bromomethane (methyl bromide)	Calculated			20 C	22.1			GC-FID			575-001
1-Bromopropane (propyl bromide)	Full	1740	0.1		14.4	30	8	GC-FID	100		575-001
1-Bromopropane (propyl bromide)	Full	1740	0.1		14.7	30	8	GC-FID	107		575-002
1,3-Butadiene	Calculated		1	5	19.6			GC-FID			575-001
n-Butane	Calculated				18.1			GC-FID			575-001
n-Butanol (n-butyl alcohol)	Calculated		100	50 #	15.5			GC-FID	94		575-001
n-Butanol (n-butyl alcohol)	Calculated		100	50 #	15.5			GC-FID	100	101.6	575-002
2-Butanol (sec-butyl alcohol)	Calculated		150	150 #	15.6			GC-FID	93		575-001
2-Butanol (sec-butyl alcohol)	Calculated		150	150 #	15.6			GC-FID	100	102.6	575-002
2-Butanone (methyl ethyl ketone, MEK)	Bilevel	1306	200		17.1	15	12	GC-FID	100		575-002
2-Butanone (methyl ethyl ketone, MEK)	OSHA 1004		200		16.88	15	8	GC-FID	92.3	96.4	575-002
2-Butoxyethanol (butyl CELLOSOLVE solvent)	Calculated		50		12			GC-FID	89.7	102	575-002
n-Butyl acetate	OSHA 1009		150	200 #	13.07	15	8	GC-FID	99.2		575-002
n-Butyl acetate	Partial	1894	150	200 #	12.3	30	8	GC-FID	90.4		575-001
n-Butyl acetate	Partial	1894	150	200 #	13.2	30	8	GC-FID	98.7		575-002
sec-Butyl acetate	Calculated		200		12.8			GC-FID	96.2		575-001
sec-Butyl acetate	Calculated		200		12.8			GC-FID	96.6		575-002
sec-Butyl acetate	OSHA 1009		200		12.74	15	8	GC-FID	98.9		575-002
t-Butyl acetate	Calculated		200		12.7			GC-FID	95.1		575-001
t-Butyl acetate	Calculated		200		12.7			GC-FID	94.8		575-002
t-Butyl acetate	OSHA 1009		200		13.09	15	8	GC-FID	98.9		575-002
Butyl acrylate	Bilevel		10 ‡		11.7	30	8	GC-FID	95		575-002
t-Butyl alcohol	Calculated		100	150	15.8			GC-FID	84	103	575-002
n-Butyl alcohol (1-butanol)	Calculated		100	50 #	15.5			GC-FID	94		575-001
n-Butyl alcohol (1-butanol)	Calculated		100	50 #	15.5			GC-FID	100	101.6	575-002
sec-Butyl alcohol (2-butanol)	Calculated		150	150 #	15.6			GC-FID	93		575-001
sec-Butyl alcohol (2-butanol)	Calculated		150	150 #	15.6			GC-FID	100	102.6	575-002
t-Butyl benzene	Calculated				11.3			GC-FID		102	575-002
Butyl CELLOSOLVE acetate (ethylene glycol monobutyl ether acetate)	Calculated		5		10.4			GC-FID			575-002
Butyl CELLOSOLVE solvent (2-butoxyethanol)	Calculated		50		12			GC-FID	89.7	102	575-002
t-Butyl ethyl ether (ethyl tert-butyl ether)	Bilevel	1356			13.1	15	8	GC-FID	101		575-001
n-Butyl glycidyl ether	Calculated		50	5.6 ‡	11.6			GC-FID	104		575-002
t-Butyl methyl ether (methyl t-butyl ether, MTBE)	Full	1352			13.6	8.5	8	GC-FID	97.4		575-001
p-tert-Butyl toluene	Bilevel		10		10.4	15	8	GC-FID	100		575-001
n-Butylbenzene	Calculated				11.23			GC-FID	103		575-002
sec-Butylbenzene	Calculated				11.3			GC-FID			575-002
gamma-Butyrolactone	Calculated				16.6			GC-FID	80.9		575-002
Camphor	Calculated		2 mg/m³		10.8			GC-FID	94.2		575-001
Camphor	Calculated		2 mg/m³		10.8			GC-FID	113		575-002
Carbolic acid (phenol)	Calculated		5	15.6 C	14.5			GC-FID			575-001 or 575-002
Carbon disulfide	Calculated		20	30	19.54			GC-FID			575-001
Carbon tetrachloride	Bilevel		10	25 C	14.1	30	8	GC-FID	98.3		575-001
2-CELLOSOLVE acetate (2-ethoxyethyl acetate)	Calculated		100		12.1			GC-FID	95.4		575-002
1-Chloro-2-methyl benzene (monochlorotoluene; OXSOL 10)	Bilevel		50 ‡		13	15	8	GC-FID	91.8		575-001
1-Chloro-2-methyl benzene (monochlorotoluene; OXSOL 10)	Bilevel		50 ‡		13	15	8	GC-FID	91		575-002
1-Chloro-4-(trifluoromethyl)benzene (parachlorobenzotri-fluoride; OXSOL 100)	Bilevel		25 ◊		11.8	15	8	GC-FID	102		575-001
1-Chloro-4-(trifluoromethyl)benzene (parachlorobenzotri-fluoride; OXSOL 100)	Bilevel		25 ◊		11.8	15	8	GC-FID	108		575-002
Chlorobenzene	Partial		75		14.41	15	8	GC-FID	93.3		575-001
Chlorobenzene	Partial	1838	75		14.41	15	8	GC-FID	87.6		575-002
Chlorobromomethane	Calculated		200		18.3			GC-FID	103		575-002
Chloroethane (ethyl chloride)	Calculated		1000		20.02			GC-FID			575-001
Chloroform	Bilevel		10	50 C	13	60	8	GC-FID	97.3		575-001
Chloromethane (methylchloride)	Calculated				24.6			GC-FID			575-001
o-Chlorostyrene	Bilevel	1374	50 ‡		9.8	15	8	GC-FID	75.2		575-002
4-Chlorotoluene	Calculated				12.4			GC-FID			575-001
Cumene (isopropyl benzene)	Bilevel		50		12.8	15	8	GC-FID	99.3		575-001
Cumene (isopropyl benzene)	Bilevel		50		12.8	15	8	GC-FID	106		575-002
Cyclohexane	Bilevel		300		15.6	15	8	GC-FID	105		575-001
Cyclohexane	Bilevel		300		15.6	15	8	GC-FID	109		575-002
Cyclohexanol	Calculated		50		13.5			GC-FID	98		575-001
Cyclohexanol	Calculated		50		13.5			GC-FID	105	89.6	575-002
Cyclohexanone	partial		50		16.41	15	8	GC-FID	100		575-002
Cyclohexene	Calculated		300		15.4			GC-FID	102		575-001
Cyclohexene	Calculated		300		15.4			GC-FID	106		575-002
Cyclopentane	Calculated				16.8			GC-FID			575-001
p-Cymene (4-isopropyltoluene)	Calculated				11.3			GC-FID			575-001

See page 244 for abbreviations.

Chemical Hazard	Validation Level	Research Report	OSHA PELs Δ TWA (ppm)	OSHA PELs Δ CLG/STEL (ppm)	Sampling Rate (ml/min)	Sampling Time Min (min)	Sampling Time Max (hrs)	Analytical Method	DE % Std. §	DE % Universal	SKC VOC Chek 575 Cat. No.
Decamethylcyclopentasiloxane (D5)	Partial	1891	5 †		5.66	15	8	GC-FID	99.0		575-001
Decamethyltetrasiloxane	Calculated				7.36			GC-FID			575-001
n-Decane	Partial				12.2			GC-FID	103	102	575-002
1-Decanol (decyl alcohol)	Calculated				9.6			GC-FID	97.3		575-002
Decyl alcohol (1-decanol)	Calculated				9.6			GC-FID	97.3		575-002
Desflurane	Partial	1893		2	13.8	30	4	GC-FID	94.3		575-002
Diacetone alcohol	Calculated		50		12.4			GC-FID	92.9	97.7	575-002
1, 2-Dibromo-3-chloropropane	Calculated		1 ppb		12.6			GC-FID	101.3		575-002
Dibromochloromethane	Calculated				15.6			GC-FID			575-001
1,2-Dibromoethane (ethylene dibromide)	Calculated		20	30	15.3			GC-FID	92.3		575-001
1,2-Dibromoethane (ethylene dibromide)	Calculated		20	30	15.3			GC-FID	99.4		575-002
1, 6-Dibromohexane (hexamethylene dibromide)	Calculated				10.7			GC-FID			575-001
o-Dichlorobenzene (1,2-dichlorobenzene)	Partial			50 C	12.5	15	8	GC-FID	79.2		575-001
o-Dichlorobenzene (1,2-dichlorobenzene)	Partial	1875		50	12.5	15	8	GC-FID	77.1		575-002
m-Dichlorobenzene (1,3-dichlorobenzene)	Calculated				12.95			GC-FID	91.8		575-001
m-Dichlorobenzene (1,3-dichlorobenzene)	Calculated				12.95			GC-FID	92.7		575-002
p-Dichlorobenzene (1,4-dichlorobenzene)	Calculated		75		12.95			GC-FID	91.1		575-001
p-Dichlorobenzene (1,4-dichlorobenzene)	Calculated		75		12.95			GC-FID	94.7		575-002
1,3-Dichlorobenzene (m-dichlorobenzene)	Calculated				12.95			GC-FID	91.8		575-001
1,3-Dichlorobenzene (m-dichlorobenzene)	Calculated				12.95			GC-FID	92.7		575-002
1,2-Dichlorobenzene (o-dichlorobenzene)	Partial			50 C	12.5	15	8	GC-FID	79.2		575-001
1,2-Dichlorobenzene (o-dichlorobenzene)	Partial	1875		50 C	12.5	15	8	GC-FID	77.1		575-002
1,4-Dichlorobenzene (p-dichlorobenzene)	Calculated		75		12.95			GC-FID	91.1		575-001
1,4-Dichlorobenzene (p-dichlorobenzene)	Calculated		75		12.95			GC-FID	94.7		575-002
Dichlorobromomethane (bromodichloromethane)	Calculated				16.1			GC-FID			575-001
Dichlorodifluoromethane (Freon 12)	Calculated		1000		18.6			GC-FID			575-001
1,1-Dichloroethane	Calculated		100		16.85			GC-FID			575-001
1,2-Dichloroethane (ethylene dichloride)	Bilevel		50	100	14.2	60	8	GC-FID	95.8		575-001
1,2-Dichloroethene (1,2-dichloroethylene)	Full				14.8	15	8	GC-FID	97.1		575-001
1,1-Dichloroethene (vinylidene chloride)	Bilevel		1		12.3	60	8	GC-FID	95.2		575-001
Dichloroethyl ether	Calculated		5 ‡	15 C	12.5			GC-FID			575-001
1,2-Dichloroethylene (1,2-dichloroethene)	Full		200		14.8	15	8	GC-FID	97.1		575-001
1,2-Dichloroethylene (1,2-dichloroethene)	Full				14.8	15	8	GC-FID	97.1		575-001
Dichloromethane (methylene chloride)	Full	1323	25	125	14.7	60	8	GC-FID	96		575-001
1,2-Dichloropropane (propylene dichloride)	Bilevel		75		14.3	15	8	GC-FID	97.7		575-001
1,1-Dichloropropene	Calculated				15.6			GC-FID			575-001
cis-1,3-Dichloropropene	Partial	1886	1 ‡		13.6	15	8	GC-FID	101		575-002
trans-1,3-Dichloropropene	Partial	1886			14.4	15	8	GC-FID	99.4		575-002
1,2-Dichlorotetrafluoroethane (Freon 114)	Calculated		1000		15.3			GC-FID			575-001
Dicyclopentadiene	Calculated		5 ‡		11.8			GC-FID			575-001
Diesel	Calculated				11.2			GC-FID			575-001 or 575-002
Diethyl ether (ethyl ether)	Calculated		400		16.4			GC-FID			575-001
Diethyl ketone (3-pentanone)	Calculated		200 ‡		14.8			GC-FID	83.9		575-001
Diethyl ketone (3-pentanone)	Calculated		200 ‡		14.8			GC-FID	100.3		575-002
Diethylene glycol dimethyl ether (2-methoxyethyl ether)	Calculated				11.5			GC-FID			575-002
Diethylene glycol monobutyl ether	Calculated				9.97			GC-FID			575-002
Diethylene glycol monoethyl ether	Calculated				9.85			GC-FID			575-002
Diethylene glycol monoethyl ether acetate	Calculated				9.88			GC-FID			575-002
Diethylene glycol monomethyl ether (2-[2-methoxyethoxy] ethanol)	Calculated				11.3			GC-FID			575-002
Diisobutyl ketone (DIBK), (isovalerone)	Bilevel	1305	50		10.3	30	8	GC-FID	98.3		575-002
1,2-Dimethoxyethane (ethylene glycol dimethyl ether)	Calculated				14.7			GC-FID			575-001 or 575-002
Dimethoxymethane (methylal)	Calculated		1000		17.1			GC-FID			575-001
Dimethyl adipate	Calculated				10.73			GC-FID			575-001
Dimethyl disulfide	Calculated				15.4			GC-FID			575-001
2,5-Dimethyl hexane	Calculated				11.86			GC-FID			575-001
2,2-Dimethyl methane	Calculated				21.7			GC-FID			575-001
Dimethyl pentanedioate	Calculated				10.8			GC-FID			575-001
Dimethyl sulfide	Calculated				19			GC-FID			575-001
Dimethyl sulfoxide	Calculated				16.3			GC-FID			575-002
N,N-Dimethylaniline	Calculated		5		12			GC-FID			575-001
2,2-Dimethylbutane (neohexane)	Calculated				14.2			GC-FID			575-001
trans-1,2-Dimethylcyclohexane	Calculated				12.4			GC-FID	106.1		575-001
N,N-Dimethylformamide (DMF)	Calculated		10		16.4			GC-FID	87.2		575-002
2,3-Dimethylpentane	Calculated				12.8			GC-FID			575-001
1,4-Dioxane	Calculated		100		15.8			GC-FID	91.4		575-002
Diphenyl oxide (phenyl ether)	Calculated		1		10.4			GC-FID			575-001
Dipropyl ketone (4-heptanone)	Calculated		50 ‡		12.1			GC-FID	85.3		575-001
Dipropyl ketone (4-heptanone)	Calculated		50 ‡		12.1			GC-FID	112		575-002
Dipropylene glycol methyl ether	Calculated		100		10.8			GC-FID	84.3		575-002
Dodecamethylcyclohexasiloxane	Calculated				6.75			GC-FID			575-001
n-Dodecanol (lauryl alcohol)	Calculated				8.7			GC-FID	107.5		575-001
n-Dodecanol (lauryl alcohol)	Calculated				8.7			GC-FID	103	103.8	575-002

See page 244 for abbreviations.

Selection Guide

VOC 575 Passive Samplers

Chemical Hazard	Validation Level	Research Report	OSHA PELs Δ TWA (ppm)	OSHA PELs Δ CLG/STEL (ppm)	Sampling Rate (ml/min)	Sampling Time Min (min)	Sampling Time Max (hrs)	Analytical Method	DE % Std. §	DE % Universal	SKC VOC Chek 575 Cat. No.
1-Dodecene	Calculated				9.29			GC-FID			575-001
1-Dodecyl alcohol (lauryl alcohol)	Calculated				8.7			GC-FID	107.5		575-001
1-Dodecyl alcohol (lauryl alcohol)	Calculated				8.7			GC-FID	103	103.8	575-002
Dodecyl methacrylate	Calculated				7.6			GC-FID			575-002
Enflurane (ethrane)	Partial	1893		2	13.8	30	4	GC-FID	101		575-002
Epichlorohydrin	Calculated		5		16.4			GC-FID	88.2		575-002
2,3-Epoxy-1-propanol (glycidol)	Calculated		50		17.8			GC-FID			575-002
2,3-Epoxypropyl methacrylate (glycidyl methacrylate)	Calculated				11.45			GC-FID			575-002
Ethanol (ethyl alcohol)	Partial	1876	1000		20.3	15	8	GC-FID	99	103	575-002
2-Ethoxyethanol	Calculated		200		14.4			GC-FID	100.8		575-001
2-Ethoxyethanol	Calculated		200		14.4			GC-FID	111.2	101	575-002
2-Ethoxyethyl acetate (2-CELLOSOLVE acetate)	Calculated		100		12.1			GC-FID	95.4		575-002
Ethrane (enflurane)	Partial	1893		2	13.8	30	4	GC-FID	101		575-002
Ethyl acetate	Partial	1894	400		13.1	30	8	GC-FID	92.8		575-001
Ethyl acetate	Partial	1894	400		14.1	30	8	GC-FID	100	101	575-002
Ethyl acrylate	Bilevel		5		13.7	15	8	GC-FID	94.2		575-002
Ethyl alcohol (ethanol)	Partial	1876	1000		20.3	15	8	GC-FID	99	103	575-002
Ethyl benzene	Bilevel		100		12.9	15	6	GC-FID	100		575-001
Ethyl benzene	Bilevel		100		12.9	15	6	GC-FID	104		575-002
Ethyl benzene	OSHA 1002		100		13.83	15	8	GC-FID	99.1		575-002
Ethyl bromide (bromoethane)	Calculated		200	250 #	18.5			GC-FID			575-001
Ethyl butyl ketone (3-heptanone)	Calculated		50		12.2			GC-FID	87.9		575-001
Ethyl butyl ketone (3-heptanone)	Calculated		50		12.2			GC-FID	103.4		575-002
Ethyl chloride (chloroethane)	Calculated		1000		20.2			GC-FID			575-001
Ethyl cyanide	Calculated				18.61			GC-FID			575-001
Ethyl ether	Calculated		400		16.4			GC-FID			575-001
Ethyl formate	Calculated		100		17.8			GC-FID			575-001
2-Ethyl hexyl acetate	Calculated				9.8			GC-FID	99		575-002
Ethyl methacrylate	Full		100		13.1	15	8	GC-FID	84.7		575-001
Ethyl methacrylate	Full		100		13.1	15	8	GC-FID	104		575-002
Ethyl propionate	Calculated				14			GC-FID			575-001
Ethyl tert-butyl ether (tert-butyl ethyl ether)	Bilevel	1356			13.1	15	8	GC-FID	101		575-001
Ethylene dibromide (1,2-dibromoethane)	Calculated		20	30	15.3			GC-FID	92.3		575-001
Ethylene dibromide (1,2-dibromoethane)	Calculated		20	30	15.3			GC-FID	99.4		575-002
Ethylene dichloride (1,2-dichloroethane)	Bilevel		50	100 C	14.2	60	8	GC-FID	95.8		575-001
Ethylene glycol	Calculated			100 mg/m³ C	17.44			GC-FID			575-002
Ethylene glycol diethyl ether	Calculated				12.27			GC-FID			575-002
Ethylene glycol dimethyl ether (1,2-dimethoxyethane)	Calculated				14.7			GC-FID			575-001 or 575-002
Ethylene glycol monobutyl ether acetate (butyl CELLOSOLVE acetate)	Calculated		5		10.4			GC-FID			575-002
Ethylene glycol monohexyl ether	Calculated				10.5			GC-FID			575-001
Ethylene glycol monomethyl ether acetate (methyl CELLOSOLVE acetate)	Calculated		25		12.9			GC-FID	92.4		575-002
Ethylene oxide	Full	1543	1	5 EL	21.2	15	8	GC-ECD	102		575-005
2-Ethylhexanol	Calculated				10.93			GC-FID	93.7	109	575-002
2-Ethyltoluene	Calculated				12.1			GC-FID	106		575-002
3-Ethyltoluene	Calculated				12.1			GC-FID	101		575-002
4-Ethyltoluene	Calculated				12.1			GC-FID	91		575-002
Freon 11 (trichlorofluoromethane)	Calculated				16.65			GC-FID			575-001
Freon 113 (1,1,2-trichloro-1,2,2-trifluoroethane)	Calculated		1000	1250 #	14.1			GC-FID			575-001
Freon 114 (1,2-dichlorotetrafluoroethane)	Calculated		1000		15.3			GC-FID			575-001
Freon 12 (dichlorodifluoromethane)	Calculated		1000		18.6			GC-FID			575-001
Gasoline	Calculated				13.84			GC-FID			575-001 or 575-002
Glutaric acid dimethyl ester	Calculated				11.5			GC-FID			575-002
Glycidol (2,3-epoxy-1-propanol)	Calculated		50		17.8			GC-FID			575-002
Glycidyl methacrylate (2,3-epoxypropyl methacrylate)	Calculated				11.45			GC-FID			575-002
Halothane	Full	1893			14.1	15	8	GC-FID	99.9		575-002
n-Heptane	Bilevel		500		13.9	15	8	GC-FID	105		575-001
n-Heptane	Bilevel		500		13.9	15	8	GC-FID	108		575-002
4-Heptanone (dipropyl ketone)	Calculated		50 ‡		12.1			GC-FID	85.3		575-001
4-Heptanone (dipropyl ketone)	Calculated		50 ‡		12.1			GC-FID	112.2		575-002
3-Heptanone (ethyl butyl ketone)	Calculated		50		12.2			GC-FID	87.9		575-001
3-Heptanone (ethyl butyl ketone)	Calculated		50		12.2			GC-FID	103.4		575-002
2-Heptanone (methyl n-amyl ketone)	Calculated		100		12.2			GC-FID	99.8		575-002
1-Heptene	Calculated				13.1			GC-FID			575-001
Hexachlorobutadiene	Calculated		0.02 ‡		10.5			GC-FID			575-001
Hexachloroethane	Calculated		1		11.5			GC-FID			575-001
Hexadecane	Calculated				7.7			GC-FID			575-001
Hexamethyldisiloxane (L2)	Partial	1892	200 †		9.98	15	8	GC-FID	102.9		575-001
Hexamethylene dibromide (1,6-dibromohexane)	Calculated				10.7			GC-FID			575-001
n-Hexane	Bilevel		500		14.3	15	8	GC-FID	100		575-001
n-Hexane	Bilevel		500		14.3	15	8	GC-FID	112		575-002
Hexanol (hexyl alcohol)	Calculated				12.64			GC-FID	92.9	97	575-002

See page 244 for abbreviations.

Chemical Hazard	Validation Level	Research Report	OSHA PELs Δ TWA (ppm)	OSHA PELs Δ CLG/STEL (ppm)	Sampling Rate (ml/min)	Sampling Time Min (min)	Sampling Time Max (hrs)	Analytical Method	DE % Std. §	DE % Universal	SKC VOC Chek 575 Cat. No.
2-Hexanone (methyl butyl ketone MBK)	Partial	1873	100		14.3	15	8	GC-FID	104	97.8	575-002
2-Hexene	Calculated				14.5			GC-FID			575-001
Hexone (methyl isobutyl ketone [MIBK])	Bilevel	1304	100		13.5	30	8	GC-FID	94.6		575-002
Hexone (methyl isobutyl ketone [MIBK])	OSHA 1004		100		13.62	30	8	GC-FID	92.9	99.5	575-002
sec-Hexyl acetate	Calculated		50		11.1			GC-FID			575-002
Hexyl alcohol (hexanol)	Calculated				12.64			GC-FID	92.9	97	575-002
Hexylene	Calculated				14.5			GC-FID			575-001
Hexylene glycol	Calculated			25 C	11.81			GC-FID			575-002
Iodomethane (methyl iodide)	Calculated				18.7			GC-FID			575-001
Isoamyl acetate	Calculated		100		11.9			GC-FID	91.9		575-001
Isoamyl acetate	Calculated		100		11.9			GC-FID	108		575-002
Isoamyl alcohol	Calculated		100	125 #	13.9			GC-FID			575-002
Isobutyl acetate	Calculated		150		12.8			GC-FID	106		575-002
Isobutyl acetate	OSHA 1009		150		13.16	15	8	GC-FID	99.1		575-002
Isobutyl acrylate	Calculated				12.2			GC-FID			575-002
Isobutyl alcohol	Calculated		100		15.6			GC-FID	93.0		575-001
Isobutyl alcohol	Calculated		100		15.6			GC-FID	100.0	100	575-002
Isoflurane	Full	1893			13.2	15	8	GC-FID	96.0		575-002
Isooctyl alcohol	Calculated		50 ‡		10.9			GC-FID			575-002
Isopentane (2-methyl butane)	Calculated		1000	610 #	15.8			GC-FID			575-001
Isophorone	Calculated		25		11.3			GC-FID			575-002
Isopropanol (isopropyl alcohol)	Partial	1839	400	500 #	18.42	15	8	GC-FID	103.5	102	575-002
Isopropyl acetate	Calculated		250		14.2			GC-FID	88.5		575-001
Isopropyl acetate	Calculated		250		14.2			GC-FID	101		575-002
Isopropyl alcohol (isopropanol)	Partial	1839	400	500 #	18.42	15	8	GC-FID	103.5	102	575-002
Isopropyl benzene (cumene)	Bilevel		50		12.8	15	8	GC-FID	99.3		575-001
Isopropyl benzene (cumene)	Bilevel		50		12.8	15	8	GC-FID	106		575-002
Isopropyl ether	Calculated		500		13.4			GC-FID			575-001
Isopropyl glycidyl ether	Calculated		50	50 #	12.8			GC-FID			575-001
4-Isopropyltoluene (p-cymene)	Calculated				11.3			GC-FID			575-001
Isovalerone (diisobutyl ketone [DIBK])	Bilevel	1308	50		10.3	30	8	GC-FID	98.3		575-002
Jet Fuel	Calculated				11.3			GC-FID			575-001
Kerosene	Calculated				11.03			GC-FID			575-001 or 575-002
Lauryl alcohol (1-dodecanol)	Calculated				8.7			GC-FID	107.5		575-001
Lauryl alcohol (1-dodecanol)	Calculated				8.7			GC-FID	103	103.8	575-002
Limonene	Calculated				11.1			GC-FID	102		575-002
Mesityl oxide	Calculated		25		13.7			GC-FID			575-001
Mesitylene (1,3,5-trimethylbenzene)	Calculated		25		12.1			GC-FID	93.6		575-001
Mesitylene (1,3,5-Trimethylbenzene)	Calculated		25		12.1			GC-FID	96		575-002
Mesitylene (1,3,5-trimethylbenzene)	OSHA 1020		25		12.1	15	8	GC-FID	101		575-002
Methanol (methyl alcohol)	Partial	1895	200	250	1.2	15	8	GC-FID	101	93.8	575-007
2-Methoxy-1-propyl acetate	Calculated				12.1			GC-FID			575-002
1-Methoxy-2-propanol (propylene glycol monomethyl ether)	Calculated		100 ‡	150 #	14.7			GC-FID	82.9		575-001
1-Methoxy-2-propanol (propylene glycol monomethyl ether)	Calculated		100 ‡	150 #	14.7			GC-FID	100	106	575-002
1-Methoxy-2-propyl acetate (propylene glycol monomethyl ether acetate)	Calculated				12.2			GC-FID	108		575-001
1-Methoxy-2-propyl acetate (propylene glycol monomethyl ether acetate)	Calculated				12.1			GC-FID	103	105	575-002
2-Methoxyethanol (methyl CELLOSOLVE)	Calculated		0.1		16.1			GC-FID	94.7		575-001
2-Methoxyethanol (methyl CELLOSOLVE)	Calculated		0.1		16.1			GC-FID	91.1	81.8	575-002
2-[2-Methoxyethoxy] ethanol (diethylene glycol monomethyl ether)	Calculated				11.3			GC-FID			575-002
2-Methoxyethyl ether (diethylene glycol dimethyl ether)	Calculated				11.5			GC-FID			575-002
Methoxyflurane	Calculated			2	13.3			GC-FID	95.7		575-002
Methyl acetate	Calculated		200	250 #	17.8			GC-FID			575-002
Methyl acrylate	Full		10		15.7	15	8	GC-FID	94.3		575-002
Methyl alcohol (Methanol)	Partial	1895	200	250	1.2	15	8	GC-FID	101	93.8	575-007
Methyl amyl alcohol (methyl isobutyl carbinol)	Calculated		25		12.8			GC-FID			575-002
Methyl bromide (bromomethane)	Calculated			20C	22.1			GC-FID			575-002
2-Methyl butane (isopentane)	Calculated		1000	610 #	15.8			GC-FID			575-001
Methyl butyl ketone (MBK), (2-hexanone)	Partial	1873	100		14.3	15	8	GC-FID	104	97.8	575-002
Methyl CELLOSOLVE (2-methoxyethanol)	Calculated		0.1		16.1			GC-FID	94.7		575-001
Methyl CELLOSOLVE (2-methoxyethanol)	Calculated		0.1		16.1			GC-FID	91.1	81.8	575-002
Methyl CELLOSOLVE acetate (ethylene glycol monomethyl ether acetate)	Calculated		25		12.9			GC-FID	92.4		575-002
Methyl chloroform (1,1,1-trichloroethane)	Bilevel		350		14.1	15	8	GC-FID	99.9		575-001
Methyl cyclohexane	Bilevel		500		14.2	15	8	GC-FID	106		575-001
Methyl ethyl ketone (MEK), (2-butanone)	Bilevel	1306	200		17.1	15	12	GC-FID	100		575-002
Methyl ethyl ketone (MEK), (2-butanone)	OSHA 1004		200		16.88	15	8	GC-FID	92.3	96.4	575-002
Methyl formate	Calculated		100		20.58			GC-FID			575-001
Methyl iodide (iodomethane)	Calculated				18.7			GC-FID			575-001
Methyl isoamyl ketone	Calculated		50		12.3			GC-FID			575-002
Methyl isobutyl carbinol (methyl amyl alcohol)	Calculated		25		12.8			GC-FID			575-002

See page 244 for abbreviations.

Selection Guide

VOC 575 Passive Samplers

Chemical Hazard	Validation Level	Research Report	OSHA PELs Δ TWA (ppm)	OSHA PELs Δ CLG/STEL (ppm)	Sampling Rate (ml/min)	Sampling Time Min (min)	Sampling Time Max (hrs)	Analytical Method	DE % Std. §	DE % Universal	SKC VOC Chek 575 Cat. No.
Methyl isobutyl ketone (MIBK), (hexone)	Bilevel	1304	100		13.5	30	8	GC-FID	94.6		575-002
Methyl isobutyl ketone (MIBK), (hexone)	OSHA 1004		100		13.62	30	8	GC-FID	92.9	99.5	575-002
Methyl isopropyl ketone	Calculated				14.8			GC-FID			575-002
Methyl isothiocyanate	Calculated				17.36			GC-FID			575-001
Methyl methacrylate (MMA)	Bilevel	1308	100		13.1	7.5	8	GC-FID	100.5		575-002
Methyl n-amyl ketone (2-heptanone)	Calculated		100		12.2			GC-FID	99.8		575-002
2-Methyl pentane	Calculated				14.1			GC-FID			575-001
Methyl propyl ketone (2-pentanone)	Calculated		200		14.8			GC-FID	92.6		575-002
3-Methyl pyrrolidinone	Calculated				13.28			GC-FID			575-002
Methyl styrene (vinyl toluene)	Calculated		100		12.3			GC-FID			575-001
Methyl t-butyl ether (MTBE)	Full	1352			13.6	8.5	8	GC-FID	97.4		575-001
Methyl tert-amyl ether (tert-amyl methyl ether)	Bilevel	1355			13.1	30	8	GC-FID	99		575-001
n-Methyl-2-pyrrolidinone	Calculated		51		13.97			GC-FID			575-001
5-Methyl-3-heptanone	Calculated		25		11.4			GC-FID	87.5		575-001
5-Methyl-3-heptanone	Calculated		25		11.4			GC-FID	110.7		575-002
Methylal (dimethoxymethane)	Calculated		1000		17.1			GC-FID			575-001
Methylchloride (chloromethane)	Calculated				24.6			GC-FID			575-002
1-Methylcyclohexanol	Full		100		12.4	15	8	GC-FID	94.7		575-001
1-Methylcyclohexanol	Full		100		12.4	15	8	GC-FID	108		575-002
Methylcyclopentane	Calculated				14.9			GC-FID			575-001
Methylene chloride (dichloromethane)	Full	1323	25	125	14.7	60	8	GC-FID	96		575-001
3-Methylhexane	Calculated				12.8			GC-FID			575-001
alpha-Methylstyrene	Bilevel	1359		100 C	12.6	15	12	GC-FID	95.7		575-002
Mineral spirits	Calculated		500		10.95			GC-FID			575-001
Monochlorotoluene (1-chloro-2-methylbenzene; OXSOL 10)	Bilevel		50 ‡		13.0	15	8	GC-FID	91.8		575-001
Monochlorotoluene (1-chloro-2-methylbenzene; OXSOL 10)	Bilevel		50 ‡		13.0	15	8	GC-FID	91		575-002
Neohexane (2,2-dimethylbutane)	Calculated				14.2			GC-FID			575-001
Nitrobenzene	Calculated				12.6			GC-FID			575-001
Nonane	Bilevel				10.6	15	8	GC-FID	103		575-001
Nonyl alcohol	Calculated				10.2			GC-FID	96.80		575-002
Octadecane	Calculated				7.1			GC-FID			575-001
Octamethylcyclotetrasiloxane (D4)	Partial	1890	10 ▼		6.32	15	8	GC-FID	97.2		575-001
Octamethyltrisiloxane (L3)	Partial	1902	200 †		8.47	15	8	GC-FID	98.3		575-001
n-Octane	Bilevel		500		12.7	15	8	GC-FID	106		575-001
n-Octane	Bilevel		500		12.7	15	8	GC-FID	110		575-002
Octanol (octyl alcohol)	Calculated				10.86			GC-FID			575-002
1-Octene	Calculated				11.99			GC-FID			575-001
Octyl alcohol (octanol)	Calculated				10.86			GC-FID			575-002
OXSOL 10 (monochlorotoluene [1-chloro-2-methyl benzene])	Bilevel		50 ‡		13	15	8	GC-FID	91.8		575-001
OXSOL 10 (monochlorotoluene [1-chloro-2-methyl benzene])	Bilevel		50 ‡		13	15	8	GC-FID	91		575-002
Parachlorobenzotrifluoride (1-chloro-4-[trifluoromethyl] benzene; OXSOL 100)	Bilevel		25 ◊		11.8	15	8	GC-FID	102		575-001
Parachlorobenzotrifluoride (1-chloro-4-[trifluoromethyl] benzene; OXSOL 100)	Bilevel		25 ◊		11.8	15	8	GC-FID	108		575-002
Pentadecane	Calculated				7.93			GC-FID			575-001
n-Pentane	Full	1311	1000		14.9	15	8	GC-FID	105.2		575-001
3-Pentanone (diethyl ketone)	Calculated		200 ‡		14.8			GC-FID	83.9		575-001
3-Pentanone (diethyl ketone)	Calculated		200 ‡		14.8			GC-FID	100.3		575-002
2-Pentanone (methyl propyl ketone)	Calculated		200		14.8			GC-FID	92.6		575-002
1-Pentene	Calculated				16.3			GC-FID			575-001
2-Pentyl acetate (sec-amyl acetate)	Calculated		125		11.8			GC-FID			575-001
Perchloroethylene (tetrachloroethylene)	Full	1686	100	200 C	13.1	7.5	12	GC-FID	100.8		575-001
Perchloroethylene (tetrachloroethylene)	OSHA 1001		100	200 C	13.06	15	8	GC-FID	95.4		575-002
Perfluoromethylcyclohexane	Partial				10.2			GC-FID	102		575-002
Phenol (carbolic acid)	Calculated		5	15.6 C	14.5			GC-FID			575-001 or 575-002
Phenyl ether (diphenyl oxide)	Calculated		1		10.4			GC-FID			575-001
Phenyl glycidyl ether	Calculated		10		11.6			GC-FID			575-001
4-Phenylcyclohexene	Calculated				11.53			GC-FID			575-001 or 575-002
alpha-Pinene	Partial	1840			11.3	15	8	GC-FID	108.6		575-002
Propane	Calculated		1000		21.73			GC-FID			575-001
n-Propanol (propyl alcohol)	Calculated		200		17.7			GC-FID	87.3		575-001
n-Propanol (propyl alcohol)	Calculated		200		17.7			GC-FID	97.8		575-002
Propionitrile	Calculated		6 ‡		18.61			GC-FID			575-001
n-Propyl acetate	Calculated		200		14.1			GC-FID	87.5		575-001
n-Propyl acetate	Calculated		200		14.1			GC-FID	101.1		575-002
Propyl alcohol (n-propanol)	Calculated		200		17.7			GC-FID	87.3		575-001
Propyl alcohol (n-propanol)	Calculated		200		17.7			GC-FID	97.8		575-002
Propyl bromide (1-bromopropane)	Full	1740	0.1		14.4	30	8	GC-FID	100		575-001
Propyl bromide (1-bromopropane)	Full	1740	0.1		14.7	30	8	GC-FID	107		575-002
n-Propylbenzene	Calculated				12.1			GC-FID	101		575-002
Propylene dichloride (1,2-dichloropropane)	Bilevel		75		14.3	15	8	GC-FID	97.7		575-001
Propylene glycol monomethyl ether (1-methoxy-2-propanol)	Calculated		100 ‡	150 #	14.7			GC-FID	82.9		575-001
Propylene glycol monomethyl ether (1-methoxy-2-propanol)	Calculated		100 ‡	150 #	14.7			GC-FID	100	106	575-002

See page 244 for abbreviations.

Chemical Hazard	Validation Level	Research Report	OSHA PELs Δ TWA (ppm)	OSHA PELs Δ CLG/STEL (ppm)	Sampling Rate (ml/min)	Sampling Time Min (min)	Sampling Time Max (hrs)	Analytical Method	DE % Std. §	DE % Universal	SKC VOC Chek 575 Cat. No.
Propylene glycol monomethyl ether acetate (1-methoxy-2-propyl acetate)	Calculated				12.2			GC-FID	108		575-001
Propylene glycol monomethyl ether acetate (1-methoxy-2-propyl acetate)	Calculated				12.1			GC-FID	103	105	575-002
Propylene oxide	Calculated		100		19.9			GC-FID	98		575-001
Propylene oxide	Calculated		100		19.9			GC-FID	99.7		575-002
Pyridine	Calculated		5		16.6			GC-FID	88.2	93.8	575-002
Sevoflurane	Partial	1893		2	12.8	30	4	GC-FID	100		575-002
Solvent naphtha (petroleum) light aromatic	Calculated				11.61			GC-FID			575-001 or 575-002
Stoddard solvent	Calculated		500		10.95			GC-FID			575-001
Styrene	Full	1313	100	200 C	13.7	15	8	GC-FID	86.3		575-002
Styrene	OSHA 1014		100	200 C	13.55	15	8	GC-FID	96.7		575-006
1,1,1,2-Tetrachloroethane	Calculated				13.63			GC-FID	98.3		575-002
1,1,2,2-Tetrachloroethane	Bilevel		5		11.8	480 ∞	8	GC-FID	64.4*		575-001
Tetrachloroethylene (perchloroethylene)	Full	1686	100	200 C	13.1	7.5	12	GC-FID	100.8		575-001
Tetrachloroethylene (perchloroethylene)	OSHA 1001		100	200 C	13.06	15	8	GC-FID	95.4		575-002
Tetradecane	Calculated				8.3			GC-FID			575-001
Tetrahydrofuran	Partial	1841	200		17.7	15	8	GC-FID	100.6		575-002
1,2,3,4-Tetramethylbenzene	Calculated				11.1			GC-FID			575-001
1,2,3,5-Tetramethylbenzene	Calculated				10.8			GC-FID			575-001
1,2,4,5-Tetramethylbenzene	Calculated				11.2			GC-FID	86.6		575-002
Toluene	Bilevel		200	300 C	14.5	15	8	GC-FID	97.9		575-001
Toluene	OSHA 111		200	300 C	14.89	10	8	GC-FID	97	93.1	575-002
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	Calculated		1000	1250 #	14.1			GC-FID			575-001
1,2,3-Trichlorobenzene	Calculated				11.34			GC-FID			575-001
1,2,4-Trichlorobenzene	Calculated			5 C	11.4			GC-FID			575-001
1,1,2-Trichloroethane	Bilevel		10		12.5	15	8	GC-FID	96.7		575-001
1,1,1-Trichloroethane (methyl chloroform)	Bilevel		350		14.1	15	8	GC-FID	99.9		575-001
Trichloroethylene	Full		100	200 C	14.9	15	8	GC-FID	102		575-001
Trichloroethylene	OSHA 1001		100	200 C	14.24	15	8	GC-FID	97.5		575-002
Trichlorofluoromethane (Freon 11)	Calculated				16.65			GC-FID			575-001
1,2,3-Trichloropropane	Bilevel		50		11.9	15	8	GC-FID	98.1		575-001
Tridecane	Calculated				9.2			GC-FID			575-001
Trifluoromethyl benzene (benzotrifluoride; OXSOL 2000)	Bilevel		100 ◊		13.3	15	8	GC-FID	106		575-001
Trifluoromethyl benzene (benzotrifluoride; OXSOL 2000)	Bilevel		100 ◊		13.3	15	8	GC-FID	107		575-002
1,2,3-Trimethylbenzene	Calculated		25 ¶		12.0			GC-FID	91.1		575-001
1,2,3-Trimethylbenzene	Calculated		25 ¶		12.0	15	8	GC-FID	93.8		575-002
1,2,3-Trimethylbenzene	OSHA 1020		25 ¶		11.6	15	4	GC-FID	98.3		575-002
1,2,4-Trimethylbenzene	OSHA 1020		25 ¶		11.7	15	4	GC-FID	93.8		575-002
1,2,4-Trimethylbenzene	Partial		25 ¶		13.05			GC-FID	88.4		575-001
1,2,4-Trimethylbenzene	Partial	1837	25 ¶		13.05	15	8	GC-FID	88.9		575-002
1,3,5-Trimethylbenzene (mesitylene)	Calculated		25 ¶		12.1			GC-FID	93.6		575-001
1,3,5-Trimethylbenzene (mesitylene)	Calculated		25 ¶		12.1			GC-FID	96		575-002
1,3,5-Trimethylbenzene (mesitylene)	OSHA 1020		25 ¶		12.1	15	8	GC-FID	101		575-002
2,2,4-Trimethylpentane	Calculated				11.89			GC-FID			575-001
n-Undecane	Calculated				9.62			GC-FID			575-001
Vinyl acetate	Full	1860		4 C #	16.4	30	8	GC-FID	92		575-002
Vinyl bromide	Calculated		LFC ‡		19.6			GC-FID			575-001
Vinyl chloride	Calculated		1		21.4			GC-FID			575-001
Vinyl toluene (methyl styrene)	Calculated		100		12.3			GC-FID			575-001
n-Vinyl-2-pyrrolidone	Calculated				13.9			GC-FID			575-001
4-Vinylcyclohexene	Calculated				12.4			GC-FID			575-001
Vinylidene chloride (1,1-dichloroethene)	Bilevel		1		12.3	60	8	GC-FID	95.2		575-001
m-Xylene	Bilevel		100	150 #	12.5	15	8	GC-FID	96.6		575-001
m-Xylene	Bilevel		100	150 #	12.5	15	8	GC-FID	101		575-002
m-Xylene	OSHA 1002		100	150 #	13.82	15	8	GC-FID	96.1		575-002
o-Xylene	Bilevel		100	150 #	11.9	15	8	GC-FID	91		575-001
o-Xylene	OSHA 1002		100	150 #	14.24	15	8	GC-FID	89.4		575-002
p-Xylene	Bilevel		100	150 #	12.8	15	8	GC-FID	95.6		575-001
p-Xylene	Bilevel		100	150 #	12.8	15	8	GC-FID	103		575-002
p-Xylene	OSHA 1002		100	150 #	13.94	15	8	GC-FID	95.3		575-002
Xylenes, Total	Partial		100		12.64	15	8	GC-FID			575-001 or 575-002

* *Lower than the NIOSH-accepted guideline*
\# *NIOSH Short Term Exposure Limit (STEL)*
∞ *Depends on detector sensitivity*
† *In-house exposure level*
‡ *NIOSH Recommended Exposure Limit (REL)*
◊ *Occidental Chemical corporate exposure limits*
Δ *Agency standards for OSHA listings represent the OSHA PELs reported in 29 CFR 1910.1000 Part 1910, Section 1000.*
§ *The values given for the desorption efficiency were obtained in SKC Inc. Laboratories. See the online guide at skcinc.com for details on the desorption solvent used.*
¶ *OSHA construction industry standards*
▼ *OARS-WEEL TWA Level (Occupational Alliance for Risk Science - Workplace Environmental Exposure Levels)*
EL *Excursion Limit*
LFC *Lowest feasible concentration*

More information at skcinc.com – search "Passive"

See page 244 for abbreviations.

UME^{X}100 Passive Sampler for Formaldehyde

Industrial Hygiene, Environmental, and Indoor Air Sampling

- Meets OSHA Method 1007 specifications
- Conforms to EU ISO 16000-4-2004
- Accuracy meets OSHA requirements
- Uses 2,4-DNPH chemistry
- Documented formaldehyde uptake rates for 15-minute to 24-hour and 7-day samples
  - Sampling rates available for other aldehydes *(see left)*
- Permits detection of low ppb levels of formaldehyde

Sampling Rates for Other Aldehydes

Compound	Sampling Rate (ml/min)
Formaldehyde *(full validation)*	**28.6** (velocity 5 to 100 cm/sec, 15 min to 24 hrs) **20.4** (velocity < 5 cm/sec, 1 to 7 days)
Acetaldehyde	22.8‡
Benzaldehyde	13.5‡
Butyraldehyde	15.8‡
Crotonaldehyde	9.71‡
Glutaraldehyde	14‡
Hexanaldehyde	9.66‡
Isovaleraldehyde	15.5‡
Propionaldehyde	14‡
Chloroacetaldehyde	19.4**
Decylaldehyde	10.4**
Heptanaldehyde	12.8**
Nonanaldehyde	11.6**
o-Phthaldehyde	12.83**
o-Tolualdehyde	12.7**
Valeraldehyde	15.4**

‡ *Partial Validation*
** *Calculated sampling rate; see online Passive Sampling Guide at skcinc.com*

Versatile UME^{X} 100 Sampler

Industrial Hygiene Sampling
OSHA PEL 0.75 ppm (TWA)
2 ppm (STEL)
DFG MAK 0.3 ppm (TWA)
1 ppm (Ceiling)

Indoor Air Sampling
2 ppb (24 hours)
0.2 ppb (7 days)

Description	Cat. No.	Qty.
UME^{X}100 Passive Sampler for Formaldehyde$^{*\dagger\Delta}$	500-100	10
Suitable for sampling other aldehydes	500-100A	25
Treated Tape for QC - UME^{X} 100*†	P20084	50

Accessory	Cat. No.	Qty.
Stand for Area Sampling *(shown above)*	690-302	ea

* *Limited shelf-life, single use only; do not reuse*
† *Store at ≤ 39.2 F (4 C)*
Δ *If sampling in an atmosphere containing formalin, see skcinc.com/instructions/1795.pdf.*

V Video | P PowerPoint | W Webinar | S Sampling Solution
Visit skcinc.com/Training

UME^{X}200 Passive Sampler for NO_2 and SO_2

Industrial Hygiene and Environmental Sampling

- Same chemistry as active OSHA Method ID-182
- Validated sampling of sulfur dioxide and/or nitrogen dioxide from 15 minutes to 24 hours
- 3-week sample storage at ambient temperature
- Documented sampling rate of 17.3 ml/min for NO_2 and 15.2 ml/min for SO_2

Description	Cat. No.	Qty.
UME^{X}200 Passive Sampler for Nitrogen Dioxide and/or Sulfur Dioxide*	500-200 500-200A	10 25
Treated Tape for QC - UME^{X} 200*	P20098	25

Accessory	Cat. No.	Qty.
Shelter for Outdoor Sampling *(shown at right)*	690-303	ea

* *Limited shelf-life, single use only; do not reuse*

Industrial Hygiene Sampling
NO_2: *TLV 0.2 ppm (TWA)*
NO_2: *DFG MAK 0.5 ppm (TWA)*
SO_2: *OSHA PEL 5 ppm (TWA)*
NIOSH REL 2 ppm (TWA)
SO_2: *DFG MAK 1 ppm (TWA)*

Environmental Sampling
NO_2: *As low as 2 ppb (24 hours)*
SO_2: *As low as 17.4 ppb (24 hours) and EPA NAAQS Standard 100 ppb (1 hour)*

UME^{X}300 Passive Sampler for Ammonia

Industrial Hygiene and Environmental Sampling

- Chemistry similar to active OSHA Method ID-188 and NIOSH 6016
  - Analysis by ion chromatography with conductivity detector or visible absorption spectrometry
- Safe – no glass or sulfuric acid liquid in the sampler
- No particulate interference
- Enhanced sensitivity with documented 39.92 ml/min uptake rate
- Validated sampling of ammonia from 15 minutes to 24 hours

Description	Cat. No.	Qty.
UME^{X}300 Passive Sampler for Ammonia*†	500-300	10
Treated Tape for QC - UME^{X} 300*†	P20083	25

Accessory	Cat. No.	Qty.
Stand for Area Sampling *(shown at right)*	690-302	ea

* *Limited shelf-life, single use only; do not reuse*
† *Store at ≤ 39.2 F (4 C)*

Best Practice

Store and prepare sampling media in solvent-free environments.

Industrial Hygiene Sampling
TLV 25 ppm (TWA)
TLV 35 ppm (STEL)
DFG MAK 20 ppm (TWA)

Environmental Sampling
As low as 25 ppb (24 hours)

Elemental Mercury Passive Sampler

Industrial Hygiene and Extended Environmental Sampling

Tech Tips

The 520 Elemental Mercury Passive Sampler only samples elemental mercury (Hg) in the vapor phase; it does not sample elemental Hg in the particulate phase or organic mercury compounds.

More Information

See information on extended sampling times and other data at osha.gov/dts/sltc/methods/inorganic/id140/id140bkr.html.

- **Lowest cost per measurement available**
  - Reusable capsule holder
  - Replaceable sorbent capsule
- **Lightweight and easy to use; no pump needed**
- **No moisture or chlorine interferences**
- **Long-term sampling up to 120 hours**
- **Validated by OSHA ID-140**
  - Documented extended sampling to 120 hours *(see backup report at left)*
- **High accuracy, sensitivity, and capacity**
  - Positive analysis of mercury
  - Removable sorbent capsule eliminates false high readings

The SKC Passive Sampler for Elemental Mercury is specified in OSHA ID-140 for eight-hour TWA sampling. A backup report by OSHA expands application of this sampler for long-term sampling up to 120 hours. Following analysis by atomic absorption, the housing can be cleaned and reused.

Description	Cat. No.	Qty.
Sorbent Capsules contain Anasorb C300* and include replacement foams and resealable bags	520-02A	10
	520-02C	30
Reusable Capsule Holder	520-03	ea
	520-03A	5

** Anasorb C300 is equivalent to Carulite and Hydrar.*
Note: *To sample low levels of mercury, use a sorbent tube.*

Hydrogen Cyanide (HCN) Passive Sampler

- **Specified in OSHA 1015**
- **Same soda lime sorbent as in NIOSH 6010 and 6017**
- **Operates at a sampling rate of 28.4 ml/min**
- **Collects HCN from 0.44 to 20 ppm**
- **Suitable for 15-minute to 8-hour samples**

The lightweight, miniature HCN Passive Sampler provides accurate HCN exposure results. Its unique design allows easy field loading of sorbent into the housing before sampling and transfer of sorbent to a vial after sampling. Samples are extracted with water and analyzed by ion chromatography/electrochemical detector (IC/ELCHM).

Description	Cat. No.	Qty.
HCN Passive Sampler	590-400	5

V Video | P PowerPoint | W Webinar | S Sampling Solution
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Passive Color Tubes

Easy, Economical Screening Tools

- **On-the-spot results**
- **Easy to use**
  - No interpretations, long calculations, or charts
  - No pump needed
- **TWA measurements**
- **Convenient, lightweight tube holder**
  - Securely clips to a worker's collar for unobtrusive measurements in the breathing zone
- **Low-cost screening device**

Gastec Color Dosimeter Tubes

Chemical Hazard	Measuring Range (ppm-hours)	Cat. No.	Qty.
Acetaldehyde	0.1 - 20	810-91D †*Δ	10
Acetaldehyde	1.2 - 360	810-152D †*	10
Acetaldehyde	4 - 1200	810-151D †*	10
Acetic acid	0.5 - 100	810-81D	10
Acetic anhydride	0.45 - 90	810-81D †	10
Acetone	5 - 1500	810-151D *	10
Acetone	1.4 - 420	810-152D †*	10
Ammonia	0.1 - 10	810-3DL	10
Ammonia	2.5 - 1000	810-3D	10
Benzene	2.4 - 600	810-122DL †	10
1,3-Butadiene	1.3 - 200	810-174D	10
Carbon dioxide	0.02 - 12%-hr	810-2D	10
Carbon monoxide	1.04 - 2000	810-1D	10
Carbon monoxide	0.4 - 400	810-1DL *	10
Chlorine	0.08 - 100	810-8D	10
Chlorine	2.4 - 240	810-132D †*Δ	10
Cumene	3.4 - 850	810-122DL †	10
1,2 Dichloroethylene	3.9 - 600	810-174D †	10
1,2 Dichloroethylene	6 - 600	810-132D †*Δ	10
Dimethyl amine	1.9 - 750	810-3D †	10
N,N-Dimethylethyl amine	4 - 1600	810-3D †	10
Ethyl alcohol	100 - 25,000	810-112D	10
Ethyl benzene	2.8 - 700	810-122DL †	10
Ethylene	1.56 - 240	810-174D †	10
Formaldehyde	0.1 - 20	810-91D *Δ	10
Formic acid	0.55 - 110	810-81D †	10
Furfural	0.2 - 40	810-91D †*Δ	10
Hydrazine	0.05 - 650	810-3D †	10
Hydrogen chloride	1 - 100	810-14D	10

† *Secondary application; requires correction factor*
* *Store tubes at 40 to 50 F (5 to 10 C).*

Chemical Hazard	Measuring Range (ppm-hours)	Cat. No.	Qty.
Hydrogen chloride	1.8 - 180	810-132D †*Δ	10
Hydrogen cyanide	1 - 200	810-12D	10
Hydrogen fluoride	1 - 100	810-17D	10
Hydrogen peroxide	0.5 - 40	810-32D	10
Hydrogen sulfide	0.2 - 200	810-4D	10
Isoprene	2.6 - 400	810-174D †	10
Methyl amine	0.19 - 19	810-3DL †	10
Methyl ethyl ketone	6.5 - 1950	810-151D †*	10
Methyl ethyl ketone	2 - 600	810-152D *	10
Methyl ethyl ketone	0.125 - 25	810-91D †*Δ	10
Methyl isobutyl ketone	4 - 1200	810-152D †*	10
Methyl isobutyl ketone	11.5 - 3450	810-151D †*	10
Nitric acid	0.32 - 32	810-17D †	10
Nitric acid	0.8 - 80	810-14D †	10
Nitrogen dioxide	0.01 - 3	810-9DL *Δ	10
Nitrogen dioxide	0.1 - 30	810-9D *Δ	10
Perchloroethylene	3 - 150	810-133D	10
Styrene	26 - 6500	810-122DL	10
Sulfur dioxide	0.2 - 100	810-5D	10
Sulfur dioxide	10 - 600	810-5DH	10
Tetrachloroethylene	1.5 - 150	810-132D *Δ	10
Tetrachloroethylene	3 - 150	810-133D *Δ	10
Toluene	2 - 500	810-122DL	10
Trichloroethylene	3 - 300	810-132D *Δ	10
Triethylamine	5.3 - 2100	810-3D †	10
Trimethylamine	0.23 - 23	810-3DL †	10
Vinyl chloride	1.56 - 240	810-174D †	10
Xylene	3.4 - 850	810-122DL †	10
Dosi Tube Holders		810-710	3

Δ *One-year shelf-life*

ABOUT

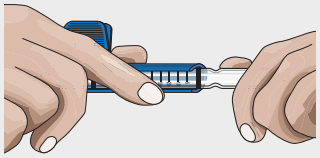
Using Passive Color Tubes

Dosimeter or diffusion tubes offer quick on-the-spot determination of exposure to chemical hazards without the need for a pump or training. Time-weighted average (TWA) measurements up to eight hours are as simple as:

1. Inserting tube in holder
2. Breaking tube tips
3. Reading results on tube in ppm-hours
4. Dividing reading by number of hours sampled

Tech Tips

- *When using passive color tubes, the time-weighted average (TWA) can be calculated at the end of the measurement period by simply dividing the length of the tube reading (in ppm-hours) by the elapsed sampling time (in hours).*
- *To avoid overstating carbon dioxide levels because of exhalation, place passive color tubes for carbon dioxide at the waist instead of the normal position in the breathing zone.*
- *When breaking the tube, the holder should be directed away from the body.*



Passive Thermal Desorption Tubes

Meet EPA Method 325 Requirements for Benzene Monitoring

- EPA-validated sampling rates available for benzene, toluene, ethylbenzene, xylenes, and many other VOCs
- May be used to sample SVOCs
- Contain pre-conditioned sorbent to meet EPA 325 requirements
  - Lower cost option available with Anasorb GCB1 sorbent
- SilcoNert® 2000 deactivated 3.5-inch length x 0.25-inch OD stainless steel tubes for sample integrity
- Allow for extended sample times for low-level measurements
- Reusable after laboratory conditioning
- Unique identification number and bar code
- Weatherproof tube shelter available
- Airflow direction and cap placement arrow indicators printed on tube
- Sealed with brass Swagelok screw caps with PTFE ferrules for transport
- Collected compounds are analyzed quantitatively using GC or GC-MS

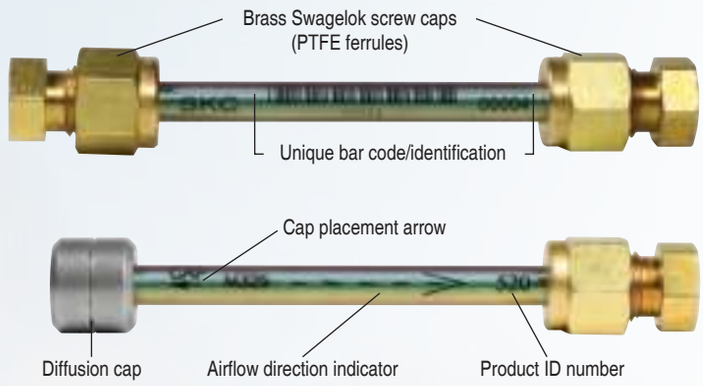
SKC Passive Thermal Desorption Tubes offer users an easy, accurate way to sample low-level VOCs and SVOCs over extended periods of time. These passive samplers meet requirements of the EPA 325 regulation for fenceline monitoring of benzene at petroleum refineries with extended sample periods of 14 days. SKC supplies sampling rates for other VOCs to expand the use of these passive devices for other applications. A weatherproof shelter is available for protecting samplers during outdoor sampling.

Description	Cat. No.	Qty.
SKC Passive TD Tubes,* 3.5 x 0.25-inch OD (sized for Perkin Elmer and Markes Int'l. thermal desorbers), deactivated stainless steel tubes filled with pre-conditioned sorbent and supplied with diffusion caps and brass Swagelok screw caps with PTFE ferrules		
Carbopack X, 400 mg	226-520	10
Anasorb GCB1,† 400 mg	226-521	10
Diffusion Caps	226-525	10
Shelter	226-526	ea

* *Tubes must be used within 30 days of conditioning.*

† *Equivalent to Carbopack B/Carbograph 1*

Accurate Sampling of BTEX, Other VOCs, and SVOCs



SKC Passive TD Tubes are conditioned and quality control tested to assure low background.

Weatherproof shelter accessory protects TD tubes.

Validated Uptake Rates (ml/min) for Selected Clean Air Act Compounds Using Carbopack X and Anasorb GCB1 Sorbents

Compound	Carbopack X	Anasorb GCB1*
Benzene	0.67 ± 0.06	0.63 ± 0.07
Carbon tetrachloride	0.51 ± 0.06	N/A
Chlorobenzene	0.51 ± 0.06	N/A
3-Chloropropene	0.51 ± 0.3	N/A
p-Dichlorobenzene	0.45 ± 0.05	N/A
1,1-Dichloroethane	0.57 ± 0.1	N/A
1,2-Dichloroethane	0.57 ± 0.08	N/A
1,1-Dichloroethene	0.57 ± 0.14	N/A
1,2-Dichloropropane	0.52 ± 0.1	N/A
Ethylbenzene	0.46 ± 0.07	0.5
Styrene	0.50 ± 0.14	N/A
Tetrachloroethene	0.48 ± 0.05	N/A
Toluene	0.52 ± 0.14	0.56 ± 0.06
1,1,1-Trichloroethane	0.51 ± 0.1	N/A
1,1,2-Trichloroethane	0.49 ± 0.13	N/A
Trichloroethene	0.50 ± 0.05	N/A
m,p-Xylene	0.46 ± 0.09	0.47 ± 0.04
o-Xylene	0.46 ± 0.12	0.47 ± 0.04

** SKC Anasorb GCB1 is equivalent to Carbopack B/Carbograph 1.*

Reference: *EPA Method 325B—Volatile Organic Compounds from Fugitive and Area Sources, Table 12.1, epa.gov/emc, search "method 325B"*

SKC Passive Thermal Desorption Tube Applications

- Fenceline monitoring
- Indoor air sampling
- Vapor intrusion studies

More Information

McClenny, W.A. et al., "24 h Diffusive Sampling of Toxic VOCs in Air onto Carbopack X" http://doi.org/fhgn4s

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ULTRA Passive Samplers

Thermal Desorption Enhances Detection

Compare ULTRA® to Canisters

Side-by-side studies using ULTRA Passive Samplers (Anasorb GCB1) and stainless steel canisters demonstrate excellent sampling correlation.

Compound	ULTRA (µg/m³)	Canister (µg/m³)
Benzene	4.2	4.5
	2.1	2.0
	1.9	1.6
	6.67	6.8
	1.58	1.5

Compound	ULTRA (µg/m³)	Canister (µg/m³)
Perchloro-ethylene	1.1	1.6
	2.3	2.2
	32.9	30.0
	1.37	2.0
	2.85	2.6

Compound	ULTRA (µg/m³)	Canister (µg/m³)
o-Xylene	7.55	7.9
	1.16	0.93
	1.96	1.9
	8.3	6.2
	13.3	11.0

Compound	ULTRA (µg/m³)	Canister (µg/m³)
Toluene	30.0	26.0
	20.3	19.0
	44.0	46.0
	10.8	8.8
	6.1	3.8

Compound	ULTRA (µg/m³)	Canister (µg/m³)
m,p-Xylene	21.2	19.2
	5.52	5.6
	34.1	36.7
	3.7	2.51
	5.7	5.1

- **Results comparable to canisters for EPA Method TO-15, without the expense**
  - No cleaning or certification costs
  - Lower purchase price
  - No expensive shipping
- **Passive alternative to EPA TO-17 — no pump required**
- **Choose from 5 sorbents for environmental air sampling**
  - Anasorb GCB1
  - Tenax TA
  - Chromosorb 106
  - Carbopack X
  - Charcoal (solvent extraction)
- **Validated sampling (uptake) rates**
  - See skcinc.com/catalog/passive-guide.php
- **Built-in blank/correction sorbent section available**
- **Sample integrity**
  - Manufactured in an ultra-clean environment
  - Extensive cleaning and QC procedures
  - Sonically welded housing

Compare ULTRA Samplers to Passive TD Tubes

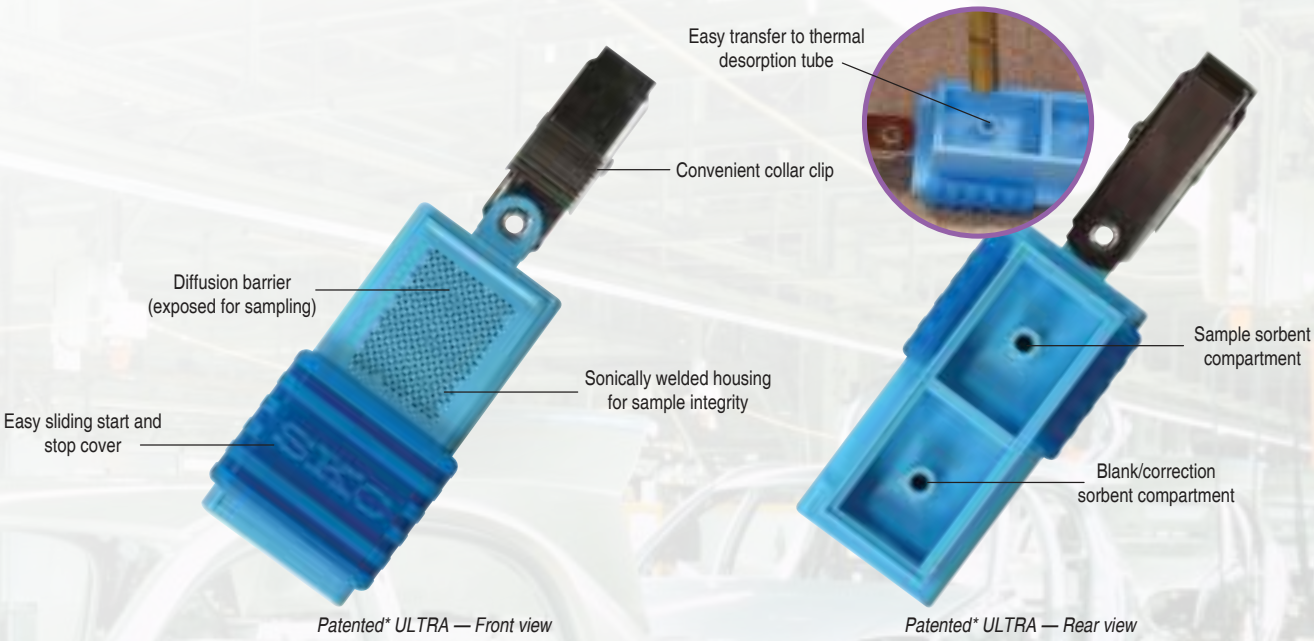
Sampler	ULTRA Passive Sampler	Passive TD Tubes
Sampling Rate for Benzene	16 ml/min	0.67 ml/min
Sampling Time	8 to 24 hours	14 days
Desorption	Transfer to thermal desorption tube	Direct insertion into thermal desorber
Recommended Applications	Environmental monitoring, vapor intrusion	Compliance fenceline monitoring of petroleum refineries according to EPA 325, vapor intrusion

Outdoor sampling shelter protects multiple samplers.

Indoor air sampling stand holds up to two samplers.

ULTRA Passive Samplers

Convenient Alternative to Canisters and Thermal Desorption Tubes



Patented ULTRA — Front view*

Patented ULTRA — Rear view*

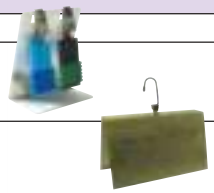
Ordering

Select from prefilled samplers or separate sampler housing and sorbent vials.

Sorbent/Amount	Economy Prefilled Samplers, without built-in blank, pk/5 Cat. No.	Prefilled Samplers, with built-in blank, pk/5 Cat. No.	Sorbent Vials for User-filled Samplers, pk/2, *require empty housing Cat. No. 690-200* Cat. No.
Anasorb GCB1,#‡ 370 mg in each compartment or vial	690-101-NB	690-101	690-201
Chromosorb 106,#† 285 mg in each compartment or vial	690-103-NB	690-103	690-203
Tenax TA,# 253 mg in each compartment or vial	690-104-NB	690-104	690-204
Charcoal,# 500 mg in each compartment or vial (solvent extraction)	690-105-NB	690-105	690-205
Carbopack X,# 400 mg in each compartment or vial	690-106-NB	690-106	690-206
Empty Sampler Housing, for user-filled ULTRA, *required*			690-200

 # Limited shelf-life *‡ Comparable to Carbopack B* *† Go to osha.gov and search "ULTRA passive" for additional information on sampling rates for Chromosorb 106.*

Sampling Accessories	Cat. No.
Transfer Funnel, for filling sampler housing with sorbent from vials, for ULTRA only	690-301
Stand for Indoor Sampling	690-302
Shelter for Outdoor Sampling	690-303



Analysis Accessories	Cat. No.
Thermal Desorption Tube, Perkin Elmer, 0.25-inch OD x 3.5-inch length, includes screens and end caps	P226530
Analysis Transfer Funnel, facilitates transfer of sorbent from vial to 0.25-inch OD thermal desorption tube	590-264

* *U.S. Patent No. 6,607,581*

See skcinc.com/catalog/passive-guide.php for uptake rates.

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SKC Particulate Samplers

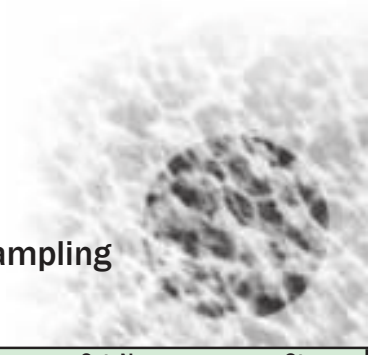
SKC is well-known in the field of aerosol science for innovative size-selective particulate samplers. SKC offers a range of samplers for industrial hygiene and environmental sampling of inhalable, thoracic, and respirable particulate, as well as environmental PM fractions and bioaerosols.

SKC Filters

Top Quality Materials for All Agency Methods

The SKC Filter Division provides top quality air sampling solutions for your applications. Choose from a range of filter diameters and configurations including bulk, preloaded, preweighed, and matched-weight. Professionals rely on our filters and scientific innovations such as Solu-CAP, Accu-CAP, coated filters, and the DPM Cassette. SKC – SCIENCE. SERVING PEOPLE.

Filter	Features	Pages
Mixed Cellulose Ester (MCE)	• Hydrophilic • Low metal background • Autoclavable • Biologically inert • Low artifact - dissolves/clears completely	104-106
Silver	• Chemically inert • High temperature resistant and autoclavable • Uniform porosity and thickness • Bacteriostatic • Hydrophilic and inorganic	107
Polycarbonate	• Smooth surface • Thin, transparent, and non-staining • Chemically resistant; biologically inert • Thermally stable up to 284 F (140 C) • Hydrophobic • Exceptionally low tare weight	107
Polyvinyl Chloride (PVC)	• Low tare weight • Very hydrophobic • Low ash	108-109
Polytetrafluoroethylene (PTFE)	• Strong and resistant to acids, bases, and solvents • Hydrophobic • Low background • Low tare mass • Autoclavable	110
Quartz	• Binder-free • Low metal background • Hydrophobic • Autoclavable • Heat treated	111
Glass Fiber	• Binder-free • High temperature tolerant • Autoclavable • Hydrophobic • High particle retention	112
Cellulose	• 100% pure • Ashless • Autoclavable • Hydrophilic	112
Gelatin	• Pre-sterilized by gamma irradiation • High moisture content • Water soluble - dissolves easily on agar • Suitable for bioaerosols	116



MCE Filters

A Gold Standard for IH Sampling

ABOUT Filter Pore Size

Glass fiber filter, 1-µm equivalent pore diameter

Polycarbonate filter, 1-µm pore size

Fibrous and porous membrane filters (glass fiber, MCE, and PTFE) are not like sieves with well-defined pores but capture particles through a combination of impaction, direct interception, Brownian diffusion, and other physical processes. **Pore size** does not determine collection efficiency but is actually a liquid filtration rating. Filters are typically 10 times more efficient **in air** than the pore size rating. For example, a 0.8-µm filter will trap at least 50% of particles as small as 0.08 µm, so even nanosized particles cannot pass through pores of traditional filters used for industrial hygiene sampling.

New to Air Sampling?

Access free SKC Tech Klip Demonstration Videos to learn how to calibrate a pump and sample with filter cassettes.

Visit skcinc.com/Training!

MCE Filters

Diameter (mm)	Pore Size (µm)	Support Pad‡	Notes	Cat. No.	Qty.
13	5.0	No		225-8050	100
25	0.45	No		225-1911	100
25	0.8	Yes		225-19	100
25	0.8	No	use with IOM *(pp. 124-125)*	225-1930	100
25	0.8	No	black grid	225-1913	100
25	1.2	No		225-1912†	100
37	0.45	No		225-1914	100
37	0.45	Yes		225-9	100
37	0.8	No		225-1939	100
37	0.8	Yes		225-5	100
37	5.0	No		225-1938	100
47	0.45	No		225-506	100
47	0.8	No		225-504	100

† *Recommended for use with the Button Sampler; see page 126* ‡ *Filter supports available on page 119*

Matched-weight MCE Filter Pairs for User-loading

Matched-weight MCE filter pairs are certified as matched in weight to within 50 µg. Load the filters into a cassette; the top filter collects the contaminant, the bottom filter acts as a control. No preweighing or conditioning is required. After sampling, both filters are weighed and the difference between weights is the sample weight.

Diameter (mm)	Filter Specifications	Cat. No.	Qty.
37	MCE, 0.8 µm, matched-weight within 50 µg, filter pairs only*	225-532*	50
47	MCE, 0.8 µm, matched-weight within 50 µg, filter pairs only*	225-531*	50

* *Not preloaded in cassettes*

Preloaded MCE Filters

All SKC preloaded filters include supports and are in SureSeal leak-free cassettes requiring a SureSeal Cassette Opener; see page 121.

Diameter (mm)	Filter Specifications	Cassette Description	Cat. No.	Qty.
25	MCE, 0.8 µm	3-pc clear plastic, banded	225-3100	50
25	MCE, 1.2 µm	3-pc black conductive, banded	225-507	50
37	MCE, 0.45 µm	3-pc black conductive, banded	225-1924	50
37	MCE, 0.45 µm	4-pc clear styrene, banded	225-1925	50
37	MCE, 0.8 µm	2-pc clear styrene, banded	225-508	50
37	MCE, 0.8 µm	3-pc clear styrene, banded	225-3-01	50
		3-pc clear styrene, not banded	225-3-01NB	50

Matched-weight MCE Filters Preloaded in Cassettes

All SKC preloaded filters include supports and are in SureSeal leak-free cassettes requiring a SureSeal Cassette Opener; see page 121.

Diameter (mm)	Filter Specifications	Cassette Description	Cat. No.	Qty.
25	MCE, 0.8 µm, matched-weight within 50 µg	2-pc clear styrene, banded	225-525	50
37	MCE, 0.8 µm, matched-weight within 100 µg	3-pc clear styrene, banded	225-3-02	50
37	MCE, 0.8 µm, matched-weight within 50 µg	2-pc clear styrene, banded	225-502	50
37	MCE, 0.8 µm, matched-weight within 50 µg	3-pc clear styrene, banded	225-503	50
			225-528	12

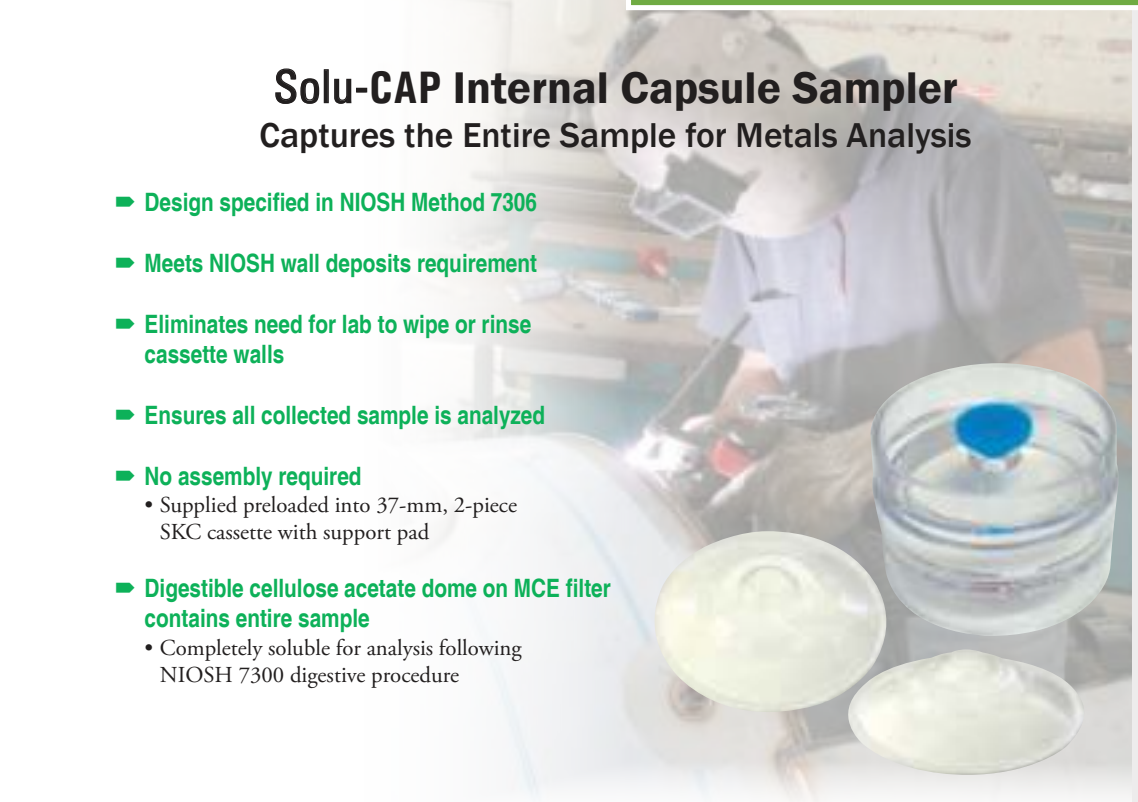
Nano-Neat MCE Filter Cassettes

Ultra-pure for sampling workplace chromium; certified < 0.1 µg chromium per filter. Cassettes are tinted purple for easy identification. Each box contains a Certificate of Compliance. All SKC preloaded filters include supports and are in SureSeal leak-free cassettes requiring a SureSeal Cassette Opener; see page 121.

Diameter (mm)	Filter Specifications	Cassette Description	Cat. No.	Qty.
37	MCE, 0.8 µm, Nano-Neat	2-pc purple styrene, banded	225-8408	50

Solu-CAP Internal Capsule Sampler

Captures the Entire Sample for Metals Analysis

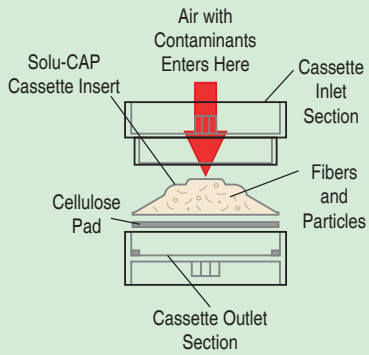


- **Design specified in NIOSH Method 7306**
- **Meets NIOSH wall deposits requirement**
- **Eliminates need for lab to wipe or rinse cassette walls**
- **Ensures all collected sample is analyzed**
- **No assembly required**
  - Supplied preloaded into 37-mm, 2-piece SKC cassette with support pad
- **Digestible cellulose acetate dome on MCE filter contains entire sample**
  - Completely soluble for analysis following NIOSH 7300 digestive procedure

AirChek Series Sample Pumps – Perfect partners for Solu-CAP
see pages 10-15 and 20-25

Use Solu-CAP® Internal Capsule Samplers to eliminate sample loss and meet NIOSH requirements for inclusion of all wall deposits. Solu-CAP's digestible cellulose acetate dome is sealed to a quality MCE filter. The user samples and sends the cassette to a laboratory. The lab removes the Solu-CAP insert, digests it in an acid solution per standard procedures, and performs analysis for airborne metals following published methods. **No sample loss!** The Solu-CAP design is specified in NIOSH 7306.

Solu-CAP = 100% Sample Contained



Eliminate sample loss from:

- ✕ Excessive filter loading during collection
- ✕ Filter transfer in the lab
- ✕ Cassette wall losses

References

Harper, M. and Ashley, K., "Acid-Soluble Internal Capsules for Closed-Face Cassette Elemental Sampling and Analysis of Workplace Air," Jnl. of Occup. and Env. Hyg., 10:6, 2013, pp. 297-306, http://doi.org/xj6

Ashley, K. and Harper, M., "Analytical Performance Issues: Closed-Face Filter Cassette (CFC) Sampling – Guidance on Procedure for Inclusion of Material Adhering to Internal Sampler Surfaces," Jnl. of Occup. and Env. Hyg., 10:3, 2013, pp. D29-D33, http://doi.org/wv3

Preloaded Solu-CAP Internal Capsule Sampler

Description	Cat. No.	Qty.
Preloaded 37-mm Solu-CAP with cellulose acetate dome sealed to 0.8-µm MCE filter in 2-piece SKC cassette with support, *requires a sample pump (pp. 10-15 and 20-25) and SureSeal Cassette Opener (see below)*	225-8517	50
Accessory		
SureSeal Cassette Opener	225-13-5A	ea

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Certified BestChek Asbestos Cassettes

The Highest Standard for Cassette Reliability

ABOUT

The 5 Cs of Asbestos Cassettes

Only from SKC — BestChek® cassettes meet or exceed NIOSH, OSHA, and ASTM standards in Count, Clearing, Conductivity, Collection Area, and Construction.

Specify SKC BestChek Asbestos Cassettes — your assurance of reliability and accuracy.

SKC Certified BestChek Filters in Carbon-filled Polypropylene Cassettes

All SKC preloaded asbestos filters include cellulose supports.

Diameter (mm)	Filter Specifications	Cassette Description		Cat. No.	Qty.
25	MCE, 0.8 µm	with cowl, banded		225-321	50
25	MCE, 0.8 µm	with cowl, banded, with stand-up plug in outlet end		225-321A	50
25	MCE, 0.8 µm, black grid	with cowl, banded		225-326	50
25	MCE, 1.2 µm, black grid	with cowl, banded		225-1934	50
25	MCE, 0.45 µm* TEM analysis	with cowl, banded, with support and 5.0-µm diffuser pad		225-327	50

* *Available as microvacuum carpet cassette with nozzle; see below left*

Microvacuum Cassettes for Asbestos

- Nozzle for easy sampling of settled dust on surfaces
- Meet specifications of ASTM Method D5755
- Use with personal sample pump at 2 L/min

Carbon-filled polypropylene with cowl and nozzle, BestChek 25-mm, 0.45-µm MCE filter for TEM analysis, and cellulose support
Cat. No. 225-322 .....ea

Styrene (non-conductive) with nozzle, 37-mm, 0.45-µm MCE filter, for TEM analysis, and cellulose support
Cat. No. 225-9543 .....ea

Asbestos Sampling Pumps

AirLite Personal Pump

Easy, Economical Asbestos Sampling

- Constant flows to 3000 ml/min
- Alkaline battery powered, over 10 hours run time
- Rugged
- Weighs only 12 ounces
- Simple operation with flow fault feature
- Model available with timer

See details and ordering on pages 26-27.

QuickTake 30 Area Pump

Li-Ion-powered High Flow Asbestos Pump

- Constant flows from 10 to 30 L/min
- 9+ hours run time for asbestos clearance
- Tough, compact case with handle weighs 4.8 pounds
- Programmable with flow fault feature
- Low-noise battery-powered alternative to vacuum pumps

See details and ordering on pages 34-35.

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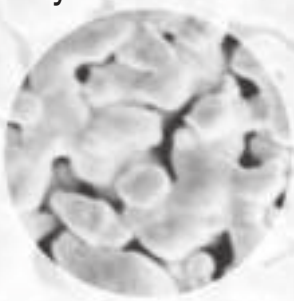
Visit skcinc.com/Training

Silver Membrane Filters

Specified for X-ray Diffraction Analysis



- **Chemically inert, high temperature resistant**
  - Autoclave and reuse repeatedly# without loss of performance
- **99.97% pure inorganic metallic silver**
- **Uniform porosity and thickness, smooth surface**
  - Ideal for NIOSH X-ray diffraction methods for crystalline silica, lead sulfide, boron carbide, and chrysotile asbestos
- **Hydrophilic and bacteriostatic**

Diameter (mm)	Pore Size (µm)	Cat. No.	Qty.
25	0.8	**225-1803**	**50**
25	0.45	**225-1802**	**50**
37	0.8	**225-1801**	**25**
47	0.8	**225-1804**	**25**

Single use only for silica analysis

Additional diameter and pore size silver membrane filters are available as a special order.

For size-selective samplers
see pages 122-136

Polycarbonate Membrane Filters

Ideal for Microscopy

- **Chemically resistant, thermally stable,† and strong**
- **Thin, transparent, non-staining, and smooth**
  - Ideal for light and electron microscopy
  - Exceptional background for sample observations
- **Hydrophobic, with exceptionally low tare weight**
- **Biologically inert**

Diameter (mm)	Pore Size (µm)	Support Pad‡	Notes	Cat. No.	Qty.
25	0.4	No		**225-1608**	**100**
25	0.8	No	use with IOM *(pp. 124-125)*	**225-1601**	**100**
37	0.4	No		**225-1609**	**100**
37	0.8	No		**225-1602**	**100**
47	0.4	No		**225-1610**	**100**

‡ *Filter supports available on page 119*

† *Maximum operating temperature is 284 F (140 C).*

For filter sampling accessories
see pages 118-121

Preloaded Polycarbonate Filters

All SKC preloaded filters include supports and are in SureSeal leak-free cassettes requiring a SureSeal Cassette Opener; see page 121.

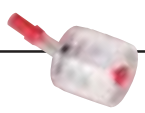
Diameter (mm)	Pore Size (µm)	Support Pad	Cassette Description	Cat. No.	Qty.
25	0.8	Yes	3-piece conductive, with cowl, banded	**225-1604**	**50**

Microvacuum Cassette with Polycarbonate Filter

All SKC preloaded filters include supports and are in SureSeal leak-free cassettes requiring a SureSeal Cassette Opener; see page 121.

Diameter (mm)	Pore Size (µm)	Support Pad	Cassette Description	Cat. No.
37	0.4	Yes	3-piece styrene (non-conductive) with nozzle; microvacuum*	**225-9542***

* *Available in a Carpet Sampling Cassette Kit; see page 144*



For sample pumps
see pages 10-15 and 20-29

Accu-CAP Internal Capsule

Eliminates Cassette Wall Losses

- **Meets specifications of NIOSH Method 0501 for gravimetric analysis**
- **Ensures entire sample is captured and analyzed**
- **Fits inside a 37-mm, 2-piece SKC cassette with support pad**
- **Static-dissipative plastic dome on PVC filter contains entire sample**
  - No cassette rinsing or wiping required
  - Prevents loss of sample during transport
  - No particles dislodged from filter during analysis preparation
- **Suitable for sampling total dust (NIOSH 0500 and 0501), respirable dust (NIOSH 0600), carbon black (NIOSH 5000), and more**

For filter cassette holders, openers, adapters, and other accessories
see pages 118-121

SKC recommends AirChek Series Pumps for use with Accu-CAP
see pages 10-15, 20-21, 24-25, and 28-29

Use Accu-CAP® Internal Capsules to meet NIOSH 0501 requirements for inclusion of all wall deposits in the sample. Accu-CAP features a static-dissipative plastic dome sealed to a quality PVC filter. The user preweighs the Accu-CAP, places it between the inlet and outlet sections of a two-piece 37-mm SKC-manufactured cassette with support pad, samples, removes Accu-CAP from the cassette, and postweighs it. **Accu-CAP effectively contains 100% of sampled particulate!**

Accu-CAP is Easy to Use

Prepare SKC 2-piece cassette with support pad.

Weigh Accu-CAP and insert in cassette.

Complete cassette assembly. After sampling, remove Accu-CAP from cassette and weigh.

References
Ashley, K. and Harper, M., "Analytical Performance Issues: Closed-Face Filter Cassette (CFC) Sampling – Guidance on Procedure for Inclusion of Material Adhering to Internal Sampler Surfaces," Jnl. of Occup. and Env. Hyg., 10:3, 2013, pp. D29-D33, http://doi.org/wv3

NIOSH Method 0501, cdc.gov/niosh/docs/2003-154/pdfs/0501.pdf

Accu-CAP Internal Capsule

Description	Cat. No.	Qty.
37-mm Accu-CAP with plastic dome sealed to 5.0-µm pore size PVC filter, *requires 37-mm cassettes (p. 113) and support pads (p. 119)*	**225-8516GLA**	**60**

V Video | P PowerPoint | W Webinar | S Sampling Solution
Visit skcinc.com/Training

GLA-5000 PVC Membrane Filters

The No. 1 Filter for Silica and Other Dusts

- **Low ash, suitable for multiple NIOSH/OSHA/ASTM air sampling methods**
  - Silica, metals, dust (total and respirable)
  - OSHA Method ID-215 (V.2) for hexavalent chromium
- **Low tare weight and moisture pickup for gravimetric stability**
  - ≤ 0.5% after 24 hours at 48% RH and 122 F (50 C)
- **Preloaded 25 and 37-mm cassettes available**
- **Available in Accu-CAP Internal Capsule**
- **Both gravimetric and chemical analyses on the same filter using NIOSH 7300 or 7301 for metals (elements)**

For PPI Sampler with preweighed PVC filter
see page 131

PVC Filters

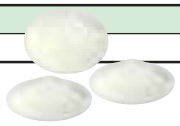
Diameter (mm)	Pore Size (µm)	Support Pad‡	Cat. No.	Qty.
25	5.0	No	225-5-25†	100
37	5.0	Yes	225-5-37-P	100
			225-80601K	1000
37	5.0	No	225-5-37	100
47	5.0	No	225-5-47	100

‡ *Filter supports available on page 119* † *Recommended for use with IOM and Button Samplers; see pages 124-126*

Accu-CAP PVC Internal Capsule — *see page 108*

Clear plastic capsule heat-sealed to a filter; fits between parts of a two-piece SKC cassette with support pad; prevents cassette wall losses; ideal for gravimetric determinations for NIOSH 0500, 0501, 0600, and 5000

Diameter (mm)	Pore Size (µm)	Cat. No.	Qty.
37	5.0	225-8516GLA	60



Matched-weight PVC Filters

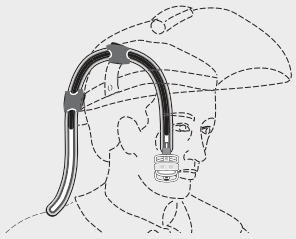
Diameter (mm)	Filter Specifications	Description	Cat. No.	Qty.
37	5.0 µm, matched-weight within 25 µg	Filter pairs only*	225-8222*	50
37	5.0 µm, matched-weight within 25 µg	2-piece clear styrene, banded	225-8201	50
37	5.0 µm, matched-weight within 25 µg	3-piece clear styrene, banded	225-8202	50

* *Not preloaded in cassettes*

Preloaded PVC Filters

All SKC preloaded filters include supports and are in SureSeal leak-free cassettes requiring a SureSeal Cassette Opener; see page 121.

Diameter (mm)	Filter Specifications	Cassette Description	Cat. No.	Qty.
25	5.0 µm	2-piece clear styrene, banded	225-8214	50
25	5.0 µm	3-piece clear styrene, banded	225-8215	50
37	5.0 µm	2-piece clear styrene, banded	225-802	50
37	5.0 µm	3-piece clear styrene, banded	225-803	50
37	5.0 µm, preweighed, 5 decimals	2-piece clear styrene, banded	225-8204	12
			225-8205	100
37	5.0 µm, preweighed, 5 decimals	3-piece clear styrene, banded	225-8208	12
			225-8209	100



Helmet Adapter#

Ideal for welders or workers who wear a helmet with face shield; effectively holds a filter cassette or sample tube in the breathing zone regardless of visor position

Cat. No. 225-600 .....ea

 # Developed in Canada by IRSST (Institut de recherche Robert-Sauvé en santé et en sécurité du travail)

PTFE Membrane Filters

Aerosol Sampling in Aggressive Chemical Environments

- Hydrophobic
- Low background for interference-free chemical determinations
- Strong and resistant to acids, bases, and solvents
- Low tare mass for accurate gravimetric analysis
- Temperature resistant to 500 F (260 C) — autoclavable
- Suitable for sampling in environments also containing water vapor

PTFE filters are the versatile choice for size-selective samplers. The material's unique properties make it ideal for gravimetric, chemical, and/or microscopic analysis of sample particulate. PTFE filters are used for environmental particulate matter sampling, metal working fluids, in the pharmaceutical industry, and more.

Tech Tips

- *Back pressure on PTFE filters can vary within the same lot.*
- *The low back pressure on PTFE filters allows longer run times at higher flow rates.*
- *PTFE filters' temperature resistance makes them stable up to 500 F (260 C).*
- *Use PTFE filters for industrial hygiene sampling of polynuclear aromatic hydrocarbons (PNAs).*
- *Because of their hydrophobic nature, PTFE filters are specified for environmental particulate sampling with gravimetric analysis.*

For size-selective samplers
see pages 122-136

For Sample Pumps
see pages 10-15 and 20-29

PTFE Membrane Filters

Diameter (mm)	Pore Size (µm)	Support Pad‡	Notes	Cat. No.	Qty.
25	0.5	No	unlaminated	**225-3708**	**250**
25	1.0	No	unlaminated	**225-3714**	**250**
25	2.0	No	unlaminated	**225-3726**	**250**
25	5.0	No	unlaminated	**225-1728**	**50**
37	1.0	No	unlaminated	**225-3705**	**150**
37	5.0	Yes	unlaminated	**225-17A**	**50**
47	0.5	No	unlaminated	**225-3753**	**150**
47	2.0	No	unlaminated	**225-3748**	**150**
37	0.45	Yes	on polypropylene support	**225-17-04**	**100**
37	1.0	Yes	on polypropylene support	**225-17-01**	**100**
25	3.0	No	with PMP support ring	**225-1711†**	**50**
37	2.0	No	with PMP support ring	**225-1709**	**50**
47	2.0	No	with PMP support ring	**225-1747**	**50**
37	0.3	No	for viruses and other bioaerosols, laminated spun-bound polyester; *available preloaded, see below*	**225-1722**	**100**

† *Recommended for use with the Button Sampler; see page 126* ‡ *Filter support pads available on page 119*

Preloaded PTFE Membrane Filters

All SKC preloaded filters include supports and are in SureSeal leak-free cassettes requiring a SureSeal Cassette Opener; see page 121.

Diameter (mm)	Filter Specifications	Cassette Description	Cat. No.	Qty.
25	PTFE, 1.0 µm, with laminated polypropylene support pad	2-piece black conductive, goblet style	**225-1725**	**50**
37	PTFE, 0.3 µm, laminated with spun-bound polyester with cellulose support; for *Anthrax*/SARS	3-piece clear styrene, banded	**225-1723**	**50**
37	PTFE, 1.0 µm, with cellulose support	3-piece clear styrene, banded	**225-1715**	**50**
37	PTFE, 2.0 µm, with cellulose ring	2-piece opaque plastic, banded	**225-1713**	**50**

Diesel Particulate Matter Cassettes

Also Suitable for Carbon Nanotubes and Fibers

DPM Cassette — Preloaded Quartz Filters with Submicron Impactor

Only from SKC

- Preloaded in specially designed cassette with internal size-selective impactor
  - Screens particles ≥ 1 micron
  - Contains two quartz filters: one for sample collection and one for dynamic blank
- Use for elemental carbon analysis of DPM or for carbon nanotubes (CNTs) and carbon nanofibers (CNFs) (NIOSH Method 5040); *see NIOSH CIB 65, cdc.gov/niosh/docs/2013-145*

Diameter (mm)	Filter Specifications	Cassette Description	Notes	Cat. No.	Qty.
37	2 heat-treated, binder-free Tissuquartz	1 piece with impactor, tamper-evident sealed, single use†	NIOSH 5040 analysis, average sample deposition area is 8.04 cm^2	**225-317***	**10**

* *Limited shelf-life* † *Requires 1/4-inch ID tubing or Filter Cassette/Cyclone Holder; see pp. 118-119*

Preloaded Quartz Filters Without Submicron Impactor

- An economical choice when no interfering respirable dusts are present
- Meets NIOSH 5040 specifications for elemental carbon
- Preloaded into standard 37 or 25-mm, 3-piece clear styrene cassette

All SKC preloaded filters include supports and are in SureSeal leak-free cassettes requiring a SureSeal Cassette Opener; see page 121.

Diameter (mm)	Filter Specifications	Cassette Description	Notes	Cat. No.	Qty.
25	Heat-treated, binder-free Tissuquartz, support pad	3-piece clear styrene, banded	Meets NIOSH NEAT 2.0 protocols for NIOSH 5040 analysis	**225-401-25***	**50**
37	Heat-treated, binder-free R-100 quartz, support pad	3-piece clear styrene, banded	NIOSH 5040	**225-401***	**50**

* *Limited shelf-life*

Quartz Depth Filters

For Elemental/Organic Carbon, DPM, and Trace-level Contaminants

Quartz Filters

- Heat treated to reduce trace organics
- Binder-free
- Low metal background

Diameter (mm)	Description	Cat. No.	Qty.
25	Type R-100	**225-1824#**	**100**
25	Tissuquartz	**225-1825¥**	**100**
37	Tissuquartz	**225-1822¥**	**25**
37	Type R-100	**225-1827#**	**100**
47	Tissuquartz	**225-1823¥**	**25**
47	Tissuquartz	**225-1811¥**	**100**
47	Type R-100	**225-1830#**	**100**
102	QM-A	**225-1808‡**	**100**
Preloaded Quartz Filters specified in NIOSH 7908 for Phosphoric Acid and Sulfuric Acid			
37	Tissuquartz with cellulose support, 2-piece clear styrene, banded	**225-9033**	**10**

¥ *432 µm thick* # *380 µm thick* ‡ *450 µm thick*

DPM Cyclone

- Extended retaining ring and special sealing securely hold SKC DPM Cassettes (at left)
- Conductive plastic construction prevents static interference
- Operate at 2 L/min when used with the DPM Cassette

DPM Cyclone includes grit pot and retaining ring
Cat. No. **225-68**

See GS-1 Cyclone on page 128

ABOUT Quartz Depth Filters

Q: What is the difference between Type R-100 and Tissuquartz depth filters?

A: Type R-100 filters meet NIOSH requirements: 99.97% retention efficiency for 0.3-µm dioctylphthalate (DOP) particles up to a 200-mg filter loading.

Tissuquartz has a typical retention efficiency of 99.90% for 0.3-µm DOP particles at 32 L/min per 100 cm^2 filter media.

Glass Fiber Depth Filters

ABOUT

Depth Filter Pore Size Rating

The pore size rating for depth filters is commonly termed "nominal" or approximate. This is due to the method for determining pore size. Depth filters are made of intertwined fibers or sintered particles. These form irregular openings through which air passes, but most particles do not. Pore size testing for depth filters is usually achieved by passing liquid containing particles of a known size through the filter. If an acceptable number of particles are trapped, that particle size becomes the "liquid nominal," which is typically stated as, "Filter removes > xx% of particles ≥ x µm."

- High-temperature tolerant — autoclavable
- Chemical and pH resistant; biologically inert
- Liquid nominal pore size of 1.0 µm
- High particle retention
- Hydrophobic
- Made of binder-free borosilicate glass fiber for purity
- Available with binder for excellent wet strength, easier handling, and filter integrity

Specified in EPA methods for environmental particulate matter gravimetric analysis

SKC quality Glass Fiber Depth Filters are used where high flow rate and micron/submicron filtration is required. Glass Fiber Filters are suitable for both liquid and air filtration. Select from binder-free filters for purity that is ideal for analytical and gravimetric determinations or filters with binder for strength in long-duration, high-pressure, or wet applications.

ABOUT

Glass Fiber Filter Types

Type A/E Glass Fiber

- High flow rates, wet strength, and dirt (solids) holding capacities
- For gravimetric analysis of air pollutants and testing dissolved/suspended wastewater solids

Type A/B Glass Fiber

- High dirt-loading capacity with thicker glass
- Manufactured of the highest quality borosilicate glass microfibers

Dia. (mm)	Pore Size (µm)Δ	Description	Cat. No.	Qty.
13	1.0	binder free, A/E	**225-16**	**500**
25	1.0	binder free, A/E	**225-702†**	**500**
25	1.0	acrylic binder, 50 ml thick	**225-703**	**100**
25	1.6	binder free, GF/A	**225-58F**	**100**
37	1.0	binder free, A/E	**225-7**	**500**
37	1.0	binder free, A/B	**225-701**	**100**
37	—	PTFE coated	**225-705**	**100**
47	1.0	binder free, A/E	**225-7047** **225-714**	**100** **500**
90	1.0	Ultra pure	**225-712**	**25**
8 x 10 inches	1.0	binder free, A/E	**225-7-07**	**100**

Δ *Liquid nominal; see About at above left*

† *Recommended for use with IOM and Button Samplers; see pages 124-126*

Preloaded Glass Fiber Filters

All SKC preloaded filters include supports and are in SureSeal leak-free cassettes requiring a SureSeal Cassette Opener; see page 121.

Dia. (mm)	Filter Specifications	Cassette Description	Cat. No.	Qty.
25	Glass Fiber, A/E, 1.0 µm,Δ cellulose support	2-piece clear plastic, banded	**225-710**	**50**
37	Glass Fiber, A/E, 1.0 µm,Δ cellulose support	2-piece clear plastic, banded	**225-709**	**50**
37	Glass Fiber, A/E, 1.0 µm,Δ cellulose support	3-piece clear plastic, banded	**225-706**	**50**

Δ *Liquid nominal; see About at above left*

Cellulose Depth Filters

- Ideal for gravimetric sampling methods
- 100% pure, ashless cellulose fiber

Dia. (mm)	Pore Size (µm)	Description	Cat. No.	Qty.
37	—	Type 40	**225-18A**	**500**

SureSeal Cassette Blanks

Certified Leak-free

All SureSeal Cassettes are vacuum leak tested and considered leak-free if there is < 1 inch Hg decay per 30 seconds when 24 inches Hg vacuum is applied and if there is < 1 psi decay per 30 seconds when 5 psi pressure is applied. SureSeal Cassettes require the use of a SureSeal Cassette Opener; *see page 121.*

Diameter (mm)	Description	Cat. No.	Qty.
25 	2 piece, standard; styrene, clear	**225-2-25LF** **225-2258**	**50** **100**
25 	3 piece, standard; styrene, clear	**225-3-25LF** **225-2259**	**50** **100**
25 	3 piece, goblet style; polypropylene, opaque white; solvent-resistant	**225-8585**	**50**
25 	2 piece, goblet; polypropylene, conductive black	**225-2257**	**50**
25 	3 piece, 2-inch middle cowl; polypropylene, conductive black	**225-3-23**	**50**
25 	3 piece, 1/2-inch middle ring; polypropylene, conductive black	**225-329**	**50**

37 	2 piece, standard; styrene, clear	**225-2LF** **225-2050LF** **225-2250**	**10** **50** **250**
37 	3 piece, standard; styrene, clear	**225-3LF** **225-3050LF** **225-3250**	**10** **50** **250**
37 	Middle ring only; styrene, clear, 1/2 inch	**225-304**	**50**

Diameter (mm)	Description	Cat. No.	Qty.
37 	2 piece, standard; styrene, opaque brown	**225-4**	**50**
37 	3 piece, standard; styrene, opaque brown	**225-8451**	**50**
37	2 piece, standard; polypropylene, opaque white; solvent-resistant	**225-8483**	**50**
37	3 piece, standard; polypropylene, opaque white; solvent-resistant	**225-45A**	**50**
37 	2 piece, standard; polypropylene, conductive black	**225-308**	**50**
37 	3 piece, standard; polypropylene, conductive black	**225-309**	**50**
	Static free – ideal for cyclones!		

47 	2 piece, standard; polypropylene, conductive black	**225-8496**	**16**
47 	3 piece, standard; polypropylene, conductive black	**225-8497**	**16**

Best Practice

Minimize cassette wall losses while sampling with a cyclone. NIOSH suggests using a static-dissipative (conductive) black polypropylene filter cassette such as Cat. No. 225-309. *See Ashley, K., Harper, M., Journal of Occupational and Environmental Hygiene, 10:3, 2013, pp. D29-D33, http://doi.org/wv3.*

Coated Filter Selection Guide

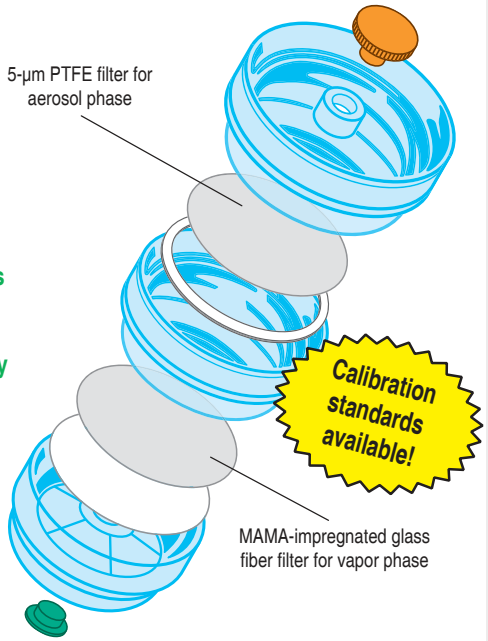
Chemical	Method	Preloaded Filter; Coating (in 37-mm cassettes)	Cat. No.*	Qty.
Acetic anhydride	OSHA 82	2 Glass Fiber filters; 1-(2-pyridyl) piperazine	225-9009 §	10
Acetic anhydride	OSHA 102	2 Glass Fiber filters; veratrylamine and di-n-octyl phthalate	225-9010 §	10
4-Aminobiphenyl	OSHA 93	2 Glass Fiber filters; sulfuric acid	225-9004	10
Aniline	NIOSH 2017 ¥	2 Glass Fiber filters; sulfuric acid	225-9004 ¥	10
Arsenic, volatile compounds	OSHA ID-1006	1 MCE filter and plastic pad; untreated and 1 cellulose support pad; sodium carbonate	225-9001	10
Benzidine	OSHA 65	2 Glass Fiber filters; sulfuric acid	225-9004	10
Bromine, chlorine	NIOSH 6011	1 **25-mm** PTFE pre-filter and polypropylene support; 1 **25-mm** specially cleaned silver membrane and polypropylene support **(in 25-mm cassette)**	225-9006	5
Crotonaldehyde	OSHA 81	2 Glass Fiber filters; 2,4-dinitrophenylhydrazine and phosphoric acid	225-9019 §	10
o-Dianisidine	OSHA 71	2 Glass Fiber filters; sulfuric acid	225-9004	10
3,3'-Dichlorobenzidine	OSHA 65	2 Glass Fiber filters; sulfuric acid	225-9004	10
Diisocyanates (HDI; 2,6-TDI; 2,4-TDI)	ASTM D5836 Δ OSHA 42	1 Glass Fiber filter and cellulose support; 1-(2-pyridyl)piperazine	225-9013 §† 225-9002 §	10 10
Diphenylamine	OSHA 78	2 Glass Fiber filters; sulfuric acid	225-9004	10
Fluorides	OSHA ID-110 NIOSH 7902 ASTM D4765	1 MCE filter and plastic pad; untreated and 1 cellulose support pad; sodium carbonate	225-9001 #	10
Fluorides, particulate	NIOSH 7906	2 Nitrocellulose filters; 1 coated with sodium carbonate, 1 uncoated	225-9031	10
Glutaraldehyde	OSHA 64	2 Glass Fiber filters; 2,4-dinitrophenylhydrazine and phosphoric acid	225-9003 §	10
Glyoxal	For IFV	2 **25-mm** Glass Fiber filters; 2,4-dinitrophenylhydrazine *(filters only, in jar)*	225-9036 §	10
Hydrazine	OSHA 108	2 Glass Fiber filters; sulfuric acid	225-9012	10
Hydrofluoric acid	NIOSH 7906	2 Nitrocellulose filters; 1 coated with sodium carbonate, 1 uncoated	225-9031	10
Hydrogen bromide	NIOSH 7907	2 Quartz filters (R-100); 1 coated with sodium carbonate, 1 uncoated	225-9032	10
Hydrogen chloride	NIOSH 7907	2 Quartz filters (R-100); 1 coated with sodium carbonate, 1 uncoated	225-9032	10
Hydrogen peroxide	OSHA 1019	2 **25-mm** Quartz filters (R-100); titanium oxysulfate hydrate **(in 25-mm cassette)**	225-9030	10
Isocyanates	ASTM Methods	1 PTFE filter; 1 Glass Fiber filter impregnated with MAMA (ISO-CHEK Sampling System, *see p. 115)*	225-9022 225-9022A	12 36
Isocyanates (HDI; 2,6-TDI; 2,4-TDI)	ASTM D5836 Δ OSHA 42	1 Glass Fiber filter and cellulose support; 1-(2-pyridyl)piperazine	225-9013 §† 225-9002 §	10 10
Isocyanates (HDI, MDI, TDI, IPDI, HDI-BT, HDI-IC)	OR-OSHA 1010	1 **13-mm** Glass Fiber filter; MAMA **(in 13-mm Swinnex holder)** *(also requires impinger)*	225-9029 §	5
Isocyanates, organic	MDHS 25/3 (UK)	1 **25-mm** A/E Glass Fiber filter; methoxyphenyl piperazine *(filters only, in jar)*	Special order §	
n-Isopropylaniline	OSHA 78	2 Glass Fiber filters; sulfuric acid	225-9004	10
Maleic anhydride	OSHA 86	2 Glass Fiber filters; veratrylamine	225-9021 §	10
Maleic anhydride	For IFV	1 **25-mm** Glass Fiber filter; veratrylamine *(filters only, in jar)*	225-9028 §	10
Mercaptans (methyl-, ethyl-, n-butyl-, phenyl-)	NIOSH 2542 OSHA 26	1 Glass Fiber filter; mercuric acetate	225-9007 §	10
4,4'-Methylene bis (2-chloroaniline) (MOCA)	OSHA 71	2 Glass Fiber filters; sulfuric acid	225-9004	10
4,4'-Methylene bis (phenyl isocyanate) (MDI)	OSHA 47	1 Glass Fiber filter and cellulose support; 1-(2-pyridyl)piperazine	225-9013 §† 225-9002 §	10 10
4,4'-Methylenedianiline	OSHA 57 NIOSH 5029	2 Glass Fiber filters; sulfuric acid	225-9004	10
1-Naphthylamine, 2-naphthylamine	OSHA 93	2 Glass Fiber filters; sulfuric acid	225-9004	10
Nitric acid	NIOSH 7907	2 Quartz filters (R-100); 1 coated with sodium carbonate, 1 uncoated	225-9032	10
Nitrobenzene	NIOSH 2017 ¥	2 Glass Fiber filters; sulfuric acid	225-9004 ¥	10
Ozone	OSHA ID-214	2 Glass Fiber filters; nitrite-impregnated	225-9014 §	10
Peracetic Acid (PAA)	OSHA PV2321	1 **25-mm** Quartz filter (R-100); titanium oxysulfate hydrate **(in 25-mm cassette)**	225-9037 •	10
Phenylenediamine (o-, m-, p-)	OSHA 87	2 Glass Fiber filters; sulfuric acid	225-9004	10
Phosphine	OSHA 1003	1 Glass Fiber filter; 1 polyester filter coated with mercuric chloride	225-9018 †§	10
Phosphoric acid	NIOSH 7908	1 Quartz filter (Tissuquartz)	225-9033	10
Phthalic anhydride	OSHA 90	2 Glass Fiber filters, veratrylamine	225-9034 §	10
Sulfur dioxide	NIOSH 6004 (modified)	1 MCE pre-filter and support/1 cellulose filter and support; sodium carbonate	225-9005	10
Sulfuric acid	NIOSH 7908	1 Quartz filter (Tissuquartz)	225-9033	10
2,4-Toluenediamine	OSHA 65	2 Glass Fiber filters; sulfuric acid	225-9004	10
2,6-Toluenediamine	OSHA 65	2 Glass Fiber filters; sulfuric acid	225-9004	10
o-Tolidine	OSHA 71	2 Glass Fiber filters; sulfuric acid	225-9004	10
Toluene-2,4-diisocyanate and toluene-2,6-diisocyanate	For IFV	1 **25-mm** Glass Fiber filter; 1-(2-pyridyl)piperazine *(filters only, in jar)*	225-9035 §	10
o-Toluidine	NIOSH 2017 ¥	2 Glass Fiber filters; sulfuric acid	225-9004 ¥	10
Toluidine (o-, m-, p-)	OSHA 73	2 Glass Fiber filters; sulfuric acid	225-9004	10
Trimellitic anhydride	OSHA 98	2 Glass Fiber filters; veratrylamine and di-n-octyl phthalate	225-9010 §	10
Valeraldehyde	OSHA 85	3 Glass Fiber filters; 2,4-dinitrophenylhydrazine and phosphoric acid	225-9020 §	10
m-Xylenediamine (m-XDA, p-XDA)	OSHA 105	2 Glass Fiber filters; sulfuric acid	225-9004	10

* *Coated filters have a limited shelf-life.*
† *Custom order due to very limited shelf-life*
Δ *ASTM D5836 and D5932 for 2,4-TDI, 2,6-TDI only*
§ *Storage below 39.2 F (4 C) required*
¥ *Also requires Sorbent Tube Cat. No. 226-15, see page 50*
\# *Collects both vapor and aerosol phases of fluorides*
• *Requires impinger and impinger trap containing sorbent. See method.*

ISO-CHEK

Simultaneous and Separate Collection of Isocyanate Phases

- **Accurately samples diisocyanates: HDI, MDI, IPDI, HMDI, 2,4-TDI, and 2,6-TDI**
- **Meets the specifications of several methods**
  - ASTM D5932 for 2,4 and 2,6-TDI
  - ASTM D6561 for HDI
  - ASTM D6562 for HDI
- **The only filter-based system that simultaneously traps and separates both monomers and oligomers**
  - For better determinations of control strategies
- **Decreases sample preparation and analysis time by 40% compared to other methods**
  - Premade calibration standards are available
- **Highly stable — low temperature storage and transport not required**
- **Highly sensitive analysis provides detection limits below current regulated exposure levels**
  - Ideal for occupational sampling and environmental surveys
  - Requires only a 15-minute sample time
- **Round-robin proficiency testing for ISO-CHEK labs ensures accurate, consistent analysis**
  - Visit skcinc.com/lab



Exploded view of ISO-CHEK Filter Cassette (Cassette in image is tinted for clarification.)

Suitable for most isocyanates, the ISO-CHEK Sampling System employs a two-stage filter arrangement that results in the simultaneous collection and separation of vapor from aerosol at the point of collection. The filter that collects the vapor phase is impregnated with 9-(N-methyl-aminomethyl) anthracene (MAMA), a highly stable reagent that minimizes storage and handling requirements.

Description	Cat. No.	Qty.
ISO-CHEK Sampling System with Derivatizing Reagent,†* preloaded clear cassettes and jars of Derivatizing Solution (MOPIP in toluene)	225-9023 225-9023A	4 10
ISO-CHEK Sampling Cassettes,* preloaded clear cassettes for isocyanates, *require Derivatizing Solution; see below*	225-9022 225-9022A	12 36

Accessories	Cat. No.	Qty.
Derivatizing Solution,†* 5 ml of MOPIP in toluene, in jars	225-9050	12
Jars, 37 mm with PTFE-lined cap	225-8377	36
Calibration Standard,‡ MAMA-HDI, 1 gram	225-9053	ea
Calibration Standard,‡ MAMA-IPDI, 1 gram	225-9054	ea
Calibration Standard,‡ MAMA-MDI, 1 gram	225-9062	ea
Calibration Standard,‡ MAMA-2,4-TDI and 2,6-TDI, 1 gram	225-9052	ea
Calibration Standard Set,‡ HDI, MDI, IPDI, 2,4-TDI, 2,6-TDI, 1 gram each	225-9055	set
Packaging Kit, materials for shipping 10 packages of 10 samplers and jars	225-9059	ea

* *Limited shelf-life*
† *Hazmat shipping charges for air shipments only, ground shipments exempt*
‡ *Limited shelf-life, freezer storage recommended; refrigerated shipping not required*

the ISO-CHEK Advantage!

- ☑ **Simultaneous collection and separation of phases at the point of collection**
  Less time-consuming and more accurate analysis of each phase
- ☑ **Reagent is stable at room temperature.**
- ☑ **1 L/min flow rate efficiently captures aerosol phase isocyanates compared to denuder collectors.**
- ☑ **No handling precautions**
  Eliminates the inconveniences of impingers

ABOUT

ISO-CHEK Development
ISO-CHEK was developed and patented by IRSST (Institut de recherche Robert-Sauvé en santé et en sécurité du travail).

For ISO-CHEK analytical laboratories visit skcinc.com/lab

V Video | P PowerPoint | W Webinar | S Sampling Solution
Visit skcinc.com/Training

Gelatin Filters

Maintain Viability of Collected Microorganisms

ABOUT

Why Use Gelatin Filters?
Sampling microbes with traditional filter materials has been known to reduce culturability due to desiccation of the microbes. The high moisture content of gelatin filters helps to maintain microorganism viability for sampling periods up to 30 minutes. In addition, studies with T3 viruses have shown gelatin filters to be the most suitable for sampling viruses (low passage and high detection sensitivity) due to their complete solubility.

- **Absolute retention rate**
  - 99.9995% for *Bacillus subtilis var.* niger spores‡
  - 99.94% for T3 phages (coli phages)‡
  - 99.9% T1 phages (coli phages)‡
- **High moisture content**
  - Maintain microbe viability for short sampling periods
- **Completely water soluble**
  - Dissolve easily when placed on agar
  - Provide the solubility required for virus sampling
- **Pre-sterilized by gamma irradiation**
- **Ideal for monitoring in pharmaceutical plants**
- **Can be used to monitor in areas where disinfectants or antibiotics are present**

The unique properties of gelatin filters provide unequalled bacteria retention levels for quantitative analysis. Sampling with gelatin filters is easy and efficient and can provide information about relative changes in microorganism concentration throughout the day. Gelatin filters dissolve easily when placed on agar, allowing for a gentle transition from sample medium to growth medium. **For maximum culturability and superior collection of inhalable-size bioaerosols, combine 25-mm gelatin filters with the SKC Button Sampler;** ***see below.***

Reference
Haferkorn, R., et al., "Comparative Studies on Detection Methods for Bacteriophages in Aerosols and on the Retentive Capability of Filters and Impingers for Bacteriophage Aerosols," Arch. Hyg., Munich 152, 1968, pp. 97-106

Dia. (mm)	Support Pad	Notes	Cat. No.	Qty.
25	No	water soluble	**225-9551†***	**50**
37	No	water soluble	**225-9552***	**50**

† *Recommended for use with IOM and Button Samplers; see pages 124-126*
* *Storage at 39.2 to 46.4 F (4 to 8 C) recommended. Avoid temperatures < 39.2 F (4 C), moisture, and chemical vapors.*
‡ *At inlet velocities of 0.25 m/s, 0.3 m/s (80% RH), and 0.3 m/s (50% RH), respectively*

For sample pumps
see pages 10-15 and 20-29

Gelatin Filters with the Button Sampler

Autoclavable Inhalable Sampler

The sterile, high-moisture properties of gelatin filters combine with the unique features of the Button Sampler for maximum microorganism survivability and superior collection of inhalable-size bioaerosols. The autoclavable Button Sampler's unique inlet contains evenly spaced holes that act as sampling orifices for multi-directional sampling. The proximity of the gelatin filter to the inlet minimizes transmission losses and provides for equal distribution of particles and low intersample variation for viable and non-viable analyses. ***For more information on the Button Sampler, see page 126.***

Description	Cat. No.
Button Sampler Pump Kit includes Button Sampler, standard AirChek XR5000 Sample Pump, single charger, 3 feet (0.9 meter) of Tygon tubing, and calibration adapter, *requires a 25-mm filter* **100-240 V**	**210-4121**

VersaTrap Spore Trap Cassette

Traps Smaller Mold Spores Using Higher Flows

- **High collection efficiency from 5 to 30 L/min**
  - VersaTrap captures *Aspergillus* and *Penicillium* mold spores as small as 1.5 µm at 30 L/min
- **A standard collection method for mold spore count and genus identification**
- **Easy analysis — ASTM Method D7391-09**
  - Positioning notches and flat edges provide for easy alignment on microscope stage
  - Uniform, well-defined rectangular deposition
- **Optimized slide adhesive**
  - Optically clear and tested for superior adhesion
- **SureSeal certified leak-free cassettes for sample integrity**
- **Unique serial number on each cassette for sample traceability**

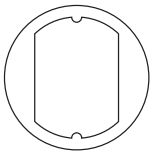
VersaTrap® Spore Trap Cassettes provide the sampling versatility needed to capture mold spores and other particles ranging from 1.5 to 3.9 µm. Sampling is as easy as selecting the flow rate that will target the desired particle size *(see table below)*, calibrating a pump to the flow rate, and collecting the sample.

VersaTrap Design

The narrow slit inlet focuses particles toward the clear glass slide coated with a sticky substrate that holds the sample securely. Targeted size particles are effectively held in a well-defined rectangular footprint. Each slide is encased in a SureSeal certified leak-free cassette to ensure sample integrity.

VersaTrap Makes Analysis Easy

- Designed for easy slide removal
- Positioning notches and flat edges for fast, easy alignment
- Well-defined rectangular footprint for accurate analysis using standard equipment
- Adhesive prevents blurring or wash off during staining
- Unique serial numbers for sample traceability



High Flows + Low Cut-points + No Particle Bounce =
High Collection Efficiency

Flow Rate (L/min)	VersaTrap 50% Cut-point (µm)
30	1.5
25	1.7
20	1.9
15	2.3
10	2.8
5	3.9

Description	Cat. No.	Qty.
VersaTrap Spore Trap Cassettes, 37 mm, *limited shelf-life*	225-9820	10
	225-9821	50

For a list of microbiological laboratories, go to skcinc.com/lab.

the VersaTrap Advantage!

- ☑ **Uniform particle deposition**
  Uniform rectangular deposition provides for accurate analysis using standard equipment.
- ☑ **High collection efficiency at flows between 5 and 30 L/min**
  Target specific size particles for true versatility. *See table below left for more information.*
- ☑ **Unique serial numbering for sample traceability**
- ☑ **Positioning notches and flat edges on slide**
  Fast, easy alignment on microscope stage

Tech Tips

▶ *VersaTrap cassettes can be operated at 30 L/min to trap the smallest Penicillium/Aspergillus spores that other spore traps do not. VersaTrap provides a 150-liter sample at 30 L/min in only 5 minutes.*

QuickTake 30 Pump Ideal for Spore Traps
see pages 34-35

More Information

- *Visit skcinc.com/instructions/1649.pdf.*
- *See astm.org for spore trap analysis Method ASTM D7391-09.*

skcinc.com

Cassette and Filter Holders

SKC Filter Cassette Holder — Reinforced to Prevent Tube Kinking

The lightweight SKC Filter Cassette Holder attaches firmly to the collar for sampling in the breathing zone. Its special design securely holds a two or three-piece 37-mm cassette with or without cyclone, 25-mm cassette with cowl, or DPM Cassette with GS-1 Cyclone. The Filter Cassette Holder includes 3 feet of 1/4-inch ID Tygon tubing and a 25-mm adapter ring (cassette in photo **not** included).

Cat. No. 225-1 ..... **ea**

Specialty Filter Holders

13-mm Swinnex

- 2-section polypropylene with silicone seal
- Reusable
- Autoclavable with filter in place
- Specified in NIOSH Method 5503 for PCBs

Cat. No. 225-32 ..... **pk/10**

Replacement silicone gaskets
Cat. No. 225-3201 ..... **pk/100**

25-mm Delrin — Inline

- 2 section with inline stainless steel support
- Broad chemical compatibility and strength
- Useful for low pressure applications

Cat. No. 225-1109 ..... **pk/6**

25-mm Delrin — Open-face

- Open-face with stainless steel support
- Lightweight and corrosion-resistant
- Includes ¼-inch ID hose barb adapter

Cat. No. 225-1107 ..... **pk/6**

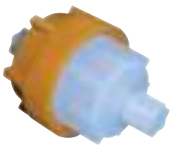
47-mm Polycarbonate

- Lightweight polycarbonate is ideal for air monitoring applications
- Opens and closes easily without disturbing the filter
- Autoclavable

Cat. No. 225-4702 ..... **ea**

47-mm Savillex PFA

- Includes ¼-inch ferrule nuts and wrench set
- Replace filters without disconnecting lines
- Operate within -328 to 500 F (-200 to 260 C)



Cat. No. 225-1712 ..... **ea**

47-mm Polypropylene

- Ideal for vacuum and pressure air sampling applications
- Can be used with pressures up to 100 psig

Cat. No. 225-1147 ..... **ea**

Filter Supports

Various materials are used to support filters during sampling. **Cellulose support pads** feature a smooth surface and uniform airflow distribution. **Porous plastic pads** are impervious to most solvents. Use **stainless steel screens** when cellulose or plastic will interfere with analysis.

Diameter (mm)	Support Material	Cat. No.	Qty.
25	Cellulose pad	225-28	100
25	Stainless steel screen, wide mesh	225-2625	ea
25	Polypropylene pad (porous plastic)	225-2901	100
37	Cellulose pad	225-27 225-2700	100 500
37	Cellulose spacer ring	225-23	25
37	Polypropylene pad (porous plastic)	225-2902	100
37	Stainless steel screen, wide mesh	225-26	ea
37	Stainless steel screen, fine mesh	225-2637	ea
47	Cellulose pad	225-2903	100
47	Stainless steel screen, wide mesh	225-2647	2

For Cassette Blanks
see page 113

Cassette Shrink Bands

Specifically designed for use with sampling cassettes, SKC Cassette Shrink Bands are self-sealing, provide a smooth writing surface for sample identification, and make tampering evident.

Fit Cassette Diameter (mm)	Color	Cat. No.	Qty.	Quantity Pricing Cat. No.	Quantity Pricing Qty.
25	White	225-2503	100	225-2503A	1400
25	Clear	—	—	225-2510	1400
37	White	225-25	100	225-25A	1000
37	Clear	225-2509	100	225-2509A	1000
37	Orange	225-2504	100	225-2504A	1000
37	Yellow	225-2507	100	225-2507A	1000
37	Red	225-2508	100	225-2508A	1000
37	Black	—	—	225-2515A	1000

Contact your SKC distributor.

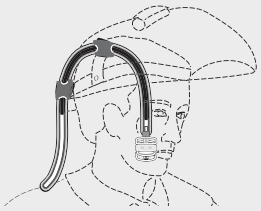
Tubing for Connecting Pump and Media

Description/Applications	ID in (mm)	OD in (mm)	Cat. No.	Feet (Meters)
Tygon, sampling trains	3/16 (4.76)	5/16 (7.94)	225-1346	10 (3)
Tygon, sampling trains; fits over impinger sidearm, impinger inlet, filter cassette outlet, or Luer adapter	1/4 (6.35)	3/8 (9.53)	225-13-4A 225-13-4 225-1345	3.3 (1) 10 (3) 50 (15)
Tygon, for calibrating DCS/DPS	5/16 (7.94)	9/16 (14.29)	225-1349	10 (3)
Tygon, sampling trains; for calibrating QuickTake Pumps	3/8 (9.53)	1/2 (12.7)	225-1351 225-1352	10 (3) 50 (15)
Latex Rubber, black, sampling trains	3/16 (4.76)	5/16 (7.94)	226-03-003	12 (3.7)
Latex Rubber, black, sampling trains; fits over impinger sidearm, impinger inlet, filter cassette outlet, or Luer adapter	1/4 (6.35)	3/8 (9.53)	226-03-004	12 (3.7)
Latex Rubber, amber, sampling trains; fits over impinger sidearm, impinger inlet, filter cassette outlet, or Luer adapter	1/4 (6.35)	3/8 (9.53)	225-1347	10 (3)
Polyurethane, reinforced to prevent kinking, sampling trains; fits over impinger sidearm, impinger inlet, filter cassette outlet, or Luer adapter	1/4 (6.35)	15/32 (11.9)	225-1350	10 (3)
Spring Tubing Supports, use with 5/16-inch OD flexible tubing to prevent kinking, pk/5			225-1348	ea

Tech Tips

- *Consider your application before selecting tubing.*
  - ***Tubing attached to the sampling media outlet*** *does* ***not*** *contact the sample; therefore, the tubing material used is not critical, but should not be prone to kinking. Select the tubing best suited for the media and pump.*
  - ***Tubing attached to the sampling media inlet for gas/vapor sampling*** *contacts the sample during specialized applications such as bag sampling. Inert PTFE tubing is recommended because it prevents adsorption of the sample on the tubing's inner surface.*
  - ***Tubing attached to the sampling media inlet for particulate sampling*** *contacts the sample during specialized applications such as microvacuum sampling. Tygon tubing is typically used, as PTFE tubing can cause sample loss in the tubing due to static effect.*

Sampling and Calibrating



Helmet Adapter*

Ideal for welders or workers who wear a helmet with face shield; effectively holds a filter cassette or sample tube in the breathing zone regardless of visor position

Cat. No. 225-600.....ea

* *Developed in Canada by IRSST (Institut de recherche Robert-Sauvé en santé et en sécurité du travail)*

SKC Filter Cassette Holder

The lightweight SKC Filter Cassette Holder attaches firmly to the collar for sampling in the breathing zone. Its special design securely holds a two or three-piece 37-mm cassette with or without cyclone, 25-mm cassette with cowl, or DPM Cassette with GS-1 Cyclone. The Filter Cassette Holder includes 3 feet of 1/4-inch ID Tygon tubing and a 25-mm adapter ring (cassette in photo **not** included).

Cat. No. 225-1.....ea

Cassette Adapters

PVC Luer taper adapters connect a cassette to 1/4-inch ID tubing.

Cat. No. 225-13-2..... pk/10
Cat. No. 225-132A pk/250

Nickel-plated Brass
Cat. No. 225-13-3..... pk/10

Sampling Labels

Identify samples with sample number, date, flow rate, pump number, time on, and time off

Cat. No. 225-1370.....pk/500

Tubing, Collar Clip, and Cable Tie

For attachment of a sampling cassette to the collar; includes 3 feet of 1/4-inch ID Tygon tubing and one alligator clip attached to a nylon cable tie

Cat. No. 225-13-8.....ea

Collar Clip and Cable Ties Only
Cat. No. 225-13-6.....pk//10
Cat. No. 225-13-6A.....pk/25

Calibration Adapters

Use the guide below to find the calibration adapter or jar required to calibrate your SKC sampler.

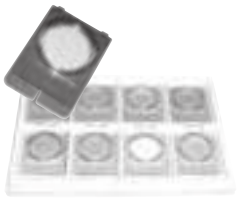
For SKC sampler	You need
Disposable PPIs	**Disposable PPI Calibration Adapter** **Cat. No. 225-389** 
Reusable PPIs GS Cyclones Low Volume PUF Tubes	**Calibration Jar, Standard** **Cat. No. 225-111** 
Devices up to 8-inch length x 3.25-inch diameter	**Calibration Jar, Large** **Cat. No. 225-112** 
Aluminum Cyclones (25 and 37 mm)	**Aluminum Cyclone Calibration Adapter** **Cat. No. 225-01-03** 
Button Sampler IFV Pro Sampler	**Button Sampler/IFV Pro Sampler Calibration Adapter** **Cat. No. 225-361** 

For SKC sampler	You need
IMPACT Sampler	**IMPACT Sampler Calibration Adapter** **Cat. No. 225-394** 
IOM Sampler	**IOM Calibration Adapter** **Cat. No. 391-01** 
PEM Sampler	**PEM Calibration Adapter** **Cat. No. 761-202** 
PMI Sampler	**PMI Calibration Adapter** **Cat. No. 225-358** 
BioStage Impactor	**BioStage Calibration Adapter** **Cat. No. P33100** 

Sampling, Transporting, and Storing

Filter-Keeper Filter Transport and Storage

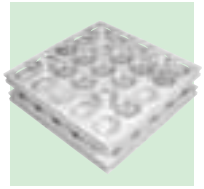
Minimize sample loss with static-dissipative plastic Filter-Keepers. The clamshell design locks the periphery of filters into place away from any surface. Eight Filter-Keepers can be kept in a numbered Filter-Keeper Archiving Tray that contains an area for labeling.



Description	Cat. No.	Qty.
25-mm Filter-Keepers include labels	225-8301	100
37-mm Filter-Keepers include labels	225-8303	100
	225-8303A	10
Archiving Trays Only	225-8305	6

Kasset-Kaddy

Each tray securely holds twenty-five 37-mm cassettes for transport or storage. The 10 x 10-inch polypropylene trays fit commercially available desiccators/ovens.



Cat. No. 225-8321.....**pk/2**

Petri Dish Slides

Easily transport filters up to 47 mm in diameter with Petri Dish Slides. The rectangular base fits most microscope stages.

Cat. No. 225-2-01.....**pk/100**

Stainless Steel Filter Lifter

Speeds removal of filters from cassettes without damage

Cat. No. 225-13-7.....**ea**

Filter Transport Case

Conductive plastic case securely holds 25-mm filters for transport.

Cat. No. 225-67.....**ea**

Mini Sampler for Welding Aerosols

The Mini Sampler makes sampling inhalable manganese and other hazardous metals in welding fume easy! The Mini Sampler's open-face aluminum entry nozzle cassette fits onto the Face Level Sampling Headset that features the headband behind the neck, making it an easy, comfortable fit under a welding helmet. Validated for sampling manganese, the Mini Sampler and the Headset are identified in ISO 10882-1:2011 as the best mounting arrangement for sampling particulates (metals) in the breathing zone inside a welder's facemask. *Requires a 13-mm filter (see pages 104 and 112) and sample pump (see pages 10-23)*

Mini SamplerΔ
Cat. No. **225-6201**

Face Level Sampling HeadsetΔ
Cat. No. **225-6200**

Tube Holder/Cover for Face Level Headset
Fits a single 6-mm OD x 70-mm L sorbent tube
Cat. No. **225-6220**

Calibration Adapter
Cat. No. **225-6202**

Δ *Developed in a research project partly funded by the Swedish Work Environment Authority at Stockholm University, Sweden*

Reference
Liden, G. and Surakka, J.,"A Headset-Mounted Mini Sampler for Measuring Exposure to Welding Aerosol in the Breathing Zone," Ann. Occup Hyg., Vol. 53, no. 2, 2009, pp. 99-116

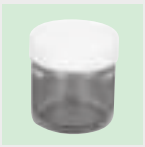
Filter Handling Kit

Includes SureSeal Cassette Opener, filter lifter, and non-serrated flat-tip forceps in a carry case

Cat. No. 225-8372..... **ea**

Glass Jars

37-mm glass jars with PTFE-lined caps provide for transport and sample solvent extraction in the field/lab.



Cat. No. 225-8377.....**pk/36**

SureSeal Cassette Opener

The SureSeal Cassette Opener is a sturdy stainless steel crowbar with extended handle for easy opening of 25 or 37-mm cassettes. *Required for all SureSeal Cassettes*

Cat. No. 225-13-5A ..... **ea**

Forceps

Non-serrated flat tips for delicate membranes
Cat. No. 225-8371..... **ea**

Serrated pointed tips
Cat. No. 225-13-1..... **ea**

PTFE-coated pointed tips to avoid contaminants when sampling for hexavalent chromium
Cat. No. 225-1344..... **ea**

The SKC Particle Size-

Use this convenient guide to help select

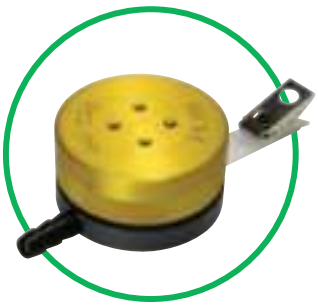
Select a 50% Cut-point or Classification	< 1 µm	< 0.25 to > 2.5 µm	2.5 µm					4 µm			
	Sub-micron	Ultrafine, Fine, and > PM2.5	PM2.5					Respirable			
Select a Flow Rate (L/min)	1.7 or 2	9	2	3	4	10	10	2	2.5	2.75	4 and 8
SKC Size-selective Samplers	DPM Cassette	Sioutas Impactor	PEM	PMI	PEM	IMPACT	PEM	PPI	Aluminum Cyclone	GS-3 Cyclone	PPI
Main Feature/ Benefit	Ideal for DPM and nano-particles	Samples ultrafine, fine, and > PM2.5 particles simultaneously	Referenced in EPA IP-10A	High collection efficiency	Referenced in EPA IP-10A	High flow for increased sensitivity	Referenced in EPA IP-10A	Precisely matches ISO 7708/CEN criteria	Specified in NIOSH 7500 and 0600	Meets ISO 7708/CEN criteria	High flow for enhanced sensitivity
Page	111	136	134	135	134	133	134	130-132	129	128	130-132

DPM Cassette
Diesel Particulate Matter
Page 111

IMPACT Sampler
PM2.5/PM10/Coarse
Page 133

Sioutas Personal Cascade Impactor
Ultrafine/Fine/ > PM2.5
Page 136

For sample pumps
see pages 10-15, 20-31



Personal Modular Impactor (PMI)
PM2.5/PM10/Coarse
Page 135

Disposable Parallel Particle Impactor (PPI)
Respirable and Thoracic
Pages 130-131

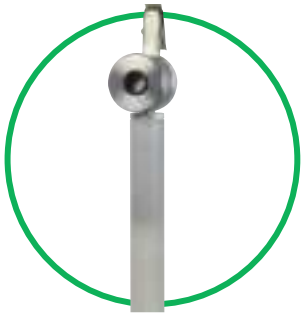
Reusable Parallel Particle Impactor (PPI)
Respirable and Thoracic
Page 132

selective Sampler Guide

sampling devices to meet your applications.

Select a 50% Cut-point or Classification	10 µm						100 µm			Particles < 10 µm but > 2.5 µm	
	Thoracic or PM10						Inhalable			PM Coarse	
Select a Flow Rate (L/min)	2	2	3	4	10	10	1	2	4	3	10
SKC Size-selective Samplers	PPI	PEM	PMI	PEM	PEM	IMPACT	IFV Pro	IOM	Button Sampler	PMI	IMPACT
Main Feature/ Benefit	Precisely matches ISO 7708/CEN criteria	Referenced in EPA IP-10A	High collection efficiency	Referenced in EPA IP-10A	Referenced in EPA IP-10A	High flow for increased sensitivity	Simultaneous sampling of mixed-phase (aerosol and vapor)	Meets U.S. and international standards	Low-level PM sampling	High collection efficiency	High flow for increased sensitivity
Page	130-132	134	135	134	134	133	127	124-125	126	135	133

Aluminum Cyclone Respirable
Page 129



IFV Pro Inhalable Sampler Mixed-phase
Page 127

GS-3 Cyclone Respirable
Page 128

IOM Sampler Inhalable
Pages 124-125

Button Sampler Inhalable
Page 126

Personal Environmental Monitor (PEM) PM2.5/PM10
Page 134

For electronic real-time particulate monitors
see pages 156-161

MultiDust Foam Discs

MultiDust Foam Discs were developed by the UK Health and Safety Executive as a way to simultaneously collect inhalable and respirable particulate fractions and determine them by weighing the dust collected on the foam disc and final filter. ***For respirable dust only,*** *weigh the filter only.*

MultiDust Foam Discs are supplied with a certificate of conformity to ISO 7708 respirable dust criteria.

Cat. No. 225-772.....10/pk
Cat. No. 225-772-50.....50/pk

IOM Sampler with MultiDust Foam Disc inserted

IOM Sampler

A Gold Standard for Personal Inhalable PM Sampling

Meets U.S. and international standards

- ACGIH sampling criteria for inhalable particulate
- ISO/CEN health-related fractions of bioaerosols
- Preferred sampler for HSE Method MDHS 14/4
- Complies with MDHS 6/3 for lead (with accessory head)
- Complies with MDHS 25/3 for organic isocyanates (stainless steel only)
- NIOSH 5700 for particulate formaldehyde
- Australian standard for inhalable particulate
- OSHA-equivalent method for particulates not otherwise regulated (PNOR)‡

Small and lightweight

- Plastic model weighs less than 2 ounces (55 grams)

Maintains sample integrity

- Removable 25-mm cassette system eliminates filter handling
- Cassette with filter is weighed as a single unit to include all collected particles in analysis

Stainless steel cassette available for chemical analysis

- Autoclavable for bioaerosol sampling

Use with MultiDust Foam Discs for simultaneous inhalable and respirable dust

- Determine respirable dust only by weighing the filter only

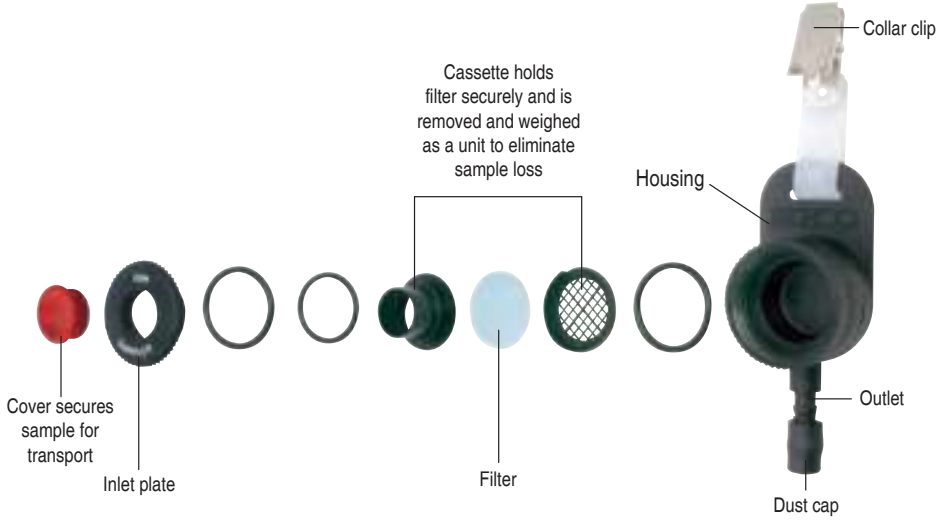
Sample Time:	*Varies*
Sample Rate:	*2 L/min; see Sampling News! on p. 125*
Sample Pump:	*Universal XR or AirChek Series*
Sample Media:	*25-mm filters; see list on p. 125*
Tubing:	*1/4-inch ID*

‡ *Reference: OSHA letter November 8, 2011; contact SKC for a copy*

Tech Tips

- ***For simultaneous respirable and inhalable sampling,*** *use a plastic IOM, PVC filter, and MultiDust foam disc (see above). The plastic IOM's low tare weight is ideal for gravimetric determinations.*
- ***For bioaerosol sampling,*** *use the autoclavable stainless steel IOM and cassette with a polycarbonate filter and MultiDust foam disc. MultiDust fractionates the sample and better maintains microorganism survivability. See above.*

Only the authentic IOM Sampler developed by the Institute of Occupational Medicine (IOM) in Scotland has been tested by the Health and Safety Laboratory, Health and Safety Executive (HSE) in the UK and verified to meet the ISO/CEN convention (ISO 7708).* The IOM Sampler houses a reusable 25-mm filter cassette that holds a method-specified filter for collection of inhalable particles. Operated with a 2 L/min personal sample pump, IOM is clipped near a worker's breathing zone and effectively traps particles up to 100 µm in aerodynamic diameter. **This method closely simulates the inhalation of particles through the nose and mouth.** The plastic cassette with filter is weighed as a single unit before and after sampling for gravimetric analysis. A stainless steel IOM cassette can be used for chemical analyses and bioaerosol sampling. Some higher flow applications for the IOM have been studied. ***See Sampling News! on page 125.***



* *Reference: Kenny, et al., "A Collaborative European Study of Personal Inhalable Aerosol Sampler Performance," Ann. Occup. Hyg., Vol. 4, No. 2, 1997, pp. 135-153*

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Professionals Choose the Authentic IOM

Only the original IOM Sampler can provide samples for the same measured dust concentration and aerodynamic size distribution as that inhaled by the worker, regardless of wind conditions and source of dust. IOM is widely accepted as one of the most effective inhalable particulate samplers available.

Description	Cat. No.
IOM Sampler and cassette,† in conductive plastic, with transport clip and cover	225-70A
IOM Sampler and cassette,† in stainless steel, with transport clip and cover	225-76A
IOM Sampler,† in conductive plastic, with stainless steel cassette, transport clip, and cover	225-79A

† *A 25-mm filter is required for sampling with the IOM; see below.*

25-mm Filters for IOM Sampler

The IOM Sampler requires a 25-mm filter for sampling. Select from the filters below to meet your application.

Description	Cat. No.	Qty.
PVC, 5.0 µm, 25 mm	225-5-25	100
Glass Fiber, 25 mm	225-702	500
MCE, 0.8 µm, 25 mm	225-1930	100
Polycarbonate, 0.8 µm, 25 mm	225-1601	100
Gelatin, sterilized, 25 mm	225-9551	50

Accessories

Description	Cat. No.
Cassette assembly, in conductive plastic, with transport clip and cover 	225-71A
Cassette assembly, in stainless steel, with transport clip and cover 	225-75A
Transport Clip and Cover 	225-72A
IOM Calibration Adapter 	391-01
Sampling Heads	
Seven Hole Head 	225-50
Asbestos Head, 25-mm cowled aluminum sampler designed for use with a gridded filter as per HSG (UK) 248 for asbestos fibers	225-54A

Sampling News!

Higher Flow Rates Expand IOM Applications

There is a growing demand for higher flow inhalable sampling devices to evaluate very low levels of unique target compounds. Several studies identify alternative applications for the IOM Sampler at flows from 8.2 to 10.64 L/min while still meeting the ISO 7708 criteria. *See Technical Note 1977 at https://bit.ly/2S97Uqe for details.*

Typically, a higher flow area sample pump, such as the SKC QuickTake 30, is used for these new applications due to the very high pressure drop of the filter at higher flow rates.

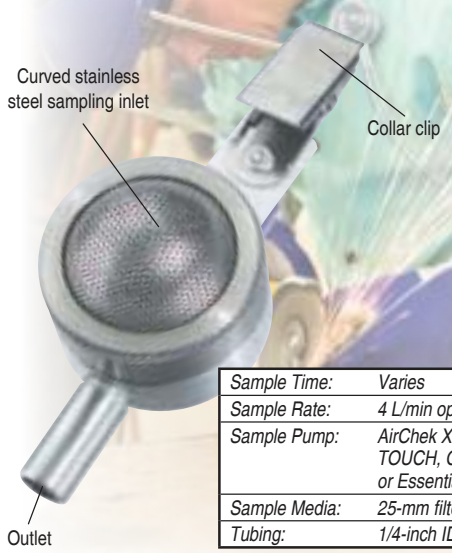
Conductive plastic cassette for gravimetric determinations

Stainless steel cassette available for chemical analysis and bioaerosol sampling

Button Aerosol Sampler

Chemical or Biological Inhalable PM Sampling

- 4 L/min flow rate enhances sensitivity for low exposure limits
- Closely follows the ACGIH/ISO sampling criteria for inhalable particulate mass
- Inlet design reduces oversampling of very large particles and sensitivity to wind direction/velocity
- Suitable for area or personal sampling
- Stainless steel construction reduces electrostatic effects
- Suitable for collecting bioaerosols for viable or non-viable analysis
  - Autoclavable



Sample Time:	*Varies*
Sample Rate:	*4 L/min optimum*
Sample Pump:	*AirChek XR5000, TOUCH, Connect, or Essential*
Sample Media:	*25-mm filters*
Tubing:	*1/4-inch ID*

The reusable SKC Button Aerosol Sampler features a porous curved-surface inlet designed to improve the collection characteristics of inhalable dust (< 100-µm aerodynamic diameter), including bioaerosols for viable or non-viable analysis. The conductive stainless steel inlet contains evenly spaced holes that act as sampling orifices for multi-directional sampling and low sensitivity to wind direction and velocity. The proximity of the filter to the inlet minimizes transmission losses and provides for equal distribution of particle loading and low intersample variation. The Button Sampler follows closely the ACGIH/ISO sampling criteria for inhalable particulate mass at 4 L/min. A convenient conductive plastic transport case is available for shipping samples to a laboratory for analysis.

Tech Tips

Sampling Bioaerosols with the Button Sampler

▶ *For growth cultures, use the Button Sampler with a sterile gelatin filter to help maintain microorganism viability.*

Recommended Pumps for Button Sampler — AirChek TOUCH, Connect, Essential, or XR5000
see pages 10-15 or 20-21

Filter Transport Case
Cat. No. 225-67

Description		Cat. No.
Button Sampler, *requires a 25-mm filter; see below*		**225-360**
Button Sampler Pump Kit includes Button Sampler, standard AirChek XR5000 Sample Pump, single charger, 3 feet of Tygon tubing, and calibration adapter, *requires a 25-mm filter; see below*	**100-240 V**	**210-4121**
Accessories		
Button Sampler Calibration Adapter		**225-361**
Filter Transport Case, for 25-mm filters, conductive plastic		**225-67**

Recommended 25-mm Filters for Button Sampler

The Button Sampler requires a 25-mm filter for sampling. SKC recommends pore sizes greater than 1 micron to lower back pressure and enhance sample time with personal sample pumps. Select from the filters below to meet your application.

Description	Cat. No.	Qty.
PVC, 5.0 µm, 25 mm	**225-5-25**	**100**
Glass Fiber, 25 mm	**225-702**	**500**
MCE, 1.2 µm, 25 mm	**225-1912**	**100**
PTFE,† 3.0 µm, 25 mm	**225-1711**	**50**
Gelatin, sterilized, 25 mm	**225-9551**	**50**

† *Back pressure on PTFE filters can vary within the same lot.*

More Information
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SKC IFV Pro Sampler

Designed for ACGIH TLVs with IFV Designation

- **True inhalable fraction and vapor sampling simultaneously**
  - Collects aerosol phase on a 25-mm filter using IOM-style inlet
  - Collects vapor in an 8 x 110-mm sorbent tube
- **Uses standard sorbent tubes following published methods for designated compounds**
- **Recommended 1 L/min flow rate allows for effective collection of both contaminant phases**
- **Meets European Standard 13936 by collecting the total of vapor and aerosol exposures**

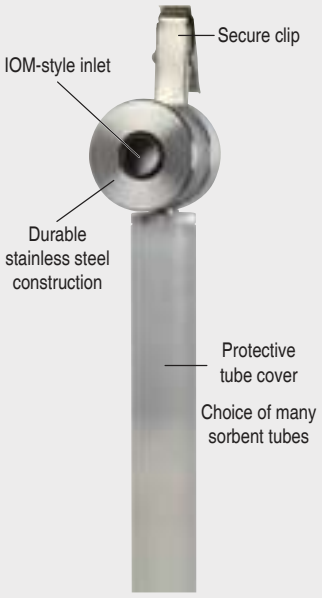
Sampling mixed-phase contaminants such as pesticides, polyaromatic hydrocarbons (PAHs), inorganic acids, and explosives is challenging because the vapor and aerosol phase distribution is constantly changing.

The IFV Pro Sampler features an IOM-style inlet for true inhalable sampling and collects vapor phase on a variety of method-specified sorbents.

ABOUT

ACGIH IFV Designation

ACGIH has assigned a TLV with Inhalable Fraction and Vapor (IFV) designation to over 50 compounds that exert sufficient vapor pressure such that the contaminant may be present in both particle and vapor phases, with each phase contributing a significant portion of the dose. *See compounds in table at below left.*



IFV Pro Sampler

IFV Pro Filter and Sorbent Tube Selection Guide

Compound	Recommended Filter*	Sorbent Tube†
Acrylamide	225-702	226-10-04
Alachlor	225-702	226-30-06
Aldrin	225-702	226-30-06
Azinphos-methyl	225-702	226-30-06
Butylated hydroxytoluene	225-702	226-211
Carbaryl	225-702	226-30-06
Carbofuran	225-702	226-30-06
Chlorpyrifos	225-702	226-30-06
Clopidol	225-702	226-30-06
Coumaphos	225-702	226-30-06
Cresol, all isomers	225-702	226-211
Demeton	225-702	226-30-06
Demeton S-methyl	225-702	226-30-06
Diazinon	225-702	226-30-06
Dibutyl phosphate	225-702	226-30-06
Dichlorvos	225-702	226-30-06
Dicrotophos	225-702	226-30-06
Dieldrin	225-702	226-30-06
Diesel fuel as total hydrocarbons	225-702	226-09
Diethanolamine	225-702	226-214
Dioxathion	225-702	226-30-06
Disulfoton	225-702	226-30-06
Endosulfan	225-702	226-30-06
2-Ethylhexanoic acid	225-702	226-10-04
Fenamiphos	225-702	226-30-06
Fensulfothion	225-702	226-30-06
Fenthion	225-702	226-30-06
Fonofos	225-702	226-30-06
Glyoxal	225-9036	226-119-7
Malathion	225-702	226-30-06
Maleic anhydride	225-9028	226-213
Methomyl	225-702	226-30-06
Methyl demeton	225-702	226-30-06
Methyl parathion	225-702	226-30-06
Mevinphos	225-702	226-30-06
Monochloroacetic acid	225-702	226-10-04
Monocrotophos	225-702	226-30-06
Naled	225-702	226-30-06
o-Phthalodinitrile	225-702	226-83
Parathion	225-702	226-30-06
Pentachlorophenol	225-702	226-211
Phorate	225-702	226-30-06
Propoxur	225-702	226-30-06
Ronnel	225-702	226-30-06
Sulfotepp	225-702	226-30-06
Sulprofos	225-702	226-30-06
Temephos	225-702	226-30-06
Terbufos	225-702	226-30-06
1,1,2,2-Tetrabromoethane	225-702	226-10-04
Tetraethylpyrophosphate (TEPP)	225-702	226-106A
Thiram	225-702	226-30-06
Toluene-2,4-diisocyanate	225-9035	—
Toluene-2,6-diisocyanate	225-9035	—
Xylidene isomers	225-702	226-10-04

** Filter details on pp. 112 and 114* *† Sorbent tube details on pp. 50-54*

Description	Cat. No.
IFV Pro Sampler Kit includes sampling head (aerosol sampler body, cassette, and front plate), protective tube cover, calibration adapter, cassette cap, cassette transport container, 10 extra tube holders (rubber sleeves), and case; *requires 25-mm filter and sorbent tube (see table above)*	**225-49K**
Tube Holders (Rubber Sleeves), pack of 25, *change after each sample*	**P3022A**

For Sample Pumps
see pages 10-15 and 20-29

GS-3 Respirable Dust Cyclone

Meets ISO 7708/CEN Criteria

Operates at 2.75 L/min to conform to the ISO 7708/CEN criteria
- Meets OSHA criteria
- Suitable for ACGIH respirable TLVs
- Higher flow rate increases sensitivity for lower concentrations

Unique design overcomes disadvantages of 10-mm nylon cyclone
- Multiple inlets eliminate ambient wind speed and orientation effects

Conductive plastic eliminates electrostatic effects
- Not a spark hazard for underground mine use

Sample Time:	*Varies*
Sample Rate:	*2.75 L/min for 4-µm cut-point* (OSHA silica rule)*
Sample Pump:	*Universal XR or AirChek Series*
Sample Media:	*25 or 37-mm filters in 3-piece cassettes*
Tubing:	*1/4-inch ID*

Use the lightweight 10-mm GS-3 Cyclone with a 25 or 37-mm three-piece filter cassette. *See Tech Tips at above left.*

Description		Cat. No.
GS-3 Cyclone with bowl adapter, cassette adapter, and grit pot	**37 mm**	**225-100**
	25 mm	**225-103**

* *Calibrated at UK Health and Safety Laboratory; visit skcinc.com/prod/225-100.asp to view the collection efficiency curve*

GS-1 Respirable Dust Cyclone

Equivalent to 10-mm Nylon Cyclone Without Static Concerns

Use at 1.7 or 2 L/min with DPM Cassette for MSHA DPM compliance sampling
- Screens out large particles to prevent DPM Cassette impactor and filter overload

Conductive plastic construction
- Eliminates electrostatic effects experienced with the 10-mm nylon cyclone
- Not a spark hazard for underground mine use

Sample Time:	*Varies*
Sample Rate:	*1.7 or 2 L/min with DPM Cassette (MSHA DPM sampling)*
Sample Pump:	*Universal XR or AirChek Series*
Sample Media:	*DPM Cassette or 37-mm filters in 3-piece cassettes*
Tubing:	*1/4-inch ID*

Use the lightweight 10-mm GS-1 Cyclone with a 37-mm three-piece filter cassette or the SKC DPM Cassette.

Description	Cat. No.
GS-1 Cyclone with bowl adapter, 37-mm cassette adapter, and grit pot	**225-105**

Tech Tips

Traditionally, respirable dust sampling with a cyclone has been performed using a clear styrene cassette. ***NIOSH now suggests that conductive black polypropylene cassettes are a better option*** *for this application to minimize cassette wall losses (Journal of Occ. and Env. Hygiene, 10:3, 2013, pp. D29-D33). For conductive black polypropylene cassettes, see page 113.*

GS Cyclones Accessories/ Replacement Parts

Replacement Cassette Adapters for GS-3 only 37 mm..... **Cat. No. 225-102**.....**ea** 25 mm..... **Cat. No. 225-101**.....**ea**
Filter Cassette/Cyclone Holder, *see p. 120 for details* **Cat. No. 225-1** .....**ea**
Standard-size Multi-purpose Calibration Jar, *see p. 120 for details* **Cat. No. 225-111** .....**ea**
Replacement Grit Pots **Cat. No. P225012**..... **pk/25**

More Information

Gautam, M. and Sreenath, A., "Performance of a Respirable Multi-inlet Cyclone," Jnl. of Aerosol Science (U.K.), Vol. 28:7, 1997, pp. 1265-1281

Kar, K. and Gautam, M., "Orientation Bias of the Isolated 10 mm Nylon Cyclone at Low Stream Velocity," AIHA Journal, Vol. 56, 1995, pp. 1090-1098

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Respirable Dust Aluminum Cyclone

Listed in OSHA Silica Rule and NIOSH Methods

- **Operates at 2.5 L/min to conform to the ISO 7708/CEN criteria**
  - Meets requirements in the OSHA silica rule
  - Suitable for ACGIH respirable TLVs
- **Specified in NIOSH Method 7500 for silica and NIOSH 0600 for respirable particulates**
- **Eliminates adverse electrostatic effects**
- **Small and lightweight**
  - 2.6 x 1.5 inches (6.6 x 3.8 cm)
- **Used with an open-face three-piece cassette for more even particle deposition on the filter**
  - Available in 25 or 37 mm
  - Inserts into middle ring of cassette

Sample Time:	*Varies*
Sample Rate:	*2.5 L/min for 4-µm cut-point (OSHA silica rule)*
Sample Pump:	*Universal XR or AirChek Series*
Sample Media:	*25 or 37-mm filters in 3-piece cassettes*
Tubing:	*1/4-inch ID*

The SKC Aluminum Cyclone is a lightweight respirable dust sampler that is placed into the middle ring of a three-piece cassette loaded with the appropriate filter. When attached to a sample pump, respirable particles collect on the filter and larger particles fall into the grit pot to be discarded. Available in 25 or 37 mm, the SKC Aluminum Cyclone provides sharp size selection of the respirable fraction. The SKC Aluminum Cyclone eliminates the electrostatic problems associated with nylon (non-conductive) cyclones and allows the cyclone to sample particles more efficiently. *See Tech Tips at right.*

ACGIH, NIOSH, the European Standard Committee (CEN), and the OSHA silica rule specify a respirable collection efficiency curve with a median cut-point of 4 µm. A leading aerosol research organization calibrated the SKC Aluminum Cyclone. Results showed that using the cyclone at a flow rate of 2.5 L/min provided the optimum match to the ISO 7708/CEN respirable criteria. *Publication available upon request*

Easy-to-use Calibration Adapter

The aluminum calibration adapter fits both the 25 and 37-mm Aluminum Cyclones and allows standard 1/4-inch ID Tygon tubing to be attached for simple calibration.

Cat. No. 225-01-03

Description		Cat. No.
Cyclone‡ with grit pot	**25 mm**	**225-01-01**
	37 mm	**225-01-02**
Accessories		
Calibration Adapter, 25/37 mm		**225-01-03**
Filter Cassette Holder, 25/37 mm		**225-1**
Replacement Grit Pots, pk/25		**P225013**
Replacement O-rings, for 37-mm cyclones, pk/5		**P22501**

‡ *Three-piece cassettes are required for use with SKC Aluminum Cyclones; see filter cassettes on pages 104-114.*

Tech Tips

- *A cyclone will not sample optimally if it is influenced by electrostatic charge. SKC cyclones are constructed of conductive plastic or aluminum that eliminates the static problem associated with non-conductive nylon cyclones.*
- *Cleaning cyclones before sampling prevents deviation in the collection efficiency curve.*
- *The cyclone grit pot must be in place during sampling for size selection to occur. Do **not** remove the grit pot during calibration and sampling.*
- *When calibrating size-selective samplers such as cyclones, use the sampler's calibration adapter. If an adapter does not exist, use the multi-purpose calibration jar with the smallest volume. See page 120.*

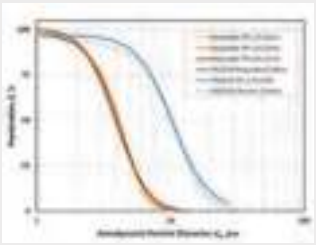
Plastic Cyclone

The SKC Plastic Cyclone is designed to sample respirable dust as per MDHS 14/4 and the ISO/CEN criteria. The static-dissipating cyclone features a snap-together cassette system and is used at a 3.0 L/min flow rate with a 25 or 37-mm cyclone cassette. Cyclones include a grit pot. The Plastic Cyclone is also suitable for MDHS 10/2 and 91.

Description	Cat. No.
Plastic Cyclone with 25-mm plastic cassette	**225-69-25**
Plastic Cyclone with 37-mm plastic cassette	**225-69-37**
Filter Transport Cassette, for 25-mm filters	**225-67**
Cassette, 25 mm	**225-62-25**
Cassette, 37 mm	**225-62-37**

PPI Advantages

- **Patented* PPI four-impactor design** provides a closer match to the entire ISO 7708/CEN curve *(see graphed comparison of PPIs and criteria below).*



- **Small, less obtrusive for worker**

- **Handy calibration adapter** — no calibration jar needed!

- **No tipping hazard!** Invert PPI without causing large particles to invalidate the filter sample.

Disposable Parallel Particle Impactors (PPIs)

Listed in the OSHA Silica Rule

- **Collection efficiency precisely matches ISO 7708/CEN criteria adopted in the OSHA final silica rule and NIOSH respirable dust methods**
- **Available in three flow rates for your applications**
  - **2 and 4 L/min models** for TWA sampling
  - **8 L/min model** for shorter-term sampling
- **Disposable anti-static plastic, designed for one-time use**
- **Disposable PPI® Sampler Options**
  - **Preloaded** with filter by SKC
  - **Empty** for filter loading by a laboratory or the user
  - **All disposable PPIs** are preloaded with pre-oiled impaction substrates in the inlet section
- **Performance published in Journal of Physics and referenced in the OSHA final silica rule**
- **Thoracic model ideal for sampling metalworking fluids (NIOSH Method 5524 and TLV), hard metals with Co, and tungsten carbide as Co**
- **Ask us about respirable PPI with preweighed filter!**

Sample Time:	*Select PPI model and contact lab for sample time to meet LOQ*
Sample Rate:	*2, 4, or 8 L/min*
Sample Pump:	*Universal XR or AirChek Series; Leland Legacy for 8 L/min*
Sample Media:	*37-mm filter and support*
Tubing:	*1/4-inch ID*

* *U.S. Patent No. 7,073,402*

SKC Silica Sampling Kits

Make compliance monitoring of airborne silica concentrations easy by choosing a basic or deluxe SKC Silica Sampling Kit as your complete silica sampling toolbox. Each kit includes preloaded Disposable PPI Respirable Dust Samplers, sample pump and charger, calibrator or rotameter, and calibration and sampling accessories, all in a convenient tool case.

Cat. No. 220-5000TC-K-S with AirChek TOUCH pump and chek-mate Calibrator shown

See more at skcinc.com/silicabrochure

Disposable Parallel Particle Impactors (PPIs)

Single-use Plastic — Convenient for Professionals and Labs

Preloaded Disposable Plastic PPI Samplers

Select the PPI for the desired convention.

Description	Cat. No.	Qty.
Preloaded Disposable PPI Samplers* contain four porous plastic disc impaction substrates, one 37-mm cellulose support, and one collection filter as noted		
Respirable PPI (red), 8 L/min, plastic, with 5.0-µm PVC filter	225-3841	ea
Respirable PPI (orange), 4 L/min, plastic, with 5.0-µm PVC filter	225-3871	ea
Respirable PPI (gold), 2 L/min, plastic, with 5.0-µm PVC filter	225-3851	ea
Thoracic PPI (blue), 2 L/min, plastic, with 0.8-µm MCE filter	225-3861	ea
With Preweighed Filter		
Respirable PPI (red), 8 L/min, plastic, 5.0-µm PVC filter preweighed to 5 decimals	225-3841-PW	ea
Respirable PPI (orange), 4 L/min, plastic, 5.0-µm PVC filter preweighed to 5 decimals	225-3871-PW	ea
Respirable PPI (gold), 2 L/min, plastic, 5.0-µm PVC filter preweighed to 5 decimals	225-3851-PW	ea

* *Designed for one-time use*

Partner SKC pumps with PPI Samplers
see pages 10-31

User-loaded Disposable Plastic PPI Samplers

Select the PPI for the desired convention.

Description	Cat. No.	Qty.
User-loaded Disposable PPI Samplers* contain four porous plastic disc impaction substrates, *require collection filter and support; see information below and select based on application*		
Respirable PPI (red), 8 L/min, plastic	225-384	ea
Respirable PPI (orange), 4 L/min, plastic	225-387	ea
Respirable PPI (gold), 2 L/min, plastic	225-385 225-385A	ea 25
Thoracic PPI (blue), 2 L/min, plastic	225-386	ea
Filters for User-loaded PPI Samplers		
PVC Filters, 37 mm, 5.0-µm pore size	225-5-37	100
MCE Filters, 37 mm, 0.8-µm pore size	225-5	100
Filter Supports for User-loaded PPI Samplers		
Support Pads, cellulose, 37 mm	225-27	100
Stainless Steel Screen, 37 mm, wide mesh	225-26	ea

* *Designed for one-time use*

Accessory	Cat. No.	Qty.
Calibration Adapter, for Disposable PPI Samplers only	225-389	ea

For the SM-4000 Direct-reading Silica Monitor
see page 156

See PPI Silica Sampling Solution Video and other silica sampling training.

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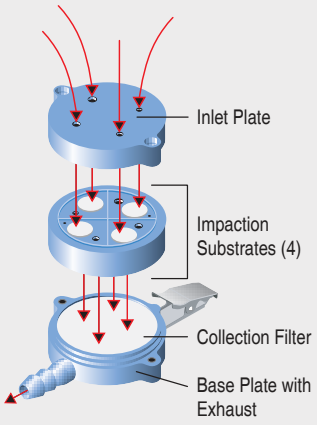
For Reusable PPIs, see page 132.

PPI Advantages

- **Patented* PPI four-impactor design** provides a closer match to the entire ISO 7708/CEN curve *(see graph on page 130)*.



- **No tipping hazard!** Invert PPI without causing large particles to invalidate the filter sample.

Partner SKC pumps with PPI Samplers
see pages 10-31

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Reusable Parallel Particle Impactors (PPIs)

Listed in the OSHA Silica Rule

- **Collection efficiency precisely matches ISO 7708/CEN criteria adopted in the OSHA final silica rule**
- **Available in three flow rates for your applications**
  - **2 and 4 L/min models** for TWA sampling
  - **8 L/min model** for shorter-term sampling
- **Reusable conductive aluminum — use with any suitable 37-mm filter**
- **Load with disposable pre-oiled impaction substrates**
  - Reduce particle bounce and buildup effects
- **Only 3.3 ounces (93.6 grams) — ideal for personal and area sampling**
- **Performance published in *Journal of Physics* and referenced in the OSHA final silica rule**
- **Thoracic model ideal for sampling metalworking fluids (NIOSH Method 5524 and TLV), hard metals with Co, and tungsten carbide as Co**

Sample Time:	*Select PPI model and contact lab for sample time to meet LOQ*
Sample Rate:	*2, 4, or 8 L/min*
Sample Pump:	*Universal XR or AirChek Series; Leland Legacy for 8 L/min*
Sample Media:	*37-mm filter and support (and four impaction substrates)*
Tubing:	*1/4-inch ID*

* *U.S. Patent No. 7,073,402*

Reusable Aluminum PPI Samplers

Select the PPI for the desired convention, choose application-appropriate filter and support, and order impaction substrates (see below).

Description	Cat. No.	Qty.
Reusable PPI Samplers, *require substrates, filters, and supports*		
Respirable PPI (red), 8 L/min, aluminum	225-383	ea
Respirable PPI (orange), 4 L/min, aluminum	225-382	ea
Respirable PPI (gold), 2 L/min, aluminum	225-380	ea
Thoracic PPI (blue), 2 L/min, aluminum	225-381	ea

Collection Filters, *required for sampling*	Cat. No.	Qty.
PVC Filters, 37 mm, 5.0-µm pore size	225-5-37	100
MCE Filters, 37 mm, 0.8-um pore size	225-5	100

Impaction Substrates, *four required for each sample for Reusable Aluminum PPI models*	Cat. No.	Qty.
Porous Plastic Discs, 3/8-inch diameter, pre-oiled, ready to use, disposable	225-388	200

Accessories	Cat. No.	Qty.
Multi-purpose Calibration Jar	225-111	ea
Forceps, stainless steel, with non-serrated flat tips	225-8371	ea
Filter-Keeper, for transport and storage of 37-mm filters	225-8303A	10

For Disposable PPIs, see pages 130-131.

IMPACT Sampler

Ambient PM10, PM2.5, or PM Coarse Sampling at 10 L/min

- Ideal for environmental PM sampling and indoor air studies
- Use with Leland Legacy or any pump at 10 L/min
- Compact design
- Higher flow rate provides increased sensitivity
- Convenient operation
  - Removable filter cassette for fast media changes
  - Disposable ready-to-use pre-oiled impaction discs reduce particle bounce — no cleaning or greasing
  - Included rain cover protects sampler during outdoor use
  - Optional quick-mount bracket secures sampler virtually anywhere

The patented‡ SKC IMPACT single-stage inertial impactor is designed for the efficient collection of PM10, PM2.5, or PM Coarse $_{(10\text{-}2.5)}$ in ambient air. IMPACT media changes are as easy as removing the filter cassette and replacing it with one already loaded. IMPACT's higher flow rate requirement provides increased sensitivity for low levels of PM. Go to *skcinc.com/instructions/Modular_Impactors_Poster.pdf* for sampling efficiency data.

Sample Time:	*Varies*
Sample Rate:	*10 L/min*
Sample Pump:	*Leland Legacy*
Sample Media:	*47-mm filter, requires impaction substrate*
Tubing:	*3/8-inch ID*

Leland Legacy Pump for IMPACT

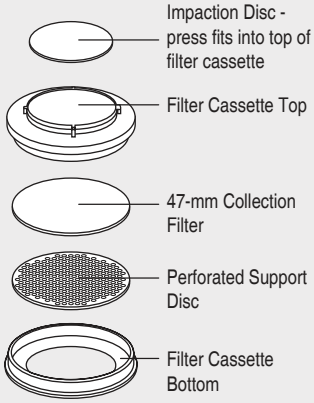
While IMPACT can be used with any pump at 10 L/min, partnering IMPACT with the Leland Legacy sample pump provides a highly efficient sampling system for environmental monitoring or indoor air studies. *See more information on the Leland Legacy Pump on pages 30-31 and the DPS System on pages 32-33.*

IMPACT Sampler		Cat. No.	Qty.
IMPACT Sampler includes sampler inlet and body, filter cassette, calibration adapter, and rain cover for sampler; *requires collection media and impaction substrate sold separately; see below*			
	PM2.5	225-392	ea
	PM10	225-390	ea
	PM Coarse includes 2 filter cassettes	225-3911	ea
Collection Filters for IMPACT Sampler (not supplied with IMPACT or DPS System) *Select a filter based on your application; required for sampling*			
Quartz Filters, 47 mm, Tissuquartz, 432 µm thick		225-1823	25
PTFE Filters,§ 47 mm, 2.0-µm pore size, with PMP support ring		225-1747	50
Impaction Substrate, *required for sampling; limited shelf-life*			
Impaction Discs, 37 mm, pre-oiled, ready to use, disposable		225-395	25
		225-395A	50
Accessories			
IMPACT Sampler Inlet Only, interchangeable on IMPACT body	**PM2.5**	P54204	ea
	PM10	P54202	ea
Filter Cassette		225-396	ea
Filter Cassette Opener		225-397	ea
Mounting Bracket		225-399	ea
PM Coarse Ring includes filter cassette, adapts IMPACT PM10 to an IMPACT PM Coarse		225-3912	ea
Petri Dish Slide, for filter transport		225-2-01	100
Calibration Adapter		225-394	ea

‡ *U.S. Patent No. 7,334,453*

§ *Back pressure on PTFE filters can vary within the same lot.*

Convenient All-in-one Filter Cassette



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For a deployable particulate sampling system featuring the IMPACT Sampler, see the DPS System on pages 32-33.

Personal Environmental Monitor (PEM)

Choice of Flows for PM10 and PM2.5 in Indoor Air

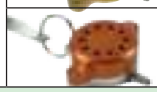
- **Referenced in EPA Method IP-10A**
  - For particles in indoor air
- **Small and unobtrusive**
  - Can be connected to a personal sample pump and worn in the breathing zone
- **Suitable for LEED Green Building sampling**

Sample Time:	*Varies*
Sample Rate:	*2, 4, or 10 L/min*
Sample Pump:	*Universal, AirChek Series, or Leland Legacy*
Sample Media:	*37-mm PTFE filters**
Tubing:	*3/16-inch ID*

The Personal Environmental Monitor is a small, lightweight impaction device used with a personal sample pump to provide effective sampling of PM10 and PM2.5 in indoor air. Personal exposure is determined through gravimetric analysis for particle mass and chemical analysis for specific compounds.

How the PEM Works

The PEM consists of three major parts: cap, impaction ring assembly, and base. A 37-mm after-filter is inserted in the base and the PEM assembled. When used with a personal sample pump at the required flow rate, aerosol is accelerated through a number of nozzles in the cap. Through inertia, particles larger than the 50% cut-point of the sampler impact onto a greased impaction ring and can be discarded after sampling. Particles smaller than the 50% cut-point pass through the impactor and collect on the 37-mm after-filter. Six models of PEM are available for the collection of PM10 or PM2.5 at three different flow rates.

Cut-point	Model	Flow Rate	Cat. No.
2.5 µm		2 L/min	761-203
		4 L/min	761-203A
		10 L/min	761-203B
10 µm		2 L/min	761-200
		4 L/min	761-200A
		10 L/min	761-200B
Accessories			
PEM Calibration Adapter			761-202
After-filter, 37-mm, 2.0-µm PTFE* with PMP support ring, pk/50			225-1709

* *Back pressure on PTFE filters can vary within the same lot.*

Pumps for sampling with the PEM

- *2 or 4 L/min flow rates, see the AirChek Series on pages 10-15, 20-21, or 28-29*
- *10 L/min flow rate and 24-hour sampling, see the Leland Legacy on pages 30-31*

PEM Applications

- Childhood asthma studies
- Green Building certification
- IAQ studies
- School zone investigations

Data Interpretation

Particulates as PM2.5

▶ ***LEED Green Buildings***
Indoor Air Maximum Concentration: 15 µg/m³

Source: LEED for New Construction Rating System v4 (U.S. Green Building Council, usgbc.org)

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Personal Modular Impactor (PMI)

Personal PM10, PM2.5, or PM Coarse Sampling at 3 L/min

- **Closely follows PM2.5 or PM10 as defined by EPA** *(see far right)*
- **Use with any constant flow pump at 3 L/min**
- **Disposable, pre-oiled impaction discs**
  - Reduce particle bounce for high collection efficiency
- **Compact and lightweight — only 2.5 ounces (71 grams)!**
  - Ideal for personal or micro-environmental sampling
- **Convenient modular design for easy operation**
  - Removable filter cassette for easy media changes
  - Convenient clip for mounting sampler in the breathing zone
- **PMI PM10 model is easily converted with accessory ring to measure PM Coarse**

Sample Time:	*Varies*
Sample Rate:	*3 L/min*
Sample Pump:	*Universal XR or AirChek Series*
Sample Media:	*37-mm filter, requires impaction substrate*
Tubing:	*1/4-inch ID*

The patented* SKC single-stage Personal Modular Impactors are designed for the highly efficient collection of PM10, PM2.5, or PM Coarse (10-2.5). The samplers are easy to use with their removable filter cassette and pre-oiled impaction disc. The 25-mm pre-oiled impaction disc mounts directly on top of the filter cassette to reduce particle bounce for high collection efficiency. A 25-mm filter may be used as an alternative impaction substrate for chemical analysis of particles. The PMI Coarse model includes a second filter cassette to allow collection of particles < 10 µm but > 2.5 µm *(see About at right)*.

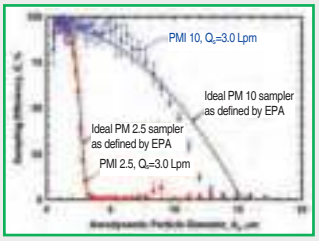
PMI Sampler	Cat. No.	Qty.
Personal Modular Impactor includes impactor and filter cassette with support screen, *requires collection filter and impaction substrate sold separately; see below*		
PM2.5 (gold)	225-352	ea
PM10 (silver)	225-350	ea
PM Coarse includes 2 filter cassettes and filter retainer	225-351	ea
Recommended Collection Filters, *required for sampling*		
Quartz Filters, 37 mm, Tissuquartz, 432 µm thick	225-1822	25
PTFE Filters,† 37 mm, 2.0-µm pore size, with PMP support ring	225-1709	50
PTFE Filters,† 37 mm, 1.0-µm pore size	225-3705	150
Recommended Impaction Substrate, *required for sampling; limited shelf-life*		
Pre-oiled Porous Plastic Discs,‡ 25 mm, ready to use, disposable	225-355	25
	225-355A	50
Accessories		
PM Coarse Ring includes filter cassette, adapts a PMI 10 to a PMI Coarse	225-3512	ea
Replacement Filter Cassette	225-356	ea
PMI Cassette Opener	225-357	ea
Forceps, stainless steel, non-serrated flat tips, *see p. 121*	225-8371	ea
Filter-Keepers, 37 mm, for filter transport, *see p. 121*	225-8303	100
	225-8303A	10
PMI Calibration Adapter	225-358	ea
Filter Retainer, secures filter in impaction substrate position on top of cassette	225-354	ea

* *U.S. Patent No. 7,334,453* † *Back pressure on PTFE filters can vary within the same lot.*
‡ *A 25-mm filter may be used as an alternative impaction substrate for chemical analysis; see pages 104-112 for filters.*

ABOUT

PMI Performance

The graph below demonstrates the high sampling efficiency of the PMI PM2.5 and PM10 Samplers when compared to the EPA PM2.5 and PM10 criteria curves. *For more information, visit skcinc.com/instructions/Modular_Impactors_Poster.pdf.*



ABOUT

PM Coarse Sampling with PMI

The PMI Coarse model includes a PM10 inlet, PM2.5 inlet (Coarse Ring), and two filter cassettes. **In Stage 1,** a 25-mm impaction substrate is placed in the top of the filter cassette beneath the PM10 inlet, but no collection filter is installed. **In Stage 2,** a 25-mm filter is placed in the impaction substrate position in the top of the second filter cassette beneath the PM2.5 (Coarse Ring) while a 37-mm collection filter is loaded into the cassette bottom. This allows for the collection of particles < 10 µm but > 2.5 µm.

Data Interpretation

Particulates as PM10

- ***LEED Green Buildings***
  Indoor Air Maximum Concentration: 50 µg/m³
  Health Care Facilities Maximum Concentration: 20 µg/m³

Source: LEED for New Construction Rating System v4 (usgbc.org)

Sioutas Personal Cascade Impactor

Separates Ultrafine, Fine, and > 2.5-µm Particles Simultaneously

the Sioutas Impactor Advantage!

Choose the Sioutas Personal Impactor for the highly efficient collection of airborne particles in five size ranges:

- ☑ > 2.5 µm
- ☑ 1.0 to 2.5 µm
- ☑ 0.50 to 1.0 µm
- ☑ 0.25 to 0.50 µm
- ☑ < 0.25 µm

Recent epidemiological studies show that ultrafine, fine, and > 2.5-µm particles may have greater pulmonary inflammatory potency than larger particles and associate increased morbidity and mortality with increased exposure to these particles. The Sioutas Impactor is the only personal impactor that precisely separates and collects ultrafine, fine, and > 2.5-µm particles simultaneously.

SKC Sioutas Impactor and Leland Legacy

U.S. EPA-ETV Performance Verified ETV

The U.S. EPA Environmental Technology Verification (EPA-ETV) Program has verified the performance of the SKC Sioutas Impactor with the Leland Legacy Sample Pump *(see pages 30-31)* as an improved and cost-effective technology. *See the report at epa.gov/etv/vt-ams.html.*

More Information

Misra, C., et al., "Development and Evaluation of a Personal Cascade Impactor Sampler (PCIS)," Journal of Aerosol Science, 33, 2002, pp. 1027-1047

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- **Precise particle separation**
  - Particle size cut-points: 2.5, 1.0, 0.50, and 0.25 µm
  - The only personal impactor that efficiently samples ultrafine, fine, and > 2.5-µm particles simultaneously
  - Maintains high collection efficiency even at high particle concentrations
- **Optimized at a 9 L/min flow rate with low pressure drop for 24-hour sampling**
  - Improves analytical sensitivity
  - Minimizes non-detectable samples
- **Preserves unstable compounds**
  - Chemically inert collection substrate
  - No impaction grease to contaminate sample
- **Minimal particle bounce and internal wall losses**
- **Suitable for sampling in outdoor** and indoor environments**
- **Size-fractionated samples can be analyzed gravimetrically, chemically, and microscopically**
- **Small and lightweight for personal or area sampling**

Sample Time:	*Varies*
Sample Rate:	*9 L/min*
Sample Pump:	*Leland Legacy*
Sample Media:	*25 and 37-mm filters*
Tubing:	*3/8-inch ID*

Leland Legacy Sample Pump

The compact, portable, and battery-operated Leland Legacy Sample Pump provides a 9 L/min flow rate for optimum Sioutas Impactor performance.
For more information, see pages 30-31.

The patented† Sioutas Personal Cascade Impactor* separates and collects airborne particles in five size ranges: > 2.5 µm, 1.0 to 2.5 µm, 0.50 to 1.0 µm, 0.25 to 0.50 µm, and < 0.25 µm. When used with PTFE filters, the Sioutas Impactor is highly efficient at collecting particles without using impaction grease or substrate coatings and at retaining unstable compounds for size-fractionated chemical analysis.

Use the Sioutas Impactor with the Leland Legacy Sample Pump at 9 L/min to ensure precise particle separation at the specified cut-points. Particles above each cut-point are collected on a 25-mm filter in the appropriate stage with particles less than 0.25 µm collecting on the 37-mm after-filter *(optional)*. The small, lightweight Sioutas Impactor simply clips to a worker's collar or lapel for personal sampling and is also suitable for area sampling.

Description	Cat. No.
Sioutas Personal Cascade Impactor	**225-370**
Tubing, Tygon, 3/8-inch ID, fits Sioutas Impactor and Leland Legacy pump, 10 feet	**225-1351**

Filters for Sioutas Impactor

Description	Qty.	Cat. No.
After-filter, PTFE,‡ 37 mm, 2.0 µm *(optional)*	**50**	**225-1709**
Collection Filter (filter for 4 stages), PTFE,‡ 25 mm, 0.5 µm, *required*	**250**	**225-3708**

* *Developed by Dr. Constantinos Sioutas of the University of Southern California in partnership with the Mickey Leland National Urban Air Toxics Research Center (NUATRC)*

† *U.S. Patent No. 6,786,105 (University of Southern California)*

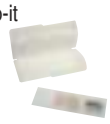
‡ *Back pressure on PTFE filters can vary within the same lot.*

** *Requires special provisions; see product operating instructions*

SKC Bioaerosol Samplers

SKC Bioaerosol Sampler Guide

Use the guide below to determine the sampler that meets your applications.

Sampler	Principle of Operation	Flow Rate (L/min)	Contaminants	Sampler Advantages	Page
BioStage Single-stage Impactor 	Impaction onto culture media	28.3	Fungi (viable) and bacteria	• SureLock positive seal • Organisms remain intact and viable • Cost-effective and reusable • Time-proven collection method • Meets NIOSH Methods 0800 and 0801	138
BioSampler 	Collection into swirling liquid	12.5 (sonic flow)	Fungi (viable and non-viable), endotoxins, viruses, and bacteria	• Maintains constant collection efficiency over 8 hours • Reduces particle bounce and re-aerosolization; preserves viability • Many analysis options	140
VersaTrap Spore Trap Cassette 	Impaction onto sticky glass slide	15 (optimum)	Fungi (total), pollen, and fibers	• Reduces particle bounce • Prevents sample loss and blurring • Allows direct quantitative analysis • Enumeration of fungal spores with low culturability	142
Button Sampler 	Filtration using porous membrane	4 (optimum)	Fungi (viable and non-viable), endotoxins, and bacteria	• Superior collection uniformity • Low sensitivity to ambient conditions • Sample suitable for viable and non-viable analysis • Personal or area bioaerosol sampling	143
Sterile Swab Kit 	Wipe sample	N/A	Fungi (viable and non-viable) and bacteria	• Easy to use • Suitable for growth cultures • Non-destructive • Collects surface contaminants	144
Carpet Sampling Cassette 	Filtration using porous membrane	10 (optimum)	Fungi (total) and fibers	• Easy to use • Suitable for high flows to enhance detection • Microvacuum nozzle for efficient sampling in carpeting	144
Stick-to-it 	Lift tape surface sample	N/A	Fungi (total), pollen, and fibers	• Ensures consistent sample area • Serialized for sample identification • Includes transport case for mailing to lab	144

BioStage

Single-stage Viable Cascade Impactor

- **SureLock positive seal ensures sample integrity**
- **Corrosion-resistant aluminum**
  - Autoclavable
- **Collected organisms remain intact and viable**
- **Uses standard-size agar plates**
- **Easy setup and calibration**
- **Proven viable sampling**
  - Meets ACGIH recommendations for bioaerosol sampling
  - Meets NIOSH Methods 0800 and 0801 requirements
  - Studies show performance equivalent to Andersen N-6 and similar samplers‡

The SKC BioStage® viable cascade impactor meets NIOSH requirements and ACGIH recommendations for sampling indoor and outdoor mold and bacteria. The BioStage comprises an inlet cone, precision-drilled 400-hole impactor stage, and a base that holds a standard-size agar plate. A high flow pump, such as the QuickTake 30 *(see page 139)*, pulls microorganisms in air through the holes (jets) where they are collected on the agar surface. Testing demonstrates that BioStage provides performance equivalent to the industry-standard Andersen N-6.‡ What sets BioStage apart from other samplers is its SureLock positive seal (instead of bulky spring clamps) that ensures sample integrity.

ABOUT MRSA

Methicillin-resistant *Staphylococcus aureus* (MRSA) infections occur typically in hospitals, elder and child care facilities, gyms, schools, and jails. A 2008 IAQA presentation** recommends a viable cascade impactor (such as the SKC BioStage) with ChromAgar for sample times of 2 to 5 minutes for sampling MRSA in air and sterile swabs *(see page 144)* for sampling MRSA on surfaces where the superbug can live for weeks to months.

Single-stage impactor with spring clamps

Single-stage BioStage with SureLock seal

SureLock seal for sample integrity — only from SKC!

	BioStage
Jet Classification Stage	400 holes (0.25-mm diameter)
Sample Rate	28.3 L/min
Median Cut-point (D_{50})	0.6 µm
Sample Media	90 to 100-mm agar plates*
Analysis	Colony culture†
Tubing	1/4-inch ID

Description	Cat. No.
BioStage* single-stage cascade impactor; *available in pump kit, see p. 139*	**225-9611**
Accessories	
Calibration Adapter for BioStage, allows tubing to connect to BioStage inlet	**P33100**
Mounting Bracket for QuickTake 30, holds BioStage in place on pump during sampling	**228-9531**

* *Requires microbiological media supplied by analytical laboratories; for a lab list, go to skcinc.com/lab*

References

† *Macher, J., "Positive-hole Correction of Multiple-jet Impactors for Collecting Viable Microorganisms," AIHA Journal, 50:11, 1989, pp. 561-568*

‡ *Samimi, B. and Shufutinsky, A., "Comparison of the Thermo-Andersen N6, the Aerotech A6, the SKC BioStage, and the SKC Micro-media Viable Samplers in Collecting Airborne Fungal Spores," AIHce 2005, San Diego, CA, Final Program, p. 43*

** *Dobranic, J., "Superbugs in Our Communities - An Introduction for the IEQ Professional," EMSL, IAQA Conference, 2008, Tampa, FL*

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BioStage Pump Kit

Complete Viable Mold and Bacteria Sampling Kit

SKC combines the high-performance BioStage Viable Cascade Impactor with the power of the QuickTake 30 Sample Pump for a complete viable mold/bacteria sampling kit. With the BioStage Pump Kit and fresh agar plates from your laboratory, you are ready to sample!

What does the kit include?

- BioStage Viable Cascade Impactor *(see page 138)*
- QuickTake 30 Sample Pump,Δ 10 to 30 L/min constant flow *(see pages 34-35)*
- AC charger/adapter
- Mounting bracket with inlet adapter designed to mount BioStage directly on the pump
- Calibration adapter
- Rotameter
- Tubing
- Deluxe carry case

QuickTake 30 Pump Applications

The QuickTake 30 Pump included in the BioStage Pump Kit can be used with many other samplers, including:

- **Spore trap cassettes**
- **Asbestos cassettes**
- **Filter cassettes**
- **Microvacuum cassettes**
- **Any viable cascade impactor within the flow range**
- **Any sampler requiring constant flows from 10 to 30 L/min within stated back pressure**

Why use BioStage with the QuickTake 30 pump?

- Provides constant 28.3 L/min flow rate
- Mounting bracket designed to mount BioStage directly on the pump
- No noisy, hot, and AC-powered vacuum pump
  - *QuickTake 30 is low noise and battery powered*
- Powerful Li-Ion battery provides up to 4-hour run times at 28.3 L/min
- One-handed transport of pump and sampler

Description		Cat. No.
BioStage Pump Kit includes BioStage,* QuickTake 30 sample pump,Δ AC charger/adapter, mounting bracket with inlet adapter, calibration adapter, rotameter, tubing, and deluxe carry case	100-240 V	228-9530K

Δ *QuickTake 30 pump is **not** CE marked.*

* *Requires microbiological media supplied by analytical laboratories; for a lab list, go to skcinc.com/lab*

More Information
skcinc.com/instructions/1512.pdf

BioSampler

Collects Bioaerosols into Liquid for Maximum Viability

- Ideal for airborne bacteria, fungi, pollen, viruses, endotoxins, mycotoxins, and other fragments
- Constructed of quality glass — autoclavable
- Collection method ensures high rate of microorganism viability
- Extends sample time to over 8 hours with ViaTrap liquid
- Overcomes sampling problems with impinger samplers
- Inlet limits collection of particles to those that would pass through the human nose

The BioSampler® is a highly efficient glass collection device used with a high-volume sonic flow pump to trap airborne microorganisms for analysis. Externally, BioSampler resembles an All-Glass Impinger (AGI-30); internally, BioSampler is specially designed to reduce particle bounce and maintain maximum viability.

BioSampler Analysis Options

- **Growth Culture** quantifies/characterizes airborne bacteria and fungi.
- **Microscopic** enumerates total airborne bacteria and fungi (provides limited identification).
- **Biochemical Assay** quantifies biological compounds based on reaction to a chemical.
- **Immunoassay** quantifies airborne allergens based on antibodies binding to a specific target antigen.
- **Polymerase Chain Reaction (PCR)** identifies bioaerosols by screening for a specific genus or species. *May require use of sterile water as collection liquid; check with laboratory.*

For a list of microbiological laboratories, visit skcinc.com/lab.

the BioSampler Advantage!

- ☑ Three tangential nozzles eject particles at an angle to the inner wall, reducing particle bounce and preserving microorganism integrity.
- ☑ Swirling liquid collection method minimizes re-aerosolization and gently entrains bioaerosols to preserve viability.
- ☑ For highest efficiency, use with non-evaporating collection liquids that have a higher viscosity than water, such as ViaTrap® mineral oil.‡
- ☑ When used with ViaTrap, collection efficiency stays constant over an 8-hour sampling period.
- ☑ Complete glass construction allows easy cleaning, sterilizing, autoclaving, and reuse.
- ☑ Samples are suitable for five different analyses. *See above left.*

Sample Time:	*Up to 8 hours*
Sample Rate:	*Sonic flow through BioSampler nozzles (12.5 L/min)*
Sample Pump:	*BioLite+*
Sample Media:	*Non-evaporating liquids, ViaTrap‡ recommended*
Tubing:	*1/4-inch ID and 3/8-inch ID*

Description			Cat. No.
BioSampler, three-piece glass including inlet section, outlet section, and collection vessel *(bottom — does not include ground joint cap)* Inlet and outlet sections are a matched set	pk/4	20 ml 20 ml 5 ml	225-9595 225-9595K4 225-9593
BioSampler Collection Vessel (bottom) and ground joint cap, for transporting samples		20 ml 5 ml	225-9596 225-9596A
BioSampler Mini Kit includes 1 BioSampler, two 20-ml collection vessels (bottoms) with caps, 1 BioSampler case with mounting rod, and 1 ViaTrap‡ (120 ml)			225-9597
ViaTrap Collection Media,‡ special mineral oil for bioaerosol sampling		120 ml 500 ml 950 ml	225-9598A 225-9598 225-9599
Glass Trap, to protect pump, for area sampling, can be used with or without sorbent, *see p. 72 for sorbent Cat. No. 225-22-02*			225-22

‡ *May not be suitable for PCR analysis; check with laboratory*

V Video | P PowerPoint | W Webinar | S Sampling Solution
Visit skcinc.com/Training

Complete BioSampler System

Efficient Collection of Bacteria, Fungi, and Viruses

- **Includes all equipment and media for bioaerosol sampling**
- **Portable sonic flow pump**
  - Maintains ≥ 15 inches mercury downstream pressure
  - No additional critical orifice needed when used with BioSampler
  - Includes protective housing with handle, vacuum gauge, and valve
- **Mounting rod secures BioSampler to case**

Sampling with the BioSampler

The BioSampler is operated with a sonic flow pump, such as the BioLite+, that can maintain ≥ 15 inches mercury or 0.5 of an atmosphere of downstream pressure in the system. The BioSampler's three nozzles act as critical (sonic) orifices, each permitting 4.2 L/min of ambient air to pass through for a total flow rate of approximately 12.5 L/min.

BioSampler Applications

- Indoor air quality investigations
- Hospitals and veterinary clinics
- Agricultural dust studies
- Research
- Public building investigations
- Food handling industry
- Pulp and paper mills and wastewater treatment plants

Deluxe BioSampler System

Description	SKC Inc. Cat. No. 115 V	SKC Ltd. Cat. No. 230 V
Deluxe BioSampler System includes 1 BioSampler, two additional 20-ml collection vessels with caps, 1 case with mounting rod and bracket, 1 ViaTrap* (120 ml), 1 BioLite+ pump, tubing/adapters, and rotameter	228-9615KD	228-9620KBD
Basic BioSampler System includes 1 BioSampler, one additional 20-ml collection vessel with cap, 1 case with mounting rod and bracket, ViaTrap* (120 ml), 1 BioLite+ pump, tubing/adapters, and rotameter.	228-9515K	228-9620KB

* *May not be suitable for PCR analysis*

For a list of microbiological laboratories, visit skcinc.com/lab.

BioLite+ Sample Pump

The portable BioLite+ Sample Pump is ideal for use with the BioSampler. BioLite+ provides non-compensated airflow up to 62 L/min or sonic flow. The BioSampler acts as a critical orifice for sonic flow without additional orifices. BioLite+ features mounting points on either side, allowing two BioSamplers to be attached and operated concurrently at a total flow rate of 25 L/min at 15 inches Hg back pressure.

BioLite+ Sample Pump
Includes protective housing with handle, vacuum gauge, and valve, supplied without orifices or rotameter, AC operation only, weighs 16 pounds (7.25 kg)

Cat. No. 228-9615.....115 V

Cat. No. 228-9620.....230 V

More Information
skcinc.com

VersaTrap Spore Trap Cassette

Traps Smaller Mold Spores Using Higher Flows

- **High collection efficiency from 5 to 30 L/min**
  - Captures *Aspergillus* and *Penicillium* mold spores as small as 1.5 µm at 30 L/min *(see table below)*
- **A standard collection method for mold spore count and genus identification**
- **Easy analysis — ASTM Method D7391-09**
  - Positioning notches and flat edges provide for easy alignment on microscope stage
  - Uniform, well-defined rectangular deposition
- **Optimized slide adhesive**
  - Optically clear and tested for superior adhesion
- **SureSeal certified leak-free cassettes for sample integrity**
- **Unique serial number on each cassette for sample traceability**

QuickTake 30 Pump Ideal for Spore Traps
see pages 34-35

VersaTrap Spore Trap Cassettes provide the sampling versatility you need to capture mold spores and other particles ranging from 1.5 to 3.9 µm. Sampling is as easy as selecting the flow rate that will target the desired particle size *(see table)*, calibrating a pump to the flow rate, and collecting the sample.

High Flows + Low Cut-points + No Particle Bounce =
High Collection Efficiency

Flow Rate (L/min)	VersaTrap 50% Cut-point (µm)
30	1.5
25	1.7
20	1.9
15	2.3
10	2.8
5	3.9

More Information

Visit skcinc.com/instructions/1649.pdf

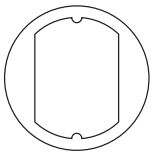
See astm.org for spore trap analysis Method ASTM D 7391-09.

Visit astm.org/COMMIT/SUBCOMMIT/D2208.htm for additional guidance on bioaerosol sampling.

VersaTrap Design

The narrow slit inlet focuses particles toward the clear glass slide coated with a sticky substrate that holds the sample securely. Targeted size particles are effectively held in a well-defined rectangular footprint. Each slide is encased in a SureSeal certified leak-free cassette to ensure sample integrity.

VersaTrap Makes Analysis Easy



- Designed for easy slide removal
- Positioning notches and flat edges for fast, easy alignment
- Well-defined rectangular footprint for accurate analysis using standard equipment
- Adhesive prevents blurring or wash off during staining
- Unique serial numbers for sample traceability

Description	Cat. No.	Qty.
VersaTrap Spore Trap Cassettes, 37 mm, *limited shelf-life*	225-9820	10
	225-9821	50

For a list of microbiological laboratories, go to skcinc.com/lab.

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Button Aerosol Sampler

Personal Filter Sampler for Inhalable-size Bioaerosols

- Collects bioaerosols for viable or non-viable analysis
- Autoclavable
- 4 L/min flow rate enhances sensitivity
- Follows closely the ISO 7708/CEN sampling criteria for inhalable particulate mass
- Inlet design reduces oversampling of very large particles and sensitivity to wind direction/velocity
- Stainless steel construction reduces electrostatic effects
- Small, lightweight for personal sampling; ideal for area sampling

Sample Time:	*Varies*
Sample Rate:	*4 L/min optimum*
Sample Pump:	*AirChek XR5000 Essential, Connect, or TOUCH*
Sample Media:	*25-mm filters*
Tubing:	*1/4-inch ID*

The Button Aerosol Sampler provides superior collection of inhalable particles, including bioaerosols such as bacteria and fungal spores for viable or non-viable analysis. Its high collection efficiency is due to its unique features:

- **Porous curved-surface inlet** improves collection characteristics of inhalable particles (< 100-µm aerodynamic diameter).
- **Stainless steel inlet** reduces electrostatic effects and contains evenly spaced holes that act as sampling orifices for multi-directional sampling and low sensitivity to wind direction and velocity.
- **Sampler is autoclavable**
- **Filter proximity to the inlet** minimizes transmission losses and provides equal distribution of particles and low intersample variation.

The Button Sampler follows closely the ISO 7708/CEN sampling criteria for inhalable particulate mass when operated with a sample pump at 4 L/min.

Selecting a Filter for Bioaerosol Sampling

Use the Button Sampler with a 25-mm gelatin filter to maintain the survival of stress-sensitive microorganisms during short sampling periods for viable analysis *(see About above right)*. For non-viable analysis, use a 25-mm MCE or PVC filter. Polycarbonate filters are ideal for sampling multiple bioaerosols. *See Wang, C., et al. below right.*

Description	Cat. No.	Qty.
Gelatin, sterilized	225-9551	50
MCE, 1.2 µm	225-1912	100
Polycarbonate, 0.8 µm	225-1601	100
PVC, 5.0 µm	225-5-25	100

Description		Cat. No.
Button Sampler, *requires a 25-mm filter; see above*		225-360
Button Sampler Pump Kit includes Button Sampler, standard AirChek XR5000 Sample Pump, single charger, 3 feet (0.9 meter) of Tygon tubing, and calibration adapter, *requires a 25-mm filter; see above*	100-240 V	210-4121
Accessories		
Button Sampler Calibration Adapter		225-361
Filter Transport Case, for 25-mm filters, conductive plastic		225-67

ABOUT

Using Gelatin Filters with the Button Sampler

For maximum microorganism survivability and superior collection of inhalable-size bioaerosols, use sterile gelatin filters with the SKC Button Sampler. The Button Sampler features a unique inlet and proximity of the filter to the inlet to minimize transmission losses and provides for equal distribution of particles and low intersample variation. The Button Sampler is autoclavable, making it ideal for applications requiring pre-sterilization. Combining the Button Sampler with the nurturing properties of gelatin filters creates a sampler that is most efficient at collecting inhalable bioaerosols for viable or non-viable analysis.

More Information

Clark Burton, N., et al., "Physical Collection Efficiency of Filter Materials for Bacteria and Viruses," Annals of Occup. Hyg., Sept. 2006, pp. 1-9

Aizenberg, V., et al., "Performance of Air-O-Cell, Burkard, and Button Samplers for Total Enumeration of Airborne Spores," AIHA Journal, Vol. 61, Dec. 2000, pp. 855-864

Adshikari, A., et al., "Performance of the Button Sampler for Outdoor Bioaerosol Collection," abstract from American Assoc. of Aerosol Research Conf., 2002, NC

Wang, C., et al., doi:10.1371/journal.pone.0120308

Sterile Surface Swab Kit

For Biological Sampling

The Sterile Surface Swab Kit is ideal for determining the relative degree and type of biological contamination in an area. This non-destructive method can be used safely on most surfaces and is ideal for irregular surfaces such as air return grills. The rayon tip is inert and non-toxic and permits good sample retrieval and adsorption. Each kit includes 10 sterile swabs in transport tubes and 10 templates (5 x 10 cm).

Sterile Surface Swab Kit*
Cat. No. 225-2402..... ea

Sterile Surface Swabs only*
Cat. No. 225-2400.....pk/50

* *Limited shelf-life*

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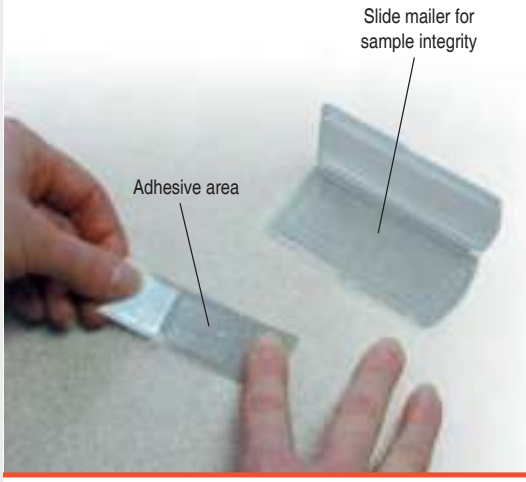
Visit skcinc.com/Training

Stick-to-it Lift Tape

Surface Sampling of Biological Contaminants



- Easy to use, inexpensive slides
- Consistent sample area for better data interpretation
- Flexible plastic for sampling irregular surfaces
- Individually serialized for sample identification

Stick-to-it flexible plastic microscope slides feature an adhesive area for easy sampling. Identify the sample area, press slide adhesive to the surface, place slide in provided mailer, and send it to a laboratory for analysis.

Description	Cat. No.	Qty.
Stick-to-it	225-9808	pk/10
	225-9809	pk/50

Quantity discounts may be available. Contact your SKC representative.

Carpet Sampling Cassettes

Collection of Fungal Spores for Microscopic Analysis

- Nozzle for easy sampling of irregular surfaces/carpeting
- Collect fungal spores in settled dust using a high flow pump

Designed for the collection of fungal spores from carpets and other dusty areas, the Carpet Sampling Cassette contains a 0.4-µm pore size polycarbonate filter preloaded into a 37-mm cassette with an attached microvacuum nozzle. A high flow pump, such as the QuickTake 30 *(see pages 34-35)*, is used for sample collection at a recommended flow rate of 10 L/min. Samples are sent to an environmental microbial laboratory for analysis of fungal spores.

Sample Time:	*Varies*
Sample Rate:	*10 L/min, recommended*
Sample Pumps:	*High-volume vacuum or QuickTake 30*
Tubing:	*1/4-inch ID and 3/8-inch ID*

Description	Cat. No.	Qty.
Microvacuum Carpet Sampling Cassette, 37-mm, 0.4-µm polycarbonate filter in banded styrene cassette with microvacuum nozzle	225-9542	ea
Carpet Sampling Cassette Kit includes 10 microvacuum carpet cassettes Cat. No. 225-9542, 10 x 10-cm disposable templates, Luer adapters, zip bags, and labels	225-9540	ea
Templates		
Disposable manila paper, 10 x 10 cm	225-2415	250
	225-2415A	10

For Microvacuum Cassettes for asbestos, see page 165.

Portable Instruments

SKC Noise — Unheard of Ease in Noise Monitoring

SKC introduces noise measurement instruments that provide ease of use, accuracy, and the features you need. SKC Noise instruments make workplace assessments and environmental monitoring easy. Get a direct line to the SKC team of Certified Occupational Hearing Conservationists and the quality and service you trust, with SKC Noise!

*See what all the noise is about on pages **146 to 153**.*

Deployable Precision Real-time Monitors

SKC is pleased to partner with Environmental Devices Corporation to offer deployable precision instruments for real-time personal, indoor air, and environmental monitoring of particulates and other contaminants and parameters.

*See pages **154 to 163** for more information on an instrument for your application.*

NoiseCHEK

NEW!

Personal Noise Dosimeter — Easiest to Use, Most Reliable Value

Introducing the SKC NoiseCHEK Dosimeter! Designed for ease of use and accuracy by our team of Certified Occupational Hearing Conservationists, NoiseCHEK provides more data and versatility than any Class 2 dosimeter on the market. Experience seamless noise measurement along with the high level of SKC quality, service, and expertise you trust.

Tired of all the noise in your noise management program?
WE'RE HERE TO HELP!

- **Measures 70 to 140 dB and peak level up to 143 dB**
  - A, C, and Z weighting; Peak C or Z weighted
  - Simultaneous A and C weighting
  - Fast and slow response time
- **Selectable exchange rate to meet different regulations**
  - 3, 4, or 5 dB
- **Four programmable virtual dosimeters for simultaneous compliance monitoring**
  - OSHA HC, OSHA PEL, MSHA, ACGIH, or custom
- **Meets ANSI S1.25, IEC61252 (Class 2)**
- **Largest display screen on a cable-free dosimeter — readable in direct sunlight**
  - 9 lines of user-selectable displayed data
  - Configure display and easily view parameters for each virtual dosimeter: SPL, Lavg, Leq, Dose, TWA, projected dose and TWA, threshold, exposure, and more
  - Octave band view
- **Device lockout feature for security**
- **Datalogging and time history — 180+ hours memory capacity**
- **40+ hours of run time with Li-Ion battery**
- **Easy automatic calibration with AcoustiCHEK Calibrator,** *see page 152*
- **DataTrac dB software for dosimeter setup and data management**
- **Bluetooth low-energy (BLE) connectivity to mobile devices**
  - Monitor one or more in-range dosimeters with SmartWave dB mobile app, *see page 147*
  - Non-BLE model available
- **Voice tag recording standard on BLE model**
- **Create field notes on BLE model**
- **Threshold-triggered noise recording on BLE model**
- **Expert support from the SKC team of Certified Occupational Hearing Conservationists (COHC)**

1/3 Octave Band Filter standard on **ALL MODELS!**

Connect with NoiseCHEK from Mobile and PC

SmartWave dB app
Free for iOS and Android Tablets/Phones

- Start/pause/stop NoiseCHEK
- View setup and monitor readings for up to four virtual dosimeters
- View octave band and history
- Add and review field notes on history files
- Generate and share compliance reports via e-mail and text

DataTrac dB Software
Free Download to PC

- Set up four virtual dosimeters
- Schedule sampling
- Download data
- Enable/disable device lockout
- Listen to voice recordings
- Review notes
- Generate and share compliance reports

ORDERING

NoiseCHEK	Cat. No.
Dosimeter Only, *requires charging dock; see below* C!	701-001
Single Kit with Class 2 Calibrator includes dosimeter, one-unit charging dock with power supply, USB cable, and USB drive with manual, in a protective carry case	701-001K-C
3-pack Kit with Class 2 Calibrator includes 3 each: dosimeters and one-unit charging docks with power supplies, 1 each: replacement windscreen, USB cable, and USB drive with manual, in a protective carry case	701-001K3-C
5-pack Kit with Class 2 Calibrator includes 5 each: dosimeters, 1 each: five-unit charging dock with power supply, replacement windscreen, USB cable, and USB drive with manual, in a protective carry case	701-001K5-C

C! *Requires calibration using AcoustiCHEK calibrator sold separately; see Accessories*

Accessories		Cat. No.
1-unit Charging Dock provides charging and connection to PC, *requires power supply, see below*		701-002
5-unit Charging Dock provides charging and connection to PC, *requires power supply, see below*		701-003
Power Supply for Charging Docks, 12 V DC, with interchangeable plugs	100-240V	220-600
Replacement Windscreen		701-004
AcoustiCHEK Calibrator, Class 2, *see page 152 for details*		703-002

For more on AcoustiCHEK Calibrators and noise instrument recalibration, see pages 152-153.

SoundCHEK Essential

SKC SoundCHEK Essential is exactly what you need to perform workplace noise assessments and environmental monitoring. Get easy setup, intuitive operation, and high versatility in a sound level meter — at a great value. SoundCHEK Essential by SKC gives you a direct line to the experts you trust for quality, service, and support.

NEW! Sound Level Meter — Ease, Versatility, and Value

Cut through the noise and **call SKC!**

Micro USB Type B connection (not shown)

Meets ANSI S1.4:2014 and IEC 61672-1:2013, Class 2

- **Highly intuitive operation**
- **Fast switching between applications**
- **Measures 25 to 140 dB**
  - Peak level from 40 to 143 dB
- **User-selectable measurement parameters**
  - Dual measurements
  - A, C, and Z weighting
  - Slow, Fast, and Impulse
  - OSHA and ACGIH settings
- **Timer and datalogging**
  - 6000 measurements stored (1 MB memory)
- **Large full-color display**
  - dB, SPL, Leq, Lmax, Lmin, Peak, Ln (3 Levels), and one user-defined value
- **12-hour continuous run time on alkaline batteries**
- **Accurate calibration with SKC AcoustiCHEK Calibrator,** *see page 152*
- **Ergonomic and lightweight – only 305 grams (10.7 ounces)**
- **Free cloud-based app and PC-based software (software upgrade available)**
- **Available in Class 1 and Class 2**
- **Multi-language**

Easy, Accurate, and Versatile Sound Level Meter that
MAKES YOUR JOB EASIER!

SoundCHEK Essential — Data Storage/Management Options

CHEKbox

Cloud-based via PC

- Free secure starter storage; upgrade to Pro is available
- Powerful employee and exposure database
- Calculators for dose and hearing protection
- Site plans with locations and more

Visit skcCHEKBox.com

DataCHEK® / DataCHEK® PRO

PC-based

- Available as a free download
- Upgrade to Pro for expanded features and analysis
  - Graphical views
  - Analysis for hearing protection
  - Dose calculations

ORDERING

SoundCHEK	Cat. No.
SoundCHEK Essential includes **Class 1 meter**, rubber boot, 4 AA batteries, USB cable, wrist strap, windscreen, and USB drive with manual, in a protective carry case C!	702-001
SoundCHEK Essential includes **Class 2 meter**, rubber boot, 4 AA batteries, USB cable, wrist strap, windscreen, and USB drive with manual, in a protective carry case C!	702-002

C! *Requires calibration using AcoustiCHEK calibrator sold separately; see Accessories*

Accessories	Cat. No.
Replacement Microphone, Class 1, *½-inch pre-polarized 25 mV/Pa electret capsule*	702-020
Replacement Microphone, Class 2, *½-inch pre-polarized 25 mV/Pa electret capsule*	702-019
Replacement Windscreen, *2.5-inch diameter for ½-inch microphones*	702-016
AcoustiCHEK Calibrator, *see page 152 for details* Class 1 Class 2	 703-001 703-002
Pre-amp Assembly, for all models of SoundCHEK Essential and Connect	702-022

SoundCHEK Connect

SKC brings wireless connectivity to sound measurement with **SoundCHEK Connect Sound Level Meters.** Perform measurements with one of the easiest-to-use instruments on the market while data stores in your secure cloud account, ready for reporting. SoundCHEK Connect works just as easily in non-wireless environments. SoundCHEK Connect by SKC gives you a direct line to the experts you trust for quality, service, and support.

Cloud-connected Multi-application Sound Level Meters

NEW!

Choose SKC because your noise monitoring program matters!

- **Intuitive operation**
- **Measures 25 to 140 dB (Class 1), 30 to 140 dB (Class 2)**
  - 40 to 143 dB Peak range
- **Dual measurements and time histories (as small as 10 ms)**
  - A, C, and Z weighting
  - Slow, Fast, Impulse, and Peak
  - OSHA and ACGIH settings
- **Selectable parameters**
- **Wi-Fi connectivity**
  - Also operates easily in non-wireless environments with direct output to .csv format
- **Models available with modules for 1/1 octave band, statistics and event recording, and 1/1-1/3 octave band**
- **Built-in hearing protection database**
- **Large, full-color display**
- **Advanced timers and datalogging**
- **Voice memo standard on all models**
- **Accurate calibration with SKC AcoustiCHEK Calibrator, see page 152**
- **Free cloud data storage**
- **All models available in Class 1 and Class 2**
- **Multi-language**

Wireless Connectivity and Ease of Use in

Truly Versatile Sound Level Meters

SoundCHEK Connect — Data Storage/Management

CHEKbox

Cloud-based via Wireless

- Free secure starter storage; upgrade available
- Powerful employee and exposure database
- Calculators for dose and hearing protection
- Site plans with locations and more

Visit skcCHEKBox.com

ORDERING

SoundCHEK Connect

Class 2

CAT NO.	Sound Level Meter 702-009	Sound Level Meter SO 702-010	Sound Level Meter SE 702-011	Sound Level Meter SEO 702-012
Parameters: Lp, Leq, Lmax, Lmin, Peak, LE	●	●		
Parameters: Lp, Leq, Lmax, Lmin, Peak, LE, Ltm3, Ltm5, Lday, Levening, Lnight, Ldn, Lden, NA, 10 definable Ln values			●	●
1/1 Octave Module		●		
Statistics and Event Recording Module			●	●
1/1-1/3 Octave Module				●
Hearing Protection Database	●	●	●	●
Meets ANSI S1.4 2014 and IEC 61672-1:2013 Class 2	●	●	●	●
Wi-Fi Connectivity: Also connects with PC via USB with direct .csv file output	●	●	●	●

All models include meter, rubber boot, 4 AA batteries, USB cable, wrist strap, windscreen, and USB drive with manual, in a protective carry case C1

C1 *Requires calibration using AcoustiCHEK calibrator sold separately; see Accessories*

Accessories	Cat. No.
Replacement Microphone, Class 1, *½-inch pre-polarized 50 mV/Pa electret capsule*	702-021
Replacement Microphone, Class 2, *½-inch pre-polarized 25 mV/Pa electret capsule*	702-019
Replacement Windscreen, *2.5-inch diameter for ½-inch microphones*	702-016
AcoustiCHEK Calibrator, *see page 152 for details*	
Class 1	703-001
Class 2	703-002
Pre-amp Assembly, for all models of SoundCHEK Essential and Connect	702-022

Need information on Class 1 SoundCHEK Connect instruments? Contact SKC today!

AcoustiCHEK

NEW!

Acoustic Calibrators for SKC Noise Instruments

The **SKC AcoustiCHEK Calibrator** is specifically designed for easy calibration of the SKC NoiseCHEK Dosimeter and SoundCHEK Essential/SoundCHEK Connect Sound Level Meters with ½-inch microphones. In the lab or in the field, AcoustiCHEK has you covered.

Calibration — the foundation of accurate noise measurement
CALL SKC!

- **Easy-to-use interface**
- **Class 1 and Class 2 models available**
  - Selectable outputs of 94 dB, 104 dB, and 114 dB at 1000 Hz
- **70 hours operation on AA alkaline batteries**
  - Auto-off feature
- **Designed for ½-inch microphones**
- **Automatic calibration for SKC sound and noise instruments**
- **Supplied with a Certificate of Manufacturer Calibration**
  - NIST-traceable certificate option available
- **IEC 60942:2017 compliant**

ORDERING

Description	Cat. No.
AcoustiCHEK Calibrator includes AA batteries	
Class 1 with built-in barometer	703-001
Class 2	703-002

Need your SKC noise instrument calibrated? See page 153.

SKC Confidence in Calibration

SKC Noise Instrument Calibration Services

Noise exposure data is only as accurate and defensible as the measuring instrument and its calibration. Not only is annual instrument calibration best practice, it is essential when using noise exposure data to show compliance with OSHA, MSHA, and ACGIH standards; selecting effective hearing protection; or, proving environmental compliance. The SKC Noise Calibration Laboratory offers fast, NIST-traceable calibration of SKC noise instruments. Testing is performed in conformance with ANSI S1.25 and IEC 61252 standards.

- **Class 1 calibration standards**
- **Confirmation of accuracy based on Class 1 and Class 2**
  - SoundCHEK sound level meters
  - NoiseCHEK noise dosimeters
  - SKC microphones
  - AcoustiCHEK calibrators
- **Service includes:**
  - Check of functional components
  - Recalibration
  - Test reports
  - NIST-traceable calibration certificate
- **Trained, dedicated technicians**
- **Fast turnaround time**
- **Competitive pricing**

CONTACT SKC FOR MORE INFORMATION!

Environmental Devices Corporation

HAZ-SCANNER IEMS

Portable Indoor Environmental Monitoring Station

- **Direct reading**
- **Measures and displays data for up to 14 critical indoor air quality parameters**
  - **Standard IEMS configuration** measures 5 parameters including PM10 or TSP particulates, CO_2, CO, temperature, and relative humidity
  - **Add up to 9 optional interchangeable sensors and/or IEMS-specific meters**
    Choose from additional toxic gas sensors, PID for VOCs, or IEMS-specific meters for light intensity, sound/noise, atomic/nuclear radiation, ELF radiation, and air velocity
  - Available analog input port for alternative meter
- **Interchangeable size-selective impactors available for PM1.0, PM2.5, or PM4.0 (close approximation of respirable)**
- **In-line standard 37-mm or optional 25-mm gravimetric filter cassette provides concurrent filter sampling for chemical and biological analyses**
- **2 L/min internal sample pump**
- **Optional alarm indicator light and siren for user-defined threshold limits**
- **Removable handheld sensors for spot-checking remote areas**
- **Datalogging**
  - Real-time wireless data transmission and wireless network software options available
- **Easy-to-use graph and reporting software — compatible with PC and Mac**

HAZ-SCANNER IEMS Applications

- *Snapshot air profiles at schools*
- *LEED Green Building certifications*
- *Job task analysis*
- *Complement to regulatory compliance*
- *IEQ assessment*

For more information, go to skcinc.com and search "770-800."

Performance Profile

Data Storage: 454,545 data points

Data Display: TWA, STEL, MAX, MIN

Run Time: 8 hrs on rechargeable NiMH battery; continuous on AC

Dimensions/Weight: 7 x 4 x 11 in (17.8 x 10.2 x 28 cm); 6 lbs (2.7 kg)

Description	Cat. No.
HAZ-SCANNER IEMS Standard Configuration includes impactor/sensors for PM10 and TSP, CO_2, CO, temperature, and RH, NiMH battery and charger, HazComm Pro Software, cables, CD with instructions, and carry case, ***contact SKC for additional impactors, sensors, and IEMS-specific meters***	770-800

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Visit skcinc.com/Training

AIR-AIDE Airborne Particulate Indoor Air Monitor

With Interchangeable PM Size Selectors

- High resolution and temperature stability
- Long-life air sample pump maintains accurate 2 L/min flow for particle separation
- Interchangeable size-selective impactors — choose PM10, PM2.5, PM1.0, or ISO respirable (4.0 µm)
- Built-in calibration factors for fine and coarse particulate matter
- NIST-traceable calibration
- Large data storage capacity
  - Run continuously for up to 15 months without downloading
- On-screen programming of sampling and data storage parameters
- PC-based software included for downloading and graphing stored data
- User-defined audible alarm
- Location codes for tagging data
- Optional wireless data transmission to PC
- Includes PC-based DustComm Pro Software for downloading, basic trend analysis, and comprehensive graphical reporting

Performance Profile

Sensing Range: 0.001 to 20 mg/m³ (0.01 to 200 mg/m³- optional)

Particle Size Range: 0.1 to 100 µm

Data Storage: 21,600 data points

Data Display: Concentration in mg/m³ and TWA, MAX, MIN, and STEL, date, and time

Run Time: ≥ 10 hrs on rechargeable NiMH battery; continuous on AC

Dimensions/Weight: 3 x 6 x 9 in (7.6 x 15.2 x 23 cm); 5 lbs (2.3 kg)

Description		Cat. No.
AIR-AIDE Monitor Kit includes monitor (0.001 to 20 mg/m³), NiMH battery, charger/adapter (100-240 V), rotameter, impactor sleeve for TSP, DustComm Pro Software, cable, and instruction manual		770-600
Accessories		
Impactor Grease		770-211
Size-selective Impactors	PM10	770-606
	PM2.5	770-605
	PM1.0	770-604
	Respirable (4 µm)	770-603

Wireless data transfer radio modems and other accessories are available. Contact SKC.

SM-4000 Direct-reading Silica Monitor

Complements Compliance Air Sampling

- **Low sensing range down to 1 µg/m³**
- **High precision of ± 3 µg/m³**
- **Readings display in µg/m³ — no conversions needed**
- **Comes standard with GS-3 Cyclone that conforms to ISO 7708/CEN criteria**
- **Concurrent filter sampling option for lab analysis and/or cross-calibration of displayed results**
  - Gravimetric filter cassette located directly behind the sensor for maximum particle deposition
  - Internal pump flows at 2.75 L/min (user adjustable)
- **Sensor and filter cassette clips directly in the breathing zone**
- **Datalogging**
  - DustComm Software for downloading, basic trend analysis, and graphical analysis and comprehensive graphical reporting

Silica Monitor SM-4000 is a direct-reading personal dust monitor optimized for the measurement of silica levels specified in the OSHA Final Silica Rule. Calibrated to a known amount of silica dust, SM-4000 provides direct readings for determination of peak silica concentrations for mitigation and lower TWAs. The SM-4000 internal pump and gravimetric filter cassette (directly behind the sensor) provide for concurrent collection of a gravimetric sample for silica analysis and cross-calibration. Use the SM-4000 for:

- Perimeter monitoring of regulated areas with user-set alarms
- Evaluation of controls and worker activities
- Recording time history of dust levels
- Filter sampling for lab analysis
- Task monitoring
- Selecting PPE

Easy to use SM-4000

Clip the sensor with GS-3 Cyclone to a worker's collar in the breathing zone.

Clip the SM-4000 to a worker's belt.

Read dust concentration on the SM-4000 display. Download data for graphing/reporting.

Performance Profile

Sensor: Light scattering

Flow Rate: 2.75 L/min (user adjustable)

Sensing Range: 1 to 20,000 µg/m³ (0.001 to 20 mg/m³)

Precision: ± 3 µg/m³ (0.003 mg/m³)

Display: Concentration in µg/m³, TWA, STEL, MIN, and MAX

Accuracy: ± 10% to filter gravimetric SAE fine test dust

Gravimetric Filter Sampling Requirements: 37-mm PVC filter for the supplied 37-mm in-line cassette (25-mm filter and cassette options are available)

Description		Cat. No.
SM-4000 Direct-reading Personal Silica Monitor Kit includes SM-4000 Monitor, GS-3 respirable cyclone, 37-mm in-line filter cassette, serial computer cable, serial to USB adapter cable, battery charger, zeroing filter, HAZ-DUST media CD with instruction manual and DustComm Pro Software (compatible with Windows XP, 7, 8, and 10), and carry case C!	110-240 V	770-700
Accessories		
Calibration Standard for Monitor, for verifying span and optical sensor performance		770-710
Calibration Jar, for calibrating and setting pump flow when using a respirable cyclone		225-112
Cleaning Kit, for cleaning SM-4000 Monitor		770-305
Replacement Battery Pack		770-4105

C! *Requires calibration with equipment sold separately; see Accessories*

HAZ-DUST 7204

Direct-reading and Compliance Dust Monitor in One Device

NEW!

- **Flow compensated pump for compliance monitoring**
  - User-selectable flow rate
- **Accepts any 37 or 25-mm preweighed, preloaded filter cassette for gravimetric samples**
  - Use filter samples to cross-calibrate to local dust
- **Easy-to-clean miniaturized optical sensor mounts in the OSHA-defined breathing zone**
- **The only dust monitor that allows true size-selective sampling in the breathing zone**
  - **Inhalable** – 2 L/min with IOM,* supplied with monitor
  - **Thoracic** – 2 L/min with thoracic impactor, supplied with monitor
  - **Respirable** – 2.75 L/min with GS-3 Cyclone*
- **Create on-screen libraries of aerosol profiles and name data sets**
- **22+ hours run time with Li-Ion battery**
- **Compact and easy to hold**
  - 4.75 x 3.5 x 2.25 inches (12.1x 8.9 x 5.7 cm)
  - 1.14 lbs (0.52 kg)
- **Optional wireless and networking capabilities**
- **Large color touch display**
  - Real-time rolling graphs — 10 sec or 1 sec
  - On-screen statistics
- **Displays in µg/m³ or mg/m³ (user selectable)**
- **In-the-field calibration verification**

*Meets ISO 7708/CEN criteria

CE

Performance Profile

Sensor: Light scattering
Flow Rate: 1 to 5 L/min
Sensing Range: 0.001 to 500 mg/m³ or 1 to 500,000 µg/m³
Measuring Range: Particle sizes from 0.1 to 100 µm
Precision: ± 0.02 mg/m³
Accuracy: ± 10% to filter gravimetric SAE fine test dust
Calibration: Gravimetric reference NIST-traceable –SAE fine test dust (ISO 12103-1)
Display: Concentration in mg/m³ or µg/m³, OSHA TWA, AVG, MAX, MIN, STEL, Ceiling, date, time, aerosol profiles, data sets, alarm levels, log rate, flow, real-time rolling graph

Description	Cat. No.
HAZ-DUST 7204 Monitor Kit includes monitor with battery, 37-mm 2-piece opaque filter cassette, open-faced sampling adapter, thoracic sampling inlet, IOM inhalable sampling head (installed), flow adapter, zero accessory, universal battery charger (100-240 V) with adapters, DustComm Pro Software and manual on USB, and mini-USB download cable, in a hard carry case C!	770-7204
Size-selective Sampling Heads	
Respirable Sampling Head, GS-3 Cyclone, mounts on HAZ-DUST 7204 sensor, *requires adapter, see below*	225-103
Adapter for Respirable Cyclone, *required when using GS-3 Cyclone*	770-313
Recommended Filters	
Quartz Filter, 37 mm, for gravimetric analysis and elemental chemical analysis of carbon-based compounds, pk/25	225-1822
PVC Filter, 37 mm, for economical general gravimetric analysis only, pk/100	225-5-37
Accessories	
Calibration Standard for Monitor, for verifying span and optical sensor performance	770-327
Calibration Jar, for calibrating and setting pump flow when using respirable sampling head	225-112

C! *Requires calibration with equipment sold separately; see Accessories*

Environmental Devices Corporation

SPLIT2 Real-time Dust Monitor

Direct Read-out with Filter Option Using Any 2 L/min Pump

- **Economical, flexible, and direct reading**
- **Highly accurate**
  - ± 10% to NIOSH Method 0600 using SAE fine test dust
- **Reliable light-scattering technology**
- **Provides concurrent gravimetric sampling for different dust fractions when used with any 2 L/min sample pump**
  - Respirable dust with GS-3 Cyclone
  - Inhalable dust with IOM Sampler
  - Use gravimetric results to program monitor for cross-calibration of displayed results
- **Compact and lightweight**
- **Programmable with easy-to-use 4-button keypad**
- **Easy-to-use software for flexible data management**
- **Alarms at hazardous concentrations**
- **DustComm Pro Software for downloading, basic trend analysis, and comprehensive graphical reporting**

CE

Attach to a pump to monitor dust levels in real time while collecting a gravimetric sample. SKC recommends using the AirChek 52/Sidekick pump. See pages 24-25.

Performance Profile

Sensing Range: 0.01 to 200 mg/m^3

Particle Size Range: 0.1 to 100 µm

Data Storage: 21,500 data points

Data Display: Concentration in mg/m^3 and TWA, MAX, MIN, and STEL

Run Time: ≥ 8 hrs on rechargeable NiMH battery

Dimensions/Weight: 7.1 x 3.1 x 1.8 in (18 x 8 x 4.5 cm); 1.7 lbs (0.78 kg)

The SPLIT2 Real-time Dust Monitor offers high flexibility in personal or area dust monitoring. Combine SPLIT2 with any 2 L/min sample pump, a sampling head (GS-3 respirable cyclone or IOM inhalable sampler), and preweighed filter for direct read-out and real-time profile of dust concentration and concurrent gravimetric dust sampling.

Description		Cat. No.
SPLIT2 Monitor with accessories includes monitor, lapel bracket, zeroing accessory, calibration standard, computer cable, DustComm Pro Software, NiMH battery pack, AC charger/adapter, and carry case. *For concurrent gravimetric sampling, see kits below*	**110-240 V**	**770-300**
SPLIT2 Monitoring Kit with IOM *(pump not included)* includes all items in Cat. No. 770-300, IOM adapter, and IOM Sampler with cassette and transport clip Cat. No. 225-70A, *see p. 125 for filters for IOM Sampler, requires sample pump; see pages 24-25*	**110-240 V**	**770-300K1**
SPLIT2 Monitoring Kit with Cyclone *(pump not included)* includes all items in Cat. No. 770-300, GS-3 Cyclone adapter, and GS-3 Cyclone Cat. No. 225-103, *see pp. 104-112 for preloaded filters, requires sample pump; see pages 24-25*	**110-240 V**	**770-300K2**

SPLIT2 Monitors and accessories are available separately. Contact SKC for more information.

HAZ-DUST I Real-time Particulate Monitor

Portable PM Survey Tool

- **Easy operation and instantaneous readings in mg/m³**
- **Highly sensitive — measures down to 0.01 mg/m³**
  - Monitors OSHA/NIOSH reference methods
- **Selectable dual measuring range feature**
  - Choose particulate concentration measurements between 0.01 and 20 mg/m³ and from 0.1 to 200 mg/m³
- **Easy-to-read digital display**
- **Low battery indicator**
- **Lightweight, rugged, and portable**
  - Optional tripod mounting
- **Optional datalogger with display and user-selectable alarm threshold**
- **Includes DustComm Pro Software for downloading, basic trend analysis, and comprehensive graphical reporting**

CE

The HAZ-DUST I is designed as a screening tool for IH, IAQ, and fenceline/perimeter monitoring of construction and other projects. HAZ-DUST I is factory calibrated for respirable particulate mass (50% cut-point of 4 µm) at ± 10% with SAE fine dust test. An alternative 10-µm cut-point calibration is available as a special order. When combined with the datalogger accessory, maximum automation is achieved for data collection, statistical analysis, graphs, and report generation.

Performance Profile

Sensing Range: 0.01 to 200 mg/m³

Particle Size Range: 0.1 to 50 µm

Data Storage (with datalogger accessory): 21,500 data points

Data Display: Concentration in mg/m³

Run Time: > 8 hrs on rechargeable NiMH battery

Dimensions/Weight: 9 x 3 x 1.5 in (23 x 7.6 x 3.8 cm); 1.25 lbs (0.6 kg)

Description		Cat. No.
HAZ-DUST I Monitor includes battery, charger, and carry case C1	110-240 V	770-1100
Accessories		
Datalogger, provides data storage, on-screen display of statistics, and user-selectable alarm threshold; includes analog signal cable, computer interface cable, and DustComm Pro Software.		770-113
Tripod Stand, adjustable stand and mounting plate for unattended monitoring		770-129
Calibration Standard, light-scattering device provides a constant value for verifying calibration		770-102
Zeroing Accessory, for pumping filtered air into the sensor for a zero reading in contaminated environments		770-130
Replacement Battery Pack, NiMH		770-108

C1 *Requires calibration with equipment sold separately; see Accessories*

For a particulate monitor with an internal constant flow pump, see the HAZ-DUST 7204 on page 157.

Environmental Devices Corporation

EPAM-5000

Direct Readout Plus Filter Sample for EPA PM Criteria

- **Fast, easy setup**
- **Interchangeable impactors**
- **Highly sensitive and accurate**
  - Accuracy is ± 10% filter gravimetric SAE fine dust test
- **Internal 4 L/min sample pump***
- **Unique aerodynamic particle-sizing real-time sensor**
  - Optional EPA FRM-style 47-mm filter cassette for gravimetric reference
- **High correlation to EPA PM10 methods and TEOM**
  - Ideal for saturation sampling
- **Wireless data transmission option transmits data up to 5 miles**
- **Ideal for ambient, environmental, and IAQ investigations and baseline surveys**
- **DustComm Pro data analysis/reporting software included**
- **Wireless network software option available for Windows**
- **Temperature controlled enclosure accessory available**

Performance Profile

Sensing Range: 0.001 to 20 and/or 0.01 to 200 mg/m³

Particle Size Range: 0.1 to 100 µm

Data Storage: 21,600 data points

Data Display: Concentration in mg/m³ and TWA, MAX, MIN, STEL, date, and time

Run Time: ≥ 24 hours on rechargeable battery; continuous on AC

Dimensions/Weight: 14 x 6 x 10 in (35.6 x 15.2 x 25.4 cm); 10 lbs (4.5 kg)

Description		Cat. No.
EPAM-5000 Monitor Kit with impactor (measures TSP without impactor), 110-240 V charger, DustComm Pro Software, computer cable, and manual, in a carry case C!	**PM10** **PM2.5** **PM1.0**	**770-203** **770-202** **770-201**
Accessories		
Calibration Standard		**770-207**
Filter Holder, 47 mm, for gravimetric sampling, *requires filter sold separately, see below*		**770-215**
Impactors, interchangeable	**10 µm** **2.5 µm** **1.0 µm**	**770-206** **770-205** **770-204**
Filters for Gravimetric Analysis		
PTFE,† with PTFE support, 47 mm, 2.0-µm pore size, pk/150		**225-3748**
Quartz (Tissuquartz), 47-mm diameter, 432 µm thick, pk/25		**225-1823**

C! *Requires calibration with equipment sold separately; see Accessories*

* *Pump has a variable flow rate designed for use at 4 L/min to achieve proper size selection.*

† *Back pressure on PTFE filters can vary within the same lot.*

For a lighter weight model with air station capabilities, see the EPAM-7500 on page 161.

Contact SKC for EPAM-5000 optional equipment and accessories, including solar panels.

EPAM-7500

Wireless, Portable PM Monitor with Touch Screen Operation

- **Simultaneous real-time measurement and gravimetric sampling for ambient and indoor particulate matter**
  - Sensitive IR optical light scattering for real-time measurement and graphical representation of PM profile
  - 47-mm FRM-style filter holder for concurrent gravimetric sampling for cross-calibration and further PM speciation
- **Measures temperature and relative humidity**
- **Configure with accessories needed for your application:**
  - Wireless modem
  - Solar panel
  - External audible alarm
  - Remote sampling probe
  - Heating element for high-humidity areas
  - Ultrasonic wind speed and direction measurement to exclude near-field sources
    - Wind speed, wind direction, barometric pressure, heat index, and GPS in one lightweight sensor; no moving parts
- **Interchangeable single-jet impactors for PM10, PM2.5, PM1.0, or respirable**
  - Sampling inlets for PM10, PM2.5, and TSP included with instrument
- **Programmable**
- **Measurements displayed simultaneously on graphical color touch screen**
- **Internal 90-dB pulse alarm — user-selectable threshold**
- **Rechargeable Li-Ion battery provides ≥ 24-hour operation**
- **Datalogging**
  - Digital outputs include serial (RS-232), removable Compact Flash card, USB Types A and B, and ethernet port
  - DustComm Pro PC analysis/reporting software included

Environmental Devices Corporation

Performance Profile

Sensing Range: 0.001 to 400 mg/m³

Particle Size Range: 0.1 to 100 µm

Data Storage: 50,000 data points

Data Display: Concentration in mg/m³ and TWA, MAX, MIN, STEL, date, time, temperature, and relative humidity

Run Time: 12 hrs on rechargeable Li-Ion battery, continuous on AC or solar

Dimensions/Weight: 4 x 10 x 9 in (10.2 x 25.4 x 22.9 cm); 7 lbs (3.2 kg)

EPAM-7500 Applications

- *Particulate indoor air quality investigations*
- *Evaluation of dust suppression/engineering controls*
- *Walk-through IAQ surveys*
- *Dust generation monitoring*
- *Quantifications of particle migration*
- *Hot spot location and identification*
- *Hazardous waste site and fenceline monitoring*
- *Urban roadside air quality studies*
- *Baseline surveys*

Ordering Information

The HAZ-SCANNER EPAM-7500 is a configurable item and only available now through December 2020.

Contact SKC to custom order the EPAM-7500.

Environmental Devices Corporation

HAZ-SCANNER EPAS

Environmental Perimeter Air Station

- **Direct-reading**
- **Portable — easily deployed**
- **Measures/documents trace-level (ppb) gas, particulates, and meteorological parameters in real time to U.S. and EU directives**
  - Configure with up to 14 interchangeable sensors and EPAS-specific meters
  - Can equip to monitor two PM sizes simultaneously
- **Two options to customize your multi-pollutant monitoring station**
  - **Basic Kit** measures 3 parameters; add up to 11 additional sensors/meters
  - **Build Your Own System Kit:** Add up to 14 sensors/meters
  - **Use the checklist on page 163** to configure your EPAS before contacting SKC
  - **Ask an SKC representative about wireless, network, and power options**
- **Wireless networking and datalogging capabilities**
  - Network up to 8 EPAS units to one central PC or Mac; wireless network software option available
- **Operate from battery, AC, or optional solar panel**
- **Easy-to-use graph and reporting software compatible with PC and Mac**
- **Temperature controlled enclosure accessory available**

The portable HAZ-SCANNER EPAS environmental perimeter air station is easily deployed as a multi-pollutant ambient air quality monitor to scan, measure, and document critical EPA criteria pollutants including nitrogen dioxide, carbon monoxide, sulfur dioxide, ozone, carbon dioxide, particulates, VOCs, and more. The EPAS provides direct readings in real time with datalogging capabilities. The graph and reporting software is compatible with PC and Mac. ***Go to skcinc.com/EPAS.***

Ordering Information

The HAZ-SCANNER EPAS environmental perimeter air station is a custom item. Build your own system to your specific applications with unique configurations and custom sensor calibrations. **Use the checklist on page 163, and contact SKC today.**

HAZ-SCANNER EPAS

Customize to Monitor High-priority Pollutants

Create a HAZ-SCANNER EPAS to fit your applications. Use the convenient checklist below as a guide to building your EPAS *before* contacting an SKC representative.

Start with:

❑ **EPAS Basic Kit**
- ✓ PM10 or TSP particulates
- ✓ Nitrogen dioxide
- ✓ Carbon monoxide

Cat. No. 770-500K1

Add up to 11 sensors/meters separately at additional cost.

or

❑ **EPAS Build Your Own System Foundation Kit**
Cat. No. 770-500

Add up to 14 sensors/meters separately at additional cost.

Choose 1 additional particulate sensor for Basic Kit *(optional)*. Choose up to 2 for Build Your Own.
- ❑ PM1.0
- ❑ PM2.5
- ❑ PM10

Choose up to 6 interchangeable gas sensors for Basic Kit *(optional)*. Choose up to 8 for Build Your Own.*
- ❑ Ammonia (EC)
- ❑ Carbon dioxide (NDIR)
- ❑ Carbon monoxide (EC)
- ❑ Chlorine (EC)
- ❑ Ethylene oxide (EC)
- ❑ Hydrocarbon: methane-specific (NDIR)
- ❑ Hydrocarbons: non-methane (NDIR)
- ❑ Hydrogen chloride (EC)
- ❑ Hydrogen cyanide (EC)
- ❑ Hydrogen sulfide (EC)
- ❑ Nitric oxide (EC)
- ❑ Nitrogen dioxide (EC)
- ❑ Oxygen (EC)
- ❑ Ozone (metal oxide semiconductor)
- ❑ Phosphine (EC)
- ❑ Sulfur dioxide (EC)
- ❑ VOCs (PID)

Choose up to 4 EPAS-specific optional meters or meteorological sensors.*
- ❑ Temperature and Relative Humidity (NTC and CAP)
- ❑ Rain gauge (tipping bucket)
- ❑ Solar radiance (photodiode)
- ❑ Barometric pressure (piezo resistive)*
- ❑ Wind speed/direction (3-cup anemometer/vane)
- ❑ Dew point temperature (software calculation)
- ❑ Sound/Noise (Type 2 SLM)
- ❑ Atomic/Nuclear radiation (Geiger counter)

❑ **Choose to add temperature controlled enclosure (-40 to 140 F [-40 to 60 C])**

* *Barometric pressure sensor applies to both the gas sensor count and the meter count.*

Contact your SKC representative today for a quote on your custom-configured station!

For EPAS device, sensor, and meter specifications, visit skcinc.com/EPAS.

V Video | P PowerPoint | W Webinar | S Sampling Solution

Visit skcinc.com/Training

SKC Surface and Dermal Samplers

SKC is proud to announce its acquisition of the CLI surface and dermal line of assessment and decontamination products! Now there are even more SKC surface and dermal sampling solutions to help you protect worker health, prevent take-home toxics, and perform public health investigations. From isocyanates and lead to asbestos fibers and fungal spores, SKC has a solution for you.

Microvacuum Cassettes for Surface Sampling

Efficient Collection of Asbestos or Fungal Spores

- **Nozzle for easy sampling on irregular surfaces/carpeting**
- **Collect contaminants in settled dust using a sample pump**
  - 2 L/min for sampling asbestos
  - 10 L/min for sampling fungal spores

SKC Microvacuum Cassettes with microvacuum nozzle are ideal for collecting asbestos or fungal spores from carpets and other dusty surfaces. SKC Microvacuum Cassettes are available with MCE filter for sampling asbestos in settled dust on surfaces as specified in ASTM Method D5755 or with polycarbonate filter for sampling fungal spores from carpeting or other surfaces.

Microvacuum Cassettes for Asbestos or Fungal Spores				
Dia. (mm)	**Filter Specifications**	**Cassette Description**	**Cat. No.**	**Qty.**
25	0.45 µm MCE, BestChek, for TEM analysis, asbestos	Carbon-filled polypropylene with cowl and nozzle	225-322	ea
37	0.45 µm MCE, for TEM analysis, asbestos	Styrene (non-conductive) with nozzle	225-9543	ea
37	0.4 µm polycarbonate for fungal spores	Styrene (non-conductive) with nozzle	225-9542	ea
Templates		**Disposable manila paper,** 10 x 10 cm	225-2415	250
			225-2415A	10
		Disposable manila paper, 1 x 1 foot	225-2416	250
			225-2416A	10
Carpet Sampling Kit for Fungal Spores includes 10 microvacuum carpet cassettes Cat. No. 225-9542, 10 x 10-cm disposable templates, Luer adapters, zip bags, and labels			225-9540	ea

Sterile Surface Swab Kit

For Biological Sampling

The Surface Swab Kit is ideal for determining the relative degree and type of biological contamination in an area. This non-destructive method can be used safely on most surfaces and is ideal for irregular surfaces such as air return grills. The rayon tip is inert, non-toxic, and permits good sample retrieval and adsorption. Each kit includes 10 sterile swabs in transport tubes and 10 templates (5 x 10 cm).

Description	Cat. No.	Qty.
Surface Swab Kit*	225-2402	ea
Surface Swabs Only*	225-2400	50

* *Limited shelf-life*

Sample Pumps
see pages 26 - 27 and 34-35

Stick-to-it Lift Tape

- Easy-to-use, inexpensive slides
- Consistent sample area for better data interpretation
- Flexible plastic for sampling irregular surfaces
- Individually serialized for sample identification
- Suitable for collecting pollen or fibers from surfaces, insulation, etc.

Stick-to-it flexible plastic microscope slides feature an adhesive area for easy sampling. Identify the sample area, press slide adhesive to the surface, place slide in provided mailer, and send to a laboratory for analysis.

Cat. No. 225-9808.....pk/10
Cat. No. 225-9809.....pk/50

Quantity discounts may be available. Contact your SKC representative.

V Video | P PowerPoint | W Webinar | S Sampling Solution
Visit skcinc.com/Training

SURFACE SWYPE

ON-THE-SPOT CHEMICAL SCREENING FOR AT-RISK AREAS

- **Suitable for OSHA PPE Standard**
- **Fast, easy results in 3 minutes**
- **Convenient and safe**
  - Use on almost any surface – Skin SWYPEs are available on page 167
- **Inexpensive – no instruments or analysis required**
- **Available for a variety of chemicals with ACGIH® skin notations**
- **Ideal for dermal exposure reduction programs**

Determine surface contamination in 3 EASY STEPS!

Spray surface, wait 30 seconds.

Wipe with SWYPE.

Check color after 3 minutes.

Surface SWYPE Kits include 25 Surface SWYPEs (limited shelf-life) and 16-oz Cleaning/Developing Solution in spray bottle

Aromatic Amines	Aromatic Isocyanates	Aliphatic Isocyanates	Aliphatic Amines	Acid/Base	Phenols
Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
769-1021K*	769-1022K	769-1023K	769-1025K*	769-1026K*	769-1027K

**22-oz solution in spray bottle included in place of 16-oz bottle*

Replacement Surface SWYPE Indicators, pk/25, *limited shelf-life, require Cleaning/Developing Solution below*

Aromatic Amines	Aromatic Isocyanates	Aliphatic Isocyanates	Aliphatic Amines	Acid/Base	Phenols
Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
769-1021	769-1022	769-1023	769-1025	769-1026	769-1027

Replacement Cleaning/Developing Solutions, 16 and 22-oz solutions supplied in spray bottle

	Aromatic Amines	Aromatic Isocyanates	Aliphatic Isocyanates	Aliphatic Amines	Acid/Base	Phenols
Qty.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
16 oz	------	769-1062	769-1062	------	------	769-1067
22 oz	769-1061	------	------	769-1065	769-1066	------
1-gallon	769-1041	------	------	------	------	------

CHEMICAL EXPOSURE INDICATORS

SKIN SWYPE

CLI by SKC Skin SWYPE indicators provide simple, fast, and visible proof of chemical exposure on skin that may have come into contact with contaminated surfaces. Skin SWYPEs identify work practices that may result in exposure, educate workers about prevention, and reinforce safe work practices. Use in conjunction with Surface SWYPE indicators to identify at-risk areas for housekeeping.

- **Fast, easy, on-the-spot results**
- **Convenient and safe**
- **Designed for use on skin – Surface SWYPEs are available on page 166**
- **Inexpensive – no instruments or analysis required**
- **Available for a variety of chemicals with ACGIH skin notation**
- **Ideal for dermal exposure reduction programs**

2 Easy SKIN-SAFE STEPS

Wipe skin with SWYPE.

Develop SWYPE in solution.

Skin SWYPE Kits include 20 Skin SWYPEs (limited shelf-life) and 16-oz Cleaning/Developing Solution in spray bottle

Aromatic Amines	Aromatic Isocyanates	Aliphatic Isocyanates	Aliphatic Amines	Acid/Base	Phenols
Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
769-1031K*	769-1032K	769-1033K	769-1035K*	769-1036K*	769-1037K

**22-oz solution in spray bottle included in place of 16-oz bottle*

Replacement Skin SWYPE Indicators, pk/20, *limited shelf-life, require Cleaning/Developing Solution below*

Aromatic Amines	Aromatic Isocyanates	Aliphatic Isocyanates	Aliphatic Amines	Acid/Base	Phenols
Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
769-1031	769-1032	769-1033	769-1035	769-1036	769-1037

Replacement Cleaning/Developing Solutions, 16 and 22-oz solutions supplied in spray bottle

	Aromatic Amines	Aromatic Isocyanates	Aliphatic Isocyanates	Aliphatic Amines	Acid/Base	Phenols
Qty.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
16 oz	------	769-1062	769-1062	------	------	769-1067
22 oz	769-1061	------	------	769-1065	769-1066	------
1-gallon	769-1041	------	------	------	------	------

PPE Breakthrough Testing

Amines, Isocyanates, Acid or Base, Phenols and Solvents

PERMEA-TEC

BREAKTHROUGH DETECTION FOR GLOVES/PROTECTIVE CLOTHING

- **Suitable for OSHA PPE Standard**
- **Test during field use, get on-the-spot results**
- **Convenient and safe**
- **Just like wearing a flexible adhesive bandage**
- **Inexpensive – No instruments or analysis required**
- **Available for a variety of chemicals with ACGIH sensitizer notations**
- **Ideal for dermal exposure reduction programs**

Toxic chemicals can permeate protective clothing, especially gloves that are subject to repeated flexing, stretching, pressure, and abrasion. In addition, variations in chemical resistance and work with chemical mixtures can make selecting protective equipment difficult. CLI by SKC PERMEA-TEC Sensors look like small adhesive bandages, but the pad (sensor) is on the outside and adheres easily to worker hands before gloving. The color change on PERMEA-TEC Sensors shows when and where breakthrough actually occurs and enables safety professionals to select the glove or other PPE best suited for protection, employee acceptance, and cost-effectiveness.

PERMEA-TEC pre-exposure

PERMEA-TEC post-exposure

PERMEA-TEC Sensors, pk/20, no Cleaning/Developing Solutions are needed except for PERMEA-TEC Aromatic Amines and Phenols

Aromatic Amines	Aromatic Isocyanates	Aliphatic Isocyanates	Aliphatic Amines	Acid/Base	Phenols
Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
769-3001	769-3002	769-3003	769-3005	769-3006	769-3007
SOLVENTS					
In addition to a color change, each PERMEA-TEC for Solvents contains a charcoal pad that can be desorbed by a laboratory and analyzed by GC to identify highly toxic solvents or those with a poor sensor response, pk/20				Cat. No. 769-3050	

Cleaning/Developing Solutions for Aromatic Amines and Phenols

Aromatic Amines *(for use with Cat. No. 769-3001)*		Phenols *(for use with Cat. No. 769-3007)*
22-oz spray bottle	1-gallon jug	16-oz spray bottle
Cat. No.	Cat. No.	Cat. No.
769-1061	769-1041	769-1067

Tech Tips

- It is recommended that PERMEA-TEC Sensors be placed on the thumb, middle finger, and palm when wearing gloves, as these areas typically represent the highest degree of contact and abrasion.
- During initial evaluation of a new glove, a worker should be double-gloved as a safety precaution. Attach PERMEA-TEC Sensors to the outside of the glove currently in use and don the new glove over the first. Check sensors hourly to determine when breakthrough occurs and change gloves accordingly.

D-TAM SKIN CLEANSERS

- **No water, lanolin, aloe vera, alcohol, pumice, or harsh surfactants**
- **Do not enhance penetration of contaminants into skin**
- **Nonabrasive and skin-friendly, even with frequent use**
- **Remove aromatic amines (MDA, TDA, MOCA, aniline, o-toluidine, and more), isocyanates and urethanes, pesticides, phenols, epoxy resins, paints, and sealants**

**U.S. Patent Nos. 7,172,995 and 6,670,313*

CLI by SKC D-TAM Skin Cleansers play an integral role in safety and health programs. Specially formulated with high molecular weight ingredients, patented* D-TAM Skin Cleansers safely and effectively remove slightly water-soluble chemicals and lipophilic (water insoluble) chemicals used with solvents. Unlike other cleansers, D-TAM will not penetrate or degrade the skin's natural lipid barrier or cause dryness and irritation — things that make skin more susceptible to chemical contamination. SKC offers D-TAM Skin Cleansers for both semipolar and very nonpolar contaminant chemicals:

D-TAM: Removes many intermediate polarity chemicals such as phenol, dinitrotoluene, benzene, malathion, nitroaniline, toluene, captan, MDA, and more

D-TAM Gold: Removes many very nonpolar compounds such as aldrin, pentachlorophenol, MDI, DDT, PCBs, and more

D-TAM Skin Cleansers

	D-TAM	D-TAM Gold
Qty.	Cat. No.	Cat. No.
8-oz personal size	769-5011	769-5021
1-gallon jug with pump dispenser	769-5001	------

DECONtamination SURFACE SOLUTIONS

- **Safely clean aromatic amines and aromatic isocyanates from most surfaces**
- **Ideal for use after detection with Surface SWYPE indicators, *see page 166***

CLI by SKC DECONtamination Solutions are an important follow-up element in housekeeping and dermal exposure reduction programs. Use Surface SWYPE Indicators *(see page 166)* to detect chemical contamination on surfaces that can be contacted by workers or are outside of regulated areas. Follow up with DECONtamination Solutions to remove contamination and ensure minimal dermal exposures.

DECONtamination Surface Solutions

	Aromatic Amines	Aromatic Isocyanates
Qty.	Cat. No.	Cat. No.
22-oz spray bottle	769-1071	769-1072
1-gallon jug	769-1051	769-1052

LeadCheck Sampling Swabs

Fast On-the-spot Lead Screening

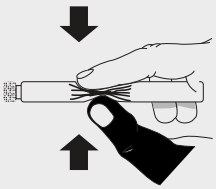
Tech Tips

CDC-NIOSH has released Effects of Skin Contact with Chemicals: What a Worker Should Know, a technical resource on dermal exposures. Visit cdc.gov/niosh/docs/2011-199/ to download the pdf.

Lead Testing in 3 Easy Steps

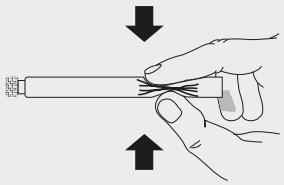
Step 1

Crush and shake



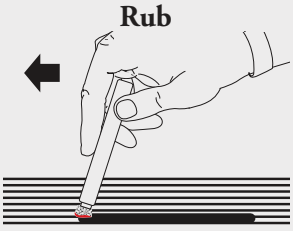
Step 2

Squeeze



Step 3

Rub



RED MEANS LEAD!

- **Fast and easy to use**
  - 3 easy steps
  - No instruments
  - Results in minutes
- **Convenient**
  - Use almost anywhere *(except skin)*
- **Inexpensive**
  - No instruments or analysis required
- **Easy to interpret**
  - Positive confirmation procedures in each kit
- **Sensitive lead kit**
  - Detects lead on 96.6% of surfaces tested
- **EPA-recognized instant lead detection test**

The LeadCheck Surface Sample Kit includes self-contained sampling swabs with all materials required for the rapid screening of lead on surfaces and in liquids. In April 2010, the EPA mandated testing for lead and use of lead-safe practices by contractors renovating, repairing, or painting structures built before 1978 (EPA RRP). The EPA has recognized the LeadCheck Kit as a tool to aid contractors in complying with this mandate. LeadCheck swabs are easy to use: crush, shake, swab, and read the result. RED MEANS LEAD®.

Simple, Inexpensive Test Kit Receives EPA Recognition

After rigorous testing, LeadCheck Swabs are recognized by the EPA for use on drywall and plaster as well as on painted wood and metal. LeadCheck Kits provide a quick and simple way for certified renovators to test for lead and take steps toward compliance under the Renovation, Repair, and Painting Rule (RRP). Visit youtube.com and search for "LeadCheck" for instructional videos on using LeadCheck Swabs on drywall, plaster, painted wood, and metal surfaces.

Hazard	Sensitivity: Solid Surface (µg)	Sensitivity: Liquid (ppm)	Interferences	Cat. No.	Qty.
Lead (Pb)	< 1	2	No other metals react to give the same color response	225-2404 225-2404A	8 16

For safe lead detection on skin, see Full Disclosure on page 171.

FULL DISCLOSURE

Instant Detection of Lead on Skin and Surfaces

- **Completely safe surface and skin testing**
  - Reagents never touch the test surface
  - Testing skin allows direct evaluation of lead exposure
  - Suitable for testing both flat and irregular surfaces
- **Immediate color change — instant results**
  - Identifies lead contamination at ≥ 18 µg
  - Wipes can be sent to a lab for quantitative results
- **Easy to use**
- **Developed, tested, and patented* by CDC-NIOSH**
- **Meets NIOSH Method 9105 for Lead in Dust Wipes**

Full Disclosure® wipe sampling provides instant and safe detection of lead on skin and surfaces. Unlike other lead sampling methods, Full Disclosure is completely safe because no chemical touches the test site. Each kit contains everything needed to detect lead at or above 18 µg on skin and surfaces. Use Full Disclosure to modify worker cleaning behavior by spot-checking surfaces and check worker skin after surface and hand cleaning. If red, clean it again! Ensure your workers go home with no lead contamination.

Description	Cat. No.
Full Disclosure Kit†# includes 11 pairs nitrile gloves, 10 wipes,‡ Disclosing Powder, extraction solution, deionized water, 10 sheets of waxed paper, and instructions	550-001
Full Disclosure Kit# for Quantitative Analysis† includes all items in above kit, 10 sample collection bottles with labels, and 10 disposable templates	550-002

* *U.S. Patent No. 6,248,593*
† *Not designed for detecting lead in paint and paint chips, on painted surfaces, or embedded in material such as plastic; not suitable for lead chromate*
‡ *Wipes conform to ASTM E1792.*
\# *Limited shelf-life*

See Tech Note at skcinc.com/instructions/1485.pdf.

Three Easy Steps to Full Disclosure of Lead

Step 1
Prepare the Solution

Step 2
Wipe to Sample

Step 3
Spray and Read Results

Yellow to Orange = lead < 18 µg

Pink to Red = lead ≥ 18 µg

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Data Interpretation
Lead on Surfaces

- Lead is considered a hazard at surface levels of:
  - ≥ *40 µg/ft² on floors*
  - ≥ *250 µg/ft² on interior window sills*

Source: TSCA Section 403 Residential Lead Standards (January 5, 2001 Federal Register)

Smear Tabs
Low-ash, acid-hardened paper Smear Tabs are designed for collecting samples on surfaces where dust and chemicals have settled. SKC Smear Tabs are specified in OSHA ID-121, ID-125G, and ID-206 for wipe sampling of metals.

Cat. No. 225-24.....pk/100

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Ghost Wipes
Sample Metals on Surfaces

- **Robust for wiping even rough surfaces**
- **Readily and completely digested in hot water or acid solution**
- **Meet specifications for sampling lead and beryllium**
  - All ASTM E1792 specifications as required by U.S. EPA
  - AIHA policy on sampling materials for lead in surface dust
  - OSHA Method ID-125G, Addendum B
  - ASTM D7707 for beryllium
  - NIOSH 9102 Elements on Wipes, including nanomaterial

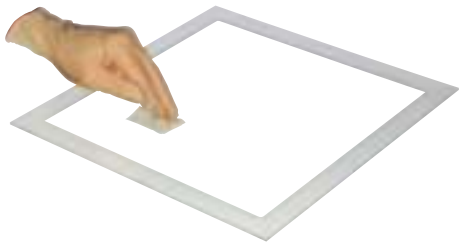
Robust Ghost Wipes hold together even when used on the roughest surfaces. In the lab, Ghost Wipes readily and completely dissolve during digestion for maximum recovery of target analyte(s). Ghost Wipes earn their name by dissolving so completely that there is no messy fibrous material to clog the sample uptake capillary or nebulizer. The Wipe Sample Test Kit below contains Ghost Wipes.

Description	Cat. No.	Qty.
Ghost Wipes, moistened with deionized water, individually sealed packets, *require 10 x 10-cm template listed below*	225-2414 225-2413	200 1000

See below for templates.

Wipe Sample Test Kit
Supplies for OSHA Wipe Tests

- **Contains materials to sample surface metals, pesticides, amines, radionuclides, corrosives, and dust**
- **Assists in evaluating hazard control effectiveness and cleaning regimens**
- **All dry materials needed for OSHA wipe sample methods (solvents not included)**



The Wipe Sample Test Kit provides the necessary supplies to sample surfaces for toxic materials that can gain entry into the body via ingestion or skin absorption. Each kit includes paper and glass fiber filters, sterile sample bags, latex gloves, cotton swabs, pH paper, cover slips, 25 Ghost Wipes for lead and other metals, 72 microslides, 20 sample containers, 3 dropper bottles, 25 paper templates (10 x 10 cm), marking pen, masking tape, clear tape, stainless steel forceps, and carry case. *Solvents are **not** included.*

Description	Cat. No.	Qty.
Wipe Sample Test Kit (as described above), *solvents are **not** included*	225-2401A	ea
Templates		
Disposable manila paper, 10 x 10 cm	225-2415 225-2415A	250 10
Disposable manila paper, 1 x 1 foot	225-2416 225-2416A	250 10

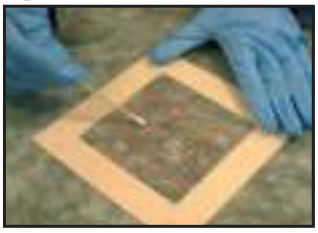
For metal in air determinations using NIOSH 7300, see page 105 for Solu-CAPs.

MethChek Immunoassay Wipe Kits

Sensitive Kits for ng-Level Detection

- Fast, reliable on-site results
- Indicate meth residue at ≥ 50 nanograms
  - Kits also available for indication at 100, 500, and 1500 nanograms
- Detect presence of meth and provide indication of meth levels
- Save money with multiple-test kits
- No shipping or lab fees
- Lightweight, portable
- Developed by CDC-NIOSH
- Safe for use on many surfaces, including animal fur

1 Wipe



2 Extract

3 Read Results

Positive result with MethChek Kit

Make informed decisions in the field!

MethChek® Kits provide on-the-spot semi-quantitative assessments of meth residue at the lowest state cleanup guideline of 50 ng/100 cm² (100, 500, and 1500-ng sensitivities are also available). Simply wipe, extract, and read results. MethChek is an ideal post-assessment tool to determine the need for further cleaning before sending cleanup crews away.

Description	Lower Limit of ID µg/100 cm²	ng	Cat. No.	Tests
MethChek 50	0.05	50	560-004	12
			560-004A	1
			560-004B	3
MethChek 100	0.1	100	560-003	12
			560-003A	1
			560-003B	3
MethChek 500	0.5	500	560-002	12
			560-002A	1
			560-002B	3
MethChek 1500	1.5	1500	560-005	12
			560-005B	3

Complete MethChek Kits

MethChek Kits contain the following:

- Gauze pads or swabs
- Trays
- Templates
- Gloves
- Syringes (except MethChek 50)
- Pipettes
- Reagents
- Detection cartridges
- Bags
- Instructions

APPLICATIONS

- **Protect** first responders
- **Develop** health and safety plans for building/environment decontamination
- **Confirm** appropriate safe levels are met before building occupancy

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SKC Air Sampling Guides

Welcome to SKC Air Sampling Guides! Sampling information based on OSHA/NIOSH/ASTM/EPA and HSE methods for over 2500 compounds is at your fingertips.

- **Easy to use - Locate the chemical hazard of interest in the alphabetic listings to view:**
  - **– Agency reference method**
  - **– Method sampling parameters (agency standard, volume, flow rate, time, and air volume)**
  - **– Analytical method**
  - **– Collecting equipment listing and page reference**

- **For VOC 575 Passive Samplers, see pages 87-93**

- **Available anywhere you are**
  - **– Print: See pages 175-243 in this catalog**
  - **– Online: Access searchable guides at skcinc.com/Training or skcltd.com/hazard-search.**

Introduction

This guide includes most hazardous substances, including their current Workplace Exposure Limits at the time of printing (where applicable). For the most up-to-date version of this guide, please visit our website at www.skcltd.com. For a full list of Workplace Exposure Limits, please consult EH40, available from HSE books or www.hse.gov.uk. This guide should not be used as an alternative to obtaining a copy of EH40 and reading the full supplementary data it contains.

The following statements are taken directly from EH40 Workplace Exposure Limits.

Workplace Exposure Limits (WELs)

WELs are British occupational exposure limits and are set in order to help protect the health of workers. WELs are concentrations of hazardous substances in the air, averaged over a specified period of time, referred to as a time-weighted average (TWA). Two time periods are used: long-term (**8 hours**) and short-term (**15 minutes**).

Short-term exposure limits (STELs) are set to help prevent effects such as eye irritation, which may occur following exposure for a few minutes.

WELs and the Control of Substances Hazardous to Health Regulations 2002 (COSHH)

Substances that have been assigned a WEL are subject to the requirements of COSHH. These regulations require employers to prevent or control exposure to hazardous substances. For further information, go to www.hse.gov.uk/coshh. Under COSHH, control is defined as adequate only if a) the principles of good control practice are applied, b) any WEL is not exceeded, and c) exposure to asthmagens, carcinogens, and mutagens are reduced as low as is reasonably practicable.

The absence of a substance from the list of WELs does not indicate that it is safe. For these substances, exposure should be controlled to a level to which nearly all the working population could be exposed, day after day at work, without any adverse effects on health.

As part of the assessment required under regulation 6 of COSHH, employers should determine their own working practices and in-house standards for control of exposure. In some cases, there may be sufficient information available for employers to set an 'in-house' working standard, e.g., from manufacturers and suppliers of the substances, publications of industry associations, occupational medicine and hygiene journals, and other agencies such as NIOSH and OSHA.

		SAMPLING									
		WEL		Vol. (liter)		Rate (ml/min)		Time			
Chemical Hazard	Agency Reference	TWA (ppm)	STEL (ppm)	TWA	STEL	TWA	STEL	TWA (hr)	STEL (min)	Analytical Method	SKC Collecting Equipment and Page No.
Acetaldehyde	MDHS 102	20 ppm (37 mg/m³)	50 ppm (92 mg/m³)	varies	varies	varies	varies	varies	varies	HPLC-PDA	ST 226-119 or 225-9003 ST 226-120 or CF/CST 70
Acetaldehyde	MDHS 88	20 ppm (37 mg/m³)	50 ppm (92 mg/m³)	diffusive	diffusive	diffusive	diffusive			HPLC	PS 500-100 94
Acetic acid	MDHS 104	10 ppm (25 mg/m³)	20 ppm (50 mg/m³)	10	3	50	200	3	15	GC-FID	ST 226-01 50
Acetic acid	MDHS 96	10 ppm (25 mg/m³)	20 ppm (50 mg/m³)	24		50		8		GC-FID	ST 226-01 50
Acetic anhydride	OSHA 102	0.5 ppm (2.5 mg/m³)	2 ppm (10 mg/m³)	7.5	7.5	50	500	2.5	15	GC-NPD	CF/CST 225-9010 70 C/HLD 225-1 118
Acetone	MDHS 104	500 pm (1210 mg/m³)	1500 ppm (3620 mg/m³)	2	2	50	200	40 min	10	GC-FID	ST 226-01 50
Acetone	MDHS 88	500 pm (1210 mg/m³)	1500 ppm (3620 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Acetone	MDHS 96	500 pm (1210 mg/m³)	1500 ppm (3620 mg/m³)	2	0.75	20	50	100 min	15	GC-FID	ST 226-01 50
Acetonitrile	MDHS 104	40 ppm (68 mg/m³)	60 ppm (102 mg/m³)	10		50		3		GC-FID	ST 226-09 50
Acetonitrile	MDHS 88	40 ppm (68 mg/m³)	60 ppm (102 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Acetonitrile	MDHS 96	40 ppm (68 mg/m³)	60 ppm (102 mg/m³)	10		20(50)		8(3.3)		GC-FID	ST 226-09 50
o-Acetylsalicylic acid	MDHS 14/4	5 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Acrolein (acrylaldehyde)	NIOSH 2501	0.02 ppm (0.05 mg/m³)	0.05 ppm (0.12 mg/m³)	24	3	50	200	8	15	GC-NPD	ST 226-118 52
Acrolein (acrylaldehyde)	OSHA 52	0.02 ppm (0.05 mg/m³)		48	3	100	200	8	15	GC-NPD	ST 226-117 52
Acrylamide	MDHS 57/2	0.1 mg/m³		48 (50)	15 (30)	100 (1000)	1000	8	15	HPLC-UV	IMP 225-36-1 72 IT 225-22 72
Acrylic Acid	OSHA PV2005	10 ppm (29 mg/m³)	20 ppm (59 mg/m³) - 1 min	24		100		240 min		LC-UV	ST 226-30-08 50
Acrylonitrile	MDHS 104	2 ppm (4.4 mg/m³)		10	3	50	200	3	15	GC-FID	ST 226-01 50
Acrylonitrile	MDHS 88	2 ppm (4.4 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Allyl alcohol	MDHS 104	2 ppm (4.8 mg/m³)	4 ppm (9.7 mg/m³)	10	3	50	200	3	15	GC-FID	ST 226-01 50
Allyl alcohol	MDHS 88	2 ppm (4.8 mg/m³)	4 ppm (9.7 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Aluminium alkyl compounds	OSHA ID-121	2 mg/m³		960		2000		8		AAS	F/CST 225-3-01 104 C/HLD 225-1 118
Aluminium metal (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Aluminium metal (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Aluminium metal (respirable dust)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Aluminium oxides (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Aluminium oxides (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Aluminium oxides (respirable dust)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
2-Aluminium salts, soluble	OSHA ID-121	2 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Aminoethanol	MDHS 96	1 ppm (2.5 mg/m³)	3 ppm (7.6 mg/m³)	10		20		8		GC-FID	ST 226-10-04 50
Ammonia anhydrous	NIOSH 6015	25 ppm (18 mg/m³)	35 ppm (25 mg/m³)	72	3	150	200	8	15	VAS	ST 226-10-06 50 F/CST 225-3-01 104
Ammonia anhydrous	NIOSH 6016	25 ppm (18 mg/m³)	35 ppm (25 mg/m³)	48	3	100	200	8	15	IC	ST 226-10-06 50 F/CST 225-3-01 104

See page 244 for abbreviations.

Sampling Guide — U.K. (HSE)

www.skcltd.com for updates

Chemical Hazard	Agency Reference	SAMPLING								Analytical Method	SKC Collecting Equipment and Page No.					
		WEL		Vol. (liter)		Rate (ml/min)		Time								
		TWA (ppm)	STEL (ppm)	TWA	STEL	TWA	STEL	TWA (hr)	STEL (min)							
Ammonium chloride (fume)	MDHS 14/4	10 mg/m³	20 mg/m³	960	30	2000	2000	8	15	GR, IC-ECN	IOM	225-70A	124	FLT	225-1930	104
Ammonium sulphamate	MDHS 14/4	10 mg/m³	20 mg/m³	960	30	2000	2000	8	15	GR	IOM	225-70A	124	FLT	225-1930	104
Aniline	MDHS 104	1 ppm (4 mg/m³)		96		200		8		GC-FID	ST	226-10	50			
Aniline	MDHS 104	1 ppm (4 mg/m³)		12		100		2		TD, GC	ST	226-357	54			
Aniline	MDHS 75/2	1 ppm (4 mg/m³)		200		2000		100 min		HPLC-UV	IOM	225-70A	124	FLT	225-58F	112
Aniline	NIOSH 2017	1 ppm (4 mg/m³)		50		200		4		GC-FID	CF/CST	225-9004	70	C/HLD	225-1	118
p-Antimony & compounds (as Sb)	MDHS 91/2	0.5 mg/m³		960		2000		8		XRF	IOM	225-70A	124	FLT	225-1930	104
Aramid respirable fibres	MDHS 87	0.5 fibres/ml		Refer to method						PCM	FLT/CL	225-54A	125	FLT	225-1913	104
Aromatic carboxylic acid anhydrides (see individual compounds)	MDHS 62/2			960	30	2000	2000	8	15	HPLC-UV	IOM ST	225-70A 226-35	124 50	FLT	225-58F	112
Arsenic & compounds (except arsine) as As	MDHS 91/2	0.1 mg/m³		960		2000		8		XRF	IOM	225-70A	124	FLT	225-1930	104
Arsine	NIOSH 6001	0.05 ppm (0.16 mg/m³)		10	3	20	200	8	15	AA-GF	ST	226-01	50			
Asbestos (chrysotile alone)	MDHS See HSG 248		0.1 fbr/cm³	240	40	1000	4000	4	10	PCM	FLT/CL FLT	225-54(A) 225-1913	125 104	FLT	225-60F	or
Asbestos, with crocidolite/amosite/ mixtures	MDHS See HSG 248		0.1 fbr/cm³	240	40	1000	4000	4	10	PCM	FLT/CL FLT	225-54(A) 225-1913	125 104	FLT FLT	225-60F 225-1913	or 104
Asphalt (petroleum fumes)	NIOSH 5042	5 mg/m³	10 mg/m³	360	60	1000	4000	6	15	GR	FLT F/CST	Contact SKC 225-2LF	110 113	SP	225-27	119
Azodicarbonamide	MDHS 92/2	1 mg/m³	3 mg/m³	960	30	2000	2000	8	15	HPLC	IOM	225-79A	124	FLT	225-58F	112
Barium compounds (soluble) (as Ba)	MDHS 91/2	0.5 mg/m³		960		2000		8		XRFS	IOM	225-70A	124	FLT	225-1930	104
Barium sulphate (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112
Barium sulphate (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC	225-69	129	FLT	225-58F	112
Barium sulphate (respirable dust)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112
Benzene	MDHS 104	1 ppm (3.25mg/m³)		10		50		3		GC-FID	ST	226-01	50			
Benzene	MDHS 104	1 ppm (3.25mg/m³)		12		100		2		TD, GC	ST	226-357	or	ST	226-358	54
Benzene	MDHS 88	1 ppm (3.25mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Benzyl butyl phthalate	MDHS 96	5 mg/m³		10		20		8		GC-FID	ST	226-35	50			
Benzyl chloride	MDHS 104	0.5 ppm (2.6 mg/m³)	1.5 ppm (7.9 mg/m³)	10	3	50	200	3	15	GC-FID	ST	226-01	50			
Benzyl chloride	MDHS 88	0.5 ppm (2.6 mg/m³)	1.5 ppm (7.9 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Beryllium & compounds (as Be) - Further analytical method required	MDHS 14/4	0.002 mg/m³		960	120	2000	2000	8	60	GR,ICP	IOM	225-70A	124	FLT	225-1930	104
Bisphenol A	MDHS 14/4	2 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112
Bornan-2-one	MDHS 104	2 ppm (13 mg/m³)	3 ppm (19 mg/m³)	10	3	50	200	3	15	GC-FID	ST	226-01	50			
Bornan-2-one	MDHS 88	2 ppm (13 mg/m³)	3 ppm (19 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84			
Bromine	NIOSH 6011	0.1 ppm (0.66 mg/m³)	0.2 ppm (1.3 mg/m³)	240	15	1000	1000	4	15	IC	CF/CST	225-9006	70	C/HLD	225-1	118
1,3-Bromomethane	OSHA PV2040	5 ppm (20 mg/m³)	15 ppm (59 mg/m³)	3	3	50	200	1	15	GC-FID	ST	226-83	52			
Butadiene	MDHS 96	1 ppm (2.2 mg/m³)		10		20(50)		8(3.3)		GC-FID	ST	226-09	50			
1,3-Butadiene	MDHS 104	1 ppm (2.2 mg/m³)		10		50		3		GC-FID	ST	226-09	50			
1,3-Butadiene	MDHS 63/2	1 ppm (2.2 mg/m³)		diffusive		diffusive		8	15	GC	ST	226-520	99			
1,3-Butadiene	MDHS 88	1 ppm (2.2 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Butan-1-ol	MDHS 104		50 ppm (154 mg/m³)		3		200		15	GC-FID	ST	226-01	50			
Butan-1-ol	MDHS 104		50 ppm (154 mg/m³)		1.5		100		15	TD, GC	ST	226-357	or	ST	226-358	54
Butan-1-ol	MDHS 88		50 ppm (154 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84			
Butan-1-ol	MDHS 96		50 ppm (154 mg/m³)	10	3	20(50)	200	8(3.3)	15	GC-FID	ST	226-01	50			
Butan-2-ol	MDHS 88	100 ppm (308 mg/m³)	150 ppm (462 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84			
Butan-2-ol	MDHS 96	100 ppm (308 mg/m³)	150 ppm (462 mg/m³)	10	3	20	200	8	15	GC-FID	ST	226-01	50			
Butan-2-one (MEK)	MDHS 104	200 ppm (600 mg/m³)	300 ppm (899 mg/m³)	4	3	50	200	3	15	GC-FID	ST	226-10	50			
Butan-2-one (MEK)	MDHS 88	200 ppm (600 mg/m³)	300 ppm (899 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84			
2-Butane	MDHS 104	600 ppm (1450 mg/m³)	750 ppm (1810 mg/m³)	10	3	50	200	3	15	GC-FID	ST	226-01	50			
2-Butoxyethanol	MDHS 104	25 ppm (123 mg/m³)	50 ppm (246 mg/m³)	10	3	50	200	3	15	GC-FID	ST	226-01	50			
2-Butoxyethanol	MDHS 104	25 ppm (123 mg/m³)	50 ppm (246 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST	226-357	or	ST	226-358	54
2-Butoxyethanol	MDHS 88	25 ppm (123 mg/m³)	50 ppm (246 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
n-Butoxyethanol acetate	MDHS 88	20 ppm (133 mg/m³)	50 ppm (332 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
n-Butyl acetate	MDHS 88	150 ppm (724 mg/m³)	200 ppm (966 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
sec-Butyl acetate	MDHS 88	200 ppm (966 mg/m³)	250 ppm (1210 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
sec-Butyl acetate	MDHS 96	150 ppm (724 mg/m³)	200 ppm (966 mg/m³)	10	3	20	200	8	15	GC-FID	ST	226-01	50			
t-Butyl acetate	MDHS 104	200 ppm (966 mg/m³)	250 ppm (1210 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST	226-358	54			
t-Butyl acetate	MDHS 88	200 ppm (966 mg/m³)	250 ppm (1210 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
t-Butyl acetate	MDHS 96	200 ppm (966 mg/m³)	250 ppm (1210 mg/m³)	10	3	20	200	8	15	GC-FID	ST	226-01	50			
Butyl acrylate	MDHS 88	1 ppm (5 mg/m³)	5 ppm (26 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84			
n-Butyl carbitol	OSHA PV2095	10 ppm (67.5 mg/m³)	15 ppm (101.2 mg/m³)	10		200		50 min		GC-FID	ST	226-01	50			
Butyl chloroformate	ASTM D6209	1 ppm (5.7 mg/m³)		varies		225		varies		GC-MS	ST	226-131	57			
2-sec-Butyl lactate	OSHA PV2080	5 ppm (30 mg/m³)		10		200		50 min		GC-FID	ST	226-01	50			
Butylphenol	OSHA PV2128	5 ppm (31 mg/m³)		20		200		100 min		HPLC-UV	ST	226-95	52			

See page 244 for abbreviations.

Chemical Hazard	Agency Reference	SAMPLING								Analytical Method	SKC Collecting Equipment and Page No.					
		WEL		Vol. (liter)		Rate (ml/min)		Time								
		TWA (ppm)	STEL (ppm)	TWA	STEL	TWA	STEL	TWA (hr)	STEL (min)							
Cadmium & compounds (except oxide fume & sulphide pigments)	MDHS 91/2	0.025 mg/m³		960		2000		8		XRFS	IOM	225-70A	124	FLT	225-1930	104
Cadmium oxide fume (as Cd)	MDHS 91/2	0.025 mg/m³	0.05 mg/m³	960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104
Cadmium sulphide & pigments (as Cd)	MDHS 91/2	0.03 mg/m³		960		2000		8		XRFS	IOM	225-70A	124	FLT	225-1930	104
Calcium carbonate (inhalable)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112
Calcium carbonate (respirable)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC	225-69	129	FLT	225-58F	112
Calcium carbonate (respirable)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112
Calcium cyanamide	OSHA ID-121	0.05 mg/m³	1 mg/m³	960		2000		8		AA	F/CST C/HLD	225-3-01 225-1	or 118	F/CST	225-3100	104
Calcium hydroxide	MDHS 14/4	1 mg/m³	4 mg/m³	1440	45	3000	3000	8	15	GR	CYC	225-69	129	FLT	225-58F	112
Calcium hydroxide	MDHS 14/4	5 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112
Calcium hydroxide	MDHS 14/4	1 mg/m³	4 mg/m³	960	30	2000	2000	8	15	GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112
Calcium oxide	MDHS 14/4	1 mg/m³	4 mg/m³	1440	45	3000	2000	8	15	GR	CYC	225-69	129	FLT	225-58F	112
Calcium oxide	MDHS 14/4	2 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112
Calcium oxide	MDHS 14/4	1 mg/m³	4 mg/m³	960	30	2000	2000	8	15	GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112
Calcium silicate (inhalable)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112
Calcium silicate (respirable)	MDHS 14/4	4 mg/m³		1440		3000		8	15	GR	CYC	225-69	129	FLT	225-58F	112
Calcium silicate (respirable)	MDHS 14/4	4 mg/m³		960		2000		8	15	GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112
Captan (ISO)	MDHS 94/2	5 mg/m³	15 mg/m³	240	30	2000	2000	8	15	GC-MS	IOM ST	225-70A 226-35	124 50	FLT	225-58F	112
Carbon black	MDHS 14/4	3.5 mg/m³	7 mg/m³	960	30	2000	2000	8	15	GR	IOM	225-70A	124	FLT	225-58F	112
Carbon dioxide	OSHA ID-172	5000 ppm (9150 mg/m³)	15000 ppm (27400 mg/m³)	2-5	2-5	10-50	300	4-8	15	GC	SB	263-Series	or	SB	253-Series	64
Carbon dioxide (by portable GC)	NIOSH 6603	5000 ppm (9150 mg/m³)	15000 ppm (27400 mg/m³)	varies	varies	20-100	20-100	varies	varies	GC	SB	232-Series	63			
Carbon disulphide	NIOSH 1600	5 ppm (15 mg/m³)		10	3	20(50)	200	8(3.3)	15	GC	ST	226-01	50	ST	226-44	51
Carbon monoxide	OSHA ID-210	20 ppm (23 mg/m³)	100 ppm (117 mg/m³)	2-5	2-5	10-50	1000	varies	varies	GC	SB SB	252-Series 262-Series	or or	SB SB	263-Series 253-Series	or 65
Carbon tetrachloride	MDHS 104	1 ppm (6.4 mg/m³)	5 ppm (32 mg/m³)	10	1.5	50	100	2	15	TD, GC	ST	226-357	or	ST	226-358	54
Carbon tetrachloride	MDHS 88	1 ppm (6.4 mg/m³)	5 ppm (32 mg/m³)	diffusive	diffusive	diffusive	diffusive	5	15	GC-FID	ST	575-001	84			
Carbon tetrachloride	MDHS 96	1 ppm (6.4 mg/m³)	5 ppm (32 mg/m³)	10(24)		20 (50)		8		GC-FID	ST	226-01	50			
Cellulose (inhalable dust)	MDHS 14/4	10 mg/m³	20 mg/m³	960	30	2000	2000	8	15	GR	IOM	225-70A	124	FLT	225-58F	112
Cellulose (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8	15	GR	CYC	225-69	129	FLT	225-58F	112
Cellulose (respirable dust)	MDHS 14/4	4 mg/m³		960		2000		8	15	GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112
Chlorine	NIOSH 6011		0.5 ppm (1.5 mg/m³)	90	15	1000	1000	1.5	15	IC	CF/CST	225-9006	70	C/HLD	225-1	118
1-Chlorine dioxide	OSHA ID-202	0.1 ppm (0.28 mg/m³)	0.3 ppm (0.84 mg/m³)	120	7.5	500	500	4	15	IC-CD	IMP IT	225-36-2 225-22	or 72	IMP	225-36-5	72
1-Chloro-2,3-epoxypropane (epichlorohydrin)	MDHS 80	0.5 ppm (1.9 mg/m³)	1.5 ppm (5.8 mg/m³)	24		50		8		TD, GC	ST	226-358	54			
1-Chloro-2,3-epoxypropane (epichlorohydrin)	MDHS 88	0.5 ppm (1.9 mg/m³)	1.5 ppm (5.8 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84			
1-Chloro-2,3-epoxypropane (epichlorohydrin)	MDHS 96	0.5 ppm (1.9 mg/m³)	1.5 ppm (5.8 mg/m³)	10		20(50)		8		GC-FID	ST	226-01	50			
Chloro-4-nitrobenzene	NIOSH 2005	1 mg/m³	2 mg/m³	96		200		8		GC-FID	ST	226-10	50			
2-Chloroacetaldehyde	OSHA 76		1 ppm (3.3 mg/m³)		7.5		500		15	GC-ECD	ST	226-15GWS	50			
Chlorobenzene	MDHS 104	1 ppm (4.7 mg/m³)	3 ppm (14 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST	226-357	54			
Chlorobenzene	MDHS 88	1 ppm (4.7 mg/m³)	3 ppm (14 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Chlorobenzene	MDHS 96	1 ppm (4.7 mg/m³)	3 ppm (14 mg/m³)	10		20(50)		8(3.3)		GC-FID	ST	226-01	50			
2-Chloroethane	MDHS 88	50 ppm (134 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
2-Chloroethane	MDHS 96	50 ppm (134 mg/m³)		10		20		3.3		GC-FID	ST	226-09	50			
Chloroethanol	MDHS 96		1 ppm (3.4 mg/m³)	10	3	20(50)	200	8(3.3)	15	GC-FID	ST	226-81A	51			
Chloroform	MDHS 88	2 ppm (9.9 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Chloroform	MDHS 96	2 ppm (9.9 mg/m³)		10		200		8		GC-FID	ST	226-01	50			
Chloroform	MDHS 96	2 ppm (9.9 mg/m³)		10		20		8		GC-FID	ST	226-01	50	or	226-348	54
Chloromethane	MDHS 96	50 ppm (105 mg/m³)	100 ppm (210 mg/m³)	10	0.5	200	100	50 min	5	GC-FID	ST	226-09	&	ST	226-01	50
bis-Chloromethyl ether	OSHA 10	0.001 ppm (0.005 mg/m³)		50		500		100 min		GC-ECD	IMP	225-36-2	72	IT	225-22	72
Chloropyrifos (ISO)	MDHS 94/2	0.2 mg/m³	0.6 mg/m³	960	30	2000	2000	8	15	GC-MS	IFV ST	225-49K 226-30-06	127 50	FLT	225-702	112
Chromium & inorganic compounds	MDHS 91/2	0.5 mg/m³		960		2000		8		XRFS	IOM	225-70A	124	FLT	225-1930	104
Chromium (VI) in chromium plating mist	MDHS 52/4	0.01 mg/m³		960	120	2000	2000	8	60	CI	IOM	225-70A	124	FLT	225-9026	
Chromium II & III compounds (as Cr)	MDHS 91/2	0.5 mg/m³		960		2000		8		XRFS	IOM	225-70A	124	FLT	225-1930	104
Chromium VI compounds (as Cr)	MDHS 52/4	0.01 mg/m³		240	30	2000	2000	2	15	CLR	IOM	225-70A	124	FLT	225-9026	
Cobalt & cobalt compounds (as Co)	MDHS 91/2	0.1 mg/m³		960		2000		8		XRFS	IOM	225-70A	124	FLT	225-1930	104
Colophony	MDHS 83/3	0.05 mg/m³	0.15 mg/m³	960	30	2000	2000	8	15	GC-FID	FLT	225-8050	104			

See page 244 for abbreviations.

Sampling Guide — U.K. (HSE)

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Chemical Hazard	Agency Reference	SAMPLING								Analytical Method	SKC Collecting Equipment and Page No.						
		WEL		Vol. (liter)		Rate (ml/min)		Time									
		TWA (ppm)	STEL (ppm)	TWA	STEL	TWA	STEL	TWA (hr)	STEL (min)								
Copper dust & mists (as Cu)	MDHS 91/2	1 mg/m³	2 mg/m³	960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104
Copper fume	MDHS 91/2	0.2 mg/m³		960		2000		8		XRFS	IOM	225-70A	124	FLT	225-1930	104
Cotton dust	MDHS 14/4	2.5 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112
Cryofluorane (INN)	MDHS 88	1000 ppm (7110 mg/m³)	1250 ppm (8890 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Cryofluorane (INN)	MDHS 96	1000 ppm (7110 mg/m³)	1250 ppm (8890 mg/m³)	3	1.5	20	100	2.5	15	GC-FID	ST	226-09	&	ST	226-01	50
Cumene	MDHS 104	25 ppm (125 mg/m³)	50 ppm (250 mg/m³)	24	3	50	200	8	15	GC-FID	ST	226-01	50			
Cumene	MDHS 104	25 ppm (125 mg/m³)	50 ppm (250 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST	226-357	54			
Cumene	MDHS 88	25 ppm (125 mg/m³)	50 ppm (250 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
Cumene	MDHS 96	25 ppm (125 mg/m³)	50 ppm (250 mg/m³)	10	3	20	200	8	15	GC-FID	ST	226-01	50			
Cyanides (except HCN, cyanogen & cyanogen chloride)	NIOSH 7904	5 mg/m³		120		500		4		ISE	FLT IMP C/HLD	225-3705 225-36-2 225-1	110 72 118	CST IT	225-2LF 225-22	113 72
Cyclohexane	MDHS 88	100 ppm (350 mg/m³)	300 ppm (1050 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
Cyclohexane	MDHS 96	100 ppm (350 mg/m³)	300 ppm (1050 mg/m³)	5	1.5	20	100	4	15	GC-FID	ST	226-01	50			
Cyclohexanol	MDHS 88	50 ppm (208 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
Cyclohexanol	MDHS 96	50 ppm (208 mg/m³)		10		20		8		GC-FID	ST	226-01	50			
Cyclohexanone	MDHS 88	10 ppm (41 mg/m³)	20 ppm (82 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84			
Cyclohexanone	MDHS 96	10 ppm (41 mg/m³)	20 ppm (82 mg/m³)	10	3	20	200	8	15	GC-FID	ST	226-01	50			
2,4-Cyclohexylamine	OSHA PV2016	10 ppm (41 mg/m³)		20		200		100 min		GC-FID	ST	226-98	52			
D (ISO)	NIOSH 5602	10 mg/m³	20 mg/m³	480		1000		8		GC-ECD	ST	226-58	51			
Dialkyl phthalate C7-C9	OSHA 104	5 mg/m³		240		1000		4		GC-FID	ST	226-56	51			
Diatomaceous earth (natural respirable dust)	MDHS 14/4	1.2 mg/m³		1440		3000		8		GR	CYC	225-69	129	FLT	225-58F	112
Diatomaceous earth (natural respirable dust)	MDHS 14/4	1.2 mg/m³		960		2000		8		GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112
Dibenzoyl peroxide	NIOSH 5009	5 mg/m³		90		1500		1		HPLC-UV	F/CST	225-3-01	104			
Dibismuth tritelluride	MDHS 91/2	10 mg/m³	20 mg/m³	960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104
1,2-Diboron trioxide	MDHS 14/4	10 mg/m³	20 mg/m³	960	30	2000	2000	8	15	GR	IOM	225-70A	124	FLT	225-58F	112
Dibromoethane	MDHS 96	0.5 ppm (3.9 mg/m³)		24		50		8		GC-ECD	ST	226-01	50			
1,2-Dibromoethane	MDHS 88	0.5 ppm (3.9 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-001	84
Dibutyl hydrogen phosphate	NIOSH 5017	1 ppm (8.7 mg/m³)	2 ppm (17 mg/m³)	240		2000		2		GC-FPD	FLT C/HLD	225-17-01 225-1	110 118	CST	225-2LF	113
2,2'-Dibutyl phthalate	OSHA 104	5 mg/m³	10 mg/m³	240		1000		4		GC-FID	ST	226-56	51			
1,3-Dichloro-4,4'-methylene dianiline (MbOCA)	MDHS 75/2	0.005 mg/m³		200		2000		100 min		HPLC-UV	IOM	225-70A	124	FLT	225-58F	112
2,2-Dichloro-4,4'-methylene dianiline (MbOCA)	OSHA 71	0.005 mg/m³		100		1000		100 min		GC-ECD	CF/CST	225-9004	70	C/HLD	225-1	118
1,2-Dichlorobenzene (ortho-dichloro-benzene)	MDHS 88	25 ppm (153 mg/m³)	50 ppm (306 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
1,4-Dichlorobenzene (ortho-dichloro-benzene)	MDHS 96	25 ppm (153 mg/m³)	50 ppm (306 mg/m³)	10	3	20	200	8	15	GC-FID	ST	226-01	50			
1,1-Dichlorobenzene (para-dichloro-benzene)	MDHS 96	2 ppm (12 mg/m³)	10 ppm (60 mg/m³)	24	3	50	200	8	15	GC-FID	ST	226-01	50			
1,4-Dichlorobenzene (para-dichloro-benzene)	MDHS 88	2 ppm (12 mg/m³)	10 ppm (60 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
1,2-Dichloroethane	MDHS 96	100 ppm		5	3	20	200	4	15	GC-FID	ST	226-01	50			
1,2-Dichloroethane (ethylene dichloride)	MDHS 104	5 ppm (21 mg/m³)		12		100		2		TD, GC	ST	226-358	54			
1,2-Dichloroethane (ethylene dichloride)	MDHS 88	5 ppm (21 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
1,2-Dichloroethane (ethylene dichloride)	MDHS 96	5 ppm (21 mg/m³)		24		50		8		GC-FID	ST	226-01	50			
Dichloroethylene cis:trans isomers 60:40	MDHS 96	200 ppm (806 mg/m³)	250 ppm (1010 mg/m³)	5		50		100 min		GC-FID	ST	226-01	50			
1,2-Dichloroethylene cis:trans isomers 60:40	MDHS 88	200 ppm (806 mg/m³)	250 ppm (1010 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Dichlorofluoromethane	MDHS 96	10 ppm (43 mg/m³)		3		20		2.5		GC-FID	ST	(2) 226-09	√	50		
Dichloromethane	MDHS 104	100 ppm (353 mg/m³)	200 ppm (706 mg/m³)	3		50		1		TD, GC	ST	226-358	54			
Dichloromethane	MDHS 88	100 ppm (353 mg/m³)	200 ppm (706 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Dichloromethane	MDHS 96	100 ppm (353 mg/m³)	200 ppm (706 mg/m³)	2	1.5	20	100	1.6	15	GC-FID	ST	(2) 226-01	√	50		
Dicyclopentadiene	MDHS 88	5 ppm (27 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Diethyl ether	MDHS	100 ppm (310 mg/m³)	200 ppm (620 mg/m³)	3		20		2.5		GC-FID	ST	226-01	50			
Diethyl ether	MDHS 88	100 ppm (310 mg/m³)	200 ppm (620 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Diethyl phthalate	OSHA 104	5 mg/m³	10 mg/m³	240		1000		4		GC-FID	ST	226-56	51			
Diethyl sulphate	MDHS 104	0.05 ppm (0.32 mg/m³)		12		100		2		TD, GC	ST	226-357	54			
Diethyl sulphate	MDHS 89	0.05 ppm (0.32 mg/m³)		96	3	200	200	8	15	GC-MS	ST	226-357	54			
Diethylamine	MDHS 96	5 ppm (15 mg/m³)	10 ppm (30 mg/m³)	10	3	20	200	8	15	GC-FID	ST	226-10	50			
Diisopropyl ether	MDHS 88	250 ppm (1060 mg/m³)	310 ppm (1310 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Diisopropyl ether	MDHS 96	251 ppm (1060 mg/m³)	311 ppm (1310 mg/m³)	1.5		20		75 min		GC-FID	ST	226-01	50			
Dimethoxymethane	MDHS 88	1000 ppm (3160 mg/m³)	1250 ppm (3950 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Dimethoxymethane	MDHS 96	1000 ppm (3160 mg/m³)	1250 ppm (3950 mg/m³)	1.5		20		75 min		GC-FID	ST	226-01	50			
Dimethyl phthalate	OSHA 104	5 mg/m³	10 mg/m³	240		1000		4		GC-FID	ST	226-56	51			
Dimethyl sulphate	MDHS 89	0.05 ppm (0.26 mg/m³)		96	3	200	200	8	15	GC-MS	ST	226-357	54			

See page 244 for abbreviations.

Chemical Hazard	Agency Reference	SAMPLING: WEL TWA (ppm)	WEL STEL (ppm)	Vol. (liter) TWA	Vol. (liter) STEL	Rate (ml/min) TWA	Rate (ml/min) STEL	Time TWA (hr)	Time STEL (min)	Analytical Method	SKC Collecting Equipment and Page No.
N,N-Dimethyl sulphate	MDHS 96	0.05 ppm (0.26 mg/m³)		12		50		4		GC-FID	ST 226-114 52
Dimethylacetamide	MDHS 96	10 ppm (36 mg/m³)	20 ppm (72 mg/m³)	10	3	20	200	8	15	GC-FID	ST 226-10 50
2-Dimethylamine	MDHS 96	2 ppm (3.8 mg/m³)	6 ppm (11 mg/m³)	24	3	50	200	8	15	GC-FID	ST 226-10 50
N,N-Dimethylaminoethanol	NIOSH 2561	2 ppm (7.4 mg/m³)	6 ppm (22 mg/m³)	24		100		4		GC-FID	ST 226-94 52
N,N-Dimethylaniline	MDHS 88	5 ppm (25 mg/m³)	10 ppm (50 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 84
N,N-Dimethylaniline	MDHS 96	5 ppm (25 mg/m³)	10 ppm (50 mg/m³)	24	3	50	200	8	15	GC-FID	ST 226-10 50
2,6-Dimethylformamide	MDHS 88	5 ppm (15 mg/m³)	10 ppm (30 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Dimethylheptan-4-one	MDHS 96	25 ppm (148 mg/m³)		10		20		8		GC-FID	ST 226-01 50
2,6-Dimethylheptan-4-one	MDHS 88	25 ppm (148 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Dioxane	MDHS 96	20 ppm (73 mg/ m³)		10		20		8		GC-FID	ST 226-01 50
1,4-Dioxane	MDHS 88	20 ppm (73 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Diphenyl ether (vapour)	MDHS 88	1 ppm (7 mg/m³)	2 ppm (14 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 84
Diphenyl ether (vapour)	MDHS 96	2 ppm (7 mg/m³)	2 ppm (14 mg/m³)	10	3	20	200	8	15	GC-FID	ST 226-01 50
Diphenylamine	OSHA 78	10 mg/m³	20 mg/m³	100		1000		100 min		HPLC-UV	CF/CST 225-9004 70 C/HLD 225-1 118
Diphosphorus pentasulphide	OSHA ID-128SG	1 mg/m³	2 mg/m³	120		2000		8		IC	F/CST 225-802 109 C/HLD 225-1 118
Diphosphorus pentoxide	OSHA ID-111	1 mg/m³	2 mg/m³	960		2000		8		IC	F/CST 225-3-01 104 C/HLD 225-1 118
Dipropylene glycol methyl ether	MDHS 104	50 ppm (308 mg/m³)		10		50		3		GC-FID	ST 226-01 50
Dipropylene glycol methyl ether	MDHS 88	50 ppm (308 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Di-tert-butyl-p-cresol	OSHA PV2108	10 mg/m³		100		1000		100 min		GC-FID	ST 226-57 51
Diuron (ISO)	NIOSH 5601	10 mg/m³		240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Dusts (Inhalable)	MDHS 14/4			960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Dusts (Respirable)	MDHS 14/4			1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Dusts (Respirable)	MDHS 14/4			960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Emery (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Emery (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Emery (respirable dust)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Endosulfan (ISO)	MDHS 94/2	0.1 mg/m³	0.3 mg/m³	480		1000		8		HPLC-UV	IFV 225-49K 127 FLT 225-702 112 ST 226-30-06 50
Enflurane	MDHS 88	50 ppm (383 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Enflurane	MDHS 96	50 ppm (383 mg/m³)		5		20		4		GC-ECD	ST 226-01 50
Ethane-1,2-diol (particulate)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Ethane-1,2-diol (vapour)	MDHS 88	20 ppm (52 mg/m³)	40 ppm (104 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Ethanethiol	NIOSH 2542	0.5 ppm (1.3 mg/m³)	2 ppm (5.2 mg/m³)	48	12	100	200	8	60	GC-FPD	CF/CST 225-9007 70 C/HLD 225-1 118
Ethanol	MDHS 104	1000 ppm (1920 mg/m³)		1.5		50		30 min		TD, GC	ST 226-358 54
Ethanol	MDHS 88	1000 ppm (1920 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Ethanol	MDHS 96	1000 ppm (1920 mg/m³)		1		50		20 min		GC-FID	ST 226-01 50
2-Ethoxyethanol	MDHS 104	2 ppm (8 mg/m³)		12		100		20		TD, GC	ST 226-358 54
2-Ethoxyethanol	MDHS 88	2 ppm (8 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 84
2-Ethoxyethanol	MDHS 96	2 ppm (8 mg/m³)		5		20		4		GC-FID	ST 226-01 50
2-Ethoxyethyl acetate	MDHS 104	2 ppm (11 mg/m³)		12		100		2		TD, GC	ST 226-357 or ST 226-358 54
2-Ethoxyethyl acetate	MDHS 104	2 ppm (11 mg/m³)		24		50		8		GC-FID	ST 226-01 50
2-Ethoxyethyl acetate	MDHS 88	2 ppm (11 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Ethyl acetate	MDHS 104	200 ppm (734 mg/m³)	400 ppm (1468 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST 226-357 or ST 226-358 54
Ethyl acetate	MDHS 88	200 ppm (734 mg/m³)	400 ppm (1468 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 OR PS 575-002 84
Ethyl acetate	MDHS 96	200 ppm (734 mg/m³)	400 ppm (1468 mg/m³)	2	1.5	20	100	100 min	15	GC-FID	ST 226-01 50
Ethyl acrylate	MDHS 104	5 ppm (21 mg/m³)	10 ppm (42 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST 226-357 54
Ethyl acrylate	MDHS 88	5 ppm (21 mg/m³)	10 ppm (42 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Ethyl acrylate	MDHS 96	5 ppm (21 mg/m³)	10 ppm (42 mg/m³)	10	3	20	200	8	15	GC-FID	ST 226-01 50
Ethyl benzene	MDHS 104	100 ppm (441 mg/m³)	125 ppm (552 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST 226-357 54
Ethyl benzene	MDHS 88	100 ppm (441 mg/m³)	125 ppm (552 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 OR PS 575-002 84
Ethyl benzene	MDHS 96	100 ppm (441 mg/m³)	125 ppm (552 mg/m³)	3	3	50	200	1	15	GC-FID	ST 226-01 50
Ethyl cyanoacrylate	OSHA 55		0.3 ppm (1.5 mg/m³)	12		100		2		HPLC-UV	ST 226-98 52
Ethyl formate	MDHS 96	100 ppm (308 mg/m³)	150 ppm (462 mg/m³)	5		20		4		GC-FID	ST 226-01 50
Ethylamine	OSHA 36	2 ppm (3.8 mg/m³)	6 ppm (11 mg/m³)	10		200		50 min		HPLC-FLUOR	ST 226-96 52
Ethylene oxide	MDHS 104	1 ppm (1.8 mg/m³)		3		50		1		TD, GC	ST 226-558 54
Ethylene oxide	MDHS 88	1 ppm (1.8 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-005 84
Ethylene oxide	MDHS 96	1 ppm (1.8 mg/m³)		6		100		1		GC-FID	ST 226-16 50
bis-2-Ethylhexyl phthalate (dioctyl phthalate)	MDHS 104	5 mg/m³	10 mg/m³	10		80		2		TD, GC	ST 226-357 54
bis-2-Ethylhexyl phthalate (dioctyl phthalate)	MDHS 96	5 mg/m³	10 mg/m³	50		100		8		GC-FID	ST 226-36 ¶ 51
bis-2-Ethylhexyl phthalate (dioctyl phthalate)	OSHA 104	5 mg/m³	10 mg/m³	240		1000		4		GC-FID	ST 226-56 51
Ferrous foundary particulate (inhalable)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Ferrous foundary particulate (respirable)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112

See page 244 for abbreviations.

Sampling Guide — U.K. (HSE)

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Chemical Hazard	Agency Reference	SAMPLING								Analytical Method	SKC Collecting Equipment and Page No.						
		WEL		Vol. (liter)		Rate (ml/min)		Time									
		TWA (ppm)	STEL (ppm)	TWA	STEL	TWA	STEL	TWA (hr)	STEL (min)								
Ferrous foundary particulate (respirable)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112	
Flour dust	MDHS 14/4	10 mg/m³	30 mg/m³			2000	2000	8	15	GR	IOM	225-70A	124	FLT	225-58F	112	
Fluoride (inorganic as F)	OSHA ID-110	2.5 mg/m³		90	22.5	1500	1500	1	15	ISE	CF/CST	225-9001	70	C/HLD	225-1	118	
Fluorine	OSHA ID-110	1 ppm (1.6 mg/m³)	1 ppm (1.6 mg/m³)	90	22.5	1500	1500	1	15	ISE	F/CST	225-3-01	or	F/CST	225-508	104	
Formaldehyde	MDHS 102	2 ppm (2.5 mg/m³)	2 ppm (2.5 mg/m³)	varies	varies	varies	varies	varies	varies	HPLC-PDA	ST CF/CST	226-119 225-9003	or 70	ST	226-120	or	
Formaldehyde	NIOSH 2541	2 ppm (2.5 mg/m³)	2 ppm (2.5 mg/m³)	24	1	100	100	4	10	GC-FID	ST	226-118	52				
Formic acid	NIOSH 2011	5 ppm (9.6 mg/m³)		24		200		2		IC-CD	FLT ST	225-1728 226-10-03	110 50	CST C/HLD	225-3-25LF 225-1	113 118	
2-Furaldehyde (furfural)	MDHS 104	2 ppm (8 mg/m³)	5 ppm (20 mg/m³)	12		100		2		TD, GC	ST	226-357	54				
2-Furaldehyde (furfural)	NIOSH 2529	2 ppm (8 mg/m³)	5 ppm (20 mg/m³)	5		20		4		GC-FID	ST	226-118	52				
2-Furaldehyde (furfural)	OSHA 72	2 ppm (8 mg/m³)	5 ppm (20 mg/m³)	180		1000		3		GC-FID	ST	226-81A	51				
Glutaraldehyde	MDHS 102	0.05 ppm (0.2 mg/m³)	0.05 ppm (0.2 mg/m³)	varies	varies	varies	varies	varies	varies	HPLC-PDA	ST CF/CST	2256-119 225-9003	or 70	ST	226-118	or	
Glycerol mist	NIOSH 600	10 mg/m³		360		3000		2		GR	CYC CST	225-01-02 225-3LF	129 113	FLT C/HLD	225-5-37-P 225-1	109 118	
Grain dust	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112	
Graphite (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112	
Graphite (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC	225-69	129	FLT	225-58F	112	
Graphite (respirable dust)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112	
Gypsum (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112	
Gypsum (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC	225-69	129	FLT	225-58F	112	
Gypsum (respirable dust)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112	
Halogeno platinum compounds as Pt	MDHS 91/2	0.002 mg/m³		960		2000		8		XRFS	IOM	225-70A	124	FLT	225-1930	104	
Halothane	MDHS 88	10 ppm (82 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84				
Hardwood dust	MDHS 14/4	3 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112	
Heptan-2-one	MDHS 88	50 ppm (237 mg/m³)	100 ppm (475 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84				
Heptan-2-one	MDHS 96	50 ppm (237 mg/m³)	100 ppm (475 mg/m³)	5		20		4		GC-FID	ST	226-01	50				
Heptan-3-one	MDHS 88	35 ppm (166 mg/m³)	100 ppm (475 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84	
Heptan-3-one	MDHS 96	35 ppm (166 mg/m³)	100 ppm (475 mg/m³)	5		20		4		GC-FID	ST	226-01	50				
n-Heptane	MDHS 104	500 ppm (2085 mg/m³)		12		100		2		TD, GC	ST	226-357	or	ST	226-358	54	
n-Heptane	MDHS 88	500 ppm (2085 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84	
n-Heptane	MDHS 96	500 ppm (2085 mg/m³)		0.5		50		10 min		GC-FID	ST	226-01	50				
Hexan-2-one	MDHS 88	5 ppm (21 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84				
Hexan-2-one	MDHS 96	5 ppm (21 mg/m³)		10		20		8		GC-FID	ST	226-01	50				
n-Hexane	MDHS 104	20 ppm (72 mg/m³)		6		50		2		TD, GC	ST	226-357	or	ST	226-358	54	
n-Hexane	MDHS 88	20 ppm (72 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84	
n-Hexane	MDHS 96	20 ppm (72 mg/m³)		10		20		8		GC-FID	ST	226-01	50				
Hydrazine	MDHS 86/2	0.01 ppm (0.013 mg/m³)	0.1 ppm (0.13 mg/m³)	480		1000		8		HPLC-UV	IMP	225-36-2	72	IT	225-22	72	
Hydrazine	MDHS 86/2	0.01 ppm (0.013 mg/m³)	0.1 ppm (0.13 mg/m³)	240		2000		2		HPLC-UV	IOM	225-70A	124	FLT	225-58F	112	
Hydrazine	OSHA 108	0.01 ppm (0.013 mg/m³)	0.1 ppm (0.13 mg/m³)	240		1000		4		IC-UV	CF/CST	225-9012	70	C/HLD	225-1	118	
Hydrogen bromide	NIOSH 7907		3 ppm (10 mg/m³)		30		2000		15	IC-CD	CF/CST	225-9032	70	C/HLD	225-1	118	
Hydrogen bromide	OSHA ID-165SG		3 ppm (10 mg/m³)	97	3	200	200	8	15	IC	ST	226-10-03	50				
Hydrogen chloride (gas & aerosol mists)	NIOSH 7907	1 ppm (2 mg/m³)	5 ppm (8 mg/m³)	600	30	2000	2000	5	15	IC-CD	CF/CST	225-9032	70	C/HLD	225-1	118	
Hydrogen chloride (gas & aerosol mists)	OSHA ID-174SG	1 ppm (2 mg/m³)	5 ppm (8 mg/m³)		7.5		500		15	IC	ST	226-10-03	50				
Hydrogen cyanide	MDHS 56/3	0.9 ppm (1 mg/m³)	4.5 ppm (5 mg/m³)	40	15	200	1000	3	15	ISE	IMP IOM	225-36-2 225-70A	72 124	IT FLT	225-22 225-1930	72 104	
Hydrogen fluoride (as F)	OSHA ID-110	1.8 ppm (1.5 mg/m³)	3 ppm (2.5 mg/m³)	90	22	14500	1500	1	15	ISE	CF/CST	225-9001	70	C/HLD	225-1	118	
Hydrogen peroxide	OSHA 1019	1 ppm (1.4 mg/m³)	2 ppm (2.8 mg/m³)	240	30	1000	2000	4	15	VAS	CF/CST	225-9030	70	C/HLD	225-1	118	
Hydrogen sulphide	OSHA 1008	5 ppm (7 mg/m³)	10 ppm (14 mg/m³)	12	7.5	50	500	4	15	IC	ST	226-177	53				
Hydroquinone	MDHS 98/3	0.5 mg/m³			30		2000		15	HPLC-UV	IOM ST	225-70A (2) 226-35-03 √	124 50	FLT	225-58F	112	
4-Hydroxy-4-methylpentan-2-one	MDHS 88	50 ppm (241 mg/m³)	75 ppm (362 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84				
4-Hydroxy-4-methylpentan-2-one	MDHS 96	50 ppm (241 mg/m³)	75 ppm (362 mg/m³)	6		20		5		GC-FID	ST	226-01	50				
2-Hydroxypropyl acrylate	OSHA PV2078	0.5 ppm (2.7 mg/m³)		10		100		100 min		GC-FID	ST	226-73	51				
Indium & compounds (as In)	MDHS 91/2	0.1 mg/m³	0.3 mg/m³	960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104	
Iodine	NIOSH 6005		0.1 ppm (1.1 mg/m³)		15		1000		15	IC	ST	226-67	51				
Iodomethane	MDHS 88	2 ppm (12 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84				
Iodomethane	MDHS 96	2 ppm (12 mg/m³)		10		20		8		GC-FID	ST	226-01	50				
Iron oxide (fume) (as Fe)	MDHS 91/2	5 mg/m³	10 mg/m³	960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104	
Iron salts (as Fe)	MDHS 91/2	1 mg/m³	2 mg/m³	960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104	
Isobutyl acetate	MDHS 104	150 ppm (724 mg/m³)	187 ppm (903 mg/m³)	6		50		2		TD, GC	ST	226-357	or	ST	226-358	54	
Isobutyl acetate	MDHS 88	150 ppm (724 mg/m³)	187 ppm (903 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84				
Isobutyl acetate	MDHS 96	150 ppm (724 mg/m³)	187 ppm (903 mg/m³)	10		20		8		GC-FID	ST	226-01	50				

See page 244 for abbreviations.

Chemical Hazard	Agency Reference	SAMPLING								Analytical Method	SKC Collecting Equipment and Page No.					
		WEL		Vol. (liter)		Rate (ml/min)		Time								
		TWA (ppm)	STEL (ppm)	TWA	STEL	TWA	STEL	TWA (hr)	STEL (min)							
Isocyanates (all) (as -NCO)	MDHS 25/4	0.02 mg/m³	0.07 mg/m³	960		2000		8		HPLC	IOM	225-79A	124	FLT	225-9011	70
Isoflurane	MDHS 88	50 ppm (383 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84			
Isooctyl alcohol (mixed isomers)	MDHS 88	50 ppm (271 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84			
Isopentane	MDHS 88	600 ppm (1800 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Isopentane	MDHS 96	600 ppm (1800 mg/m³)		varies		varies		varies		GC-FID	ST	226-01	50			
Isopropyl acetate	MDHS 104		200 ppm (849 mg/m³)		1.5		100		15	TD, GC	ST	226-357	or	ST	226-358	54
Isopropyl acetate	MDHS 88		200 ppm (849 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84			
Isopropyl acetate	MDHS 96		200 ppm (849 mg/m³)		1.5		100		15	GC-FID	ST	226-01	50			
Kaolin (respirable dust)	MDHS 14/4	2 mg/m³		1440		3000		8		GR	CYC	225-69	129	FLT	225-58F	112
Kaolin (respirable dust)	MDHS 14/4	2 mg/m³		960		2000		8		GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112
Lead & inorganic compounds	MDHS 91/2	0.15 mg/m³		960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104
Limestone (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112
Limestone (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC	225-69	129	FLT	225-58F	112
Limestone (respirable dust)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112
Lithium hydride - Further analytical method required	MDHS 14/4		0.02 mg/m³	960	120	2000	2000	8	60	GR, ICP	IOM	225-70A	124	FLT	225-1930	104
Lithium hydroxide	OSHA ID-121		1 mg/m³	960		2000		8		AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118
Machine made mineral fibre (MMMF) (except for ceramic refractory)	MDHS 59/2	5 mg/m³ & 2 fibres/ml		240		1000		8		GR + PCM	FLT/CL	225-54A	125	FLT	225-1913	104
Magnesite (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112
Magnesite (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC	225-69	129	FLT	225-58F	112
Magnesite (respirable dust)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112
Magnesium oxide (as Mg) (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112
Magnesium oxide (as Mg) (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112
Magnesium oxide (as Mg) (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC	225-69	129	FLT	225-58F	112
Malathion	OSHA 62	10 mg/m³		60		1000		1		GC-FPD	ST	226-30-16	50			
Maleic anhydride	MDHS 104	1 mg/m³	3 mg/m³	12		100		2		TD, GC	ST	226-357	54			
Maleic anhydride	OSHA 86	1 mg/m³	3 mg/m³	60		500		2		HPLC-UV	CF/CST	225-9021	70	C/HLD	225-1	118
Manganese & inorganic compounds (as Mn) (inhalable)	MDHS 91/2	0.2 mg/m³		960		2000		8		XRFS	IOM	225-70A	124	FLT	225-1930	104
Manganese & inorganic compounds (as Mn) (respirable)	MDHS 91/2	0.05 mg/m³		960		2000		8		XRFS	IOM	225-70A	124	FLT	225-1930	104
Manganese in welding fume	ISO 10882-1	0.5 mg/m³		varies		750		varies		GR	H/SET CAL	225-6200 225-6202	121 121	MINI FLT	225-6201 225-8050	121 104
Marble (total inhalable)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112
Marble (total respirable)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC	225-69	129	FLT	225-58F	112
Marble (total respirable)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112
Mercury & compounds (except alkyl compounds)	NIOSH 6009	0.02 mg/m³		48		200		4		AA	ST	226-17-1A	50	F/CST	225-3-01	104
Metalworking fluids (water-mix)	MDHS 95/2			24(96)		2000		2(8)		AAS/ICP-AES	IOM	225-70A	124	FLT	225-1930	104
Methacrylic acid	OSHA PV2005	20 ppm (72 mg/m³)	40 ppm (143 mg/m³)	24		100		4		HPLC-UV	ST	226-30-08	50			
Methanethiol	OSHA 26	0.5 ppm (1 mg/m³)		20		200		100 min		GC-FPD	CF/CST	225-9007	70	C/HLD	225-1	118
Methanol	MDHS 104	200 ppm (266 mg/m³)	250 ppm (333 mg/m³)	12	3	50	200	4	15	GC-FID	ST	226-51	50			
Methanol	MDHS 88	200 ppm (266 mg/m³)	250 ppm (333 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-007	84			
Methanol	MDHS 96	200 ppm (266 mg/m³)	250 ppm (333 mg/m³)	5	3	20	200	4	15	GC-FID	ST	226-51	51			
2-Methoxyethanol	MDHS 104	1 ppm (3 mg/m³)		3		50		1		TD, GC	ST	226-357	or	ST	226-358	54
2-Methoxyethanol	MDHS 88	1 ppm (3 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
2-Methoxyethanol	MDHS 96	1 ppm (3 mg/m³)		48		100		8		GC-FID	ST	226-01	50			
2-Methoxyethyl acetate	MDHS 104	1 ppm (5 mg/m³)		12		100		2		TD, GC	ST	226-357	or	ST	226-358	54
2-Methoxyethyl acetate	MDHS 88	1 ppm (5 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
2-Methoxyethyl acetate	MDHS 96	1 ppm (5 mg/m³)		24		50		8		GC-FID	ST	226-01	50			
1-Methoxypropan-2-ol	MDHS 104	100 ppm (375 mg/m³)	150 ppm (560 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST	226-357	54			
1-Methoxypropan-2-ol	MDHS 88	100 ppm (375 mg/m³)	150 ppm (560 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84			
1-Methoxypropyl acetate	MDHS 88	50 ppm (274 mg/m³)	100 ppm (548 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
Methyl acetate	MDHS 104	200 ppm (616 mg/m³)	250 ppm (770 mg/m³)	6	1.5	50	100	2	15	TD, GC	ST	226-358	54			
Methyl acetate	MDHS 88	200 ppm (616 mg/m³)	250 ppm (770 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84			
Methyl acetate	MDHS 96	200 ppm (616 mg/m³)	250 ppm (770 mg/m³)	2.4	3	20	200	2	15	GC-FID	ST	226-01	50			
Methyl acrylate	MDHS 104	5 ppm (18 mg/m³)	10 ppm (36 mg/m³)	6	1.5	50	100	2	15	TD, GC	ST	226-357	54			
Methyl acrylate	MDHS 88	5 ppm (18 mg/m³)	10 ppm (36 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84			
Methyl acrylate	MDHS 96	5 ppm (18 mg/m³)	10 ppm (36 mg/m³)	10	3	20	200	8	15	GC-FID	ST	226-01	50			
Methyl cyanoacrylate	OSHA 55		0.3 ppm (1.4 mg/m³)		12		100		120	HPLC-UV	ST	226-98	52			
Methyl ethyl ketone peroxide (MEKP)	OSHA 77		0.2 ppm (1.5 mg/m³)		15		1000		15	HPLC-UV	ST	226-93	52			

See page 244 for abbreviations.

Sampling Guide — U.K. (HSE)

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Chemical Hazard	Agency Reference	SAMPLING WEL TWA (ppm)	WEL STEL (ppm)	Vol. (liter) TWA	Vol. (liter) STEL	Rate (ml/min) TWA	Rate (ml/min) STEL	Time TWA (hr)	Time STEL (min)	Analytical Method	SKC Collecting Equipment and Page No.
Methyl isocyanate	OSHA 54		0.02 ppm		15		50		300	HPLC-FD	ST 226-94 52
Methyl methacrylate	MDHS 104	50 ppm (208 mg/m³)	100 ppm (416 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST 226-357 54
Methyl methacrylate	MDHS 88	50 ppm (208 mg/m³)	100 ppm (416 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Methyl methacrylate	MDHS 96	50 ppm (208 mg/m³)	100 ppm (416 mg/m³)	5	1.5	20	100	4	15	GC-FID	ST 226-30-06 50
N-Methyl-2-pyrrolidone	MDHS 96	10 ppm (40 mg/m³)	20 ppm (80 mg/m³)	24	3	50	200	8	15	GC-FID	ST 226-01 50
N-Methylacryonitrile	OSHA 37	1 ppm (2.8 mg/m³)		20		200		100 min		GC-NPD	ST 226-01 50
3-Methylaniline	NIOSH 3511	0.5 ppm (2.2 mg/m³)		100		1000		100 min		GC-FID	IMP 225-36-2 or 72 IMP 225-36-5 72 IT 225-22
Methylbutan-1-ol	MDHS 96	100 ppm (366 mg/m³)	125 ppm (458 mg/m³)	5	3	20	200	4	15	GC-FID	ST 226-01 50
3-Methylbutan-1-ol	MDHS 88	100 ppm (366 mg/m³)	125 ppm (458 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Methylcyclohexanol	MDHS 88	50 ppm (237 mg/m³)	75 ppm (356 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 or PS 575-002 84
2-Methylcyclohexanol	MDHS 96	50 ppm (237 mg/m³)	75 ppm (356 mg/m³)	5	3	20	200	4	15	GC-FID	ST 226-01 50
2-Methylcyclohexanone	MDHS 104	50 ppm (233 mg/m³)	75 ppm (350 mg/m³)	24		200	100	2	15	TD, GC	ST 226-357 54
4,4-Methylcyclohexanone	MDHS 96	50 ppm (233 mg/m³)	75 ppm (350 mg/m³)	5		20		4		GC-FID	ST 226-115 52
4,4'-Methylenebis(orthochloroaniline) (MbOCA)	MDHS 75/2	0.005 mg/m³		200		2000		100 min		HPLC-UV	IOM 225-70A 124 FLT 225-58F 112
5-Methylenedianiline (MDA)	MDHS 75/2	0.01 ppm (0.08 mg/m³)		200		2000		100 min		HPLC-UV	IOM 225-70A 124 FLT 225-58F 112
5-Methylheptane-3-one	MDHS 88	10 ppm (53 mg/m³)	20 ppm (107 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 or PS 575-002 84
5-Methylheptane-3-one	MDHS 96	10 ppm (53 mg/m³)	20 ppm (107 mg/m³)	10	3	20	200	8	15	GC-FID	ST 226-01 50
4-Methylhexan-2-one	MDHS 88	20 ppm (95 mg/m³)	100 ppm (475 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
4-Methylpentan-2-ol	MDHS 88	25 ppm (106 mg/m³)	40 ppm (170 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
4-Methylpentan-2-ol	MDHS 96	25 ppm (106 mg/m³)	40 ppm (170 mg/m³)	10	3	20	200	8	15	GC-FID	ST 226-01 50
2-Methylpentan-2-one	MDHS 96	50 ppm (208 mg/m³)	100 ppm (416 mg/m³)	10	3	20	200	8	15	GC-FID	ST 226-01 50
4-Methylpentan-2-one	MDHS 88	50 ppm (208 mg/m³)	100 ppm (416 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
2-Methylpentane-2,4-diol	OSHA PV2101	25 ppm (123 mg/m³)	25 ppm (123 mg/m³)		3		200		15	GC-FID	ST 226-01 50
Methylpropan-1-ol	MDHS 96	50 ppm (154 mg/m³)	75 ppm (231 mg/m³)	10		20(50)		8(3.3)		GC-FID	ST 226-01 50
2-Methylpropan-1-ol	MDHS 88	50 ppm (154 mg/m³)	75 ppm (231 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Methyl-tert-butyl-ether	MDHS 88	50 ppm (183.5 mg/m³)	100 ppm (367 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 84
Methyl-tert-butyl-ether	NIOSH 1615	50 ppm (183.5 mg/m³)	100 ppm (367 mg/m³)	96		200		8		GC-FID	ST 226-37 51
Mica (total inhalable)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Mica (total respirable)	MDHS 14/4	0.8 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Mica (total respirable)	MDHS 14/4	0.8 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Molybdenum compounds (insoluble) (as Mo)	MDHS 91/2	10 mg/m³	20 mg/m³	960	30	2000	2000	8	15	XRFS	IOM 225-70A 124 FLT 225-1930 104
Molybdenum compounds (soluble) (as Mo)	MDHS 91/2	5 mg/m³	10 mg/m³	960	30	2000	2000	8	15	XRFS	IOM 225-70A 124 FLT 225-1930 104
Monochloroacetic acid	NIOSH 2008	0.3 ppm (1.2 mg/m³)		48		100		8		IC-CD	ST 226-47-01 51
Nickel (insoluble compounds except nickel tetracarbonyl) (as Ni)	MDHS 91/2	0.5 mg/m³		960		2000		8		XRFS	IOM 225-70A 124 FLT 225-1930 104
Nickel (soluble compounds except nickel tetracarbonyl) (as Ni)	MDHS 91/2	0.1 mg/m³		960		2000		8		XRFS	IOM 225-70A 124 FLT 225-1930 104
Nicotine	MDHS 104	0.5 mg/m³	1.5 mg/m³	360		1000		6		GC-NPD	ST 226-95 52
Nicotine	MDHS 96	0.5 mg/m³	1.5 mg/m³	360		1000		6		GC-NPD	ST 226-30-04 50
Nitric acid	NIOSH 7907		1 ppm (2.6 mg/m³)	600	30	2000	2000	5	15	IC-CD	CF/CST 225-9032 70 C/HLD 225-1 118
Nitrobenzene	MDHS 104	0.2 ppm (1 mg/m³)		12		100		2		TD, GC	ST 226-357 54
Nitrobenzene	MDHS 104	0.2 ppm (1 mg/m³)		12		100		2		TD, GC	ST 226-357 54
Nitrobenzene	MDHS 96	0.2 ppm (1 mg/m³)		48		100		8		GC-FID	ST 226-10 50
Nitrobenzene	NIOSH 2017	0.2 ppm (1 mg/m³)		24		200		2		GC-FID	CF/CST 225-9004 70 C/HLD 225-1 118
Nitrogen dioxide	NIOSH 6014	0.1 mg/m³		1.5-6		25-200		1-4		VAS	ST 226-40-02 51
Nitrogen monoxide	NIOSH 6014	0.5 mg/m³		1.5-6		25-200		1-4		VAS	ST 226-40-02 51
2-Nitromethane	NIOSH 2527	100 ppm (254 mg/m³)	150 ppm (381 mg/m³)	2.4		20		2		GC-NSD	ST 226-111A 52
di-n-Nitropropane	MDHS 96	5 ppm (18 mg/m³)		1.8		20		1.5		GC-FID	ST 226-110 52
Octyl phthalate	OSHA 104	5 mg/m³	10 mg/m³	240		1000		4		GC-FID	ST 226-56 51
Oil mist	MDHS 84/2			960	240	2000	2000	8	120	GR	IOM 225-70A 124 FLT 225-58F 112
Orthotoluidine	MDHS 75/2	0.1 ppm (0.5 mg/m³)		200		2000		100 min		HPLC-UV	IOM 225-70A 124 FLT 225-58F 112 ST 226-35 50
Osmium tetraoxide (as Os)	MDHS 91/2	0.0002 ppm (0.002 mg/m³)	0.0006 ppm (0.006 mg/m³)	960	30	2000	2000	8	15	XRFS	IOM 225-70A 124 FLT 225-1930 104
2,2'-Oxalic acid	OSHA PV2115	1 mg/m³	2 mg/m³	100		1000		100 min		IC	FLT 225-701 112 CST 225-3LF 113 C/HLD 225-1 118
Oxydiethanol	NIOSH 5523	23 ppm (101 mg/m³)		60		1000		1		GC-FID	ST 226-57 51
Ozone	OSHA ID-214		0.2 ppm (0.4 mg/m³)		22.5		1500		15	IC	CF/CST 225-9014 70 C/HLD 225-1 118
Paracetamol (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Paraffin wax (fume)	OSHA PV2047	2 mg/m³	6 mg/m³	100		1000		100 min		GC-FID	F/CST 225-706 112 C/HLD 225-1 118
Paraquat dichloride (ISO) (respirable dust)	MDHS 14/4	0.08 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Paraquat dichloride (ISO) (respirable dust)	MDHS 14/4	0.08 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Pentaerythritol (inhalable dust)	MDHS 14/4	10 mg/m³	20 mg/m³	960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112

See page 244 for abbreviations.

Chemical Hazard	Agency Reference	SAMPLING WEL TWA (ppm)	WEL STEL (ppm)	Vol. (liter) TWA	Vol. (liter) STEL	Rate (ml/min) TWA	Rate (ml/min) STEL	Time TWA (hr)	Time STEL (min)	Analytical Method	SKC Collecting Equipment and Page No.
Pentaerythritol (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Pentaerythritol (respirable dust)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Pentan-2-one	MDHS 88	200 ppm (716 mg/m³)	250 ppm (895 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Pentan-2-one	MDHS 96	200 ppm (716 mg/m³)	250 ppm (895 mg/m³)	10		20		8		GC-FID	ST 226-01 50
Pentan-3-one	MDHS 88	200 ppm (716 mg/m³)	250 ppm (895 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 or PS 575-002 84
Pentane	MDHS 104	600 ppm (1800 mg/m³)		6		50		2		TD, GC	ST 226-358 54
Pentane	MDHS 88	600 ppm (1800 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 84
Pentyl acetates (all isomers)	MDHS 88	50 ppm (270 mg/m³)	100 ppm (541 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 84
Pentyl acetates (all isomers)	MDHS 96	50 ppm (270 mg/m³)	100 ppm (541 mg/m³)	5		20		4		GC-FID	ST 226-01 50
Peroxodisulphate salts	MDHS 79/2			960	30	2000	2000	8	15	IC	IOM 225-70A 124 FLT 225-1930 104
p-Phenol	MDHS 104	2 ppm (7.8 mg/m³)	4 ppm (16 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST 226-357 54
p-Phenol	MDHS 96	2 ppm (7.8 mg/m³)	4 ppm (16 mg/m³)	24	3	100	200	4	15	GC-FID	ST 226-95 52
2-Phenyldiamine	OSHA 87	0.1 mg/m³		100		1000		100 min		HPLC-UV	CF/CST 225-9004 70 C/HLD 225-1 118
Phenylpropene (alpha-methyl styrene)	MDHS 96	50 ppm (246 mg/m³)	100 ppm (491 mg/m³)	10	3	20	200	8	15	GC-FID	ST 226-01 50
2-Phenylpropene (alpha-methyl styrene)	MDHS 104	50 ppm (246 mg/m³)	100 ppm (491 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST 226-357 54
2-Phenylpropene (alpha-methyl styrene)	MDHS 88	50 ppm (246 mg/m³)	100 ppm (491 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Phorate (ISO)	NIOSH 5600	0.05 mg/m³	0.2 mg/m³	240		1000		4		GC-FPD	ST 226-58 51
Phosgene	OSHA 61	0.02 ppm (0.08 mg/m³)	0.06 ppm (0.25 mg/m³)	240		1000		4		GC-NPD	ST 226-117 52
Phosphine	OSHA 1003	0.1 ppm (0.14 mg/m³)	0.2 ppm (0.28 mg/m³)	240	30	1000	2000	4	15	ICP-AES	CF/CST 225-9004 70 C/HLD 225-1 118
Phosphorus trichloride	NIOSH 6402	0.2 ppm (1.1 mg/m³)	0.5 ppm (2.9 mg/m³)	24		200		2		IC	IMP 225-36-2 72 IT 225-22 72
Phthalic anhydride	MDHS 62/2	4 mg/m³	12 mg/m³	960	30	2000	2000	8	15	HPLC-UV	IOM 225-70A 124 FLT 225-58F 112 ST 226-35 50
Phthalic anhydride	OSHA 90	4 mg/m³	12 mg/m³	75		1000		1.25		HPLC-UV	CF/CST 225-9004 70 C/HLD 225-1 118
Picloram (ISO)	OSHA PV2049	10 mg/m³	20 mg/m³	60		1000		1		GR	FLT 225-803 109 C/HLD 225-1 118
Piperazine dihydrochloride - Further GC-FID analysis required	MDHS 14/4	0.1 mg/m³	0.3 mg/m³	120		1000		8		GR, GC-FID	IOM 225-70A 124 FLT 225-58F 112
Plaster of Paris (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Plaster of Paris (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Plaster of Paris (respirable dust)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Polychlorinated biphenyls (PCB)	ASTM 4861	0.1 mg/m³		960		2000		8		GC-ECD	PUF 226-124 or PUF 226-92 52
Polychlorinated biphenyls (PCB)	NIOSH 5503	0.1 mg/m³		48		100(200)		8(4)		GC-ECD	FLT 225-16 50 CST 225-32 70 ST 226-39 51
Polyvinylchloride (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Polyvinylchloride (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Polyvinylchloride (respirable dust)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Portland cement (inhalable dust)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Portland cement (respirable dust)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Portland cement (respirable dust)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Potassium hydroxide - Further analytical method required	MDHS 14/4		2 mg/m³		10		2000		15	GR, AA or AES	IOM 225-70A 124 FLT 225-1930 104
Prop-2-yn-1-ol	OSHA 97	1 ppm (2.3 mg/m³)	3 ppm (7 mg/m³)	6		50		2		GC-ECD	ST 226-178 53
Propan-1-ol	MDHS 104	200 ppm (500 mg/m³)	250 ppm (625 mg/m³)	8	1.5	50	100	150 min	15	TD, GC	ST 226-358 54
Propan-1-ol	MDHS 104	200 ppm (500 mg/m³)	250 ppm (625 mg/m³)	8	1.5	50	100	150 min	15	TD, GC	ST 226-358 54
Propan-1-ol	MDHS 88	200 ppm (500 mg/m³)	250 ppm (625 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 or PS 575-002 84
Propan-1-ol	MDHS 96	200 ppm (500 mg/m³)	250 ppm (625 mg/m³)	10	3	20	200	8	15	GC-FID	ST 226-01 50
Propan-2-ol	MDHS 104	400 ppm (999 mg/m³)	500 ppm (1250 mg/m³)	3	1.5	50	100	1	15	TD, GC	ST 226-358 54
Propan-2-ol	MDHS 88	400 ppm (999 mg/m³)	500 ppm (1250 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
Propan-2-ol	MDHS 96	400 ppm (999 mg/m³)	500 ppm (1250 mg/m³)	3	3	20	200	2.5	15	GC-FID	ST 226-01 50
Propane-1,2-diol (particulates)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Propane-1,2-diol (total vapour & particulates)	OSHA PV2051	150 ppm (474 mg/m³)		60	15	1000	1000	1	15	GC-FID	ST 226-57 51
Propionic acid	OSHA PV2293	10 ppm (31 mg/m³)	15 ppm (46 mg/m³)	18		200		90 min		GC-FID	ST 226-15 50
Propoxur (ISO)	NIOSH 5601	0.5 mg/m³	2 mg/m³	240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
n-Propranolol	MDHS 14/4	2 mg/m³	6 mg/m³	960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Propyl acetate	MDHS 96	200 ppm (849 mg/m³)	250 ppm (1060 mg/m³)	10	3	20	200	8	15	GC-FID	ST 226-01 50
n-Propyl acetate	MDHS 104	200 ppm (849 mg/m³)	250 ppm (1060 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST 226-357 or ST 226-358 54
n-Propyl acetate	MDHS 88	200 ppm (849 mg/m³)	250 ppm (1060 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 84
Propylene oxide	MDHS 104	1 ppm (2.4 mg/m³)		1		50		20 min		TD, GC	ST 226-358 54
Propylene oxide	MDHS 88	1 ppm (2.4 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-001 or PS 575-002 84
Propylene oxide	MDHS 96	1 ppm (2.4 mg/m³)		5		20		250 min		GC-FID	ST 226-01 50
Pulverized fuel ash (inhalable)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Pulverized fuel ash (respirable)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Pulverized fuel ash (respirable)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124

See page 244 for abbreviations.

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Chemical Hazard	Agency Reference	SAMPLING								Analytical Method	SKC Collecting Equipment and Page No.
		WEL		Vol. (liter)		Rate (ml/min)		Time			
		TWA (ppm)	STEL (ppm)	TWA	STEL	TWA	STEL	TWA (hr)	STEL (min)		
Pyrethrum	OSHA 70	1 mg/m³		60		1000		1		GC-ECD	ST 226-30-16 50
Pyridine	MDHS 104	5 ppm (16 mg/m³)	10 ppm (33 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST 226-357 54
Pyridine	MDHS 88	5 ppm (16 mg/m³)	10 ppm (33 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-002 84
2-Pyridine	MDHS 96	5 ppm (16 mg/m³)	10 ppm (33 mg/m³)	48		100		8		GC-FID	ST 226-01 50
Pyridylamine	OSHA PV2143	0.5 ppm (2 mg/m³)	2 ppm (7.8 mg/m³)	240		1000		4		GC-NPD	CF/CST 225-9004 70 C/HLD 225-1 118
Pyrocatechol	OSHA PV2014	5 ppm (23 mg/m³)		100		1000		100 min		HPLC-UV	ST 226-57 51
Refractory ceramic & special purpose fibres	MDHS 14/4	5 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Refractory ceramic & special purpose fibres	MDHS 59/2	0.3 fibre/ml		240		1000		8		PCM	FLT/CL 225-54A 125 FLT 225-1913 104
Rhodium (metal fume & dust) as Rh	MDHS 91/2	0.1 mg/m³	0.3 mg/m³	960	30	2000	2000	8	15	XRFS	IOM 225-70A 124 FLT 225-1930 104
Rhodium (soluble salts) as Rh	MDHS 91/2	0.001 mg/m³	0.003 mg/m³	960	30	2000	2000	8	15	XRFS	IOM 225-70A 124 FLT 225-1930 104
Rosin-based solder flux fume	MDHS 83/3	0.05 mg/m³	0.15 mg/m³	960	30	2000	2000	8	15	GC-FID	FLT 225-8050 104
Rotenone (ISO)	NIOSH 5007	5 mg/m³	10 mg/m³	120		1000		2		HPLC-UV	FLT 225-17-01 110 CST 225-4 113 C/HLD 225-1 118
Rouge (total inhalable)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Rouge (total respirable)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Rouge (total respirable)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Rubber fume	MDHS 47/3	0.6 mg/m³		960		2000		8		GR, SE	IOM 225-70A 124 FLT 225-58F 112
Rubber process dust	MDHS 14/4	6 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Selenium & compounds (except hydrogen selenide) (as Se)	MDHS 91/2	0.1 mg/m³		960		2000		8		XRFS	IOM 225-70A 124 FLT 225-1930 104
Silica amorphous (inhalable dust)	MDHS 14/4	6 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Silica amorphous (respirable dust)	MDHS 14/4	2.4 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Silica amorphous (respirable dust)	MDHS 14/4	2.4 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Silica fused (respirable dust)	MDHS 14/4	0.08 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Silica fused (respirable dust)	MDHS 14/4	0.08 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Silica crystalline (respirable)	MDHS 101/2	0.1 mg/m³		1440		3000		8		IR, XRD	CYC 225-69 129 FLT 225-58F 112
Silica crystalline (respirable)	MDHS 101/2	0.1 mg/m³		960		2000		8		IR, XRD	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Silicone carbide (not whiskers) (total inhalable)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Silicone carbide (not whiskers) (total respirable)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Silicone carbide (not whiskers) (total respirable)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Silver (soluble compounds as Ag)	MDHS 91/2	0.01 mg/m³		960		2000		8		XRFS	IOM 225-70A 124 FLT 225-1930 104
Silver metallic	MDHS 91/2	0.1 mg/m³		960		2000		8		XRFS	IOM 225-70A 124 FLT 225-1930 104
Sodium azide (as NaN3)	OSHA ID-211	0.1 mg/m³	0.3 mg/m³		5		1000		5 min	IC-UV	ST 226-55 51 FLT 225-5-37-P 109 CST 225-2LF 113 SPC 225-23 119 C/HLD 225-1 118
Sodium hydrogen sulphite	OSHA ID-121	5 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Sodium hydroxide - Further analytical method required	MDHS 14/4		2 mg/m³		10		2000		15	GR, AA or AES	IOM 225-70A 124 FLT 225-1930 104
Softwood dust	MDHS 14/4	5 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Starch (respirable)	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Starch (respirable)	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Starch (total inhalable)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Styrene	MDHS 104	100 ppm (430 mg/m³)	250 ppm (1080 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST 226-358 54
Styrene	MDHS 88	100 ppm (430 mg/m³)	250 ppm (1080 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS 575-006 84
Styrene	MDHS 96	100 ppm (430 mg/m³)	250 ppm (1080 mg/m³)	10	5	20	330	8	15	GC-FID	ST 226-01 50
Sucrose	MDHS 14/4	10 mg/m³	20 mg/m³	960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112
Sulful dioxide	NIOSH 6004	0.5 ppm (1.3 mg/m³)	1 ppm (2.7 mg/m³)	180	15	1000	1000	3	15	IC	CF/CST 225-9004 70 C/HLD 225-1 118
Sulphuric acid	NIOSH 7908	0.05 mg/m³		960		2000		8		IC-CD	CF/CST 225-9033 70 C/HLD 225-1 118
Sulphuric acid	OSHA 113	0.05 mg/m³		480		2000		4		IC	PPI 225-3861 130 FLT 225-5 104 IS 225-388 130 SP 225-27 118
Sulphuryl difluoride	NIOSH 6012	5 ppm (21 mg/m³)	10 ppm (42 mg/m³)	10		20		8		IC-ECN	ST 226-16 50
Talc (respirable dust)	MDHS 14/4	1 mg/m³		1440		3000		8		GR	CYC 225-69 129 FLT 225-58F 112
Talc (respirable dust)	MDHS 14/4	1 mg/m³		960		2000		8		GR	IOM 225-70A 124 FLT 225-58F 112 FOAM 225-772 124
Tantalum	MDHS 91/2	5 mg/m³	10 mg/m³	960	30	2000	2000	8	15	XRFS	IOM 225-70A 124 FLT 225-1930 104
Tellurium & compounds (except hydrogen telluride) as Te	MDHS 91/2	0.1 mg/m³		960		2000		8		XRFS	IOM 225-70A 124 FLT 225-1930 104
1,1,2,2-Terphenyls (o- isomers)	NIOSH 5021		0.5 ppm (4.8 mg/m³)		22.5		1500		15	GC-FID	F/CST 225-1713 110 C/HLD 225-1 118
Tetrabromomethane	MDHS 96	0.5 ppm (7.2 mg/m³)		96		200		8		GC-FID	ST 226-10 50
Tetrachloroethane	MDHS 96			24		50		8		GC-FID	ST 226-81A 51

See page 244 for abbreviations.

Chemical Hazard	Agency Reference	SAMPLING								Analytical Method	SKC Collecting Equipment and Page No.						
		WEL		Vol. (liter)		Rate (ml/min)		Time									
		TWA (ppm)	STEL (ppm)	TWA	STEL	TWA	STEL	TWA (hr)	STEL (min)								
1,1,2,2-Tetrachloroethane	MDHS 88			diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84				
Tetrachloroethylene	MDHS 104	20 ppm (138 mg/m³)	40 ppm (275 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST	226-357	54				
Tetrachloroethylene	MDHS 104	20 ppm (138 mg/m³)	40 ppm (275 mg/m³)	12		100		2		GC-FID	ST	226-357	54				
Tetrachloroethylene	MDHS 88	20 ppm (138 mg/m³)	40 ppm (275 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84	
Tetrachloroethylene	MDHS 96	20 ppm (138 mg/m³)	40 ppm (275 mg/m³)	3		20		2.5		GC-FID	ST	226-01	50				
Tetrachlorophthalic anhydride	MDHS 62/2			960	30	2000	2000	8	15	HPLC-UV	IOM ST	225-70A 226-35	124 50	FLT	225-58F	112	
Tetraethyl lead (as Pb)	NIOSH 2533			96		200		8		GC-PID	ST	226-30-04	50				
Tetrahydrofuran	MDHS 88	50 ppm (150 mg/m³)	100 ppm (300 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84				
Tetrahydrofuran	MDHS 96	50 ppm (150 mg/m³)	100 ppm (300 mg/m³)	9	1.5	20	100	7	15	GC-FID	ST	226-01	50				
Thallium (soluble compounds) (as Tl)	MDHS 91/2	0.1 mg/m³		960		2000		8		XRFS	IOM	225-70A	124	FLT	225-1930	104	
Tin compounds (inorganic except SnH4) (as Sn)	MDHS 91/2	2 mg/m³	4 mg/m³	960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104	
Tin compounds (organic except cyhexatin) (ISO) (as Sn)	NIOSH 5504	0.1 mg/m³	0.2 mg/m³	480		1000		8		HPLC AA-GF	ST C/HLD	226-30 225-1	50 118	F/CST	225-706	112	
Titanium dioxide - respirable	MDHS 14/4	4 mg/m³		1440		3000		8		GR	CYC	225-69	129	FLT	225-58F	112	
Titanium dioxide - respirable	MDHS 14/4	4 mg/m³		960		2000		8		GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112	
Titanium dioxide (inhalable)	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112	
Toluene	MDHS 104	50 ppm (191 mg/m³)	100 ppm (384 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST	226-358	54				
Toluene	MDHS 88	50 ppm (191 mg/m³)	100 ppm (384 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84				
Toluene	MDHS 96	50 ppm (191 mg/m³)	100 ppm (384 mg/m³)	6	3	100	200	1	15	GC-FID	ST	226-01	50				
o-Toluidine	MDHS 75/2	0.1 ppm (0.5 mg/m³)		200		2000		100 min		HPLC-UV	IOM ST	225-70A 226-35	124 50	FLT	225-58F	112	
o-Toluidine	MDHS 96	0.1 ppm (0.5 mg/m³)		48		100		8		GC-FID	ST	226-10	50				
o-Toluidine	NIOSH 2017	0.1 ppm (0.5 mg/m³)		24		200		2		GC-FID	CF/CST	225-9004	70	C/HLD	225-1	118	
Tributyl phosphate (all isomers)	NIOSH 5034	5 mg/m³	5 mg/m³	90		1500		1		GC-FPD	F/CST	225-3-01	104	C/HLD	225-1	118	
1,2,4-Trichlorobenzene	NIOSH 5517	1 ppm	5 ppm	12	3	25	200	8	15	GC-ECD	FLT CST	225-17-03 Special order	110	ST C/HLD	226-30-04 225-1	50 118	
1,1,1-Trichloroethane	MDHS 104	100 ppm (555 mg/m³)	200 ppm (1110 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST	226-358	54				
1,1,1-Trichloroethane	MDHS 88	100 ppm (555 mg/m³)	200 ppm (1110 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84				
1,1,1-Trichloroethane	MDHS 96	100 ppm (555 mg/m³)	200 ppm (1110 mg/m³)		3		200		15	GC-FID	ST	226-01	50				
1,1,2-Trichloroethane	MDHS 88			diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84				
1,1,2-Trichloroethane	MDHS 96			10		20		8		GC-FID	ST	226-01	50				
Trichloroethylene	MDHS 88	100 ppm (550 mg/m³)	150 ppm (820 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84				
Trichloroethylene	MDHS 96	100 ppm (550 mg/m³)	150 ppm (820 mg/m³)	10	2	20	200	8	15	GC-FID	ST	226-01	50				
1,1,2-Trichloroethylene	MDHS 104	100 ppm (550 mg/m³)	150 ppm (820 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST	226-357	54				
Trichloronitromethane	OSHA PV2103	0.1 ppm (0.68 mg/m³)	0.3 ppm (2.1 mg/m³)	5		200		25 min		GC-ECD	ST	226-93	52				
Triethylamine	OSHA PV2060	2 ppm (8 mg/m³)	4 ppm (17 mg/m³)	10		100		100 min		GC-FID	ST	226-98	52				
Triglycidyl isocyanurate (TGIC)	MDHS 85/2	0.1 mg/m³		200	30	2000	2000	100 min	15	HPLC-UV	IOM	225-70A	124	FLT	225-58F	112	
Triglycidyl isocyanurate (TGIC)	OSHA PV2055	0.1 mg/m³		60		1000		1		GC-ECD	CF/CST	225-9027	70	C/HLD	225-1	118	
Trimellitic anhydride	MDHS 62/2	0.04 mg/m³	0.12 mg/m³	960	30	2000	2000	8	15	HPLC-UV	IOM ST	225-70A 226-35	124 50	FLT	225-58F	112	
Trimethylbenzenes (all isomers or mixtures)	MDHS 104	25 ppm (125 mg/m³)		12		100		2		TD, GC	ST	226-357	or	ST	226-358	54	
3,5,5-Trimethylbenzenes (all isomers or mixtures)	MDHS 88	25 ppm (125 mg/m³)		diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84				
2,4,6-Trimethylcyclohex-2-enone	MDHS 96		5 ppm (29 mg/m³)	10		20		8		GC-FID	ST	226-81A	51				
3,5,5-Trimethylcyclohex-2-enone	MDHS 104		5 ppm (29 mg/m³)		1.5		100		15	TD, GC	ST	226-357	54				
3,5,5-Trimethylcyclohex-2-enone	MDHS 88		5 ppm (29 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-002	84				
Trinitrotoluene	OSHA 44	0.5 mg/m³		60		1000		1		GC-TEA-EAP	ST	226-35-03	50				
Tri-o-tolyl phosphate	NIOSH 5037	0.1 mg/m³	0.3 mg/m³	90		1000		1.5		GC-FPD	F/CST	225-3-01	104	C/HLD	225-1	118	
Triphenyl phosphate	NIOSH 5038	3 mg/m³	6 mg/m³	240		1000		4		GC-FPD	F/CST	225-3-01	104	C/HLD	225-1	118	
Tungsten & insoluble compounds (as W) & others	MDHS 91/2	5 mg/m³	10 mg/m³	960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104	
Tungsten & soluble compounds (as W)	MDHS 91/2	1 mg/m³	3 mg/m³	960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104	
Turpentine	NIOSH 1551	100 ppm (566 mg/m³)	150 ppm (850 mg/m³)	10		20(50)		8(3.3)		GC-FID	ST	226-01	50				
Vanadium pentoxide	MDHS 91/2	0.05 mg/m³		960		2000		8		XRFS	IOM	225-70A	124	FLT	225-1930	104	
Vanadium pentoxide	NIOSH 7504	0.05 mg/m³		660		2200		5		XRD	F/CST C/HLD	225-803 225-1	109 118	CYC	225-01-02	129	
Vinyl chloride	MDHS 96	1 ppm (2.6 mg/m³)		5		50		1.6		GC-FID	ST	(2) 226-01 √	50				
Vinylidene chloride	MDHS 88	2 ppm (8 mg/m³)	5 ppm (20 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	84				
Vinylidene chloride	MDHS 96	2 ppm (8 mg/m³)	5 ppm (20 mg/m³)	5		20		4		GC-FID	ST	226-01	50				
Welding fume	ISO 10882-1	See specific fumes eg. Chromium				750				GR	H/SET CAL	225-6200 225-6202	121 121	MINI FLT	225-6201 225-8050	121 104	
Wood dust (inhalable)	MDHS 14/4	See hardwood / soft wood		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112	

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Chemical Hazard	Agency Reference	SAMPLING								Analytical Method	SKC Collecting Equipment and Page No.					
		WEL		Vol. (liter)		Rate (ml/min)		Time								
		TWA (ppm)	STEL (ppm)	TWA	STEL	TWA	STEL	TWA (hr)	STEL (min)							
Wood dust (respirable)	MDHS 14/4	See hardwood / soft wood		1440		3000		8		GR	CYC	225-69	129	FLT	225-58F	112
Wood dust (respirable)	MDHS 14/4	See hardwood / soft wood		960		2000		8		GR	IOM FOAM	225-70A 225-772	124 124	FLT	225-58F	112
Wool process dust	MDHS 14/4	10 mg/m³		960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112
Xylene (o-,m-,p-,or mixed isomers)	MDHS 104	50 ppm (220 mg/m³)	100 ppm (441 mg/m³)	12	1.5	100	100	2	15	TD, GC	ST	226-357	or	ST	226-358	54
Xylene (o-,m-,p-, or mixed isomers)	MDHS 88	50 ppm (220 mg/m³)	100 ppm (441 mg/m³)	diffusive	diffusive	diffusive	diffusive			GC-FID	PS	575-001	or	PS	575-002	84
Xylene (o-,m-,p-, or mixed isomers)	MDHS 96	50 ppm (220 mg/m³)	100 ppm (441 mg/m³)	21	3	50	200	7	15	GC-FID	ST	226-01	50			
Yttrium	MDHS 91/2	1 mg/m³	3 mg/m³	960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104
Zinc chloride (fume)	MDHS 91/2	1 mg/m³	2 mg/m³	960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104
Zinc distearate (inhalable dust)	MDHS 91/2	10 mg/m³	20 mg/m³	960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104
Zinc distearate (respirable dust)	MDHS 91/2	4 mg/m³		1440		3000		8		XRFS	CYC	225-69	129	FLT	225-1930	104
Zinc distearate (respirable dust)	MDHS 91/2	4 mg/m³		960		2000		8		XRFS	IOM FOAM	225-70A 225-772	124 124	FLT	225-1930	104
Zinc oxide	MDHS 14/4			960		2000		8		GR	IOM	225-70A	124	FLT	225-58F	112
Zirconium compounds (as Zr)	MDHS 91/2	5 mg/m³	10 mg/m³	960	30	2000	2000	8	15	XRFS	IOM	225-70A	124	FLT	225-1930	104

√ *This application requires two tubes.*

¶ *Use two Cat. No. 226-36 tubes.*

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See page 244 for abbreviations.

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Acenaphthene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m^3 (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
Acenaphthene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Acenaphthene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-UV	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Acenaphthylene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Acenaphthylene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m^3 (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
Acenaphthylene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-UV	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Acetaldehyde	ASTM D 5197			varies		500-1200		5 min-24 hrs		HPLC-UV	ST 226-120 or ST 226-119 52
Acetaldehyde	NIOSH 2538	LFC		10		20		8		GC-FID	ST 226-27 50
Acetaldehyde	NIOSH 3507	LFC		60		125		8		HPLC	IMP 225-36-2 72 IT 225-22 72
Acetaldehyde	OSHA 68	200		3	0.75	50	50	1	15	GC-NPD	ST 226-27 50
Acetaldehyde (Aldehydes, Screening)	NIOSH 2539	LFC		5		10		8		GC-FID & GC-MS	ST 226-118 52
Acetamide	OSHA PV2084			10		20(50)		8(3.3)		GC-NPD	ST 226-10 50
Acetates (screening)	NIOSH 2549			5		20		4		GC-MS	ST 226-330 54
Acetic acid	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Acetic acid	NIOSH 1603	10	15	24		50		8		GC-FID	ST 226-01 50
Acetic acid	OSHA ID 186SG	10		48		200		4		IC or GC-FID	ST 226-01 50
Acetic acid	OSHA PV2119			48		200		4		IC or GC-FID	ST 226-01 50
Acetic anhydride	NIOSH 3506		5	90		1000		1.5		VAS	IMP 225-36-2 72 IT 225-22 72
Acetic anhydride	OSHA 102	5		7.5	7.5	50	500	2.5	15	GC-NPD	CF/CST 225-9010 70 C/HLD 225-1 118
Acetic anhydride	OSHA 82	5		0.75		50		15 min		GC-NPD	CF/CST 225-9009 70 C/HLD 225-1 118
Acetoin	NIOSH 2558			1-10		10-200		varies		GC-FID	ST NA SKC
Acetoin (acetyl methyl carbinol)	OSHA 1012 #	0.05		9	3	50	200	3	15	GC-FID	ST 226-183 53
Acetoin (acetyl methyl carbinol)	OSHA 1013 #	0.05		9	3	50	200	3	15	GC-FID	ST 226-183 53
Acetone	ASTM D 5197			varies		500-1200		5 min-24 hrs		HPLC-UV	ST 226-120 or ST 226-119 52
Acetone	OSHA 69	1000		3		50		1		GC-FID	ST NA SKC
Acetone (Ketones I)	NIOSH 1300	250		2	0.75	20	50	100 min	15	GC-FID	ST 226-01 50
Acetone (Ketones I)	NIOSH 2555			0.5 - 3		10-200		varies		GC-FID	ST NA SKC
Acetonitrile	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Acetonitrile	NIOSH 1606	20		10		20(50)		8(3.3)		GC-FID	ST 226-09 50
Acetophenone	OSHA PV2003			12		100		2		GC-FID	ST 226-35 50
Acetyl methyl carbinol (acetoin)	NIOSH 2558			1-10		10-200		varies		GC-FID	ST NA SKC
Acetylene tetrabromide (1,1,2,2-tetrabromoethane)	NIOSH 2003			96		200		8		GC-FID	ST 226-10 50
Acid blue 9	OSHA PV2129			100		1000		100 min		HPLC-UV	F/CST 225-706 112 C/HLD 225-1 118
Acridine	OSHA 58	0.2 mg/m^3		960		2000		8		GR & HPLC-FD, or GR & HPLC-UV	FLT 225-7 112 CST 225-2LF 113 C/HLD 225-1 118
Acrolein	NIOSH 2501	0.1	0.3	24	3	50	200	8	15	GC-NPD	ST 226-118 52
Acrolein	OSHA 52	0.1		48	3	100	200	8	15	GC-NPD	ST 226-117 52
Acrolein (Aldehydes, Screening)	NIOSH 2539	0.1	0.3	5		10		8		GC-FID & GC-MS	ST 226-118 52

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Acrylamide	OSHA 21	0.3 mg/m³		120		1000		2		GC-NPD	ST 226-10 50 FLT 225-16 112 CST 225-32 118
Acrylamide	OSHA PV2004	0.3 mg/m³		120		1000		2		HPLC-UV	ST 226-57 51
Acrylic acid	NON 10			48		100		8		GC	ST 226-70A 51
Acrylic acid	NON 60			24		100		4		HPLC-UV	ST 226-30-08 50
Acrylonitrile	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Acrylonitrile	NIOSH 1604	1	10 (15 min)	10	3	20(50)	200	8(3.3)	15	GC-FID	ST 226-01 50
Acrylonitrile	OSHA 37	2	10	20	6	200	400	100 min	15	GC-NPD	ST 226-01 50
Actinomycetes, thermophilic	NIOSH 0800			varies		28,300		varies		varies	BI 225-9611 138
Aerobic bacteria (by GC-FAME)	NIOSH 0801			50-300		28300		varies		GC-FID	BI 225-9611 138
Alcohols (screening)	NIOSH 2549			5		20		4		GC-MS	ST 226-330 54
Alcohols combined	NIOSH 1405	varies	varies	varies	varies	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
Alcohols I *(see specific compounds)*	NIOSH 1400	varies		varies		varies		varies		GC-FID	ST 226-01 50
Alcohols II *(see specific compounds)*	NIOSH 1401	varies		varies		varies		8		GC-FID	ST 226-01 50
Alcohols III *(see specific compounds)*	NIOSH 1402	varies		varies		varies		8		GC-FID	ST 226-01 50
Alcohols IV *(see specific alcohol)*	NIOSH 1403	varies		varies		varies		varies		GC-FID	ST 226-01 50
Aldehydes	EPA TO-5			< 80 L		100-1000 ml/min				HPLC-UV	IMP 225-36-1 72 IT 225-22 72
Aldehydes (screening)	NIOSH 2539	varies		5		20		4		GC-FID & GC-MS	ST 226-118 52
Aldehydes (screening)	NIOSH 2549			5		20		4		GC-MS	ST 226-330 54
Aldicarb (Organonitrogen Pesticides)	NIOSH 5601			240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Aldicarb (Temik)	OSHA 74			480		1000		8		GC-NPD	ST 226-30-16 50
Aldrin	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Aldrin	NIOSH 5502	0.25 mg/m³		240		500		8		GC-ECN	F/CST 225-709 112 IMP 225-36-2 72 IT 225-22 72 C/HLD 225-1 118
Aliphatic hydrocarbons (screening)	NIOSH 2549			5		20		4		GC-MS	ST 226-330 54
Alkaline dusts	NIOSH 7401				30		2000		15	TITRA	F/CST 225-1715 110 C/HLD 225-1 118
Allethrin	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Allyl alcohol	OSHA PV2140	2 (skin)		10		50		200 min		GC-FID	ST 226-01 50
Allyl alcohol (Alcohols Combined)	NIOSH 1405	2	4 (skin)	1-10	1-10	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
Allyl alcohol (Alcohols III)	NIOSH 1402	2		10	3	200	200			GC-FID	ST 226-01 50
Allyl chloride	NIOSH 1000	1	2		15		1000		15	GC-FID	ST 226-01 50
Allyl glycidyl ether	NIOSH 2545	5	10	6	3	50	200	2	15	GC-FID	ST 226-35-03 50
Allyl propyl disulfide	OSHA PV2086	2		10		20(50)		8(3.3)		GC-FPD	ST 226-110 52
Alumina (aluminum & compounds [total dust as Al])	NIOSH 7013	10 mg/m³		360		1000		6		AA-F	F/CST 225-3-01 104 C/HLD 225-1 118
Alumina (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	CYC 225-01-02 129 C/HLD 225-1 118 F/CST 225-803 109
Alumina (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
alpha-Alumina (respirable fraction)	OSHA PV2121	5 mg/m³		varies		varies		varies		GR	CYC 225-105 128 F/CST 225-803 109 C/HLD 225-1 118
alpha-Alumina (total dust)	OSHA PV2121	15 mg/m³		960		2000		4-8		GR	F\CST 225-802 109 C/HLD 225-1 118 CST 225-2LF 113
Aluminum (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	10 mg/m³ (total dust)	5 mg/m³ (respirable)	1-330		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Aluminum & compounds (total dust as Al)	NIOSH 7013	10 mg/m³		360		1000		6		AA-F	F/CST 225-3-01 104 C/HLD 225-1 118

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

		SAMPLING ∞																	
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time											
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number								
Aluminum (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	10 mg/m³ (total dust)		5-100		1000-4000		varies		ICP-AES	F/CST C/HLD	225-3-01 225-1	or 118	F/CST	225-803	109			
Aluminum (Elements by ICP HNO_3 Digestion)	NIOSH 7303	10 mg/m³ (total dust) 5 mg/m³ (respirable fume)		2-10,000		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Aluminum (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	10 mg/m³ (total dust) 5 mg/m³ (respirable dust)		5-100		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Aluminum (respirable fraction)	OSHA PV2121	5 mg/m³		varies		varies		varies		GR	F/CST C/HLD	225-803 225-1	109 118	CYC	225-105	128			
Aluminum (total dust)	OSHA PV2121	15 mg/m³		480-960		2000		4-8		GR	F/CST CST	225-802 225-2LF	109 113	C/HLD	225-1	118			
Aluminum soluble salts	OSHA ID 121			960		2000		8		AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Amines	NIOSH 2002	varies		20		40		8		GC-FID or GC-NSD	ST	226-10	50						
Amines, aliphatic	NIOSH 2010	varies		24		50		8		GC-FID	ST	226-10	50						
2-Amino-2-methy-1-propanol	OSHA PV2145			10		100		100 min		HPLC-UV	ST	226-30-16	50						
4-Aminobiphenyl	OSHA 93			100		1000		100 min		GC-ECD	CF/CST	225-9004	70	C/HLD	225-1	118			
2-Aminoethanol	NIOSH 2007	3	6	10		20		8		GC-FID	ST	226-10-04	50						
2-Aminoethanol	NIOSH 3509	3	6	240		1000		4		IC	IMP	225-36-1	72	IT	225-22	72			
2-Aminoethanol	OSHA PV2111	3		10	1.5	100	100	100 min	15	HPLC-UV	ST	226-30-18	50						
Aminoethanol compounds I *(see specific compounds)*	NIOSH 2007	varies		varies		varies		8		GC-FID	ST	226-10-04	50						
Aminoethanol compounds II *(see specific compounds)*	NIOSH 3509	varies		240		1000		4		IC	IMP	225-36-1	72	IT	225-22	72			
Aminoethylethanolamine	OSHA PV2116			10		100				HPLC-UV	ST	226-30-18	50						
p-Aminophenylarsonic acid (arsenic, organo-)	NIOSH 5022			960		2000		8		IC-AA	FLT C/HLD	225-17-01 225-1	110 118	CST	225-3LF	113			
2-Aminopyridine	OSHA PV2143	0.5		240		1000		4		GC-NPD	CF/CST	225-9004	70	C/HLD	225-1	118			
3-Aminopyridine	OSHA PV2143			240		1000		4		GC-NPD	CF/CST	225-9004	70	C/HLD	225-1	118			
4-Aminopyridine	OSHA PV2143			240		1000		4		GC-NPD	CF/CST	225-9004	70	C/HLD	225-1	118			
Amitrole	OSHA PV2006			60		1000		1		HPLC-UV	IMP	225-36-1	72	IT	225-22	72			
Ammonia	NIOSH 6015	25	35	72	3	150	200	8	15	VAS	ST	226-10-06	50	F/CST	225-3-01	104			
Ammonia	NON 41			18	5	75	500	4	10	CLR	ST	226-61	51						
Ammonia	OSHA ID 188	50		24	7.5	100	500	4	15	IC-CD	ST	226-29	50						
Ammonia (by IC)	NIOSH 6016	25	35	48	3	100	200	8	15	IC	ST	226-10-06	50	F/CST	225-3-01**	104			
Ammonium chloride (fume)	OSHA ID 188			960	30	2000	2000	8	15	IC-CD	F/CST	225-3-01	104	C/HLD	225-1	118			
Ammonium hydroxide *(see ammonia)*																			
Ammonium metavanadate *(see vanadium oxides)*	NIOSH 7504																		
sec-Amyl acetate (2-pentyl acetate)	NIOSH 1450	125		10		200		50 (min)		GC-FID	ST	226-01	50						
n-Amyl acetate (Esters I)	NIOSH 1450	100		1-10		10-200		varies		GC-FID	ST	226-01	50						
Aniline	NIOSH 2017	LFC		24		200		2		GC-FID	CF/CST	225-9004	70	ST	226-15	50			
Aniline	OSHA PV2079	5		24		50		8		GC-FID	ST	226-98	52						
Aniline (Amines, Aromatic)	NIOSH 2002	LFC		24		50		8		GC-FID or GC-NSD	ST	226-10	50						
Anisidine	NIOSH 2514	0.5 mg/m³		240		1000		4		HPLC-UV	ST	226-30-05	50						
Anthophyllite fibers *(see asbestos fibers)*	NIOSH 7400																		

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Anthracene	OSHA 58	0.2 mg/m³		960		2000		8		GR & HPLC-FD, or GR & HPLC-UV	FLT 225-7 112 CST 225-2LF 113 C/HLD 225-1 118
Anthracene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m³ (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
Anthracene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Anthracene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-UV	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Antimony & compounds (as Sb)	OSHA ID 121	0.5 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Antimony & compounds (as Sb)	OSHA ID 125G	0.5 mg/m³		480		2000		4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Antimony (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	0.05 mg/m³		1-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Antimony (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	0.5 mg/m³		50-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Antimony (Elements by ICP HNO_3 Digestion)	NIOSH 7303	0.5 mg/m³		3-100,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Antimony (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.5 mg/m³		50-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Antimony (ICP Analysis of Metal/metalloid Particulates from Solder Operations)	OSHA ID 206	0.5 mg/m³		480		2000		4		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Apron	OSHA PV2102			60		1000		1		HPLC-UV	F/CST 225-709 112 C/HLD 225-1 118
Aroclor	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Aroclor	NIOSH 5602			480		1000		8		GC-ECD	ST 226-58 51
Aroclor 1242	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Aroclor 1242 (42% Cl) *(see polychlorobiphenyls)*	NIOSH 5503										
Aroclor 1254	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Aroclor 1254 (54% Cl) *(see polychlorobiphenyls)*	NIOSH 5503										
Aroclor 1260	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Aromatic hydrocarbons (screening)	NIOSH 2549			5		20		4		GC-MS	ST 226-330 54
Arsenic (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	0.002 mg/m³		32-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Arsenic & compounds (as As)	NIOSH 7900	2 µg/m³ (15 min)		30		2000		15		AA-F	F/CST 225-3-01 104 C/HLD 225-1 118
Arsenic (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	0.002 mg/m³		5-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Arsenic (Elements by ICP HNO_3 Digestion)	NIOSH 7303	0.002 mg/m³		8-5,000,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Arsenic (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.002 mg/m³ (C)		5-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Arsenic (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Arsenic (inorganic compounds as As)	OSHA ID 1006	0.01 mg/m³		480		2000		4		ICP-MS	F/CST 225-3-01 104 C/HLD 225-1 118
Arsenic trioxide as AS	NIOSH 7901	2 mg/m³ (15 min)		30		2000		15		AAS-GF	FLT 225-5 ‡ 104 CST 225-2LF 113 C/HLD 225-1 118
Arsenic, inorganic (volatile compounds as As)	OSHA ID 1006	0.01 mg/m³		480		2000		4		ICP-MS	CF/CST 225-9001 70 C/HLD 225-1 118
Arsenic, organo-	NIOSH 5022			960		2000		8		IC-AA	FLT 225-17-01 110 CST 225-2LF 113 C/HLD 225-1 118
Arsine	NIOSH 6001	2 µg/m³ (15 min)		10	3	20	200	8	15	AAS-GF	ST 226-01 50
Arylam *(see carbaryl)*											
Asbestos	OSHA ID 160	0.1 fbr/cc	1 fbr/cc EL	25-1200	25-1200	500-2500	500-2500	varies	varies	PCM	FLT/CL 225-321 or FLT/CL 225-326 or FLT/CL 225-321A or FLT/CL 225-327 106
Asbestos ([bulk] by PLM)	NIOSH 9002	1% (bulk)		bulk						PLM	
Asbestos (by TEM)	NIOSH 7402	0.1 fbr/cc/400L		960		2000		8		TEM	FLT/CL 225-327 106

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Asbestos (chrysotile)	NIOSH 9000			bulk						XRD	
Asbestos (structure number concentrations)	ASTM D 5755			varies		2000		2 min (minimum)		TEM	MVC 225-322 165
Asbestos fibers	NIOSH 7400	0.1 fbr/cc/400L		varies		varies		varies		PCM	FLT/CL 225-321 or FLT/CL 225-326 or FLT/CL 225-321A or FLT/CL 225-327 106
Aspartame	NIOSH 5031			480		1000		8		HPLC-UV	FLT C/HLD 225-17-01 110 225-1 118 CST 225-2LF 113
Asphalt fume (benzene-soluble & total particulate)	NIOSH 5042	5 mg/m³ (15 min) (C)		360	60	1000	4000	6	15	GR	FLT CST Contact SKC 225-2LF 113 SP 225-27 119
Asphalt fume particulate	ASTM D 6494			960		2000		8		GR	F/CST 225-1713 110 C/HLD 225-1 118
Asphalt fumes (petroleum)	OSHA 58			960		2000		8		GR & HPLC-FD, or GR & HPLC-UV	FLT C/HLD 225-7 112 225-1 118 CST 225-2LF 113
Atrazine	ASTM D 4861			240-7200		1000-5000		4-24		GC-NPD	PUF 226-92 56
Atrazine	NIOSH 5602	5		480		1000		8		GC-ECD	ST 226-58 51
Azelaic acid	NIOSH 5019			960		2000		8		GC-FID	F/CST 225-803 109 C/HLD 225-1 118
Azinphos-methyl	OSHA PV2087	0.2 mg/m³		480		1000		8		GC-FPD	ST 226-30-16 50
Azinphos-methyl (Organophosphorus Pesticides)	NIOSH 5600	0.2 mg/m³		240		1000		4		GC-FPD	ST 226-58 51
Bacteria	NIOSH 0800			varies		28,300		varies		varies	BI 225-9611 138
Bacteria (by GC-FAME)	NIOSH 0801			50-300		28300		varies		GC-FID	BI 225-9611 138
Bacteria (in air)	NON 48			62.5-375		12,500 +		5-30		varies	BS 225-9595 140 VT 225-9598A◊ 140
Barium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306			3-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Barium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	0.5 mg/m³		50-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or C/HLD 225-1 118 F/CST 225-803 ¥ 109
Barium (Elements by ICP HNO_3 Digestion)	NIOSH 7303			1-100,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Barium (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Barium (insoluble compounds)	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Barium (soluble compounds)	NIOSH 7056	0.5 mg/m³		960		2000		8		AA	F/CST 225-3-01 104 C/HLD 225-1 118
Barium (soluble compounds)	OSHA ID 121	0.5 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Barium chloride (barium, soluble compounds)	NIOSH 7056	0.5 mg/m³		960		2000		8		AA	F/CST 225-3-01 104 C/HLD 225-1 118
Barium sulfate (respirable fraction)	OSHA ID 204	5 mg/m³		varies		varies		varies		GR & XRF	CYC 225-105 128 C/HLD 225-1 118 F/CST 225-3-01 104
Barium sulfate (total dust)	OSHA ID 121	15 mg/m³		960		2000		8		AA or AES	F/CST 225-802 109 C/HLD 225-1 118
Baygon (propoxur)	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Baygon (propoxur)	OSHA PV2007			48		100		8		HPLC-UV	ST 226-30-16 50
Bendiocarb	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Bendiocarb (Ficam)	OSHA PV2008			240		1000		4		HPLC-UV	ST 226-30-16 50
Benomyl (Organonitrogen Pesticides)	NIOSH 5601			240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Benomyl (respirable dust)	OSHA PV2107	5 mg/m³		varies		varies		varies		HPLC-UV	ST 226-30-16 50 CYC 225-105 128
Benomyl (total dust)	OSHA PV2107	15 mg/m³		60		1000		1		HPLC-UV	ST 226-30-16 50
Bentonite *(see Particulates Not Otherwise Regulated, total and respirable)*											
Benz(a)anthracene	OSHA In House File			960		2000				HPLC-UV	F/CST 225-709 112 C/HLD 225-1 118
Benz(a)anthracene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m³ (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
Benz(a)anthracene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 C/HLD 225-1 118 ST 226-30-04 50

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Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Benz(a)anthracene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-FD	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Benzaldehyde	ASTM D 5197			varies		500-1200		5 min-24 hrs		HPLC-UV	ST 226-120 or ST 226-119 52
Benzene	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Benzene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Benzene	OSHA 1005	1	5					8	15	GC-FID	PS 575-002 84
Benzene	OSHA 1005	1	5	12	0.75	50	50	4	15	GC-FID	ST 226-01 50
Benzene	OSHA 1005	1	5	12	0.5	50	50	240 min	10	GC-FID	ST 226-01 50
Benzene (by portable GC)	NIOSH 3700	0.1	1 (15 min)	varies		20-5000		varies		P GC-PID	SB 232 Series 63
Benzene (Hydrocarbons, Aromatic)	NIOSH 1501	0.1	1	5-30	5-30	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
alpha-Benzene hexachloride	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
beta-Benzene hexachloride	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
gamma-Benzene hexachloride	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Benzene-soluble & total particulate (asphalt fume)	NIOSH 5042		5 mg/m³ (15 min) (C)	360	60	1000	4000	6	15	GR	FLT Contact SKC SP 225-27 119 CST 225-2LF 113
Benzene-soluble particulate matter	ASTM D 4600			960		2000		8		GR	FLT 225-7 112 SP 225-27 119 CST 225-2LF 113 C/HLD 225-1 118
Benzidine	NIOSH 5509	LFC		96		200		8		HPLC-UV	FLT 225-16 112 CST 225-32 118
Benzidine	OSHA 65			100		1000		100 min		GC-ECD	CF/CST 225-9004 70 C/HLD 225-1 118
Benzidine dyes (dyes, benzidine)	NIOSH 5013	LFC		480		1000		8		HPLC	FLT 225-17A 110 CST 225-3LF 113 C/HLD 225-1 118
Benzidine-based dyes	OSHA 65			100	15	1000	1000	100 min		GC-ECD	CF/CST 225-9004 70 C/HLD 225-1 118
Benzo(a)pyrene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515	0.1 mg/m³		480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Benzo(a)pyrene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m³ (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111 PEM 761-200B 134 FLT 225-1709 110
Benzo(a)pyrene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-FD	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Benzo(b)fluoranthene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m³ (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111 PEM 761-203B 134 FLT 225-1709 110
Benzo(b)fluoranthene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Benzo(b)fluoranthene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-FD	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Benzo(e)pyrene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Benzo(e)pyrene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m³ (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
Benzo(e)pyrene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-FD	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Benzo(g,h,i)perylene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m³ (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
Benzo(g,h,i)perylene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Benzo(g,h,i)perylene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-FD	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Benzo(k)fluoranthene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Benzo(k)fluoranthene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-FD	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118

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		SAMPLING ∞																	
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time											
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number								
Benzoalphapyrene	OSHA 58	0.2 mg/m³		960		2000		8		GR & HPLC-FD, or GR & HPLC-UV	FLT C/HLD	225-7 225-1	112 118	CST	225-2LF	113			
Benzophenone	NON 39			480		1000		8		GC-FID	ST	226-56	51						
Benzophenone	OSHA PV2130	0.5 mg/m³		48		200		4		GC-FID	ST	226-110	52						
Benzothiazole in asphalt fume	NIOSH 2550			480		1000		8		GC-SCD	F/CST C/HLD	225-1713 225-1	110 118	ST	226-30-04	50			
Benzoyl peroxide	NIOSH 5009	5 mg/m³		90		1500		1		HPLC-UV	F/CST	225-3-01	104	C/HLD	225-1	118			
Benzyl acetate	OSHA PV2124			10		100		100 min		GC-FID	ST	226-73	51						
Benzyl alcohol	OSHA PV2009			24		100		4		GC-FID	ST	226-95	52						
Benzyl chloride	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
Benzyl chloride (hydrocarbons, halogenated)	NIOSH 1003	1		10		10-200		varies		GC-FID	ST	226-01	50						
Beryllium & compounds	OSHA ID 125G	0.2 µg/m³	2.0 µg/m³	480	60	2000	2000	4	15	ICP-AES	F/CST F/CST C/HLD	225-3-01 225-803 225-1	or or 118	F/CST F/CST	225-3100 225-8215	or 109			
Beryllium & compounds (as Be)	NIOSH 7102		0. 5 µg/m³	960		2000		8		AA-GF	F/CST	225-3-01	104	C/HLD	225-1	118			
Beryllium & compounds (as Be)	OSHA 1023	0.2 µg/m³	2.0 µg/m³	480	30	2000	2000	4	15	ICP-AES	FLT W	225-5 225-24	104 172	CST	225-2LF	113			
Beryllium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	0.0005 mg/m³	0.005 mg/m³	10-2000		1000-4000		varies		ICP-AES	SC	225-8517	105	C/HLD	225-1	118			
Beryllium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	0.0005 mg/m³		1250-2000		1000-4000		varies		ICP-AES	F/CST C/HLD	225-3-01 225-1	or 118	F/CST	225-803	109			
Beryllium (Elements by ICP HNO_3 Digestion)	NIOSH 7303			35-25,000,000		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Beryllium (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.0005 mg/m³		1250-2000		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Beryllium (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W	225-2414	172	TMP	225-2415	172			
Beryllium (ICP analysis of metal/metalloid particulates from solder operations)	OSHA ID 206	0.2 µg/m³	2.0 µg/m³	480	10	2000	2000	4	5	ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Beryllium (in air by portable fluorometry)	NIOSH 7704	2 mg/m³	5 mg/m³ (C)	240-2000		1000-4000				P FLUOR UV/VIS	F/CST C/HLD	225-3-01 225-1	or 118	F/CST	225-3100	104			
BHC (alpha-, beta-, gamma-)	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF	226-92	56						
Bioaerosol sampling	NIOSH 0800			varies		28,300		varies		varies	BI	225-9611	138						
Bioaerosols				15-150		15000		1-10 min		varies	STC	225-9820	117						
Bioaerosols	NON 48			62.5-375		12,500 +		5-30		varies	BS	225-9595	140	VT	225-9598A	140			
Biphenyl (diphenyl)	NIOSH 2530	0.2		10		20(50)		8(3.3)		GC-FID	ST	226-35-01	50						
4,4'-Bipyridine (vapor & aerosol)	NON 26			96	2	200	200	8	10	HPLC	ST C/HLD	226-30-05 225-1	50 118	F/CST	225-706	112			
Bismuth	OSHA ID 121			480-960		2000		4-8		AAS/AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Bismuth (Elements by ICP HNO_3 Digestion)	NIOSH 7303			1-10,000		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Bismuth telluride, Se-doped	OSHA ID 121	5 mg/m³		960		2000		8		AA or AES	FLT CST	225-5-37-P 225-2LF	109 113	C/HLD	225-1	118			
Bismuth telluride, undoped (respirable dust)	OSHA ID 121	5 mg/m³		varies		varies		varies		GR & AA or GR & AES	CYC F/CST	225-105 225-803	128 109	C/HLD	225-1	118			
Bisphenol A	OSHA 1018			240		1000		240 (min)		HPLC-UV/PDA	F/CST	225-709	112	C/HLD	225-1	118			
Borates tetrasodium salts (anhydrous, decahydrate & pentahydrate)	OSHA ID 125G			480		2000		4		ICP-AES	F/CST F/CST C/HLD	225-3-01 225-803 225-1	or or 118	F/CST F/CST	225-3100 225-8215	or 109			
Boron (Elements by ICP HNO_3 Digestion)	NIOSH 7303			1-3,300		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Boron carbide	NIOSH 7506			600		2500		4		XRD	F/CST CYC	225-803 225-01-02	109 129	C/HLD	225-1	118			

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Boron oxide (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Boron oxide (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Bromine	NIOSH 6011	0.1	0.3	240	15	1000	1000	4	15	IC	CF/CST 225-9006 70 C/HLD 225-1 118
Bromine	OSHA ID 108	0.1		120	7.5	500	500	4	15	IC	IMP 225-36-2 72 IT 225-22 72
Bromoethane (ethyl bromide)	NIOSH 1011			4		20(50)		3.3(1.3)		GC-FID	ST 226-01 50
Bromoform (hydrocarbons, halogenated)	NIOSH 1003	0.5 (skin)		10		10-200		varies		GC-FID	ST 226-01 50
1-Bromopropane	NIOSH 1025			0.1-12		10-200		varies		GC-FID	ST 226-01 50
1-Bromopropane	OSHA 1017			12		50		240 (min)		GC-FID	ST 226-01 50
1-Bromopropane	OSHA PV2061			12		100		2		GC-FID	ST 226-01 50
2-Bromopropane	NIOSH 1025			0.1-12		10-200		varies		GC-FID	ST 226-01 50
2-Bromopropane	OSHA 1017			12		50		240 (min)		GC-FID	ST 226-01 50
2-Bromopropane	OSHA PV2062			12		100		2		GC-FID	ST 226-01 50
Bromotrifluoromethane (trifluorobromomethane)	NIOSH 1017	1000		0.3		20		15 min		GC-FID	ST 226-09 50 ST 226-01 50
Bromoxynil	NIOSH 5010			240		1000		4		HPLC-UV	F/CST 225-1713 110 C/HLD 225-1 118
Bromoxynil octanoate	NIOSH 5010			240		1000		4		HPLC-UV	F/CST 225-1713 110 C/HLD 225-1 118
BTEX (hydrocarbons, aromatic. *(See benzene, toluene, ethylbenzene, and xylene)*	NIOSH 1501	varies		varies		varies		varies		GC-FID	ST 226-01 50
1,3-Butadiene	NIOSH 1024	LFC		10		20		8		GC-FID	ST 226-37 51
1,3-Butadiene	OSHA 56	1	5	3		50		1		GC-FID	ST 226-73 51
Butane	OSHA PV2010			3		50		1		GC-FID	ST NA SKC
n-Butanol (alcohols combined)	NIOSH 1405	50 (skin)		2-10		10-200		varies		GC-FID	ST 226-01 50
2-Butanone	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
2-Butanone	OSHA 1004	200		12		50		4		GC-FID	ST NA SKC
2-Butanone (Ketones I)	NIOSH 2555			1-10		10-200		varies		GC-FID	ST NA SKC
2-Butanone (methyl ethyl ketone)	NIOSH 2500	200	300	10	3	20(50)	200	8(3.3)	15	GC-FID	ST 226-81A 51
2-Butanone (methyl ethyl ketone)	OSHA 1004	200				16.88		8		GC-FID	PS 575-002 84
2-Butanone (methyl ethyl ketone)	OSHA 16	200		3	1.5	100	100	30 min	15	GC-FID	ST 226-10 50
2-Butanone (methyl ethyl ketone)	OSHA 84	200		3	0.75	50	50	1	15	GC-FID	ST NA SKC
2-Butoxyethanol (alcohols IV)	NIOSH 1403	5 (skin)		2-10		10-50		varies		GC-FID	ST 226-01 50
2-Butoxyethanol (butyl CELLOSOLVE solvent)	OSHA 83	50		48		100		8		GC-FID	ST 226-01 50
2-Butoxyethanol acetate	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
2-Butoxyethanol acetate (butyl CELLOSOLVE acetate)	OSHA 83			48		100		8		GC-FID	ST 226-01 50
n-Butyl acetate	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
n-Butyl acetate	OSHA 1009	150				13.07	13.07	8	15	GC-FID	PS 575-002 84
n-Butyl acetate	OSHA 1009	150		12	0.75	50	50	4	15	GC-FID	ST 226-01 50
sec-Butyl acetate	OSHA 1009	200				12.74	12.74	8	15	GC-FID	PS 575-002 84
sec-Butyl acetate	OSHA 1009	200		12	0.75	50	50	4	15	GC-FID	ST 226-01 50
t-Butyl acetate	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
t-Butyl acetate	OSHA 1009	200				13.09	13.09	8	15	GC-FID	PS 575-002 84
t-Butyl acetate	OSHA 1009	200		12	0.75	50	50	4	15	GC-FID	ST 226-01 50

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

		SAMPLING ∞									
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time			
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
n-Butyl acetate (Esters I)	NIOSH 1450	150	200	1-10	1-10	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
sec-Butyl acetate (Esters I)	NIOSH 1450	200		1-10		10-200		varies		GC-FID	ST 226-01 50
t-Butyl acetate (Esters I)	NIOSH 1450	200		1-10		10-200		varies		GC-FID	ST 226-01 50
Butyl acrylate	OSHA PV2011			12		50		4		GC-FID	ST 226-73 51
n-Butyl acrylate	NON 54	5	15	10	3	20	200	8	15	GC-FID	ST 226-81A 51
n-Butyl alcohol	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
n-Butyl alcohol	OSHA 5001	200		12		4				GC-FID	ST 226-82 52
sec-Butyl alcohol	OSHA 5001	200		12		4				GC-FID	ST 226-82 52
n-Butyl alcohol (alcohols combined)	NIOSH 1405	50 (skin)		2-10		10-200		varies		GC-FID	ST 226-01 50
sec-Butyl alcohol (alcohols combined)	NIOSH 1405	100	150	2-10	2-10	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
t-Butyl alcohol (Alcohols I)	NIOSH 1400	100	150	10		20(50)		8(3.3)		GC-FID	ST 226-01 50
n-Butyl alcohol (alcohols II)	NIOSH 1401		50	10	3	20(50)	200	8(3.3)	15	GC-FID	ST 226-01 50
sec-Butyl alcohol (alcohols II)	NIOSH 1401	100	150	10	3	20(50)	200	8(3.3)	15	GC-FID	ST 226-01 50
Butyl butryrate	OSHA PV2090			10		200		50 min		GC-FID	ST 226-01 50
Butyl carbitol (diethylene glycol monobutyl ether)	OSHA PV2095			10		200		50 min		GC-FID	ST 226-01 50
Butyl carbitol acetate	OSHA PV2095			10		200		50 min		GC-FID	ST 226-01 50
Butyl CELLOSOLVE acetate *(see 2-butoxyethanol acetate)*	OSHA 83										
Butyl CELLOSOLVE solvent *(see 2-butoxyethanol)*	OSHA 83										
t-Butyl chromate (as CrO_3)	OSHA ID 215 (V2)	0.005 mg/m³		960		2000			15	IC-UV	F/CST 225-802 109 C/HLD 225-1 118
n-Butyl glycidyl ether	NIOSH 1616		5.6 (15 min)		3		200		15	GC-FID	ST 226-01 50
n-Butyl lactate	OSHA PV2080			10		200		50 min		GC-FID	ST 226-01 50
n-Butyl mercaptan (mercaptans)	NIOSH 2542		0.5 (15 min)	48	12	100	200	8	60	GC-FPD	CF/CST 225-9007 70 C/HLD 225-1 118
t-Butyl methyl ether (MTBE)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Butyl ziram	OSHA PV2065			180		1000		3		HPLC-UV	ST 226-30-16 50
n-Butylamine	NIOSH 2012		5		15		1000		15	GC-FID	ST 226-53 51
Butylated hydroxytoluene	OSHA PV2108			100		1000		100 min		GC-FID	ST 226-57 51
1,3-Butylene glycol (glycols)	NIOSH 5523			60		1000		1		GC-FID	ST 226-57 51
o-sec-Butylphenol	OSHA PV 2128			20		200		1.6		HPLC-UV	ST 226-95 52
p-tert-Butylphenol	OSHA PV2085			20		200		100 min		GC-FID	ST 226-95 52
Butyltin trichloride	OSHA ID 217SG			240		1000		4		AA-GF	ST 226-30-16 50
p-tert-Butyltoluene (Hydrocarbons, Aromatic)	NIOSH 1501	10	20	1-29	1-29	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
Butyraldehyde	ASTM D 5197			varies		500-1200		5 min-24 hrs		HPLC-UV	ST 226-120 ° or ST 226-119 52
Butyraldehyde (Aldehydes, Screening)	NIOSH 2539			5		20		4		GC-FID & GC-MS	ST 226-118 52
Cadmium	OSHA ID 189	5 µg/m³		960		2000		8		AA	F/CST 225-3-01 104 C/HLD 225-1 118
Cadmium & compounds (as Cd)	NIOSH 7048	LFC		480	30	1000	2000	8	15	AA-F	F/CST 225-3-01 104 C/HLD 225-1 118
Cadmium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	LFC		3-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Cadmium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	LFC		13-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Cadmium (Elements by ICP HNO_3 Digestion)	NIOSH 7303			3-500,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Cadmium (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	LFC		13-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Cadmium (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Cadmium dust (as Cd)	OSHA ID 121	0.2 mg/m³	0.5 mg/m³	960	30	2000	2000	8	15	AA	F/CST 225-3-01 104 C/HLD 225-1 118
Cadmium dust (as Cd)	OSHA ID 206	0.2 mg/m³	0.5 mg/m³	960	30	2000	2000	8	15	ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Cadmium fume (ICP analysis of metal/metalloid particulates from solder operations)	OSHA ID 206	0.1 mg/m³	0.3 mg/m³ (C)	480		2000		4		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Calcium & compounds (as Ca)	NIOSH 7020	varies		240		1000		4		AA-F	F/CST 225-3-01 104 C/HLD 225-1 118
Calcium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306			Varies		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Calcium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	varies		5-200		1000-4000		varies		ICP-AES	F/CST 225-3-01 or C/HLD 225-1 118 F/CST 225-803 ¥ 109
Calcium (Elements by ICP HNO_3 Digestion)	NIOSH 7303			2-10,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Calcium (Elements by ICP $HNO_3/HClO_4$ Ashing)	NIOSH 7300	varies		5-200		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Calcium *(see specific compounds)*	NIOSH 7020	varies		varies		varies		varies		AA-F	F/CST 225-3-01 104 C/HLD 225-1 118
Calcium carbonate	OSHA ID 121	15 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Calcium carbonate (calcium)	NIOSH 7020	2 mg/m³		240		1000		4		AA-F	F/CST 225-3-01 104 C/HLD 225-1 118
Calcium carbonate (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Calcium carbonate (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Calcium carbonate *(see Particulates Not Otherwise Regulated, total and respirable)*											
Calcium cyanamide	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Calcium hydroxide	OSHA ID 121	5 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Calcium hydroxide (calcium)	NIOSH 7020	2 mg/m³		240		1000		4		AA-F	F/CST 225-3-01 104 C/HLD 225-1 118
Calcium hydroxide *(see Particulates Not Otherwise Regulated, total and respirable)*											
Calcium oxide	OSHA ID 121	5 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Calcium oxide (calcium)	NIOSH 7020	2 mg/m³		240		1000		4		AA-F	F/CST 225-3-01 104 C/HLD 225-1 118
Calcium oxide (Elements by ICP HNO_3 Digestion)	NIOSH 7303	2 mg/m³		3-10,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Calcium silicate (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Calcium silicate (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Calcium sulfate (Particulates Not Otherwise Regulated, total and respirable)											
Camphor (Ketones II)	NIOSH 2553	2		1-25		10-200		varies		GC-FID	ST NA SKC
Camphor (Ketones II)	NIOSH 1301	2		10		20(50)		8(3.3)		GC-FID	ST 226-01 50
Caprolactam	OSHA PV2012			100		1000		100 min		HPLC-UV	ST 226-57 51
Capsaicin	NIOSH 5041			480	15	1000	1000	8	15	HPLC-FD	FLT 225-16 112 CST 225-32 118
Captan	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Captan	OSHA PV2093			60		1000		1		HPLC-UV	ST 226-30-16 50
Captan (Organonitrogen Pesticides)	NIOSH 5601	5 mg/m³		240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Carbaryl	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Carbaryl (Organonitrogen Pesticides)	NIOSH 5601	5 mg/m³		240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Carbaryl (Sevin)	NIOSH 5006	5 mg/m³		240		1000		4		VAS	F/CST 225-706 112 C/HLD 225-1 118
Carbaryl (Sevin)	OSHA 63	5 mg/m³		60		1000		1		HPLC-UV	ST 226-30-16 50
Carbendazim (Organonitrogen Pesticides)	NIOSH 5601			240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Carbitol	OSHA PV2013			10		200		50 min		GC-FID	ST 226-01 50

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Carbitol acetate	OSHA PV2013			10		200		50 min		GC-FID	ST 226-01 50
Carbofuran	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Carbofuran (Organonitrogen Pesticides)	NIOSH 5601	0.1 mg/m³		240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Carbon black	NIOSH 5000	3.5 mg/m³		360		1500		4		GR	FLT 225-5-37-P 109 CST 225-3LF 113 SCN 225-26 119 C/HLD 225-1 118
Carbon black	OSHA ID 196	3.5 mg/m³		960		2000		8		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Carbon dioxide	OSHA ID 172	5000	30000	2-5	2-5	10-50	300	4-8	15	GC-TCD	SB 253 Series or SB 263 Series 64
Carbon dioxide (by portable GC)	NIOSH 6603	5000	30000	varies	varies	20-100	20-100	varies	varies	P GC-TCD	SB 232 Series 63
Carbon disulfide	NIOSH 1600	1	10	10	3	20(50)	200	8(3.3)	15	GC-FPD	ST 226-01 50 DRT 226-44 51
Carbon monoxide	OSHA ID 209	50								DRI	DRI 805-18970
Carbon monoxide	OSHA ID 210	50		2-5	2-5	10-50	1000	varies	varies	GC-DID	SB 252 Series or SB 253 Series or SB 262 Series or SB 263 Series 64
Carbon tetrachloride	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Carbon tetrachloride	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Carbon tetrachloride (hydrocarbons, halogenated)	NIOSH 1003		2 (1 hrs)		15		10-200		varies	GC-FID	ST 226-01 50
Carbon, activated (Particulates Not Otherwise Regulated, total)											
3-Carene (terpenes)	NIOSH 1552			24		50		8		GC-FID	ST 226-01 50
Catechol (pyrocatechol)	OSHA PV2014			100		1000		100 min		HPLC-UV	ST 226-57 51
Cell fragments (bioaerosols)				15-150		15000		1-10 min		varies	STC 225-9820 117
CELLOSOLVE acetate *(see 2-ethoxyethyl acetate)*											
CELLOSOLVE solvent *(see 2-ethoxyethanol)* (alcohols IV)	NIOSH 1403										
Cellulose (paper fiber) (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Cellulose (paper fiber) (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Cellulose *(see Particulates Not Otherwise Regulated, total and respirable)*											
Cellulose insulation	NIOSH 7404			varies		1000		varies		SEM	FLT/CL 225-1604 107
Cerium	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Chlordane	NIOSH 5510	0.5 mg/m³		150		1000		2.5		GC-ECD	ST 226-107 52 FLT 225-5 104 CST 225-2LF 113 SCN 225-26 119 C/HLD 225-1 118
Chlordane	OSHA 67	0.5 mg/m³		480		1000		8		GC-ECD	ST 226-30-16 50
Chlordane (non-occupational exposure)	ASTM D 4947			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Chlordane (technical)	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Chlorinated & organonitrogen herbicides	NIOSH 5602			480		1000		8		GC-ECD	ST 226-58 51
Chlorinated & organonitrogen herbicides (hand wash)	NIOSH 9200									GC-ECD	NA SKC
Chlorinated camphene (toxaphene)	NIOSH 5039	LFC		30	15	1000	1000	0.5	15	GC-ECD	F/CST 225-3-01 104 C/HLD 225-1 118
Chlorinated diphenyl ether (chlorinated diphenyl oxide)	NIOSH 5025	0.5 mg/m³		180		1000		3		GC-ECD	F/CST 225-3-01 104 C/HLD 225-1 118
Chlorinated diphenyl oxide	NIOSH 5025	0.5 mg/m³		90		1000		1.5		GC-ECD	F/CST 225-3-01 104 C/HLD 225-1 118
Chlorinated hydrocarbons (screening)	NIOSH 2549			5		20		4		GC-MS	ST 226-330 54
Chlorinated terphenyl (60% chlorine)	NIOSH 5014			720		1500		8		GC-ECD	F/CST 225-706 112 C/HLD 225-1 118
Chlorine	NIOSH 6011	0.5	1	90	15	1000	1000	1.5	15	IC	CF/CST 225-9006 70 C/HLD 225-1 118
Chlorine	OSHA ID 101		1 (C)	240	15	1000	1000	4	15	ISE	IMP 225-36-2 72 IT 225-22 72

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Chlorine (prefiltered)	OSHA ID 101		1 (C)	240	15	1000	1000	4	15	ISE	IMP 225-36-2 72; IT 225-22 72; CST 225-3-23 113; SP 225-2901 119; FLT 225-3708 110
Chlorine dioxide	OSHA ID 202	0.1		120	7.5	500	500	4	15	IC-CD	IMP 225-36-2 72; IT 225-22 72
1-Chloro-1-nitropropane	NIOSH S211	20		12		200				GC-FID	ST NA SKC
5-Chloro-2-methyl-4-isothiazolin-3-one (Kathon 886)	NON 55	0.75 mg/m³	0.23 mg/m³	50	7.5	200	500	4	15	HPLC-UV	ST 226-99 52
1-Chloro-4-(trifluoromethyl)benzene	NIOSH 1026			0.1-10.0		10-200		8		GC-FID	ST 226-01 50
Chloroacetaldehyde	NIOSH 2015	1			3		200		15	GC-ECD	ST 226-15GWS 50
Chloroacetaldehyde	OSHA 76		1 (C)		2.5		500		5	GC-ECD	ST 226-15GWS 50
Chloroacetic acid	NIOSH 2008			48		100		8		IC-CD	ST 226-47-01 51
p-Chloroaniline	OSHA PV2109			6		100		1		HPLC-UV	ST 226-10 50
Chlorobenzene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54; TH 224-26-02 39; CPC 224-26-CPC 39
Chlorobenzene (monochlorobenzene)	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series; PK 228 Series
Chlorobenzene (monochlorobenzene) (hydrocarbons, halogenated)	NIOSH 1003			10		10-200		varies		GC-FID	ST 226-01 50
4-Chlorobenzotrifluoride	NIOSH 1026			0.1-10.0		10-200		varies		GC-FID	ST 226-01 50
p-Chlorobenzotrifluoride	NIOSH 1026			0.1-10.0		10-200		varies		GC-FID	ST 226-01 50
Chlorobiphenyl	NIOSH 5503	0.001 mg/m³ (10 hrs)		48		100(200)		8(4)		GC-ECD	FLT 225-16 112; CST 225-32 118; ST 226-39 51
Chlorobromomethane (hydrocarbons, halogenated)	NIOSH 1003	200		60		10-200		8		GC-FID	ST 226-01 50
Chlorodiphenyl (42% Cl)	OSHA PV2089		1	60		1000		1		GC-ECD	ST 226-30-16 50
Chlorodiphenyl (42% Cl) (*see* polychlorinated biphenyls)	NIOSH 5503										
Chlorodiphenyl (54% Cl)	OSHA PV2088		0.5	60		1000		1		GC-ECD	ST 226-30-16 50
Chlorodiphenyl (54% Cl) (*see* polychlorinated biphenyls)	NIOSH 5503										
Chloroethane (ethyl chloride)	NIOSH 2519			3		50		1		GC-FID	ST 226-09 50
2-Chloroethanol (ethylene chlorohydrin)	NIOSH 2513		1	10		20(50)		8(3.3)		GC-FID	ST 226-81A 51
Chloroform (trichloromethane)	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series; PK 228 Series
Chloroform (trichloromethane)	OSHA 05		50 (C)	10		200		50 min		GC-FID	ST 226-01 50
Chloroform (trichloromethane) (hydrocarbons, halogenated)	NIOSH 1003		2		15		10-200		varies	GC-FID	ST 226-01 50
bis-Chloromethyl ether	OSHA 10			50		500		100 min		GC-ECD	IMP 225-36-2 72; IT 225-22 72
Chloromethyl methyl ether	NON 29			2.4	0.3	10	20	4	15	GC-ECD	ST NA SKC
Chloromethyl methyl ether	OSHA 10			50		500		100 min		GC-ECD	IMP 225-36-2 72; IT 225-22 72
4-Chloronitrobenzene (nitrobenzenes)	NIOSH 2005	0.1 ppm		96		200		8		GC-FID	ST 226-10 50
Chlorophene	OSHA PV2186	5 ppm		10		100			100 min	GC-FID	ST 226-35 50; C/HLD 225-1 118
p-Chlorophenol	NIOSH 2014			24		50		8		HPLC-UV	ST 226-10 50
Chloropicrin	NON 51	0.1		144		100		24		GC-MSD	ST 226-175 53
Chloropicrin	OSHA PV2103	0.1		3		200		15 min		GC-ECD	ST 226-93 52
beta-Chloroprene	NIOSH 1002		1 (15 min)		1.5		100		15	GC-FID	ST 226-01 50
beta-Chloroprene	OSHA 112	25		6		50		2		GC-ECD	ST 226-111A 52
Chlorothalonil	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Chlorotoluron	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Chlorpropham (Organonitrogen Pesticides)	NIOSH 5601			240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Chlorpyrifos (Dursban)	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Chlorpyrifos (Dursban)	OSHA 62			480		1000		8		GC-FPD	ST 226-30-16 50
Chlorpyrifos (Organophosphorus Pesticides)	NIOSH 5600	0.2 mg/m³		240		1000		4		GC-FPD	ST 226-58 51
Chromic acid & chromates (as CrO_3)	OSHA ID 215 (V2)	0.005 mg/m³		960		2000		8	15	IC-UV	F/CST 225-802 Ω 109 C/HLD 225-1 118
Chromic acid & chromates (chromium hexavalent)	NIOSH 7600	1 µg/m³ (10 hrs)		240		1000		4		VAS	F/CST 225-803 109 C/HLD 225-1 118
Chromic acid & chromates (chromium hexavalent)	NIOSH 7604	1 µg/m³ (10 hrs)		960		2000		8		IC-CD	F/CST 225-803 109 C/HLD 225-1 118
Chromium & compounds (as Cr)	NIOSH 7024	0.5 mg/m³		10 - 1000		1000-3000		varies		AA-F	F/CST 225-3-01 or F/CST 225-8410 104 C/HLD 225-1 118
Chromium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	0.5 mg/m³		1-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Chromium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	0.5 mg/m³		5-1000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Chromium (Elements by ICP HNO_3 Digestion)	NIOSH 7303	0.5 mg/m³		8-500,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Chromium (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.5 mg/m³		5-1000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Chromium (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Chromium acetate	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Chromium carbonate	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Chromium metal & insoluble compounds	OSHA ID 121	1 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Chromium metal & insoluble compounds	OSHA ID 125G	1 mg/m³		480		2000		4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Chromium phosphate	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Chromium soluble salts (except hexavalent)	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Chromium trioxide (CR(VI))	OSHA ID 215 (V2)	0.005 mg/m³		960		2000		8		IC-UV	F/CST 225-802 109 C/HLD 225-1 118
Chromium, hexavalent	ASTM D 6832			varies		1000-5000		varies		IC	F/CST 225-802 or F/CST 225-1713 or F/CST 225-709 or F/CST 225-401 111
Chromium, hexavalent	NIOSH 7600	1 µg/m³ (10 hrs)		240		1000		4		VAS	F/CST 225-802 109 C/HLD 225-1 118
Chromium, hexavalent	NIOSH 7604	1 µg/m³ (10 hrs)		240		1000		4		IC-CD	F/CST 225-802 109 C/HLD 225-1 118
Chromium, hexavalent	NIOSH 7605	0.001 mg/m³ (10 hrs)		1-400		1000-4000		varies		IC-PCD-UV	F/CST 225-802 109 C/HLD 225-1 118
Chromium, hexavalent	NIOSH 7703	0.001 mg/m³ (10 hrs)		10-1200		1000-4000		varies		P VAS	F/CST 225-802 109 C/HLD 225-1 118
Chromium, hexavalent	OSHA ID 103	0.005 mg/m³ (C)		960	30	2000	2000	8	15	DPP	F/CST 225-802 109 C/HLD 225-1 118
Chromium, hexavalent	OSHA W4001	0.005 mg/m³ (C)								IC-UV	FLT 225-5-37 or FLT 225-1822 111
Chromium, hexavalent (CR(VI))	OSHA ID 215 (V2)	0.005 mg/m³		960		2000		8		IC-UV	F/CST 225-802 Ω 109 C/HLD 225-1 118
Chromium, hexavalent (in settled dust)	NIOSH 9101			bulk	bulk					CLR or VAS or IC	
Chrysene	OSHA 58	0.2 mg/m³		960		2000		8		GR & HPLC-FD, or GR & HPLC-UV	FLT 225-7 112 CST 225-2LF 113 C/HLD 225-1 118
Chrysene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m³ (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
Chrysene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515	LFC		480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Chrysene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506	LFC		480		2000		4		HPLC-UV	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Chrysotile *(see asbestos fibers)*	NIOSH 9000			bulk						XRD	

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Abbreviations and references are found on pages 244-245.

Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Chrysotile fibers *(see asbestos fibers)*	NIOSH 7400										
Coal dust (> 5% SiO_2) *(see silica, respirable crystalline)*	OSHA ID 142										
Coal tar naphtha (naphthas)	NIOSH 1550	100		3		20		2.5		GC-FID	ST 226-01 50
Coal tar pitch volatiles	OSHA 58	0.2 mg/m³		960		2000		8		GR & HPLC-FD, or GR & HPLC-UV	FLT 225-7 112 CST 225-2LF 113 C/HLD 225-1 118
Cobalt	OSHA ID 213	0.1 mg/m³		480		2000		6		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Cobalt & compounds (as Co)	NIOSH 7027	0.05 mg/m³		960		2000		8		AA-F	F/CST 225-3-01 104 C/HLD 225-1 118
Cobalt (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	0.05 mg/m³ (dust, fume)		1-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Cobalt (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	0.5 mg/m³ (dust, fume)		25-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Cobalt (Elements by ICP HNO_3 Digestion)	NIOSH 7303	0.5 mg/m³ (dust, fume)		3-500,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Cobalt (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.05 mg/m³ (dust, fume)		25-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Cobalt (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Cobalt acetate	OSHA ID 125G			480		2000		4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Cobalt carbonyl	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Cobalt hydrocarbonyl	OSHA ID 121	0.1 mg/m³ (as Co)		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Cobalt metal, dust & fume	OSHA ID 125G	0.1 mg/m³		480		2000		4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Cobalt metal, dust & fume (as Co)	OSHA ID 121	0.1 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Coke oven emissions	OSHA 58	0.15 mg/m³		960		2000		8		GR & HPLC-FD, or GR & HPLC-UV	FLT 225-7 112 CST 225-2LF 113 C/HLD 225-1 118
Command (dimethazone)	OSHA PV2066			60		1000		1		GC-ECD	ST 226-30-16 50
Copper (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	1 mg/m³ (dust) 0.1 mg/m³ (fume)		5-1000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Copper (Elements by ICP HNO_3 Digestion)	NIOSH 7303	1 mg/m³ (dust) 0.1 mg/m³ (fume)		15-500,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Copper (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	1 mg/m³ (dust) 0.1 mg/m³ (fume)		5-1000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Copper (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Copper dust	NIOSH 7029	1 mg/m³		480		1000		8		AA-F	F/CST 225-3-01 104 C/HLD 225-1 118
Copper dusts & mists	OSHA ID 125G	1 mg/m³		480		2000		4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Copper dusts & mists (as Cu)	OSHA ID 121	1 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Copper fume	NIOSH 7029	0.1 mg/m³		480		1000		8		AA-F	F/CST 225-3-01 104 C/HLD 225-1 118
Copper fume	OSHA ID 121	0.1 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Copper fume	OSHA ID 125G	0.1 mg/m³		480		2000		4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Copper fume (ICP analysis of metal/metalloid particulates from solder operations)	OSHA ID 206	0.1 mg/m³		480		2000		4		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Co-Ral (coumaphos)	OSHA PV2134			480		1000		8		GC-FPD	ST 226-30-16 50
Corn starch (Particulates Not Otherwise Regulated, respirable)											

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Abbreviations and references are found on pages 244-245.

		SAMPLING ∞																	
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time											
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number								
Corundum (Al_2O_3) (*see* alpha-alumina [total dust])																			
Corundum (emery) (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT CYC	225-5-37-P 225-01-02	109 129	C/HLD CST	225-1 225-3LF	118 113			
Corundum (emery) (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT CST	225-5-37-P 225-2LF	109 113	C/HLD	225-1	118			
di-tert-butyl-p-Cresol	OSHA PV2108			100		1000		100 min		GC-FID	ST	226-57	51						
Cresol (all isomers)	NIOSH 2546	10 mg/m³		24		100		4		GC-FID	ST	226-95	52						
Cresol (all isomers)	OSHA 32	5		24		100		4		HPLC-UV	ST	226-95	52						
Cresols	EPA TO-8			< 80 L		100-1000 ml/min				HPLC-UV	IMP	225-36-1	72	IT	225-22	72			
Cristobalite (*see* silica, respirable crystalline)	OSHA ID 142																		
Cristobalite (silica, crystalline [respirable] by XRD)	NIOSH 7500	0.05 mg/m³		400-1000		2500		varies		XRD	F/CST C/HLD	225-803 225-1	109 118	CYC	225-01-02	129			
Cristobalite (silica, crystalline by IR)	NIOSH 7602	0.05 mg/m³		1000		2000-4000		varies		IR	F/CST CYC	225-803 225-01-02	109 129	C/HLD	225-1	118			
Crocidolite fibers (*see* asbestos fibers)	NIOSH 7400																		
Crotonaldehyde	ASTM D 5197			varies		500-1200		5 min-24 hrs		HPLC-UV	ST	226-120	or	ST	226-119	52			
Crotonaldehyde	NIOSH 3516	2		48		200		4		DPP	IMP	225-36-2	72	IT	225-22	72			
Crotonaldehyde	OSHA 81	2		6		100		1		HPLC-UV	CF/CST	225-9019	70	C/HLD	225-1	118			
Crotonaldehyde (Aldehydes, Screening)	NIOSH 2539	2		5		20		4		GC-FID & GC-MS	ST	226-118	52						
Crufomate	OSHA PV2015			60		1000		1		GC-FPD	ST	226-30-16	50						
Cryolite (fluorides)	NIOSH 7902	2.5 mg/m³		480		1000		8		ISE	CF/CST	225-9001	70	C/HLD	225-1	118			
Cumene (isopropyl benzene)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39			
Cumene (isopropyl benzene)	OSHA PV2137	50		24		200		2		GC-FID	ST	226-01	50						
Cumene (isopropyl benzene) (Hydrocarbons, Aromatic)	NIOSH 1501	50 (skin)		1-30		10-200		8(3.3)		GC-FID	ST	226-01	50						
Cupric carbonate as Cu (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300			960		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Cyanazine	NIOSH 5602			480		1000		8		GC-ECD	ST	226-58	51						
Cyanide (as Cn)	OSHA ID 120	5 mg/m³		120		1000		2		ISE	F/CST IT	225-3-01 225-22	104 72	IMP	225-36-2	72			
Cyanides, aerosol & gas	NIOSH 7904		5 mg/m³ (10 min)	120		500		4		ISE	FLT IMP C/HLD	225-3705 Δ 225-36-2 225-1	110 72 118	CST IT	225-2LF 225-22	113 72			
Cyanogen	OSHA PV2104			12		200		1		GC-NPD	ST	226-117	52						
Cyanuric acid	NIOSH 5030			480		1000		8		HPLC-UV	F/CST	225-802	109	C/HLD	225-1	118			
Cyclohexane (hydrocarbons, BP 36 to 216 C)	NIOSH 1500	300		2.5-5		10-200		varies		GC-FID	ST	226-01	50						
Cyclohexanol (alcohols combined)	NIOSH 1405	50 (skin)		1-10		10-200		varies		GC-FID	ST	226-01	50						
Cyclohexanol (alcohols III)	NIOSH 1402	50		10		20(50)		8(3.3)		GC-FID	ST	226-01	50						
Cyclohexanone	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39			
Cyclohexanone	OSHA 01	50		10		20(50)		8(3.3)		GC-FID	ST	226-110	52						
Cyclohexanone (Ketones I)	NIOSH 1300	25		10		20(50)		8(3.3)		GC-FID	ST	226-01	50						
Cyclohexanone (Ketones I)	NIOSH 2555			1-10		10-200		varies		GC-FID	ST	NA SKC							
Cyclohexene (hydrocarbons, BP 36 to 216 C)	NIOSH 1500	300		5-7		10-200		varies		GC-FID	ST	226-01	50						
Cyclohexylamine	OSHA PV2016			20		200		100 min		GC-FID	ST	226-98	52						
Cyclonite (RDX)	OSHA PV2135	1.5 mg/m³		120		1000				HPLC-UV	F/CST	225-709	112	C/HLD	225-1	118			

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Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Cyhexatin	NIOSH 5504	0.1 mg/m³		500		1500				AA-GF	F/CST 225-709 112 ST 226-30 50 C/HLD 225-1 118
Cypermethrin	OSHA PV2063			60		1000		60 min		GC-ECD	ST 226-30-16 50
2,4-D (2,4-dichlorophenoxyacetic acid)	NIOSH 5001	10 mg/m³		180		1000		3		HPLC-UV	F/CST 225-706 112 C/HLD 225-1 118
2,4-D (2-butoxyethyl ester)	NIOSH 5602			480		1000		8		GC-ECD	ST 226-58 51
2,4-D (2-butoxyethyl ester)	NIOSH 5602			480		1000		8		GC-ECD	ST 226-58 51
2,4-D acid	NIOSH 5602	10		480		1000		8		GC-ECD	ST 226-58 51
2,4-D, BE	NIOSH 5602			480		1000		8		GC-ECD	ST 226-58 51
2,4-D, EH	NIOSH 5602			480		1000		8		GC-ECD	ST 226-58 51
2,4-D, ME (2,4-dichlorophenoxyacetic acid)	NIOSH 5602			480		1000		8		GC-ECD	ST 226-58 51
Dacthal	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
DBP *(see dibutyl phthalate)*	OSHA 104										
p,p-DDE	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
p,p-DDT	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
DDVP (dichlorvos)	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Decabromodiphenyl oxide	NIOSH 2559			48-960		2000		varies		HPLC-UV	FLT 225-1822 111 SP 225-27 119 CST 225-2LF 113
n-Decane	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
n-Decane (hydrocarbons, BP 36 to 216 C)	NIOSH 1500			2		10-50		varies		GC-FID	ST 226-01 50
DEHP *(see di-2-ethylhexyl phthalate)*	OSHA 104										
Demeton	NIOSH 5514	0.1 mg/m³		480		1000		8		GC-FPD	FLT 225-5 104 SCN 225-26 119 CST 225-2LF 113 ST 226-30-05 50 C/HLD 225-1 118
DEP *(see diethyl phthalate)*	OSHA 104										
Desflurane	OSHA 106			3		50		1		GC-FID	ST 226-81A 51
Di-(2-ethylhexyl) phthalate (DEHP)	NIOSH 5020			180		1000		3		GC-FID	F/CST 225-3-01 104 C/HLD 225-1 118
Di(ethyleneglycol) ethyl ether acrylate	OSHA PV2132	1 mg/m³		48		200		4		GC-FID	ST 226-110 52
Diacetone alcohol (alcohols combined)	NIOSH 1405	50		1-10		10-200		varies		GC-FID	ST 226-01 50
Diacetone alcohol (alcohols III)	NIOSH 1402	50		10		20(50)		8(3.3)		GC-FID	ST 226-01 50
Diacetyl	OSHA 1012 #	0.005	0.025	9	3	50	200	3	15	GC-FID	ST 226-183 53
Diacetyl	OSHA 1013 #	0.005	0.025	9	3	50	200	3	15	GC-FID	ST 226-183 53
Diallyl disulfide	OSHA PV2086			10		20(50)		8(3.3)		GC-FPD	ST 226-110 52
1,2-Diaminoethane	NIOSH 2540			10		100		1.7		HPLC-UV	ST 226-30-18 50
o-Dianisidine	OSHA 71			100	15	1000	1000	100 min		GC-ECD	CF/CST 225-9004 70 C/HLD 225-1 118
o-Dianisidine dyes (dyes, benzidine)	NIOSH 5013	LFC		480		1000		8		HPLC-UV	FLT 225-17A 110 CST 225-3LF 113 C/HLD 225-1 118
Diazinon	ASTM D 4861			240-7200		1000-5000		4-24		GC-NPD	PUF 226-92 56
Diazinon	OSHA 62			480		1000		8		GC-FPD	ST 226-30-16 50
Diazinon (organophosphorus pesticides)	NIOSH 5600	0.1 mg/m³		240		1000		4		GC-FPD	ST 226-58 51
Diazomethane	NIOSH 2515	0.2		10		200		50 min		GC-FID	ST 226-23 50
Dibenz(a,h)anthracene (polynuclear aromatic hydrocarbons by GC-MS)	ASTM D 6209			350 m³ (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
Dibenz(a,h)anthracene (polynuclear aromatic hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Dibenz(a,h)anthracene (polynuclear aromatic hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-FD	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Dibromodifluoromethane (difluorodibromomethane)	NIOSH 1012	100		10		20(50)		8(3.3)		GC-FID	ST 226-01 50

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

		SAMPLING ∞																	
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time											
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number								
1,2-Dibromoethane (ethylene dibromide)	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
1,2-Dibromoethane (ethylene dibromide)	NIOSH 1008	0.045	0.13	24	3	50	200	8	15	GC-ECD	ST	226-01	50						
2-Dibutyl aminoethanol (aminoethanol compounds I)	NIOSH 2007	2		10		20(50)		8(3.3)		GC-FID	ST	226-10-04	50						
Dibutyl phosphate	NIOSH 5017	1	2	240		2000		2		GC-FPD	FLT C/HLD	225-17-01 225-1	110 118	CST	225-2LF	113			
Dibutyl phthalate	NIOSH 5020	5 mg/m³		100		1000		100 min		GC-FID	F/CST	225-3-01	104	C/HLD	225-1	118			
Dibutyl phthalate (DBP)	OSHA 104	5 mg/m³		240		1000		4		GC-FID	ST	226-56	51						
Dibutyltin bis (isooctyl mercaptoacetate) (organotin compounds as Sn)	NIOSH 5504	0.1 mg/m³		480		1000		8		HPLC & AA-GF	ST C/HLD	226-30 225-1	50 118	F/CST	225-709	112			
Dibutyltin dilaurate (as Sn)	OSHA ID 218SG			500		1000		500 min		AA	F/CST	225-3-01	104	C/HLD	225-1	118			
Dibutyltin maleate (as Sn)	OSHA ID 224SG			200		1000		200 min		AA-GF	F/CST	225-3-01	104	C/HLD	225-1	118			
2,2-Dichloro-1,1,1-trifluoroethane	NON 50			9		50		3		GC-FID	ST	226-09	50						
1,1-Dichloro-1-fluoroethane	OSHA 113			1		50		20 min		GC-FID	ST	NA SKC							
1,1-Dichloro-1-nitroethane	NIOSH 1601	2		1.5-15		10-1000				GC-FID	ST	226-81A	51						
m-Dichlorobenzene	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
m-Dichlorobenzene	NIOSH 1003				3		10-200			GC-FID	ST	226-01	50						
o-Dichlorobenzene	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
p-Dichlorobenzene	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
o-Dichlorobenzene (hydrocarbons, halogenated)	NIOSH 1003		50		3		10-200		varies	GC-FID	ST	226-01	50						
p-Dichlorobenzene (hydrocarbons, halogenated)	NIOSH 1003	1.7 (LOQ)		3		10-200		varies		GC-FID	ST	226-01	50						
3,3'-Dichlorobenzidine	OSHA 65			100		1000		100 min		GC-ECD	CF/CST	225-9004	70	C/HLD	225-1	118			
Dichlorodifluoromethane	NIOSH 1018	1000		3		20		2.5		GC-FID	ST	226-01	50	ST	226-09	50			
1,2-Dichloroethane	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39			
1,1-Dichloroethane (ethylidene chloride)	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
1,1-Dichloroethane (Hydrocarbons, Halogenated)	NIOSH 1003	100		10		10-200		varies		GC-FID	ST	226-01	50						
Dichloroethyl ether	NIOSH 1004	5	10	10		20(50)		8(3.3)		GC-FID	ST	226-01	50						
cis-1,2-Dichloroethylene	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
1,2-Dichloroethylene (hydrocarbons, halogenated)	NIOSH 1003	200		3		10-200		varies		GC-FID	ST	226-01	50						
Dichlorofluoromethane	NIOSH 2516	10		3		20		2.5		GC-FID	ST	226-25	50						
Dichloromethane (methylene chloride)	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
Dichloromethane (methylene chloride)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39			
Dichloromethane *(see methylene chloride)*																			
Dichloromonofluoromethane (dichlorofluoromethane)	NIOSH 2516	10		3		20		2		GC-FID	ST	226-09 ♠	50						
2,4-Dichlorophenoxyacetic acid (2,4-D)	NIOSH 5001	10 mg/m³		180		1000		3		HPLC-UV	F/CST	225-709	112	C/HLD	225-1	118			
1,2-Dichloropropane (propylene dichloride)	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
1,2-Dichloropropane (propylene dichloride)	NIOSH 1013	LFC		3		20		2.5		GC-ECN	ST	226-81A	51						
cis-1,3-Dichloropropene	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
trans-1,3-Dichloropropene	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
2,2-Dichloropropionic acid	OSHA PV2017			10		200		50 min		HPLC-UV	ST	226-10	50						
1,2-Dichlorotetrafluoroethane (dichlorodifluoromethane)	NIOSH 1018	1000		3		20		2.5		GC-FID	ST	226-01	50	ST	226-09	50			
Dichlorotrifluoroethane	NON 50			9		50		3		GC-FID	ST	226-09	50						

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Dichlorvos (DDVP)	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Dichlorvos (DDVP)	OSHA 62	1 mg/m³		480		1000		8		GC-FPD	ST 226-30-16 50
Dicloran	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Dicofol	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Dicrotophos	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Dicrotophos (Bidrin)	OSHA PV2099			480		1000		8		GC-FPD	ST 226-30-16 50
Dicrotophos (Organophosphorus Pesticides)	NIOSH 5600	0.25 mg/m³		240		1000		4		GC-FPD	ST 226-58 51
Dicyclopentadiene	OSHA PV2098			10		100		100 min		GC-FID	ST 226-01 50
Dieldrin	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Diesel emissions *(see elemental carbon)*	NIOSH 5040									TOA-FID	
Diesel exhaust particles *(see elemental carbon)*	NIOSH 5040									TOA-FID	
Diesel particulate matter	ASTM D 6877			varies		1000-4000		varies		EGA-TOS	DPM 225-317 or F/CST 225-401 111
Diesel particulate matter	MSHA 30CFR57	350 µg/m³ (total carbon)		varies		2000		varies		TOA-FID	DPM 225-317 111 CYC 225-105 128 C/HLD 225-1 118
Diesel particulate matter	MSHA 30CFR57	350 µg/m³ (total carbon)		varies		varies		varies		TOA-FID	F/CST 225-401 111 CYC 225-100 128 C/HLD 225-1 118
Diethanolamine	OSHA PV2018			10		100		100 min		HPLC-UV	ST 226-30-18 50
Diethanolamine (DEA) (Aminoethanol Compounds II)	NIOSH 3509	3		240		1000		4		IC	IMP 225-36-1 72 IT 225-22 72
Diethyl ether (ethyl ether)	NIOSH 1610			0.25-3		10-200		varies		GC-FID	ST 226-01 50
Diethyl ketone (3-pentanone)	OSHA PV2136			10		100		100		GC-FID	ST NA SKC
Diethyl phthalate (DEP)	OSHA 104			240		1000		4		GC-FID	ST 226-56 51
Diethylamine	OSHA 41	25		10	3	200	200	50 min	15	HPLC	ST 226-96 52
Diethylamine (amines, aliphatic)	NIOSH 2010	10	25	24	3	50	200	8	15	GC-FID	ST 226-10 50
2-Diethylaminoethanol (aminoethanol compounds I)	NIOSH 2007	10		10		20(50)		8(3.3)		GC-FID	ST 226-10-04 50
Diethylene dioxide *(see dioxane)*											
Diethylene ether *(see dioxane)*											
Diethylene glycol (glycols)	NIOSH 5523			60		1000		1		GC-FID	ST 226-57 51
Diethylenetriamine	OSHA 60			10		100		100 min		HPLC-UV	ST 226-30-18 50
Difluorodibromomethane	NIOSH 1012	100		6		50		2		GC-FID	ST 226-01 50
Diglycidyl ether of bisphenol A	OSHA 1018			240		1000		240 (min)		HPLC-UV/PDA	F/CST 225-709 112 C/HLD 225-1 118
Dihexyl phthalate	OSHA PV2076			240		1000		4		GC-FID	ST 226-56 51
Dihydrocapsaicin	NIOSH 5041			480	15	1000	1000	8	15	HPLC-FD	FLT 225-16 112 CST 225-32 118
Diisobutyl ketone (Ketones I)	NIOSH 1300	25		10		20(50)		8(3.3)		GC-FID	ST 226-01 50
Diisobutyl ketone (Ketones I)	NIOSH 2555			1-10		10-200		varies		GC-FID	ST NA SKC
Diisocyanates	OSHA 42			240	15	1000	1000	4	15	HPLC-UV or HPLC-FD	CF/CST 225-9002 or CF/CST 225-9013 70 C/HLD 225-1 118
Dimethazone	OSHA PV2066			60		1000		1		GC-ECD	ST 226-30-16 50
Dimethoate	OSHA PV2113			480		1000		8		GC-FPD	ST 226-30-16 50
Dimethoxymethane (methylal)	NIOSH 1611	1000		2		20		1.5		GC-FID	ST 226-01 50
Dimethyl adipate	OSHA PV2019			20		200		100 min		GC-FID	ST 226-01 50
Dimethyl arsenic acid (arsenic, organo-)	NIOSH 5022			960		2000		8		IC-AA	FLT 225-17-01 110 CST 225-2LF 113 C/HLD 225-1 118
Dimethyl disulfide	NON 42			12		1000		12 min		GC-FPD	SB 253-10 or SB 263-10 or SB 231-10 62
Dimethyl glutarate	OSHA PV2020			20		200		100 min		GC-FID	ST 226-01 50
Dimethyl phthalate (DMP)	OSHA 104	5 mg/m³		240		1000		4		GC-FID	ST 226-56 51

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Dimethyl succinate	OSHA PV2021			20		200		100 min		GC-FID	ST 226-01 50
Dimethyl sulfate	NIOSH 2524	0.1 (8 hrs)		12		50		4		GC-ECN	ST 226-114 52
Dimethyl sulfate	OSHA PV2147	1		10		100		100 min		GC-FPD	ST 226-115 52
Dimethyl sulfide	NON 42			12		1000		12 min		GC-FPD	SB 263-10 or SB 231-10 62
2,3-Dimethyl-2,3-dinitrobutane	NON 44	0.15 mg/m³ OEL		10		200		50 min		GC-ECD	ST 226-35-03 50
Dimethylacetamide	NIOSH 2004	10		80		1000		8		GC-FID	ST 226-10 50
Dimethylamine	NIOSH 2010	10		24		50		8		GC-FID	ST 226-10 50
Dimethylamine	OSHA 34	10		10		20		8		HPLC	ST 226-96 52
2-Dimethylamino ethanol	NIOSH 2561			10-24		20-100		varies		GC-FID	ST 226-94 52
1-Dimethylamino-2-propanol	NIOSH 2561			10-24		20-100		varies		GC-FID	ST 226-94 52
2,4-Dimethylaminobenzene (Amines, Aromatic)	NIOSH 2002	2		24		50		8		GC-FID or GC-NSD	ST 226-10 50
N,N-Dimethylaniline	OSHA PV2064	5		30		200		2.5		GC-FID	ST 226-98 52
N,N-Dimethylaniline (Amines, Aromatic)	NIOSH 2002	5	10	24	3	50	200	8	15	GC-FID or GC-NSD	ST 226-10 50
2,5-Dimethylbenzaldehyde	ASTM D 5197			varies		500-1200		5 min-24 hrs		HPLC-UV	ST 226-120 ᴼ or ST 226-119 52
N,N-Dimethylethanolamine	NIOSH 2561			10-24		20-100		varies		GC-FID	ST 226-94 52
N,N-Dimethylformamide	NIOSH 2004	10		24		50		8		GC-FID	ST 226-10 50
N,N-Dimethylformamide	OSHA 66	10		9.6	3	20	200	8	15	GC-NPD	ST 226-01 50
1,1-Dimethylhydrazine	NIOSH 3515	0.06 (120 min)		60		1000		1		VAS	IMP 225-36-2 72 IT 225-22 72
N,N-Dimethyl-p-toluidine (Amines, Aromatic)	NIOSH 2002			96		200		8		GC-FID or GC-NSD	ST 226-10 50
Dimethyltin dichloride	NIOSH 5526	0.1 mg/m³		60	60	250	1000	4	60	GC-FPD	ST 226-30-16 50
Di-n-hexyl phthalate	OSHA PV2076			240		1000		4		GC-FID	ST 226-56 51
Dinitrotoluene (DNT)	OSHA 44	1.5 mg/m³		60		1000		1		GC-TEA	ST 226-56 51
Di-n-octyl phthalate (DNOP)	OSHA 104			240		1000		4		GC-FID	ST 226-56 51
n-Dioctyl phthalate (DNOP)	OSHA 104			240		1000		4		GC-FID	ST 226-56 51
Dioxane (diethylene dioxide)	NIOSH 1602	1 (30 min)		10		20(50)		8(3.3)		GC-FID	ST 226-01 50
Dioxin (including, PHDDs, PCDDs, PBDDs)	EPA TO-9A					200-280 L/min		24 hrs		HRGC-HRMS	PUF 226-131 57 FLT 225-1808 111
Diphenyl	NIOSH 2530	0.2		30		100		5		GC-FID	ST 226-35-01 50
Diphenyl ether	OSHA PV2022	0.2		20		200		100 min		GC-FID	ST 226-95 52
p,p-Diphenyl methane diisocyanate (MDI) (*see* methylene bisphenyl isocyanate)	OSHA 47										
Diphenylamine	OSHA 78			100		1000		100 min		HPLC-UV	CF/CST 225-9004 70 C/HLD 225-1 118
Diphenylmethane-4,4'-diisocyanate (4,4-methylene bisphenyl isocyanate) (isocyanates)	NIOSH 5521	50 μg/m³	200 μg/m³ (10 min) C	480	10	1000	1000	8	10	HPLC-ELCHM & HPLC-UV	IMP 225-36-1 72 IT 225-22 72
Dipropyl disulfide	OSHA PV2086			10		20(50)		8(3.3)		GC-FPD	ST 226-110 52
Dipropylene glycol methyl ether	OSHA 101	100		10		100		100 min		GC-FID	ST 226-01 50
Dipropylene glycol methyl ether (glycol ethers)	NIOSH 2554			3-25		100-200		varies		GC-FID	ST 226-81A 51
Dipropylene glycol monomethyl ether (glycol ethers)	NIOSH 2554			3-25		100-200		varies		GC-FID	ST 226-81A 51
Direct black 38 (dyes, benzidine)	NIOSH 5013	LFC		480		1000		8		HPLC	FLT 225-17A 110 CST 225-3LF 113 C/HLD 225-1 118
Direct blue 6 (dyes, benzidine)	NIOSH 5013	LFC		480		1000		8		HPLC	FLT 225-17A 110 CST 225-3LF 113 C/HLD 225-1 118
Direct blue 8 (dyes, benzidine)	NIOSH 5013	LFC		480		1000		8		HPLC	FLT 225-17A 110 CST 225-3LF 113 C/HLD 225-1 118

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Direct brown 95 (dyes, benzidine)	NIOSH 5013	LFC		480		1000		8		HPLC	FLT 225-17A 110 CST 225-3LF 113 C/HLD 225-1 118
Direct red 2 (dyes, benzidine)	NIOSH 5013	LFC		480		1000		8		HPLC	FLT 225-17A 110 CST 225-3LF 113 C/HLD 225-1 118
Direct red 28 (dyes, benzidine)	NIOSH 5013	LFC		480		1000		8		HPLC	FLT 225-17A 110 CST 225-3LF 113 C/HLD 225-1 118
Di-sec-octyl phthalate *(see di-[2-ethylhexy] phthalate)*											
Disulfoton	OSHA PV2105			480		1000		8		GC-FPD	ST 226-30-16 50
Disulfoton (Organophosphorus Pesticides)	NIOSH 5600	0.1 mg/m³		240		1000		4		GC-FPD	ST 226-58 51
Diuron	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Diuron (Organonitrogen Pesticides)	NIOSH 5601	10 mg/m³		240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Divinyl benzene	OSHA 89			12		50		4		GC-FID	ST 226-73 51
DMP *(see dimethyl phthalate)*	OSHA 104										
DNOP *(see di-n-octyl phthalate)*	OSHA 104										
DNT (dinitrotoluene)	OSHA 44	1.5 mg/m³		60		1000		1		GC-TEA	ST 226-56 51
n-Dodecane	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Dursban (chlorpyrifos)(organophosphorus pesticides)	NIOSH 5600	0.2 mg/m³	0.6 mg/m³	240		1000		4		GC-FPD	ST 226-58 51
Dust (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Dust, inorganic				15-150		15,000		1-10 min		varies	STC 225-9820 117
Dust, respirable	OSHA PV2121	5.0 mg/m³		varies		varies		varies		GR	FLT 225-803 109 C/HLD 225-1 118 CYC 225-105 128
Dust, respirable (particulates)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Dust, respirable (in workplace atmospheres)	ASTM D 4532			varies		2500		varies		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Dust, total	OSHA PV2121	15 mg/m³		720		1500		8		GR	FLT 225-802 109 C/HLD 225-1 118
Dust, total nuisance (particulates)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Dust, total, particulates not otherwise regulated	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Dyes, benzidine, o-tolidine, o-dianisidine	NIOSH 5013	LFC		480		1000		8		HPLC-UV	FLT 225-17A 110 CST 225-3LF 113 C/HLD 225-1 118
Elemental carbon (diesel exhaust)	MSHA			varies		varies		varies		EGA-TOS	DPM 225-317 111 CYC 225-105 128
Elemental carbon (diesel exhaust)	NIOSH 5040			varies		varies		varies		TOA-FID	F/CST 225-401 111 CYC 225-100 128 C/HLD 225-1 118
Elements by Cellulosic Internal Capsule Sampler *(see specific element)*	NIOSH 7306	Varies		Varies		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Elements by ICP Aqua Regia ashing *(see specific element)*	NIOSH 7301	varies		varies		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Elements by ICP HNO_3 digestion *(see specific element)*	NIOSH 7303	varies		varies		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Elements by ICP $HNO_3/HClO_4$ ashing *(see specific element)*	NIOSH 7300	varies		varies		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Elements on wipes *(see specific element)*	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Elements qualitative	OSHA ID 204			480		2000		8		XRF	F/CST 225-3-01 104 C/HLD 225-1 118
Emery (corundum) (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Emery (corundum) (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Endosulfan (thiodan)	OSHA PV2023			60		1000		1		GC-ECD	ST 226-30-16 50
Endotoxins (bacteria in air)	NON 48			62.5-375		12,500 +		5-30		varies	BS 225-9595 140 VT 225-9598A◊ 140
Endrin	NIOSH 5519	0.1 mg/m³		240		1000		4		GC-ECD	CST 225-2LF 113 FLT 225-5 104 SCN 225-26 119 ST NA SKC C/HLD 225-1 118
Enflurane (ethrane)	OSHA 103			12		50		4		GC-FID	ST 226-81A 51
Enflurane (ethrane)	OSHA 29			10		20		8		GC-FID	ST 226-01 50
Environmental tobacco smoke (nicotine & 3-ethenylpyridine)	NON 49			90-720		1500		1-8		GC-NSD	ST 226-170 53
Environmental tobacco smoke (respirable particles)	ASTM D 5955			varies		varies		varies		GR & HPLC-UV & HPLC-FD	FLT 225-3705 110 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Environmental tobacco smoke (solanesol, respirable particles)	ASTM D 6271			150-3600		2500		1-24		HPLC-UV	FLT 225-3705 110 CST 225-3LF 113 CYC 225-01-02 129 C/HLD 225-1 118
Epichlorohydrin	NIOSH 1010	LFC		10	3	20(50)	200	8(3.3)	15	GC-FID	ST 226-01 50
EPN	NIOSH 5012	0.5 mg/m³		480		1000		8		GC-FPD	F/CST 225-709 112 C/HLD 225-1 118
1,2-Epoxypropane *(see propylene oxide)*											
2,4,D-Esters	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Esters I *(see specific compounds)*	NIOSH 1450	varies		1-10		varies		varies		GC-FID	ST 226-01 50
Estradiol	OSHA PV2001			240		1000		4		HPLC-UV	F/CST 225-706 112 C/HLD 225-1 118
Estriol	OSHA PV2001			60		1000		1		HPLC-UV	F/CST 225-706 112 C/HLD 225-1 118
Estrone	OSHA PV2001			60		1000		1		HPLC-UV	F/CST 225-706 112 C/HLD 225-1 118
1,2-Ethanediol (ethylene glycol) (glycols)	NIOSH 5523			24		100		4		GC-FID	ST 226-57 51
1,2-Ethanediol dinitrate	OSHA 43	0.2 (C)			15		1000		15	HPLC-TEA	ST 226-35-03 50
Ethanol (ethyl alcohol)	OSHA 5001	1000		12		50		4			ST 226-82 52
Ethanol (ethyl alcohol)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Ethanolamine	OSHA PV2111	3		10	1.5	100	100	100 min	15	HPLC-UV	ST 226-30-18 50
3-Ethenylpyridine	NON 49			90-720		1500		1-8		GC-NSD	ST 226-170 53
3-Ethenylpyridine & nicotine	ASTM D 5075			90-2160		1500		1-24		GC-NPD	ST 226-93 52
Ethion (Organophosphorus Pesticides)	NIOSH 5600	0.4 mg/m³		240		1000		4		GC-FPD	ST 226-58 51
Ethoprop (Organophosphorus Pesticides)	NIOSH 5600			240		1000		4		GC-FPD	ST 226-58 51
2-Ethoxyethanol	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
2-Ethoxyethanol (alcohols IV)	NIOSH 1403	0.5 (skin)		1-6		10-50		varies		GC-FID	ST 226-01 50
2-Ethoxyethanol (CELLOSOLVE solvent)	OSHA 79	200		48	15	100	1000	8	15	GC-FID	ST 226-01 50
2-Ethoxyethanol (CELLOSOLVE solvent) (alcohols IV)	NIOSH 1403	0.5 (skin)		1-6		10-50		varies		GC-FID	ST 226-01 50
2-Ethoxyethyl acetate	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
2-Ethoxyethyl acetate (CELLOSOLVE acetate)	OSHA 79	100		48	15	100	1000	8	15	GC-FID	ST 226-01 50
2-Ethoxyethyl acetate (Esters I)	NIOSH 1450	0.5 (skin)		1-10		10-200		varies		GC-FID	ST 226-01 50
Ethrane (enflurane)	OSHA 29			10		100		1.6		GC-FID	ST 226-01 50
Ethyl 2-cyanoacrylate	OSHA 55			12		100		2		HPLC-UV	ST 226-98 52
Ethyl acetate	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Ethyl acetate	NIOSH 1457	400		10		20		8		GC-FID	ST 226-01 50
Ethyl acrylate	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Ethyl acrylate	NON 54	5	15	10	3	20	200	8	15	GC-FID	ST 226-81A 51

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Ethyl acrylate	OSHA 92	25		12	0.75	50	50	4	15	GC-FID	ST 226-73 51
Ethyl acrylate (Esters I)	NIOSH 1450	4 (LOQ)		1-10		10-200		varies		GC-FID	ST 226-01 50
Ethyl alcohol (ethanol)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Ethyl alcohol (ethanol)	OSHA 100	1000		12		50		4		GC-FID	ST 226-82 52
Ethyl alcohol (ethanol)	OSHA 5001	1000		12		50		4			ST 226-82 52
Ethyl alcohol (ethanol) (Alcohols I)	NIOSH 1400	1000		1		50		20 min		GC-FID	ST 226-01 50
Ethyl amyl ketone	NIOSH 1301	50		25		200		2		GC-FID	ST 226-01 50
Ethyl benzene	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Ethyl benzene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Ethyl benzene	OSHA 1002	100				13.83		8		GC-FID	PS 575-002 84
Ethyl benzene	OSHA 1002	100		12		50		4		GC-FID	ST 226-01 50
Ethyl benzene (Hydrocarbons, Aromatic)	NIOSH 1501	100	125	1-24	1-24	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
Ethyl bromide (bromoethane)	NIOSH 1011			4		20		3.3		GC-FID	ST 226-01 50
Ethyl butyl ketone (3-heptanone) (Ketones II)	NIOSH 2553	50		1-25		10-200		varies		GC-FID	ST NA SKC
Ethyl butyl ketone (3-heptanone) (Ketones II)	NIOSH 1301	50		24		200		2		GC-FID	ST 226-01 50
Ethyl chloride	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Ethyl chloride	NIOSH 2519			3		50		1		GC-FID	ST 226-25 50
Ethyl ether (ethyl ether)	NIOSH 1610			0.25-3		10-200		varies		GC-FID	ST 226-01 50
Ethyl formate	NIOSH 1452	100		10		20		8		GC-FID	ST 226-01 50
Ethyl lactate	OSHA PV2081			10		200		50 min		GC-FID	ST 226-01 50
Ethyl mercaptan (mercaptans)	NIOSH 2542		0.5 (15 min)	48	12	100	200	8	60	GC-FPD	CF/CST 225-9007 70 C/HLD 225-1 118
Ethyl methacrylate	NIOSH 2537			1-8		10-50		varies		GC-FID	ST 226-30-06 50
Ethyl methacrylate	OSHA PV2100			10		20(50)		8(3.3)		GC-FID	ST 226-01 50
Ethyl O-(p-nitrophenyl) phenylphosphonothionate (EPN)	NIOSH 5012	0.5 mg/m³		480		1000		8		GC-FPD	F/CST 225-709 112 C/HLD 225-1 118
Ethyl parathion	ASTM D 4861			240-7200		1000-5000		4-24		GC-NPD	PUF 226-92 56
Ethyl silicate	NIOSH S-264	100		9		50		3		GC-FID	ST 226-30-04 50
2-Ethyl toluene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
3-Ethyl toluene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
4-Ethyl toluene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Ethyl vinyl benzene	OSHA 89			12		50		4		GC-FID	ST 226-73 51
Ethyl-3-ethoxypropionate	OSHA PV2025			10		100		100 min		GC-FID	ST 226-01 50
Ethylamine	OSHA 36	10		10		200		50 min		HPLC-UV	ST 226-96 52
Ethylene chlorohydrin	NIOSH 2513		1	10	3	20(50)	200	8(3.3)	15	GC-FID	ST 226-81A 51
Ethylene dibromide (1,2-dibromoethane)	NIOSH 1008	0.045	0.13 (15 min)	10	3	20(50)	200	8(3.3)	15	GC-ECD	ST 226-01 50
Ethylene dibromide (1,2-dibromoethane)	OSHA 02	20	30	10	1	20(50)	200	8(3.3)	5	GC-ECD	ST 226-01 50
Ethylene dichloride	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Ethylene dichloride (1,2-dichloroethane)	OSHA 03	50	100	10	3	200	200	1	15	GC-ECD	ST 226-01GWS 50
Ethylene dichloride (1,2-dichloroethane) (hydrocarbons, halogenated)	NIOSH 1003	1	2	3	3	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
Ethylene glycol (glycols)	NIOSH 5523			60		1000		1		GC-FID	ST 226-57 51

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

		SAMPLING ∞									
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time			
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Ethylene glycol dinitrate	OSHA 43		0.2 (C)		15		1000		15	HPLC-TEA	ST 226-35-03 50
Ethylene glycol dinitrate (nitroglycerine)	NIOSH 2507		0.1 mg/m³		15		1000		15	GC-ECD	ST 226-35-03 50
Ethylene oxide	ASTM D 4413			6	3	100	200	1	15	GC-FID	ST 226-16 or ST 226-36 51
Ethylene oxide	ASTM D 5578			9.6	1.5	20	100	8	15	GC-ECD	ST 226-178 53
Ethylene oxide	NIOSH 1614	0.1	5 (10 min)	24	1.5	100	150	4	10	GC-ECD	ST 226-178 53
Ethylene oxide	OSHA 1010	1	5.0 EL	12	0.75	50	50	4	15	GC-ECD	ST 226-178 53
Ethylene oxide (by portable GC)	NIOSH 3702	0.1	5 (10 min)	varies	varies	20-4000	varies	varies	varies	P GC-PID	SB 232 Series 63
Ethylene oxide (Qazi-Ketcham)	NON 14			10		20(50)		8(3.3)		GC	ST 226-36 51
Ethylene thiourea	NIOSH 5011	LFC		480		2000		4		VAS	F/CST 225-802 109 C/HLD 225-1 118
Ethylene thiourea	OSHA 95			480		2000		4		HPLC-UV	F/CST 225-706 112 C/HLD 225-1 118
Ethylenediamine	NIOSH 2540	10		10		100		1.7		HPLC-UV	ST 226-30-18 50
Ethylenediamine	OSHA 60	10		10		100		100 min		HPLC-UV	ST 226-30-18 50
Ethylenimine	NIOSH 3514			48		200		4		HPLC-UV	IMP 225-36-2 72 IT 225-22 72
2-Ethylhexyl acrylate	OSHA PV2026			12		100		2		GC-FID	ST 226-73 51
di-2-Ethylhexyl phthalate (DEHP)	OSHA 104	5 mg/m³		240		1000		4		GC-FID	ST 226-56 51
ETS *(see environmental tobacco smoke)*	NON 49										
Fenamiphos (Organophosphorus Pesticides)	NIOSH 5600	0.1 mg/m³		240		1000		4		GC-FPD	ST 226-58 51
Fenvalerate	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Ferric chloride *(see iron salts, soluble as Fe)*	OSHA ID 121										
Ferrovanadium dust	OSHA ID 125G	1 mg/m³		480	30	2000	2000	4	15	ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Fibers (bioaerosols)				15-150		15000		1-10 min		varies	STC 225-9820 117
Fibers *(see specific compounds)*											
Fibrous glass (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Fibrous glass (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Fibrous glass dust	OSHA ID 160	15 mg/m³	1 fbr/cc EL	60-300	48	500-2500	1600	120		PCM	FLT/CL 225-321 106
Fluometuron	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Fluoranthene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m³ (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
Fluoranthene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Fluoranthene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-FD	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Fluorene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m³ (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
Fluorene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Fluorene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-UV	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Fluoride (particulate)	NIOSH 7906	2.5 mg/m³		960		2000		8		IC-CD	CF/CST 225-9031 70 C/HLD 225-1 118
Fluorides	ASTM D 4765			varies		2000		varies		ISE	CF/CST 225-9001 70 C/HLD 225-1 118
Fluorides (aerosol & gas by ISE)	NIOSH 7902	2.5 mg/m³	6 (HF)	480	22.5	1000	1500	8	15	ISE	CF/CST 225-9001 70 C/HLD 225-1 118
Fluorides (as F)	OSHA ID 110	2.5 mg/m³		90	22.5	1500	1500	1	15	ISE	CF/CST 225-9001 70 C/HLD 225-1 118
Fluorine	OSHA ID 110	0.1		480		1000				ISE	IMP 225-36-2 72 IT 225-22 72
Fluorotrichloromethane (trichlorofluoromethane)	NIOSH 1006		1000		5		20		240	GC-FID	ST 226-09 50

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Folpet	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Fonofos (Dyfonate)	OSHA PV2027			480		1000		8		GC-FPD	ST 226-30-16 50
Fonofos (Organophosphorus Pesticides)	NIOSH 5600	0.1 mg/m³		240		1000		4		GC-FPD	ST 226-58 51
Formaldehyde	ASTM D 5197			varies		500-1200		5 min-24 hrs		HPLC-UV	ST 226-120 ○ or ST 226-119 52
Formaldehyde	EPA IP-6A					100-1000 ml/min		5 min-24 hrs		HPLC-UV	ST 226-119 or ST 226-120 52
Formaldehyde	EPA IP-6C					20.4 ml/min		7 days		HPLC-UV	PS 500-100 94
Formaldehyde	EPA IP-6C					20.4 ml/min		15 min-8 hrs		HPLC-UV	PS 500-100 94
Formaldehyde	EPA IP-6C					20.4 ml/min		1-7 days		HPLC-UV	PS 500-100 94
Formaldehyde	EPA TO-11A					28.6 ml/min		15 min-8 hrs		HPLC-UV	PS 500-100 94
Formaldehyde	EPA TO-11A					28.6 ml/min		7 days		HPLC-UV	PS 500-100 94
Formaldehyde	EPA TO-11A					28.6 ml/min		15 min-24 hrs		HPLC-UV	PS 500-100 94
Formaldehyde	EPA TO-11A			varies		100-2000 ml/min		varies		HPLC-UV	ST 226-119 or ST 226-120 52
Formaldehyde	NIOSH 2016	0.016	0.1 (C)	1-<15	1-<15	30-500	30-500	varies	varies	HPLC-UV	ST 226-119 ♠ 52
Formaldehyde	NIOSH 2541	0.016	0.1 (C)	24	1	100	100	4	10	GC-FID	ST 226-118 52
Formaldehyde	NIOSH 3500	0.016	0.1	96	15	200	1000	8	15	VAS	IMP 225-36-1 72 IT 225-22 72 FLT 225-1709 ** 110 CST 225-2LF 113 SCN 225-26 119
Formaldehyde	OSHA 1007	0.75	2	13.8	0.43	28.6	28.6	8	15	HPLC-UV	PS 500-100 94
Formaldehyde	OSHA 52	0.75	2	24	3	100	200	4	15	GC-NPD	ST 226-117 or ST 226-54 51
Formaldehyde (Aldehydes, Screening)	NIOSH 2539	0.016	0.1	5		20		4		GC-FID & GC-MS	ST 226-118 52
Formaldehyde on dust (textile or wood)	NIOSH 5700	0.016	0.1	240		2000		4		HPLC-UV	IOM 225-70A 124 FLT 225-5-25 109
Formetanate (Organonitrogen Pesticides)	NIOSH 5601			240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Formic acid	NIOSH 2011	5		24		200		2		IC-CD	FLT 225-1728 110 CST 225-3-25LF 113 ST 226-10-03 50 C/HLD 225-1 118
Formic acid	OSHA ID 186SG	5		48		100		8		IC	ST 226-09 50
Freon 11	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Freon 113	OSHA 113	1000		1		50		20 min		GC-FID	ST NA SKC
Freon 113 (1,1,2-trichloro-1,2,2-trifluoroethane)	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Freon 114	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Freon 12	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Freon 123	NON 50			9		50		3		GC-FID	ST 226-09 50
Freon 141b	OSHA 113	1000		1		50		20 min		GC-FID	ST NA SKC
Fungi	NIOSH 0800			varies		28,300		varies		varies	BI 225-9611 138
Fungi (in air)				15-150		15000		1-10 min		varies	STC 225-9820 117
Fungi (in air) (BioSampler method)	NON 48			62.5-375		12,500 +		5-30		varies	BS 225-9595 140 VT 225-9598A 140
Furans (including PHDFs, PCDFs, PBDFs)	EPA TO-9A					200-280 L/min		24 hrs		HRGC-HRMS	PUF 226-131 57 FLT 225-1808 111
Furfural	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Furfural	NIOSH 2529			5		20		4		GC-FID	ST 226-118 52
Furfural	OSHA 72	5		180		1000		3		GC-FID	ST 226-81A 51
Furfural (Aldehydes, Screening)	NIOSH 2539			5		20		4		GC-FID & GC-MS	ST 226-118 52
Furfuryl alcohol	NIOSH 2505	10	15	5		20		4		GC-FID	ST 226-115 52
Gallium (Elements by ICP HNO_3 Digestion)	NIOSH 7303			1-3,300		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Gasoline	OSHA PV2028			10	1.5	20(50)	100	8(3.3)	15	GC-FID	ST 226-01 50
Glass, fibrous *(see asbestos fibers)*	NIOSH 7400										
Glutaraldehyde	NIOSH 2531	0.2			4		200		20	HPLC-UV	ST 226-118 52
Glutaraldehyde	NIOSH 2532	0.2			3		200		15	HPLC-UV	ST 226-119 52
Glutaraldehyde	NON 43			30	15	250	1000	2	15	GC-FID	ST 226-10 50
Glutaraldehyde	OSHA 64				15		1000		15	HPLC-UV	CF/CST 225-9003 70 C/HLD 225-1 118
Glycerin mist (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Glycidol (2,3-epoxy-1-propanol)	NIOSH 1608	25		10		20(50)		8(3.3)		GC-FID	ST 226-01 50
Glycol chlorohydrin *(see ethylene chlorohydrin)*											
Glycol ethers	NIOSH 2554			3-25		100-200		varies		GC-FID	ST 226-81A 51
Glycols	NIOSH 5523			60		1000		1		GC-FID	ST 226-57 51
Glyphosate	OSHA PV2067			100		1000		100 min		HPLC-UV	F/CST 225-706 112 C/HLD 225-1 118
Gold	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Gold (Elements by ICP HNO_3 Digestion)	NIOSH 7303			1-3,300		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Graphite (natural) *(see Respirable dust)*	OSHA ID 142										
Graphite (synthetic) (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Graphite (synthetic) (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Grunerite fibers *(see asbestos)*	OSHA ID 160										
Gypsum (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Gypsum (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Hafnium	OSHA ID 121	0.5 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Halothane	OSHA 103			12		50		4		GC-FID	ST 226-81A 51
Halothane	OSHA 29			9		100		1.5		GC-FID	ST 226-01 50
HDI *(see hexamethylene diisocyanate)*											
Heptachlor	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Heptachlor	OSHA PV2029	0.5 mg/m³		60		1000		1		GC-ECD	ST 226-30-16 50
Heptachlor (non-occupational exposure)	ASTM D 4947			240-7200	250	1000-5000		4-24		GC-ECD	PUF 226-92 56
Heptachlor epoxide	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Heptanal (Aldehydes, Screening)	NIOSH 2539			5		20		4		GC-FID & GC-MS	ST 226-118 52
n-Heptane	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
3-Heptanone (ethyl butyl ketone) (Ketones II)	NIOSH 2553	50		1-25		10-200		varies		GC-FID	ST NA SKC
2-Heptanone (methyl n-amyl ketone) (Ketones II)	NIOSH 2553	100		1-25		10-200		varies		GC-FID	ST NA SKC
Hexachloro-1,3-cyclopentadiene	NIOSH 2518	0.01		24		50		8		GC-ECD	ST 226-116 52
Hexachlorobenzene	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Hexachlorobutadiene	NIOSH 2543	0.02		48		100		8		GC-ECD	ST 226-30-04 50
Hexachlorocyclopentadiene	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-124 56
Hexachlorocyclopentadiene (hexachloro-1,3-cyclopentadiene)	NIOSH 2518	0.01		48		100		8		GC-ECD	ST 226-116 52
Hexachloroethane (hydrocarbons, halogenated)	NIOSH 1003	1		10		10-200		varies		GC-FID	ST 226-01 50
Hexamethylene diisocyanate	NIOSH 5522	35 µg/m³	140 µg/m³	360	20	1000	2000	6	10	HPLC-FD	IMP 225-36-1 72 IT 225-22 72

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
1,6-Hexamethylene diisocyanate	OSHA 42			15		1000		15 min		HPLC-UV or HPLC-FD	CF/CST 225-9002 or CF/CST 225-9013 70; C/HLD 225-1 118
Hexamethylene diisocyanate (gaseous)	ASTM D 6562			15		1000		15 min		HPLC-UV or HPLC-FD	CF/CST 225-9023 or CF/CST 225-9022 70; C/HLD 225-1 118
Hexamethylene diisocyanate (HDI) (isocyanates)	OR-OSHA 1010	0.02	0.02	45	5	1000	1000	45 min	5	HPLC	IMP 225-36-1 72 IT 225-22 72; CF/CST 225-9029 70
Hexamethylene diisocyanate (isocyanates)	NIOSH 5521	35 µg/m³	140 µg/m³ (10 min) (C)	480	10	1000	1000	8	10	HPLC-ELCHM & HPLC-UV	IMP 225-36-1 72 IT 225-22 72
1,6-Hexamethylene diisocyanate (isocyanates, total)	NIOSH 5525	35 µg/m³	140 µg/m³ (10 min) (C)	1-500		1000-2000		varies		HPLC-UV	FLT 225-7 112 CST 225-4 113; SP 225-27 or IOM 225-76A 124; FLT 225-702 112
Hexamethylene diisocyanate (monomeric aerosol)	ASTM D 6561			15		1000		15 min		HPLC-UV	CF/CST 225-9023 or CF/CST 225-9022▼ 70; C/HLD 225-1 118
Hexamethylene diisocyanate (monomeric gaseous)	ASTM D 6561			15		1000		15 min		HPLC-UV	CF/CST 225-9023 or CF/CST 225-9022 70; C/HLD 225-1 118
Hexamethylene diisocyanate (oligomeric aerosol)	ASTM D 6561			15		1000		15 min		HPLC-UV	CF/CST 225-9023 or CF/CST 225-9022▼ 70; C/HLD 225-1 118
Hexamethylene diisocyanate biuret	OSHA PV2030			15		1000		15 min		HPLC-UV	FLT 225-7 112 CST 225-3LF 113; C/HLD 225-1 118
Hexamethylene diisocyanate biuret (HDI-BT) (isocyanates)	OR-OSHA 1010	1.0 mg/m³	0.5 mg/m³	45	5	1000	1000	45 min	5	HPLC	IMP 225-36-1 72 IT 225-22 72; CF/CST 225-9029 70
Hexamethylene diisocyanate isocyanurate (HDI-IC) (isocyanates)	OR-OSHA 1010	1.0 mg/m³	0.5 mg/m³	45	5	1000	1000	45 min	5	HPLC	IMP 225-36-1 72 IT 225-22 72; CF/CST 225-9029 70
Hexamethylenetetramine	NON 52			15		1000		15 min		GC-NPD or GC-FID	ST 226-57 51
Hexanal	ASTM D 5197			varies		500-1200		5 min-24 hrs		HPLC-UV	ST 226-120 or ST 226-119 52
Hexanal (Aldehydes, Screening)	NIOSH 2539			5		20		4		GC-FID & GC-MS	ST 226-118 52
n-Hexane	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39; CPC 224-26-CPC 39
n-Hexane	NIOSH 1500	50		4		200		20 (min)		GC-FID	ST 226-01 50
1,6-Hexanediol	NIOSH 1500			5	3	200	200			GC-FID	ST 226-01 50
Hexanediol diacrylate	NON 39			480		1000		8		GC-FID	ST 226-56 51
1,6-Hexanediol diacrylate	OSHA PV2133	1 mg/m³		48		200		4		GC-FID	ST 226-110 52
2-Hexanone (Ketones I)	NIOSH 2555			1-10		10-200		varies		GC-FID	ST NA SKC
2-Hexanone (methyl butyl ketone) (Ketones I)	NIOSH 1300	1		10		20(50)		8(3.3)		GC-FID	ST 226-01 50
Hexavalent chromium	ASTM D 6832			varies		1000-5000		varies		IC	F/CST 225-802 or F/CST 225-1713 or F/CST 225-709 or F/CST 225-401 111
Hexavalent chromium	NIOSH 7600	1 µg/m³ (10 hrs)		240		1000		4		VAS	F/CST 225-802 109 C/HLD 225-1 118
Hexavalent chromium	NIOSH 7604	1 µg/m³ (10 hrs)		240		1000		4		IC-CD	F/CST 225-802 109 C/HLD 225-1 118
Hexavalent chromium	NIOSH 7605	0.001 mg/m³ (10 hrs)		1-400		1000-4000		varies		IC-PCD-UV	F/CST 225-802 109 C/HLD 225-1 118
Hexavalent chromium	NIOSH 7703	0.001 mg/m³ (10 hrs)		10-1200		1000-4000		varies		P VAS	F/CST 225-802 109 C/HLD 225-1 118
Hexavalent chromium	OSHA ID 103		0.005 mg/m³ (C)	960	30	2000	2000	8	15	DPP	F/CST 225-802 109 C/HLD 225-1 118
Hexavalent chromium	OSHA W4001		0.005 mg/m³ (C)							IC-UV	FLT 225-5-37 or FLT 225-1822 111
Hexavalent chromium (CR(VI))	OSHA ID 215 (V2)	0.005 mg/m³		960		2000		8		IC-UV	F/CST 225-802 109 C/HLD 225-1 118
Hexavalent chromium (in settled dust)	NIOSH 9101			bulk	bulk					CLR or VAS or IC	
Hexone	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39; CPC 224-26-CPC 39

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

		SAMPLING ∞																	
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time											
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number								
Hexone	OSHA 1004	100				13.62		8		GC-FID	PS	575-002	84						
Hexone	OSHA 1004	100		12		50		4		GC-FID	ST	NA SKC							
Hexone (Ketones I)	NIOSH 2555	50		1-10		10-200		varies		GC-FID	ST	NA SKC							
Hexone (methyl isobutyl ketone) (Ketones I)	NIOSH 1300	50	75	10	3	20(50)	200	8(3.3)	15	GC-FID	ST	226-01	50						
sec-Hexyl acetate	NIOSH 1450	50		10		200		50 (min)		GC-FID	ST	226-01	50						
Hexylene glycol	OSHA PV2101				3		200		15	GC-FID	ST	226-01	50						
HMX	OSHA PV2032			480		1000		8		HPLC-UV	F/CST	225-709	112	C/HLD	225-1	118			
Hydrazine	NIOSH 3503		0.03 (120 min)	90		1000		1.5		VAS	IMP	225-36-2	72	IT	225-22	72			
Hydrazine	NON 22			96		200		8		CLR	ST	226-42-02	51						
Hydrazine	OSHA 108	1		240		1000		4		LC-UV	CF/CST	225-9012	70	C/HLD	225-1	118			
Hydrazine	OSHA 20	1		20		100		3.3		HPLC-UV	ST	226-42-02	51						
Hydrazoic acid	NON 25				15		1000		15	HPLC-UV	ST	226-55	51						
Hydrazoic acid	OSHA ID 211				5		1000		5	IC-UV	ST CST C/HLD	226-55 225-2LF 225-1	51 113 118	FLT SPC	225-5-37-P 225-23	109 119			
Hydrocarbons BP 36 to 216 C *(see specific compounds)*	NIOSH 1500	varies		varies		varies		varies		GC-FID	ST	226-01	50						
Hydrocarbons, aromatic *(see specific compounds)*	NIOSH 1501	varies		varies		varies		varies		GC-FID	ST	226-01	50						
Hydrocarbons, halogenated *(see specific compounds)*	NIOSH 1003	varies		varies		varies		varies		GC-FID	ST	226-01	50						
Hydrofluoric acid (fluorides)	NIOSH 7906	3	6	960	30	2000	2000	8	15	IC-CD	CF/CST	225-9031	70	C/HLD	225-1	118			
Hydrogen bromide	NIOSH 7907		3		30		2000		15	IC-CD	CF/CST	225-9032	70						
Hydrogen bromide	OSHA ID 165SG	3		97	3	200	200	8	15	IC	ST	226-10-03	50						
Hydrogen chloride	NIOSH 7907		5		30		2000		15	IC-CD	CF/CST	225-9032	70						
Hydrogen chloride (hydrochloric acid)	OSHA ID 174SG		5		7.5		500		15	IC	ST	226-10-03	50						
Hydrogen cyanide	NIOSH 6010		4.7		2-90		50-200		varies	VAS	ST	226-210	54	CST	225-710	112			
Hydrogen cyanide	NIOSH 6017		4.7		2-90		50-200		varies	IC/ELCM	ST	226-210	54	CST	225-710	112			
Hydrogen cyanide	OSHA 1015	10				28.4		8	15	IC-ELCM	PS	590-400	96						
Hydrogen cyanide	OSHA ID 120	10		120	15	1000	1000	2	15	ISE	CST IT SP	225-3LF 225-22 225-2902	113 72 119	IMP FLT	225-36-2 225-5	72 104			
Hydrogen cyanide (cyanides)	NIOSH 7904		5 mg/m³ (10 min)		15		1000		15	ISE	FLT IMP C/HLD	225-3705 Δ 225-36-2 225-1	110 72 118	CST IT	225-2LF 225-22	113 72			
Hydrogen fluoride	NIOSH 7906	3	6	960	30	2000	2000	8	15	IC-CD	CF/CST	225-9031	70	C/HLD	225-1	118			
Hydrogen fluoride (as F)	OSHA ID 110	3	6	90	22	1500	1500	1	15	ISE	CF/CST	225-9001	70	C/HLD	225-1	118			
Hydrogen fluoride (fluorides)	NIOSH 7902	3	6	480	30	1000	2000	8	15	ISE	CF/CST	225-9001	70	C/HLD	225-1	118			
Hydrogen peroxide	OSHA 1019	1.0 (1.4 mg/m³)		240	30	1000	2000	4	15	VAS	CF/CST	225-9030	70	C/HLD	225-1	118			
Hydrogen sulfide	NIOSH 6013		10 (10 min)	24	3	100	300	4	10	IC	ST	NA SKC							
Hydrogen sulfide	NON 42			12		1000		12 min		GC-FPD	SB	231-10	62						
Hydrogen sulfide	OSHA 1008	10	20	12	7.5	50	500	4	15	IC	ST	226-177	53						
Hydroquinone	NIOSH 5004		2 mg/m³ (15 min)		30		2000		15	HPLC-UV	F/CST	225-3-01	104	C/HLD	225-1	118			
Hydroquinone	OSHA PV2094	2 mg/m³		20		200		100 min		HPLC-UV	ST	226-98	52						
4-Hydroxy-4-methyl-2-pentanone *(see diacetone alcohol)*																			

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Abbreviations and references are found on pages 244-245.

Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
4-Hydroxy-4-methyl-2-petanone (alcohols combined)	NIOSH 1405	50		1-10		10-200		varies		GC-FID	ST 226-01 50
2-Hydroxypropyl acrylate	OSHA PV2078			10		100		100 min		GC-FID	ST 226-73 51
2-Imidazolidinethione (ethylene thiourea)	NIOSH 5011	LFC		480		1000		8		VAS	F/CST 225-803 109 C/HLD 225-1 118
Indeno(1,2,3-cd)pyrene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Indeno(1,2,3-cd)pyrene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m^3 (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
Indeno(1,2,3-cd)pyrene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-FD	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Indium	OSHA ID 121	0.1 mg/m^3		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Indium & compounds (as In)	OSHA ID 121	0.		480-960		2000		4-8		AA/;AES	F/CST 225-3-01 104 C/HLD 225-1 118
Indium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	0.1 mg/m^3		8-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Indium (Elements by ICP HNO_3 Digestion)	NIOSH 7303			15-500,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Iodine	NIOSH 6005	0.1		15		1000		15		IC	ST 226-67 51
Iodine	NON 16			48		100		8		IC	ST 226-67 51
Iodine	OSHA ID 212	0.1 (C)		2.5		500		5		IC	ST 226-80 51
Iodine (particulates)	OSHA ID 212	0.1		2.5		500		5		IC	ST 226-142 53
Iodine (vapor)	OSHA ID 212	0.1		2.5		500		5		IC	ST 226-80 51
Iron	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Iron & compounds (as Fe)	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Iron (bulk)	OSHA ID 125G			480		2000		4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Iron (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	5 mg/m^3 (dust, fume) as Fe		2-500		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Iron (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	5 mg/m^3 (dust, fume)		5-100		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Iron (Elements by ICP HNO_3 Digestion)	NIOSH 7303	0.5 mg/m^3 (dust, fume)		1-5,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Iron (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	5 mg/m^3 (dust, fume)		5-100		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Iron (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Iron oxide (Elements by ICP HNO_3 Digestion)	NIOSH 7303			1-5,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Iron oxide fume	OSHA ID 121	10 mg/m^3		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Iron oxide fume	OSHA ID 125G	10 mg/m^3		480		2000		4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Iron salts, soluble (as Fe)	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Isoamyl acetate (Esters I)	NIOSH 1450	100		1-10		10-200		varies		GC-FID	ST 226-01 50
Isoamyl alcohol (alcohols combined)	NIOSH 1405	100	125 (skin)	1-10	1-10	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
Isoamyl alcohol (alcohols III)	NIOSH 1402	100	125	10	3	20(50)	200	8(3.3)	15	GC-FID	ST 226-01 50
Isobutanol (isobutyl alcohol)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Isobutyl acetate	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Isobutyl acetate	OSHA 1009	150				13.16	13.16	8	15	GC-FID	PS 575-002 84
Isobutyl acetate	OSHA 1009	150		12	0.75	50	50	4	15	GC-FID	ST 226-01 50
Isobutyl acetate (Esters I)	NIOSH 1450	150		1-10		10-200		varies		GC-FID	ST 226-01 50
Isobutyl alcohol	OSHA 5001	200		12		4				GC-FID	ST 226-82 52

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Isobutyl alcohol (alcohols combined)	NIOSH 1405	50		2-10		10-200		varies		GC-FID	ST 226-01 50
Isobutyl alcohol (alcohols II)	NIOSH 1401	50		10		20(50)		8(3.3)		GC-FID	ST 226-01 50
Isobutyl alcohol (isobutanol)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Isobutyl isobutyrate	OSHA PV2090			10		200		50 min		GC-FID	ST 226-01 50
Isobutyraldehyde (Aldehydes, Screening)	NIOSH 2539			5		20		4		GC-FID & GC-MS	ST 226-118 52
Isocyanates *(see specific isocyanate)*	NIOSH 5521	varies		480	10	1000	1000	8	10	HPLC-ELCHM & HPLC-UV	IMP 225-36-1 72 IT 225-22 72
Isocyanates *(see specific isocyanate)*	NIOSH 5522	varies	varies	360	20	1000	2000	6	10	HPLC-FD	IMP 225-36-1 72 IT 225-22 72
Isocyanates *(see specific isocyanate)*	OR-OSHA 1010	varies	varies	45	5	1000	1000	45 min	5	HPLC	IMP 225-36-1 72 IT 225-22 72 CF/CST 225-9029 70
Isocyanates, total *(see specific isocyanate)*	NIOSH 5525	varies	varies	1-500	1-500	1000-2000	1000-2000	varies	varies	HPLC-UV	FLT 225-7 ‡ 112 CST 225-4 113 SP 225-27 or IOM 225-76A 124 FLT 225-702 ‡ 112
Isoflurane	OSHA 103			12		50		4		GC-FID	ST 226-81A 51
Isooctyl alcohol	OSHA PV2033	100		10		20(50)		8(3.3)		GC-FID	ST 226-01 50
Isophorone	NIOSH 2508	4		10		20(50)		8(3.3)		GC-FID	ST 226-81A 51
Isophorone	NIOSH 2556	4		2-25		10-100		varies		GC-FID	ST 226-93 52
Isophorone (3,5,5-trimethylcyclohex-2-enone)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Isophorone diisocyanate	OSHA PV2034			60	15	1000	1000	1	15	HPLC-UV	CF/CST 225-9002 70 C/HLD 225-1 118
Isophorone diisocyanate (IPDI)	OR-OSHA 1010	0.02	0.02	45	5	1000	1000	45 min	5	HPLC	IMP 225-36-1 72 IT 225-22 72 CF/CST 225-9029 70
Isophorone diisocyanate (isocyanates, total)	NIOSH 5525	45 µg/m³	180 µg/m³ (10 min) C	1-500		1000-2000		varies		HPLC-UV	FLT 225-7 ‡ 112 CST 225-4 113 SP 225-27 or IOM 225-76A 124 FLT 225-702 ‡ 112
Isopropanol (isopropyl alcohol)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Isopropyl acetate	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Isopropyl acetate	NIOSH 1454			9		50		3		GC-FID	ST 226-01 50
Isopropyl acetate	NIOSH 1460			0.1-9		20-200		varies		GC-FID	ST 226-01 50
Isopropyl alcohol	OSHA 5001	200		12		4				GC-FID	ST 226-82 52
Isopropyl alcohol (Alcohols I)	NIOSH 1400	400	500	3	3	20	200	2.5	15	GC-FID	ST 226-01 50
Isopropyl alcohol (isopropanol)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Isopropyl amine	OSHA PV2126	5		20		100		200 min		HPLC	ST 226-30-18 50
N-Isopropyl aniline	OSHA 78			100		1000		100 min		HPLC-UV	CF/CST 225-9004 70 C/HLD 225-1 118
Isopropyl benzen (cumene)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Isopropyl ether	NIOSH 1618	500		0.1-3		10-50		varies		GC-FID	ST 226-01 50
Isopropyl glycidyl ether	NIOSH 1620		50 (15 min)		3		200		15	GC-FID	ST 226-01 50
Isovaleraldehyde	ASTM D 5197			varies		500-1200		5 min-24 hrs		HPLC-UV	ST 226-120 ° or ST 226-119 52
Isovaleraldehyde (Aldehydes, Screening)	NIOSH 2539			5		20		4		GC-FID & GC-MS	ST 226-118 52
Kaolin (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Kaolin (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Kathon 886 (kathon biocide)	NON 55			50	7.5	200	500	4	15	HPLC-UV	ST 226-99 52

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Sampling Guide

skcinc.com for updates

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Kepone	NIOSH 5508	1 µg/m³		480		1000		8		GC-ECD	F/CST 225-3-01 104 IMP 225-36-1 72 IT 225-22 72
Kerosene	OSHA PV2139			20		100		200 min		GC-FID	ST 226-01 50
Kerosene (naphthas)	NIOSH 1550	100 mg/m³		10		20(50)		8(3.3)		GC-FID	ST 226-01 50
Ketones	EPA TO-5			< 80 L		100-1000 ml/min				HPLC-UV	IMP 225-36-1 72 IT 225-22 72
Ketones (screening)	NIOSH 2549			5		20		4		GC-MS	ST 226-330 54
Ketones I *(see specific compounds)*	NIOSH 1300	varies		varies		10-200		varies		GC-FID	ST 226-01 50
Ketones I *(see specific compounds)*	NIOSH 2555			varies		varies		varies		GC-FID	ST NA SKC
Ketones II *(see specific compounds)*	NIOSH 1301	varies		varies		varies		8		GC-FID	ST 226-01 50
Ketones II *(see specific ketone)*	NIOSH 2553	varies	varies	1-25	1-25	10-200	10-200	varies	varies	GC-FID	ST NA SKC
Lanthanum (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306			Varies		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Lanthanum (Elements by ICP Aqua Regia Ashing)	NIOSH 7301			5-1000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Lanthanum (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300			5-1000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Lanthanum (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Lasso (aroclor)	OSHA PV2035			100		1000		100 min		HPLC-UV	F/CST 225-706 112 C/HLD 225-1 118
Lead	NIOSH 7082	< 0.1 mg/m³		720		1500		8		AAS-F	F/CST 225-3-01 104 C/HLD 225-1 118
Lead	NIOSH 7105	< 0.1 mg/m³		720		1500		8		AAS-GF	F/CST 225-3-01 104 C/HLD 225-1 118
Lead (by field portable XRF)	NIOSH 7702	< 0.1 mg/m³		960		2000		8		XRF	F/CST 225-3-01 104
Lead (by portable ultrasound extraction/ASV)	NIOSH 7701	0.05 mg/m³		20-1500		1000-4000		varies		P ASV	F/CST 225-3-01 104 C/HLD 225-1 118
Lead (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	0.05 mg/m³		4-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Lead (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	0.05 mg/m³		50-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Lead (Elements by ICP HNO_3 Digestion)	NIOSH 7303	0.5 mg/m³		35-100,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Lead (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.05 mg/m³		50-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Lead (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Lead (ICP analysis of metal/metalloid particulates from solder operations)	OSHA ID 206			480		2000		4		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Lead (in dust wipes)	NIOSH 9105									SPOT	W 550-001 or W 550-002 171
Lead (in surface dust)	ASTM E 1792			bulk						varies	W 225-2414 172 TMP 225-2415 172
Lead (in surface dust)	OSHA ID 125G			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Lead (in workplace air)	ASTM D 6785			varies		varies		varies		AAS-F	IOM 225-70A 124 FLT 225-1930 104
Lead (on surfaces)	NIOSH 9100									AA-F or AA-GF or ICP	W 225-2401A 172
Lead chromate (CR(VI))	OSHA ID 215 (V2)	0.005 mg/m³		960		2000		8		IC-UV	F/CST 225-802 Ω 109 C/HLD 225-1 118
Lead oxide (as lead)	NIOSH 7082	< 0.1 mg/m³		720		1500		8		AAS-F	F/CST 225-3-01 104 C/HLD 225-1 118
Lead oxide (as Pb)	NIOSH 7105	< 0.1 mg/m³		720		1500		8		AAS-GF	F/CST 225-3-01 104 C/HLD 225-1 118
Lead oxide (by field portable XRF)	NIOSH 7702	< 0.1mg/m³		960		2000		8		XRF	F/CST 225-3-01 104
Lead oxide (by portable ultrasound extraction/ASV)	NIOSH 7701	0.05 mg/m³		20-1500		1000-4000		varies		P ASV	F/CST 225-3-01 104 C/HLD 225-1 118
Lead sulfide (as Pb)	NIOSH 7505	< 0.1 mg/m³		750		2500		5		XRD	F/CST 225-803 109 C/HLD 225-1 118 CYC 225-01-02 129
Lead, inorganic fumes & dusts (as Pb)	OSHA ID 121	0.05 mg/m³		960	30	2000	2000	8	15	AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Lead, inorganic fumes & dusts (as Pb)	OSHA ID 125G	0.05 mg/m³		480	30	2000	15	4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Lead, inorganic surface dusts (as Pb)	OSHA ID 121									AA or AES	W 225-2401A 172

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

		SAMPLING ∞																	
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time											
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number								
Limestone (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT CST	225-5-37-P 225-2LF	109 113	C/HLD	225-1	118			
Limestone *(see calcium carbonate)*																			
Limestone *(see Particulates Not Otherwise Regulated, total and respirable)*																			
Limonene	OSHA PV2036			10		20(50)		8(3.3)		GC-FID	ST	226-01	50						
Limonene *(see online Passive Sampling Guide)*																			
Limonene (terpenes)	NIOSH 1552			24		50		8		GC-FID	ST	226-01	50						
Lindane (gamma-BHC)	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF	226-92	56						
Linuron	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF	226-92	56						
Lithium	OSHA ID 121			960		2000		8		AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Lithium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306			Varies		1000-4000		varies		ICP-AES	SC	225-8517	105	C/HLD	225-1	118			
Lithium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301			100-2000		1000-4000		varies		ICP-AES	F/CST C/HLD	225-3-01 225-1	or 118	F/CST	225-803 ¥	109			
Lithium (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300			100-2000		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Lithium hydride (as Li)	OSHA ID 121	0.025 mg/m³		960		2000		8		AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Lithium hydroxide (alkaline dust)	NIOSH 7401			960		2000		8		TITRA	F/CST	225-1715	110	C/HLD	225-1	118			
Lithium hydroxide (as Li)	OSHA ID 121			960		2000		8		AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Magnesite (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT CYC	225-5-37-P 225-01-02	109 129	C/HLD CST	225-1 225-3LF	118 113			
Magnesite (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT CST	225-5-37-P 225-2LF	109 113	C/HLD	225-1	118			
Magnesium	OSHA ID 121			960	30	2000	2000	8	15	AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Magnesium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306			1-330		1000-4000		varies		ICP-AES	SC	225-8517	105	C/HLD	225-1	118			
Magnesium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	10 mg/m³ (fume, as oxide)		5-67		1000-4000		varies		ICP-AES	F/CST C/HLD	225-3-01 225-1	or 118	F/CST	225-803	109			
Magnesium (Elements by ICP HNO_3 Digestion)	NIOSH 7303			1-10,000		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Magnesium (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	10 mg/m³ (fume, as oxide)		5-67		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Magnesium oxide (as Mg, elements by ICP)	NIOSH 7303	10		5-33,000		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Magnesium oxide fume (respirable dust)	OSHA ID 121	5 mg/m³		960		2000		8		GR & AA or GR & AES	F/CST CYC	225-3-01 225-105	104 128	C/HLD	225-1	118			
Magnesium oxide fume (total dust)	OSHA ID 121	15 mg/m³		960		2000		8		AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Malathion	ASTM D 4861			240-7200		1000-5000		4-24		GC-NPD	PUF	226-92	56						
Malathion	OSHA 62	15 mg/m³		60		1000		1		GC-FPD	ST	226-30-16	50						
Malathion (Organophosphorus Pesticides)	NIOSH 5600	10 mg/m³		60		1000		1		GC-FPD	ST	226-58	51						
Maleic anhydride	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39			
Maleic anhydride	NIOSH 3512	0.25		360		1000		6		HPLC-UV	IMP	225-36-2	72	IT	225-22	72			
Maleic anhydride	OSHA 25	0.25		20		100		3.3		HPLC-UV	ST	226-30-07	50	ST	226-30	50			
Maleic anhydride	OSHA 86	0.25		60		500		2		HPLC-UV	CF/CST	225-9021 ††	70	C/HLD	225-1	118			
Maneb	OSHA 107			500		2000		250		HPLC-UV	F/CST	225-3-01	104	C/HLD	225-1	118			
Manganese & compounds (as Mn)	OSHA ID 121		5 mg/m³ (C)	960	10	2000	2000	8	5	AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Manganese & compounds (as Mn)	OSHA ID 125G		5 mg/m³		10		2000		5	ICP-AES	F/CST F/CST C/HLD	225-3-01 225-803 225-1	or or 118	F/CST F/CST	225-3100 225-8215	or 109			

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Sampling Guide

skcinc.com for updates

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Manganese (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	1 mg/m³	3 mg/m³	1-1000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Manganese (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	1 mg/m³	3 mg/m³	5-200	5-200	1000-4000	1000-4000	varies	varies	ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Manganese (Elements by ICP HNO_3 Digestion)	NIOSH 7303	1 mg/m³	3 mg/m³	0.05-10,000	0.05-10,000	1000-4000	1000-4000	varies	varies	ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Manganese (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	1 mg/m³	3 mg/m³	5-200	5-200	1000-4000	1000-4000	varies	varies	ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Manganese (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Manganese fume	OSHA ID 125G		5 mg/m³	480	30	2000	2000	4	15	ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Manganese fume (as Mn)	OSHA ID 121		5 mg/m³ (C)	960	10	2000	2000	8	5	AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Manganese in welding fume	NON 58		5 mg/m³	varies		750		varies		GR	FLT 225-8050 104 CST 225-6201 and C/HLD 225-6200 121
Manganese tetroxide (as Mn)	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Manganese tetroxide (as Mn)	OSHA ID 125G			480		2000		4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Marble (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Marble (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Marble *(see Particulates Not Otherwise Regulated, total and respirable)*											
MDI (4,4-methylene bisphenyl isocyanate)	OSHA 47	50 µg/m³	200 µg/m³		10		1000		10	HPLC-UV	CF/CST 225-9002 or CF/CST 225-9013 70 C/HLD 225-1 118
MDI (4,4-methylenebis[phenyl isocyanate]) (isocyanates, total)	NIOSH 5525	50 µg/m³	200 µg/m³ (10 min) C	1-500		1000-2000		varies		HPLC-UV	FLT 225-7 ‡ 112 CST 225-4 113 SP 225-27 or IOM 225-76A 124 FLT 225-702 ‡ 112
MDI (4,4'-methylenebisphenyl isocyanate) (isocyanates)	NIOSH 5521	50 µg/m³	200 µg/m³ (10 min) C	480	10	1000	1000	8	10	HPLC-ELCHM & HPLC-UV	IMP 225-36-1 72 IT 225-22 72
MEK *(see methyl ethyl ketone)*											
Mercaptans *(see specific compounds)*	NIOSH 2542		0.5 (15 min)	48	12	100	200	8	60	GC-FPD	CF/CST 225-9007 70 C/HLD 225-1 118
Mercury	NIOSH 6009	0.05 mg/m³		48		200		4		AA	ST 226-17-1A 50 F/CST 225-3-01 104
Mercury (Rathje & Marcero)	NON 17			48		100		8		AA	ST 226-17-1A 50
Mercury (Rathje & Marcero)	NON 17			varies		1000-3000		varies		AA	ST 226-17-3A 50
Mercury (vapor)	OSHA ID 140	0.1 mg/m³		3-100		200		varies		AA	ST 226-17-1A 50 F/CST 225-3-01 104
Mercury (vapor) *(see online Passive Sampling Guide)*	OSHA ID 140									AA	CH 520-03 96 C 520-02A 96
Mercury, Particulate (in Workplace Atmospheres, air samples)	OSHA ID 145		0.01 mg/m³		30		2000		15	AA	F/CST 225-3-01 104 C/HLD 225-1 118
Mercury, Particulate (in Workplace Atmospheres, wipe samples)	OSHA ID 145		0.01 mg/m³							wipe	SM TB 225-24 172
Mesityl oxide (Ketones II)	NIOSH 2553	10		1-25		10-200		varies		GC-FID	ST NA SKC
Mesityl oxide (Ketones II)	NIOSH 1301	10		10		20(50)		8(3.3)		GC-FID	ST 226-01 50
Mesitylene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Mestranol	OSHA PV2068			480		2000		4		HPLC	F/CST 225-802 109 C/HLD 225-1 118
Metal & metalloid particulates	OSHA ID 121	varies	varies	960	30	2000	2000	8	15	AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Metal & metalloid particulates	OSHA ID 125G	varies	varies	480	30	2000	2000	4	15	ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Metal & metalloid particulates (bulk sample)	OSHA ID 125G	varies	varies	bulk	bulk					ICP-AES	SM TB 225-24 172

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Metal removal fluid (aerosol)	ASTM D 7049			960		2000		8		GR	FLT 225-2LF 113; C/HLD 225-1 118; Contact SKC CST
Metal working fluids (aerosols)	ASTM D 7049			960		2000		8		GR	FLT 225-2LF 113; C/HLD 225-1 118; Contact SKC CST
Metals (ICP analysis of metal/metalloid particulates from solder operations) (bulk sample)	OSHA ID 206	varies	varies	bulk	bulk					ICP-AES	SM TB 225-24 172
Metals (in settled dust)	ASTM D 6966			wipe		wipe		wipe		varies	W 225-2414 172; TMP 225-2415 172
Metals in workplace atmospheres	ASTM D 4185			varies		2000		varies		AAS	F/CST 225-3-01 104; C/HLD 225-1 118
Metals, trace (Elements by ICP $HNO_3/HClO_4$ Ashing)	NIOSH 7300	varies	varies	varies	varies	1000-4000	1000-4000	varies	varies	ICP-AES	F/CST 225-3-01 104; C/HLD 225-1 118
Metalworking fluids (thoracic particulates)	NIOSH 5524 ●	0.4 mg/m³ (thoracic particulates)		2000		varies		varies		GR	PPI 225-381 130; IS 225-388 130; SCN 225-26 119; FLT SP Contact SKC 225-27 or
Metalworking fluids (total particulates)	NIOSH 5524 ●	0.5 mg/m³ (total particulates)		1000 (min)		2000		varies		GR	FLT C/HLD 225-2LF 113; Contact SKC 225-1 118; CST
Methacrylic acid	NON 60			24		100		4		HPLC-UV	ST 226-30-08 50
Methamidophos (Organophosphorus Pesticides)	NIOSH 5600			240		1000		4		GC-FPD	ST 226-58 51
Methanol (methyl alcohol)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54; CPC 224-26-CPC 39; TH 224-26-02 39
Methanol (methyl alcohol)	NIOSH 2000	200	250	5	3	20	200	4	15	GC-FID	ST 226-51 51
Methidathion	OSHA PV2074			60		1000		1		GC-ECD	ST 226-58 51
Methiocarb (Organonitrogen Pesticides)	NIOSH 5601			240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Methomyl	OSHA PV2114			60		1000		1		HPLC-UV	ST 226-30-16 50
Methomyl (Organonitrogen Pesticides)	NIOSH 5601	2.5 mg/m³		240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Methotrexate	OSHA PV2146			120		1000		2		HPLC-UV	ST 226-30-16 50
2-Methoxy-1-propanol	OSHA 99			10		100		100 min		GC-FID	ST 226-01 50
2-Methoxy-1-propyl acetate	OSHA 99			10		100		100 min		GC-FID	ST 226-01 50
1-Methoxy-2-propanol	OSHA 99			10		100		100 min		GC-FID	ST 226-01 50
1-Methoxy-2-propanol (glycol ethers)	NIOSH 2554			3-25		100-200		varies		GC-FID	ST 226-81A 51
1-Methoxy-2-propyl acetate	OSHA 99			10		100		100 min		GC-FID	ST 226-01 50
1-Methoxy-2-propyl acetate (glycol ethers)	NIOSH 2554			3-25		100-200		varies		GC-FID	ST 226-81A 51
Methoxychlor	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Methoxychlor	OSHA PV2038	15 mg/m³		60		1000		1		GC-ECD	ST 226-30-16 50
2-Methoxyethanol	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54; CPC 224-26-CPC 39; TH 224-26-02 39
2-Methoxyethanol (methyl CELLOSOLVE solvent)	OSHA 79	25		48	15	100	1000	8	15	GC-FID	ST 226-01 50
2-Methoxyethanol (methyl CELLOSOLVE solvent) (alcohols IV)	NIOSH 1403	0.1 (skin)		6-50		10-50		varies		GC-FID	ST 226-01 50
2-Methoxyethyl acetate	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54; CPC 224-26-CPC 39; TH 224-26-02 39
2-Methoxyethyl acetate (methyl CELLOSOLVE acetate)	OSHA 79	25		48	15	100	1000	8	15	GC-FID	ST 226-01 50
2-Methoxyphenol	OSHA PV2039			20		200		100 min		GC-FID	ST 226-95 52
3-Methoxyphenol	OSHA PV2039			20		200		100 min		GC-FID	ST 226-95 52
4-Methoxyphenol	OSHA PV2039			20		200		100 min		GC-FID	ST 226-95 52
Methoxypropanol	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54; CPC 224-26-CPC 39; TH 224-26-02 39
Methyl acetate	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54; CPC 224-26-CPC 39; TH 224-26-02 39
Methyl acetate	NIOSH 1458	200	250	5	3	20	200	4	15	GC-FID	ST 226-01 50

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Methyl acrylate	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Methyl acrylate	NIOSH 1459	10		5		20		4		GC-FID	ST 226-01 50
Methyl acrylate	NIOSH 2552	10		1-5		10-200		varies		GC-FID	ST NA SKC
Methyl acrylate	NON 54	5	15	10	3	20	200	8	15	GC-FID	ST 226-81A 51
Methyl acrylate	OSHA 92	10		12		50		4		GC-FID	ST 226-73 51
Methyl acrylonitrile	OSHA 37			20		200		100 min		GC-NPD	ST 226-01 50
Methyl alcohol (methanol)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Methyl alcohol (methanol)	NIOSH 2000	200	250	5	3	20	200	4	15	GC-FID	ST 226-51 51
Methyl alcohol (RH < 50% @ 25 C)	OSHA 5001	200		3		50		1		GC-FID	ST 226-82 52
Methyl alcohol (RH > 50% @ 25 C)	OSHA 5001	200		5		50		100 min		GC-FID	ST 226-82 52
Methyl amine	OSHA 40	10		10		20		8		HPLC-UV	ST 226-96 52
Methyl arsonic acid (arsenic, organo-)	NIOSH 5022			480		1000		8		IC-AA	FLT 225-17-01 110 CST 225-2LF 113 C/HLD 225-1 118
Methyl bromide	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Methyl bromide	NIOSH 2520	LFC		1-5		10-100		varies		GC-Aed	ST 226-82 52 ST 226-44-02 52
Methyl bromide	OSHA PV2040		20		3		200		15	GC-FID	ST 226-82 52
Methyl butyl ketone (Ketones I)	NIOSH 2555			1-10		10-200		varies		GC-FID	ST NA SKC
Methyl butyl ketone (MBK, 2-hexanone) (Ketones I)	NIOSH 1300	1		10		20(50)		8(3.3)		GC-FID	ST 226-01 50
Methyl CELLOSOLVE acetate (2-methoxyethyl acetate)	NIOSH 1451	0.1		12		50		4		GC-FID	ST 226-01 50
Methyl CELLOSOLVE acetate (2-methoxyethyl acetate)	OSHA 79	25		48	15	100	1000	8	15	GC-FID	ST 226-01 50
Methyl CELLOSOLVE solvent (2-methoxyethanol)	OSHA 79	25		48	15	100	1000	8	15	GC-FID	ST 226-01 50
Methyl CELLOSOLVE solvent (2-methoxyethanol) (alcohols IV)	NIOSH 1403	0.1 (skin)		6-50		10-50		varies		GC-FID	ST 226-01 50
Methyl chloride	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Methyl chloride	NIOSH 1001	LFC			0.5		100		5	GC-FID	ST 226-09 50 ST 226-01 50
Methyl chloroform	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Methyl chloroform (1,1,1-Trichloroethane)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Methyl chloroform (1,1,1-trichloroethane)	OSHA 14	350		3	3	20	200	2.5	15	GC-FID	ST 226-01 50
Methyl chloroform (1,1,1-trichloroethane) (hydrocarbons, halogenated)	NIOSH 1003		350		3		10-200		varies	GC-FID	ST 226-01 50
Methyl cyclohexane (hydrocarbons, BP 36 to 216 C)	NIOSH 1500	400		4		10-200		varies		GC-FID	ST 226-01 50
Methyl ethyl ketone	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Methyl ethyl ketone	OSHA 1004	200		12		50		4		GC-FID	ST NA SKC
Methyl ethyl ketone (Ketones I)	NIOSH 2555			1-10		10-200		varies		GC-FID	ST NA SKC
Methyl ethyl ketone (MEK) *(see 2-butanone)*											
Methyl ethyl ketone (MEK) *(see 2-butanone)*	NIOSH 2500	200	300	10	3	20(50)	200	8(3.3)	15	GC-FID	ST 226-81A 51
Methyl ethyl ketone (MEK, 2-butanone)	OSHA 1004	200				16.88		8		GC-FID	PS 575-002 84
Methyl ethyl ketone peroxide	NIOSH 3508		0.2 (15 min)		120		1000		120	VAS	IMP 225-36-1 72 IT 225-22 72
Methyl ethyl ketone peroxide	OSHA 77				15		1000		15	HPLC-UV	ST 226-93 52
Methyl formate	OSHA PV2041	100		3		50		1		GC-FID	ST 226-83 52
Methyl iodide	NIOSH 1014	2		48		100		8		GC-FID	ST 226-01 50

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

		SAMPLING ∞									
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time			
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Methyl isoamyl acetate (Esters I)	NIOSH 1450	50		1-10		10-200		varies		GC-FID	ST 226-01 50
Methyl isoamyl ketone	OSHA PV2042	100		24		50		8		GC-FID	ST 226-01 50
Methyl isobutyl carbinol (methyl amyl alcohol) (alcohols combined)	NIOSH 1405	25	40 (skin)	1-10	1-10	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
Methyl isobutyl carbinol (methyl amyl alcohol) (Alcohols III)	NIOSH 1402	25	40	10	3	20(50)	200	8(3.3)	15	GC-FID	ST 226-01 50
Methyl isobutyl ketone	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Methyl isobutyl ketone	OSHA 1004	100		12		50		4		GC-FID	ST NA SKC
Methyl isobutyl ketone (hexone)	OSHA 1004	100				13.62		8		GC-FID	PS 575-002 84
Methyl isobutyl ketone (hexone) (Ketones I)	NIOSH 1300	50	75	10	3	20(50)	200	8(3.3)	15	GC-FID	ST 226-01 50
Methyl isobutyl ketone (Ketones I)	NIOSH 2555	50		1-10		10-200		varies		GC-FID	ST NA SKC
Methyl isocyanate (MIC)	OSHA 54	0.02		15		50		5		HPLC-FD	ST NA SKC
Methyl mercaptan	NIOSH 2542		0.5 (15 min)	48	12	100	200	8	60	GC-FPD	CF/CST 225-9007 70 C/HLD 225-1 118
Methyl mercaptan	NON 42			12		1000		12 min		GC-FPD	SB 231-10 62
Methyl mercaptan	OSHA 26		10	20		200		100 min		GC-FPD	CF/CST 225-9007 70 C/HLD 225-1 118
Methyl methacrylate	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Methyl methacrylate	NIOSH 2537	100		1-8		10-50		varies		GC-FID	ST 226-30-06 50
Methyl methacrylate	NON 54	50	75	10	3	20	200	8	15	GC-FID	ST 226-81A 51
Methyl methacrylate	OSHA 94	100		3		50		1		GC-FID	ST 226-73 51
Methyl n-amyl ketone (2-heptanone) (Ketones II)	NIOSH 2553	100		1-25		10-200		varies		GC-FID	ST NA SKC
Methyl parathion	ASTM D 4861			240-7200		1000-5000		4-24		GC-NPD	PUF 226-92 56
Methyl parathion	OSHA PV2112			480		1000		8		GC-FPD	ST 226-30-16 50
Methyl parathion (Organophosphorus Pesticides)	NIOSH 5600	0.2 mg/m³		240		1000		4		GC-FPD	ST 226-58 51
Methyl propyl ketone (2-pentanone)	NIOSH 1300	150		10		200		50 (min)	15	GC-FID	ST 226-01 50
Methyl propyl ketone (Ketones I)	NIOSH 2555			1-10		10-200		varies		GC-FID	ST NA SKC
alpha-Methyl styrene (Hydrocarbons, Aromatic)	NIOSH 1501	50	100	1-30	1-30	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
beta-Methyl styrene (Hydrocarbons, Aromatic)	NIOSH 1501	50	100	1-30	1-30	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
Methyl styrene (vinyl toluene)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
17-a-Methyl testosterone	OSHA PV2001			60		1000		1		HPLC-UV	F/CST 225-706 112 C/HLD 225-1 118
Methyl-2-cyanoacrylate	OSHA 55			12		100		2		HPLC-UV	ST 226-98 52
1-Methyl-2-ethyl benzene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
1-Methyl-2-pyrrolidinone	OSHA PV2043			10		200		50 min		GC-FID	ST 226-01 50
N-Methyl-2-pyrrolidinone	NIOSH 1302			96		200		8		GC-NPD, FID	ST 226-01 50
N-Methyl-2-pyrrolidinone	OSHA PV2043			10		200		50 min		GC-FID	ST 226-01 50
1-Methyl-3-ethyl benzene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
5-Methyl-3-heptanone (ketones II)	NIOSH 2553	25		1-25		10-200		varies		GC-FID	ST NA SKC
5-Methyl-3-heptanone (ketones II)	NIOSH 1301	25		10		20(50)		8(3.3)		GC-FID	ST 226-01 50
1-Methyl-4-ethyl benzene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
2-Methyl-4-isothiazolin-3-one (Kathon 886)	NON 55	1.5 mg/m³	4.5 mg/m³	50	7.5	200	500	4	15	HPLC-UV	ST 226-99 52
Methylal (dimethoxymethane)	NIOSH 1611	1000		1.8		20		1.5		GC-FID	ST 226-01 50
Methylal *(see dimethoxymethane)*											

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Methylcyclohexanol	NIOSH 1404	50		12		25		8		GC-FID	ST 226-01 50
Methylcyclohexanone	NIOSH 2521	50	75	3		50		1		GC-FID	ST 226-115 52
4,4-Methylene bisphenyl isocyanate (MDI)	OSHA 47		200 µg/m³		15		1000		15	HPLC-UV	CF/CST 225-9002 or CF/CST 225-9013 70 C/HLD 225-1 118
4,4-Methylene bisphenyl isocyanate (MDI) (isocyanates)	NIOSH 5521	50 µg/m³	200 µg/m³ (10 min) C	480	10	1000	1000	8	10	HPLC-ELCHM & HPLC-UV	IMP 225-36-1 72 IT 225-22 72
4,4-Methylene bisphenyl isocyanate (MDI) (isocyanates)	OR-OSHA 1010	0.02	0.005	45	5	1000	1000	45 min	5	HPLC	IMP 225-36-1 72 IT 225-22 72 CF/CST 225-9029 70
Methylene chloride	NIOSH 1005	LFC		2	1.5	20	100	1.6	15	GC-FID	ST 226-01 50
Methylene chloride	OSHA 59	25	125	10	0.25	50	50	3.3	5	GC-FID	ST 226-09-02 50
Methylene chloride	OSHA 80	25	125	3	0.25	50	50	1	5	GC-FID	ST NA SKC
Methylene chloride (dichloromethane)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
4,4-Methylene diphenyl isocyanate (MDI)	NIOSH 5522	50 µg/m³	200 µg/m³ (10 min) C	360	20	1000	2000	6	10	HPLC-FD	IMP 225-36-1 72 IT 225-22 72
4,4'-Methylenebis(2-chloroaniline) (MOCA)	OSHA 71			100		1000		100 min		GC-ECD	CF/CST 225-9004 70 C/HLD 225-1 118
Methylene-bis-(4-cyclohexylisocyanate)	OSHA PV2092				15		1000		15	HPLC-UV	CF/CST 225-9013 70 C/HLD 225-1 118
Methylene-bis-(4-cyclohexylisocyanate) (isocyanates, total)	NIOSH 5525		110 µg/m³ (10 min) C		1-500		1000-2000		varies	HPLC-UV	FLT 225-7 ‡ 112 CST 225-4 113 SP 225-27 or IOM 225-76A 124 FLT 225-702 ‡ 112
4,4-Methylenebisphenyl isocyanate (MDI) (isocyanates, total)	NIOSH 5525	50 µg/m³	200 µg/m³ (10 min) C	1-500		1000-2000		varies		HPLC-UV	FLT 225-7 ‡ 112 CST 225-4 113 SP 225-27 or IOM 225-76A 124 FLT 225-702 ‡ 112
4,4'-Methylenedianiline (MDA)	NIOSH 5029	LFC		480		1000		8		HPLC-UV	CF/CST 225-9004 70 C/HLD 225-1 118
4,4'-Methylenedianiline (MDA)	OSHA 57			100		1000		100		GC-ECD	CF/CST 225-9004 70 C/HLD 225-1 118
Methyl-n-amyl ketone (2-heptanone) (Ketones II)	NIOSH 1301	100		1-25		10-200		8		GC-FID	ST 226-01 50
Methylphenols	EPA TO-8			< 80 L		100-1000 ml/min				HPLC-UV	IMP 225-36-1 72 IT 225-22 72
Methyl-t-butyl-ether (MTBE)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Methyl-tert-butyl ether	NIOSH 1615			96		200		8		GC-FID	ST 226-37 51
Methyltetrahydrophthalic anhydride	NON 28			200	20	40	1000	8	20	GC-FID	ST 226-30 50
Methyltin dichloride	NIOSH 5526	0.1 mg/m³		60	60	250	1000	4	60	GC-FPD	ST 226-30-16 50
Metolachlor	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Metolachlor	NIOSH 5602			480		1000		8		GC-ECD	ST 226-58 51
Metribuzin	OSHA PV2044			240		1000		4		GC-FPD	ST 226-30-16 50
Mevinphos (phosdrin) (Organophosphorus Pesticides)	NIOSH 5600	0.01		240		1000		4		GC-FPD	ST 226-58 51
Mexacarbate	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
MIBK *(see methyl isobutyl ketone)*											
MIC (methyl isocyanate)	OSHA 54	0.02		15		50		5		HPLC-FD	ST NA SKC
Mica *(see Respirable dust)*	OSHA ID 142										
Mineral spirits (naphthas)	NIOSH 1550	350 mg/m³	1800 mg/m³	3	1	20	200	2.5	5	GC-FID	ST 226-01 50
Mineral wool fiber (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Mineral wool fiber (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Mirex	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Mold spores (in air)				15-150		15000		1-10 min		varies	STC 225-9820 117
Molybdenum (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306			1-330		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Molybdenum (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	5 mg/m³ (soluble) 10 mg/m³ (insoluble)		5-67		1000-4000		varies		ICP-AES	F/CST 225-3-01 or 225-803 109 C/HLD 225-1 118
Molybdenum (Elements by ICP HNO_3 Digestion)	NIOSH 7303	5 mg/m³ (soluble) 10 mg/m³ (insoluble)		0.5-10,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Molybdenum (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	5 mg/m³ (soluble) 10 mg/m³ (insoluble)		6-67		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Molybdenum (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Molybdenum insolubles (as Mo)	OSHA ID 125G	15 mg/m³		480		2000		4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Molybdenum insolubles (as Mo) (respirable fraction)	OSHA ID 121	15 mg/m³ (total dust)		960		2000		8		GR & AA or GR & AES	F/CST 225-3-01 104 C/HLD 225-1 118 CYC 225-105 128
Molybdenum solubles (as Mo)	OSHA ID 121	5 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Monochloroacetic acid (chloroacetic acid)	NIOSH 2008			48		100		8		IC-CD	ST 226-47-01 51
Monocrotophos (Azodrin)	OSHA PV2045			480		1000		8		GC-FPD	ST 226-30-16 50
Monocrotophos (Organophosphorus Pesticides)	NIOSH 5600	0.25 mg/m³		240		1000		4		GC-FPD	ST 226-58 51
Monoethanolamine (2-aminoethanol)	NIOSH 3509	3	6	240		1000		4		IC	IMP 225-36-1 72 IT 225-22 72
Monoethanolamine *(see 2-aminoethanol)*											
Monomethyl aniline	NIOSH 3511	0.5		100		1000		100 min		GC-FID	IMP 225-36-2 72 IT 225-22 72
Monomethyl hydrazine	NIOSH 3510		0.04 (120 min)		15		1000		15	VAS	IMP 225-36-2 72 IT 225-22 72
Monomethyl hydrazine	OSHA 20		0.2		4.5		300		15	HPLC-UV	ST 226-42-02 51
Monuron	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Morpholine	OSHA PV2123	20		10		100		100 min		GC-FID	ST 226-98 52
Mycobacteria	NIOSH 0801			50-300		28300		varies		GC-FID	BI 225-9611 138
Mycobacterium tuberculosis (airborne)	NIOSH 0900			1920		4000		8		PCR	FLT 225-3705 110 SP 225-27 119 CST 225-3LF 113 C/HLD 225-1 118
Mycotoxins (fungi in air)	NON 48			62.5-375		12,500 +		5-30		varies	BS 225-9595 140 VT 225-9598A 140
Naphtha (coal tar)	NIOSH 1550	100		10		20(50)		8(3.3)		GC-FID	ST 226-01 50
Naphtha (coal tar)	OSHA 48	100		3		200		15 min		GC-FID	ST 226-01 50
Naphthalene	OSHA 35	10		10	3	20(50)	200	8(3.3)	15	GC-FID	ST 226-110 52
Naphthalene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m³ (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
Naphthalene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Naphthalene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506	10	15	480		2000		4		HPLC-UV	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
1,5-Naphthalene diisocyanate	OSHA PV2046			60		1000		1		HPLC-UV-FD	CF/CST 225-9013 70 C/HLD 225-1 118
1,5-Naphthalene diisocyanate (isocyanates, total)	NIOSH 5525	40 µg/m³	70 µg/m³ (10 min) C	1-500	1-500	1000-2000	1000-2000	varies	varies	HPLC-UV	FLT 225-7 ‡ 112 CST 225-4 113 SP 225-27 or IOM 225-76A 124 FLT 225-702 ‡ 112
Naphthas *(see specific compounds)*	NIOSH 1550	varies		varies		varies		8		GC-FID	ST 226-01 50
alpha-Naphthylamine	OSHA 93			100		1000		100 min		GC-ECD	CF/CST 225-9004 70 C/HLD 225-1 118
beta-Naphthylamine	OSHA 93			100		1000		100 min		GC-ECD	CF/CST 225-9004 70 C/HLD 225-1 118
Naphthylamines (alpha- & beta-)	NIOSH 5518			96		200		8		GC-FID	FLT 225-16 112 CST 225-32 118 ST 226-51 51

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Naphthylene diisocyanate (NDI) (isocyanates)	NIOSH 5521	40 µg/m³	70 µg/m³ (10 min) C	480	10	1000	1000	8	10	HPLC-ELCHM & HPLC-UV	IMP 225-36-1 72 IT 225-22 72
Naphthylthiourea *(see ANTU)*											
Nickel (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	0.015 mg/m³		2-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Nickel (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	0.015 mg/m³		5-1000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or C/HLD 225-1 118 F/CST 225-803 109
Nickel (Elements by ICP HNO_3 Digestion)	NIOSH 7303	0.012 mg/m³		1-50,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Nickel (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.15 mg/m³		5-1000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Nickel (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Nickel (metal & insoluble compounds as Ni)	OSHA ID 125G	1 mg/m³		480		2000		4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Nickel (metal, soluble, & insoluble compounds as Ni)	OSHA ID 121	1 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Nickel (soluble compounds as Ni)	OSHA ID 121	1 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Nickel (soluble compounds as Ni)	OSHA ID 125G	1 mg/m³		480		2000		4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Nickel carbonyl	NIOSH 6007	0.001		72		150		8		AA-GF	ST NA SKC F/CST 225-3-01 104
Nicotine	NIOSH 2544	0.5 mg/m³		360		1000		6		GC-NPD	ST 226-30-04 50
Nicotine	NIOSH 2551	0.5 mg/m³		480		1000		8		GC-NPD	ST 226-93 52
Nicotine	NON 19			120		1000		2		GC	ST 226-93 52
Nicotine	NON 49			90-720		1500		1- 8		GC-NSD	ST 226-170 53
Nicotine & 3-ethenylpyridine	ASTM D 5075			varies		1500		varies		GC-NPD	ST 226-93 52
Niobium (Elements by ICP HNO_3 Digestion)	NIOSH 7303	0.012 mg/m³		0.1-3,300		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Nitric acid	NIOSH 7907	2	4	600	30	2000	2000	5	15	IC-CD	CF/CST 225-9032 70 C/HLD 225-1 118
Nitric acid	OSHA ID 165SG	2		96	7.5	200	500	8	15	IC	ST 226-10-03 50
Nitric oxide	NON 59	25		3-24		100		4		IC	ST 226-40A 51
p-Nitroaniline	NIOSH 5033	3 mg/m³		240		1000		4		HPLC-UV	F/CST 225-3-01 104 C/HLD 225-1 118
Nitrobenzene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 CPC 224-26-CPC 39 TH 224-26-02 39
Nitrobenzene	NIOSH 2005	1		48		100		8		GC-FID	ST 226-10 50
Nitrobenzene	NIOSH 2017	1		24		200		2		GC-FID	CF/CST 225-9004 70 ST 226-15 50
p-Nitrochlorobenzene (nitrobenzenes)	NIOSH 2005	0.1		96		200		8		GC-FID	ST 226-10 50
Nitrochloroform	NON 51	0.1		144		100		24		GC-MSD	ST 226-175 53
Nitrochloromethane	NON 51	0.1		144		100		24		GC-MSD	ST 226-175 53
4-Nitrodiphenyl	OSHA PV2082			240		500		8		GC-FID	ST 226-30-16 50
Nitroethane	NIOSH 2526	100		2.4		20		2		GC-FID	ST 226-3002A 50
Nitrofurazone	OSHA PV2069			240		1000		4		HPLC-UV	F/CST 225-709 112 C/HLD 225-1 118
Nitrogen dioxide	NIOSH 6014		1 (NO_2)	1.5-6		25-200		varies		VAS	ST 226-40-02 51
Nitrogen dioxide	OSHA ID 182		5 (C)		3		200		15	IC	ST 226-40-02 51
Nitroglycerin	NIOSH 2507		0.1 mg/m³		3		200		15	GC-ECD	ST 226-35-03 50
Nitroglycerin	OSHA 43		0.1 mg/m³		15		1000		15	HPLC	ST 226-35-03 50
Nitromethane	NIOSH 2527			2.4		20		2		GC-NSD	ST 226-111A 52
1-Nitropropane	OSHA 46	25		3		100		30 min		GC-FID	ST 226-93 52
2-Nitropropane	NIOSH 2528	LFC		2		20		1.5		GC-FID	ST 226-110 52

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
2-Nitropropane	OSHA 46	25		3		100		30 min		GC-FID	ST 226-93 52
1-Nitropyrene in diesel particulates	NIOSH 2560			480-960		1000-2000		varies		GC-NCD	FLT 225-7 112 SP 225-27 119 SPC 225-23 119
N-Nitrosodiethanolamine	OSHA 31			480		2000		4		GC-TEA	F/CST 225-706 112 C/HLD 225-1 118
N-Nitrosodiphenylamine	OSHA 23			240		1000		4		HPLC-UV	IMP 225-36-2 72 IT 225-22 72
m-Nitrotoluene (nitroaromatic compounds)	NIOSH 2005	2 ppm		96		200		8		GC-FID	ST 226-10 50
o-Nitrotoluene (nitroaromatic compounds)	NIOSH 2005	2 ppm		96		200		8		GC-FID	ST 226-10 50
p-Nitrotoluene (nitroaromatic compounds)	NIOSH 2005	2 ppm		96		200		8		GC-FID	ST 226-10 50
Nitrotoluene (nitrobenzenes)	NIOSH 2005	2 ppm		96		200		8		GC-FID	ST 226-10 50
Nitrous oxide	NIOSH 6600	25		3		100-4000		varies		P IR	SB 231-05 62
trans-Nonachlor	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Nonane	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
n-Nonane (hydrocarbons, BP 36 to 216 C)	NIOSH 1500	200		4		10-200		varies		GC-FID	ST 226-01 50
Nonpolar organic compounds	NON 38	varies		varies				varies		GC	PUF 226-129 57
Norethindrone	OSHA PV2070			480		2000		4		HPLC-UV	F/CST 225-802 109 C/HLD 225-1 118
Nuisance dust (Particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Nuisance dust *(see dust, respirable nuisance)*											
n-Octane	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
n-Octane	OSHA PV2138	500		4		50		80 min		GC-FID	ST 226-01 50
n-Octane (hydrocarbons, BP 36 to 216 C)	NIOSH 1500	75	385	4	4	0-200	0-200	varies	varies	GC-FID	ST 226-01 50
1-Octanethiol	NIOSH 2510		0.5 (15 min)		3		200		15	GC-FPDS	ST 226-35-03 50
Octanol	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Octyl alcohol	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
di-n-Octyl phthalate (DNOP)	OSHA 104			240		1000		4		GC-FID	ST 226-56 51
Oil mist (mineral)	NIOSH 5026	5 mg/m^3	10 mg/m^3	480	30	1000	2000	8	15	IR	F/CST 225-3-01 or F/CST 225-802 109 C/HLD 225-1 118
Oil mist (mineral)	OSHA ID 128	5 mg/m^3		960		2000		8		FLUOR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Oil mist (mineral)	OSHA ID 178SG	5 mg/m^3		960		2000		8		GR & IR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Oil mist (total aerosol)	NON 46	5 mg/m^3		varies		2000		varies		GR	IOM 225-70A 124 FLT 225-5-25 109
Oil mist (vegetable) *(see Particulates Not Otherwise Regulated, total and respirable)*											
Organic vapors (charcoal tube method)	ASTM D 3686			varies	varies	varies	varies	varies	varies	GC	ST 226-01 50
Organic vapors (diffusive sampler method)	ASTM D 4597			varies	varies	varies	varies	varies	varies	GC	PS 575-001 or PS 575-002 84
Organonitrogen pesticides *(see specific compounds)*	NIOSH 5601			240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Organophosphorus pesticides *(see specific compounds)*	NIOSH 5600	varies		varies		varies		8		GC-FPD	ST 226-58 51
Organotin compounds as Sn *(see specific compounds)*	NIOSH 5504	0.1 mg/m^3		480		1000		8		HPLC & AA-GF	ST 226-30 50 F/CST 225-709 112 C/HLD 225-1 118
Organotincompounds as Sn *(see specific compounds)*	NIOSH 5526	0.1 mg/m^3		60	60	250	1000	4	60	GC-FPD	ST 226-30-16 50
Oxalic acid	OSHA PV2115	1 mg/m^3		100		1000		100 min		IC	FLT 225-701 112 CST 225-3LF 113 C/HLD 225-1 118
Oxamyl (Organonitrogen Pesticides)	NIOSH 5601			240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Oxychlordane	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Ozone	OSHA ID 214	0.1		90-120	22.5	250-500	1500	180 min at 500 ml/min 480 min at 250 ml/min		IC	CF/CST 225-9014 70
PAHs (Polynuclear Aromatic Hydrocarbons by GC, *see specific compounds*)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
PAHs (Polynuclear Aromatic Hydrocarbons by GC-MS, *see specific compounds*)	ASTM D 6209			350 m^3 (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
PAHs (Polynuclear Aromatic Hydrocarbons by HPLC, *see specific compounds*)	NIOSH 5506			480		2000		4		HPLC-UV	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Palladium (Elements by ICP HNO_3 Digestion)	NIOSH 7303			0.1-3,300		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Paper fiber (cellulose) (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Paper fiber (cellulose) (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Paraffin wax fume	OSHA PV2047			100		1000		100 min		GC-FID	F/CST 225-706 112 C/HLD 225-1 118
Paraquat	NIOSH 5003	0.1 mg/m^3		480		1000		8		HPLC-UV	FLT 225-17-01 110 CST 225-2LF 113 C/HLD 225-1 118
Parathion	OSHA 62	0.1 mg/m^3		480		1000		8		GC-FPD	ST 226-30-16 50
Parathion (Organophosphorus Pesticides)	NIOSH 5600	0.05 mg/m^3		240		1000		4		GC-FPD	ST 226-58 51
Particulates not otherwise regulated (total dust)	OSHA PV2121	15 mg/m^3		960		2000		4-8		GR	FLT 225-802 109 C/HLD 225-1 118
Particulates not otherwise regulated, respirable	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Particulates not otherwise regulated, respirable fraction	OSHA PV2121	5 mg/m^3		varies		varies		varies		GR	FLT 225-803 109 C/HLD 225-1 118 CYC 225-105 128
Particulates, inorganic (bioaerosols)				15-150		15000		1-10 min		varies	STC 225-9820 117
Particulates, respirable	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Particulates, total *(see specific compounds)*	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Particulates, total *(see specific compounds)*	NIOSH 0501			120		2000		1		GR	AC 225-8516GLA 108 C/HLD 225-1 118 CST 225-2LF 113
PCBs (42% Cl) *(see polychlorobiphenyls)*	NIOSH 5503										
PCBs (54% Cl) *(see polychlorobiphenyls)*	NIOSH 5503										
PCBs (polychlorinated biphenyls)	EPA TO-4A					200-280 L/min		24 hrs		varies	PUF 226-131 57 FLT 225-1808 111
Pentachlorobenzene	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Pentachlorobenzene (polychlorobenzenes)	NIOSH 5517			12		25		8		GC-ECD	FLT 225-17-03 110 CST Special order ST 226-30-04 50
Pentachlorophenol	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Pentachlorophenol	NIOSH 5512	0.5 mg/m^3		480		1000		8		HPLC-UV	CST 225-3LF 113 SCN 225-26 119 IMP 225-36-2 72 IT 225-22 72 FLT 225-5 104
Pentachlorophenol	OSHA 39	0.5 mg/m^3		48		200		4		HPLC-UV	ST 226-97 52
Pentaerythritol (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Pentaerythritol (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Pentamidine isethionate	NIOSH 5032			960		2000		8		HPLC-FD	CST 225-4 113 FLT 225-5-37-P 109 C/HLD 225-1 118
n-Pentane	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
n-Pentane (hydrocarbons, BP 36 to 216 C)	NIOSH 1500	120	610	4	4	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
2,3-Pentanedione	OSHA 1016	0.5		10	3	50	200	200 (min)	15	GC-FID	ST 226-183 53

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number					
2-Pentanone (Ketones I)	NIOSH 2555			1-10		10-200		varies		GC-FID	ST	NA SKC				
2-Pentanone (methyl propyl ketone)	NIOSH 1300	150		10		200		50 (min)	15	GC-FID	ST	226-01	50			
2-Pentanone (methyl propyl ketone) (Ketones I)	NIOSH 1300	150		10		20(50)		8(3.3)		GC-FID	ST	226-01	50			
Peracetic acid	NON 57				15		1000 π		15	MAS/HPLC-UV	CF/CST ST	225-9030 226-199-UC	70 54	ST	226-193-UC	or
Peracetic acid	OSHA PV2321	0.4		15		1500	1000		15	GC-FID	CF/CST	225-9037	70			
Perchloric acid	OSHA ID 115SG			120		500		4		CLR	IMP	225-36-2	72	IT	225-22	72
Perchloroethylene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39
Perchloroethylene	Indoor					13.1 ml/min		8-24 hrs		TD, GC	PS PS	690-101 690-104	or 100	PS	690-103	or
Perchloroethylene (tetrachloroethylene)	OSHA 1001	100	200 (C)			13.06		8	5	GC-FID	PS	575-002	84			
Perchloroethylene (tetrachloroethylene)	OSHA 1001	100	200 (C)	12	0.75	50	50	4	5	GC-FID	ST	226-01	50			
Perchloroethylene (tetrachloroethylene) (hydrocarbons, halogenated)	NIOSH 1003	LFC		3		10-200		varies		GC-FID	ST	226-01	50			
Perchloroethylene (tetrachloroethylene) (portable GC)	NIOSH 3704	LFC		1		20-5000		varies		P GC	SB PT	232-01 NA SKC	or with	SB SBLK	249-01-PP NA SKC	with
Perlite (< 1% Quartz) *(see Particulates Not Otherwise Regulated, total and respirable)*																
cis-Permethrin	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF	226-92	56			
trans-Permethrin	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF	226-92	56			
Peroxyacetic acid (peracetic acid) & Hydrogen peroxide	NON 57				15		1000 π		15	MAS/HPLC-UV	CF/CST ST	225-9030 226-199-UC	70 54	ST	226-193-UC	or
Pesticides	EPA IP-8					1-5 L/min		4-24 hrs		GC-ECD	PUF	226-92	or	PUF	226-124	53
Pesticides	EPA TO-10A					1-5 L/min		4-24 hrs		GC-ECD	PUF	226-92	or	PUF	226-124	53
Pesticides, carbamate	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF	226-92	56			
Pesticides, organochlorine	ASTM D 4861			240-7200		1000-5000		4-24		varies	PUF	226-92	or	PUF	226-124	56
Pesticides, organochlorine	EPA TO-4A					200-280 L/min		24 hrs		varies	PUF	226-131	57	FLT	225-1808	111
Pesticides, organonitrogen *(see specific compounds)*	NIOSH 5601			240		1000		4		HPLC-UV	ST	226-58	or	ST	226-30-16	50
Pesticides, organophosphorus	ASTM D 4861			240-7200		1000-5000		4-24		varies	PUF	226-92	or	PUF	226-124	56
Pesticides, pyrethrin	ASTM D 4861			240- 7200		1000-5000		4-24		HPLC-UV	PUF	226-92	56			
Pesticides, triazine	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV or GC-ECD	PUF	226-92	56			
Petroleum distillate (naphthas)	NIOSH 1550	350 mg/m^3	1800 mg/m^3	3.6	1.5	20	100	3	15	GC-FID	ST	226-01	50			
Petroleum distillate fractions (PDF)	OSHA 48	500		3		20		2.5		GC-FID	ST	226-01	50			
Petroleum ether (benzin) (naphthas)	NIOSH 1550	350 mg/m^3	1800 mg/m^3	3	1.5	20(50)	100	2.5(1)	15	GC-FID	ST	226-01	50			
Petroleum naphtha (naphthas)	NIOSH 1550	350 mg/m^3	1800 mg/m^3	3	1.5	20(50)	100	2.5(1)	15	GC-FID	ST	226-01	50			
Phenanthrene	OSHA 58			960		2000		8		GR & HPLC-FD, or GR & HPLC-UV	FLT C/HLD	225-7 225-1	112 118	CST	225-2LF	113
Phenanthrene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m^3 (max)		225 L/min		1-24		GC-MS	PUF	226-131	57	FLT	225-1808	111
Phenanthrene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST C/HLD	225-1713 225-1	110 118	ST	226-30-04	50
Phenanthrene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-UV	F/CST C/HLD	225-1713 225-1	110 118	ST	226-30-04	50
Phenol	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Phenol	EPA TO-8			< 80 L		100-1000 ml/min				HPLC-UV	IMP 225-36-1 72 IT 225-22 72
Phenol	OSHA 32	5		24		100		4		HPLC-UV	ST 226-95 52
Phenol (cresols)	NIOSH 2546	5	15.6 (15 min)	24	3	100	200	4	15	GC-FID	ST 226-95 52
Phenolics (screening)	NIOSH 2549			5		20		4		GC-MS	ST 226-330 54
Phenothiazine	OSHA PV2048			100		1000		1		GC-NPD	F/CST 225-706 112 C/HLD 225-1 118
Phenyl ether	NIOSH 1617	1		48		100		8		GC-FID	ST 226-01 50
Phenyl ether	OSHA PV2022	1		20		200		100 min		GC-FID	ST 226-95 52
Phenyl ether-biphenyl mix	NIOSH 2013	1		24		50		8		GC-FID	ST 226-10 50
Phenyl glycidyl ether	NIOSH 1619		1 (15 min)		80		1000		80	GC-FID	ST 226-01 50
Phenyl hydrazine	NIOSH 3518		0.14 (120 min)		120		1000		120	VAS	IMP 225-36-2 72 IT 225-22 72
Phenyl mercaptan	OSHA PV2075			20		200		100 min		GC-FID	CF/CST 225-9007 70 C/HLD 225-1 118
N-Phenyl-1-naphthylamine	OSHA 96			240		2000		4		HPLC-FD	FLT 225-703 ‡ 112 CST 225-3-23 113 C/HLD 225-1 118
N-Phenyl-2-naphthylamine	OSHA 96			240		1000		4		HPLC-FD	FLT 225-703 ‡ 112 CST 225-3-23 113 C/HLD 225-1 118
m-Phenylenediamine	OSHA 87			100		1000		100 min		HPLC-UV	CF/CST 225-9004 70 C/HLD 225-1 118
o-Phenylenediamine	OSHA 87			100		1000		100 min		HPLC-UV	CF/CST 225-9004 70 C/HLD 225-1 118
p-Phenylenediamine	OSHA 87	0.1 mg/m³		100		1000		100 min		HPLC-UV	CF/CST 225-9004 70 C/HLD 225-1 118
o-Phenylphenol	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Phorate	ASTM D 4861			240-7200		1000-5000		4-24		GC-NPD	PUF 226-92 56
Phorate (Organophosphorus Pesticides)	NIOSH 5600	0.05 mg/m³	0.2 mg/m³	240		1000		4		GC-FPD	ST 226-58 51
Phosdrin (mevinphos) (Organophosphorus Pesticides)	NIOSH 5600	0.01	0.03	120	15	1000	1000	2	15	GC-FPD	ST 226-58 51
Phosgene	EPA TO-6			< 50 L		100-1000 ml/min				HPLC-UV	IMP 225-36-1 72 IT 225-22 72
Phosgene	OSHA 61	0.1		240		1000		4		GC-NPD	ST 226-117 52
Phosgene & chloroformates	NON 40			24		50		8		GC-FPD	ST 226-153 53
Phosphine	NIOSH 6002	0.3	1	12	3	100	200	8	15	UV-VIS	ST 226-165A †† 53
Phosphine	OSHA 1003	0.3		240	30	1000	2000	4	15	ICP-AES	CF/CST 225-9018 †† 70 C/HLD 225-1 118
Phosphoric acid	NIOSH 7908	1 mg/m³	3 mg/m³	960	30	2000	2000	8	15	IC-cd	CF/CST 225-9033 70 C/HLD 225-1 118
Phosphoric acid	OSHA ID 111	1 mg/m³		960	30	2000	2000	8	15	IC	F/CST 225-3-01 104 C/HLD 225-1 118
Phosphoric acid	OSHA ID 165SG	1 mg/m³		960	30	2000	2000	8	15	IC	ST 226-10-03 50
Phosphorous (Elements by ICP HNO_3 Digestion)	NIOSH 7303	0.1 mg/m³		250-500,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Phosphorus	NIOSH 7905	0.1 mg/m³		12		200		1		GC-FPD	ST 226-35-03 50
Phosphorus (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	0.1 mg/m³		9-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Phosphorus (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	0.1 mg/m³		25-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 109 C/HLD 225-1 118
Phosphorus (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.1 mg/m³		25-200		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Phosphorus (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Phosphorus pentasulfide	OSHA ID 128SG	1 mg/m³		960	30	2000	2000	8	15	IC	F/CST 225-802 109 C/HLD 225-1 118
Phosphorus trichloride	NIOSH 6402	0.2	0.5	24		200		2		VAS	IMP 225-36-2 72 IT 225-22 72
Phthalates *(see specific compounds)*											
Phthalic anhydride	OSHA 90	2		75		1000		1.25		HPLC-UV	CF/CST 225-9034 70 C/HLD 225-1 118

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

		SAMPLING ∞																	
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time											
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number								
Picloram (tordon) (total dust)	OSHA PV2049	15 mg/m³		60		1000		1		GR	F/CST	225-803	109	C/HLD	225-1	118			
Picloram (tordon) (respirable dust)	OSHA PV2049	5 mg/m³		varies		varies		varies		GR	FLT CYC	225-706 225-105	112 128	C/HLD	225-1	118			
alpha-Pinene (terpenes)	NIOSH 1552			24		50		8		GC-FID	ST	226-01	50						
beta-Pinene (terpenes)	NIOSH 1552			24		50		8		GC-FID	ST	226-01	50						
Piperonyl butoxide	OSHA PV2110			30		1000		30 min		HPLC-UV	ST	226-30-16	50						
Pirimiphos methyl	OSHA PV2071			120		1000		2		GC-ECD	ST	226-30-16	50						
Plaster of Paris (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT CYC	225-5-37-P 225-01-02	109 129	C/HLD CST	225-1 225-3LF	118 113			
Plaster of Paris (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT CST	225-5-37-P 225-2LF	109 113	C/HLD	225-1	118			
Platinum	OSHA ID 130SG			90		1000		1.5		AA	F/CST	225-3-01	104	C/HLD	225-1	118			
Platinum (Elements by ICP HNO_3 Digestion)	NIOSH 7303			200-25,000,000		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Platinum (as Pt), metal	OSHA ID 121			960		2000		8		AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Platinum (as Pt), soluble salts	OSHA ID 121	2 µg/m³		960		2000		8		AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118			
PM2.5	EPA IP-10A					9 L/min		24 hrs		GR	CI FLT	225-370 225-1709	136 110	FLT	225-3708	110			
PM2.5	EPA IP-10A					10 L/min		24 hrs		GR	PEM	761-203B	134	FLT	225-1709	110			
PNAs (Polynuclear Aromatic Hydrocarbons by GC, *see specific compounds*)	NIOSH 5515			480		2000		4		GC-FID	F/CST C/HLD	225-1713 225-1	110 118	ST	226-30-04	50			
PNAs by HPLC *(see specific compounds)*	NIOSH 5506			480		2000		4		HPLC-UV	F/CST C/HLD	225-1713 225-1	110 118	ST	226-30-04	50			
PNAs selected	OSHA 58			960		2000		8		GR & HPLC-FD, or GR & HPLC-UV	FLT C/HLD	225-7 225-1	112 118	CST	225-2LF	113			
Pollen (in air)				15-150		15000		1-10 min		varies	STC	225-9820	117						
Pollen (in air)	NON 48			62.5-375		12,500 +		5-30		varies	BS	225-9595	140	VT	225-9598A◊	140			
Polychlorinated biphenyls	ASTM D 4861			240-7200		1000-5000		4-24		varies	PUF	226-92	or	PUF	226-124	56			
Polychlorinated biphenyls	NIOSH 5503	0.001 mg/m³ (10 hrs)		48		100(200)		8(4)		GC-ECD	FLT ST	225-16 226-39	112 51	CST	225-32	118			
Polychlorobenzenes *(see specific compounds)*	NIOSH 5517	varies		varies		varies		8		GC-ECD	FLT CST	225-17-03 Special order	110	ST C/HLD	226-30-04 225-1	50 118			
Polychlorobiphenyls (42% Cl)	NIOSH 5503	0.001 mg/m³ (10 hrs)		48		100(200)		8(4)		GC-ECD	FLT ST	225-16 226-39	112 51	CST	225-32	118			
Polychlorobiphenyls (54% Cl)	NIOSH 5503	0.001 mg/m³ (10 hrs)		48		100(200)		8(4)		GC-ECD	FLT ST	225-16 226-39	112 51	CST	225-32	118			
Polycyclic aromatic compounds (PACs), total	NIOSH 5800			960	30	2000	2000	8	15	FLUOR	F/CST C/HLD	225-1713 225-1	110 118	ST	226-30-04	50			
Polycyclic aromatic hydrocarbons (PAHs)	EPA IP-7			30,000 L		20 L/min				GC-FID, -MS, HPLC	PUF	226-131	57	FLT	225-1808	111			
Polycyclic aromatic hydrocarbons (PAHs)	EPA TO-13A					220 L/min		24 hrs		GC-MS	PUF	226-131	57	FLT	225-1808	111			
Polynuclear aromatic hydrocarbons (polynuclear aromatic hydrocarbons by GC, *see specific compounds*)	NIOSH 5515	varies		480		2000		4		GC-FID	F/CST C/HLD	225-1713 225-1	110 118	ST	226-30-04	50			
Polynuclear aromatic hydrocarbons (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209	varies		350 m³ (max)		225 L/min		4-24		GC-MS	PUF	226-131	57	FLT	225-1808	111			
Polynuclear aromatic hydrocarbons by HPLC *(see specific compounds)*	NIOSH 5506	varies		480		2000		4		HPLC-UV	F/CST C/HLD	225-1713 225-1	110 118	ST	226-30-04	50			
Portland cement (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT CYC	225-5-37-P 225-01-02	109 129	C/HLD CST	225-1 225-3LF	118 113			
Portland cement (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT CST	225-5-37-P 225-2LF	109 113	C/HLD	225-1	118			

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Portland cement (respirable dust) *(see respirable dust)*	OSHA ID 142										
Portland cement (total dust)	OSHA ID 207	15 mg/m³		240		1000		4		XRD	F/CST 225-803 109 C/HLD 225-1 118
Potassium & compounds	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Potassium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306			Varies		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Potassium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301			5-1000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Potassium (Elements by ICP $HNO_3/HClO_4$ Ashing)	NIOSH 7300			5-1000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Potassium chromate (CR(VI))	OSHA ID 215 (V2)	0.005 mg/m³		960		2000		8		IC-UV	F/CST 225-802 109 C/HLD 225-1 118
Potassium cyanide (cyanides)	NIOSH 7904	5 mg/m³ (10 min)		15		1000		15		ISE	FLT 225-3705 Δ 110 CST 225-2LF 113 IMP 225-36-2 72 IT 225-22 72 C/HLD 225-1 118
Potassium hydroxide (alkaline dust)	NIOSH 7401			960		2000		8		TITRA	F/CST 225-1715 110 C/HLD 225-1 118
Potassium hydroxide (as K)	OSHA ID 121			10		2000		5		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Progesterone	OSHA PV2001			60		1000		1		HPLC-UV	F/CST 225-706 112 C/HLD 225-1 118
Propane	OSHA PV2077	1000		5		100		50 min		GC-FID	ST NA SKC
1,2,3-Propanetriol trinitrate	OSHA 43			15		1000		15 min		HPLC-UV	ST 226-35-03 50
n-Propanol	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Propargyl alcohol	OSHA 97			6		50		2		GC-ECD	ST 226-178 53
Propazine	ASTM D 4861			240-7200		1000-5000		4-24		GC-NPD	PUF 226-92 56
Propham (Organonitrogen Pesticides)	NIOSH 5601			240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Propionaldehyde	ASTM D 5197			varies		500-1200		5 min-24 hrs		HPLC-UV	ST 226-120 ° or ST 226-119 52
Propionaldehyde (Aldehydes, Screening)	NIOSH 2539			5		20		4		GC-FID & GC-MS	ST 226-118 52
Propionic acid	OSHA PV2293			18		2000		90 min		IC	ST 226-15 50
Propionitrile	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Propoxur (Baygon)	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Propoxur (Baygon)	OSHA PV2007			60		1000		1		HPLC-UV	ST 226-30-16 50
Propoxur (Organonitrogen Pesticides)	NIOSH 5601	0.5 mg/m³		240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
n-Propyl acetate	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
n-Propyl acetate (Esters I)	NIOSH 1450	200	250	1-10	1-10	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
Propyl alcohol	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
n-Propyl alcohol	OSHA 5001	200		12		4				GC-FID	ST 226-82 52
n-Propyl alcohol (alcohols combined)	NIOSH 1405	200	250 (skin)	1-10	1-10	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
n-Propyl alcohol (alcohols II)	NIOSH 1401	200	250	10	3	20(50)	200	8(3.3)	15	GC-FID	ST 226-01 50
n-Propyl benzene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Propylene dichloride (1,2-dichloro propane)	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Propylene dichloride (1,2-dichloro propane)	NIOSH 1013	LFC		3		20		2.5		GC-ECN	ST 226-81A 51
Propylene glycol	NIOSH 5523			60		1000		1		GC-FID	ST 226-57 51
Propylene glycol	OSHA PV2051			60	15	1000	1000	1	15	GC-FID	ST 226-57 51
Propylene glycol monomethyl ether (glycol ethers)	NIOSH 2554			3-25		100-200		varies		GC-FID	ST 226-81A 51
Propylene glycol monomethyl ether acetate (glycol ethers)	NIOSH 2554			3-25		100-200		varies		GC-FID	ST 226-81A 51

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Abbreviations and references are found on pages 244-245.

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Propylene oxide (1, 2-epoxypropane)	NIOSH 1612	LFC		5		20		4.2		GC-FID	ST 226-01 50
Propylene oxide (1, 2-epoxypropane)	OSHA 88	100		5	5	100	1000	50 min	5	GC-FID	ST 226-81A 51
Pyrene	OSHA 58			960		2000		8		GR & HPLC-FD, or GR & HPLC-UV	FLT 225-7 112 CST 225-2LF 113 C/HLD 225-1 118
Pyrene (Polynuclear Aromatic Hydrocarbons by GC-MS)	ASTM D 6209			350 m^3 (max)		225 L/min		1-24		GC-MS	PUF 226-131 57 FLT 225-1808 111
Pyrene (Polynuclear Aromatic Hydrocarbons by GC)	NIOSH 5515			480		2000		4		GC-FID	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Pyrene (Polynuclear Aromatic Hydrocarbons by HPLC)	NIOSH 5506			480		2000		4		HPLC-FD	F/CST 225-1713 110 ST 226-30-04 50 C/HLD 225-1 118
Pyrethrin pesticides *(see specific compounds)*	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Pyrethrum	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Pyrethrum	NIOSH 5008	5 mg/m^3		100		1000		2		HPLC-UV	F/CST 225-709 112 C/HLD 225-1 118 SP 225-27 119
Pyrethrum	OSHA 70	5 mg/m^3		60		1000		1		GC-ECD	ST 226-30-16 50
Pyridine	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Pyridine	NIOSH 1613	5		48		100		8		GC-FID	ST 226-01 50
Pyridine	OSHA PV2295	5		10		100		100 min		GC-FID	ST 226-95 52
Quartz (respirable) in coal dust, (silica in coal mine dust)	NIOSH 7603	0.05 mg/m^3		300-1000		2000-4000		varies		IR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-309 113
Quartz *(see silica, respirable crystalline)*	OSHA ID 142										
Quartz (silica, crystalline [respirable]) by XRD	NIOSH 7500	0.05 mg/m^3		400-1000		2500		varies		XRD	F/CST 225-803 109 CYC 225-01-02 129 C/HLD 225-1 118
Quartz (silica, crystalline by IR)	NIOSH 7602	0.05 mg/m^3		1000		2000-4000		varies		IR	F/CST 225-803 109 C/HLD 225-1 118 CYC 225-01-02 129
Radon progeny (on dust, in mines)	NON 56			5		2000		5 min		DRI	FLT 225-702 112 CST 225-1107 118
Resmethrin	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Resmethrin	OSHA PV2052			60		1000		1		HPLC-UV	ST 226-30-16 50
Resorcinol	NIOSH 5701	10		120		500		4		GC-FID	ST 226-57 51
Respirable Dust using Aluminum Cyclone	OSHA ID 142	50 $\mu g/m^3$		1200		2500		8		GR & XRD	FLT 225-5-37-P 109 CST 225-3050LF 113 C/HLD 225-1 118 CYC 225-01-02 129
Respirable Dust using GS-3 Cyclone	OSHA ID 142	50 $\mu g/m^3$		1320		2750		8		GR & XRD	FLT 225-5-37-P 109 CST 225-3050LF 113 C/HLD 225-1 118 CYC 225-100 128
Respirable Dust using PPI Samplers	OSHA ID 142	50 $\mu g/m^3$		960		2000		8		GR & XRD	FLT 225-5-37-P 109 PPI 225-385 130
Rhodamine B	OSHA PV2072			240		1000		4		HPLC-UV	F/CST 225-709 112 C/HLD 225-1 118
Ribavirin	NIOSH 5027			480		1000		8		HPLC-UV	F/CST 225-709 112 C/HLD 225-1 118
Ronnel	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF 226-92 56
Ronnel	OSHA PV2054	15 mg/m^3		60		1000		1		GC-FPD	ST 226-30-16 50
Ronnel (Organophosphorus Pesticides)	NIOSH 5600	10 mg/m^3		60		1000		1		GC-FPD	ST 226-58 51
Rotenone	NIOSH 5007	5 mg/m^3		120		1000		2		HPLC-UV	FLT 225-17-01 110 CST 225-4 113 C/HLD 225-1 118
Rouge (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Rouge (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Rubber solvent (naphthas)	NIOSH 1550	350 mg/m^3	1800 mg/m^3	10	1.5	20(50)	100	8(3.3)	15	GC-FID	ST 226-01 50
Safrotin	OSHA PV2050			60		1000		1		GC-ECD	F/CST 225-709 112 C/HLD 225-1 118
Scopolamine methyl nitrate	OSHA PV2144			120		1000		2		HPLC-UV	F/CST 225-709 or 112 F/CST 225-706 112 C/HLD 225-1 118

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Selenium	OSHA ID 121	0.2 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Selenium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	0.2 mg/m³		2-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Selenium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	0.2 mg/m³		13-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Selenium (Elements by ICP HNO_3 Digestion)	NIOSH 7303	0.2 mg/m³		8-250,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Selenium (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.2 mg/m³		13-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Selenium (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Sevin *(see carbaryl)*											
Silica (quartz) in coal dust (quartz in coal mine dust by IR)	NIOSH 7603	0.05 mg/m³		300-1000		2000-4000		varies		IR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Silica, amorphous (respirable)	NIOSH 7501	6 mg/m³		50-400		2500		varies		XRD	F/CST 225-803 109 C/HLD 225-1 118 CYC 225-01-02 129
Silica, crystalline (respirable) by XRD	NIOSH 7500	0.05 mg/m³		400-1000		2500		varies		XRD	F/CST 225-803 109 CYC 225-01-02 129 C/HLD 225-1 118
Silica, crystalline by IR	NIOSH 7602	0.05 mg/m³		1000		2000-4000		varies		IR	F/CST 225-803 109 C/HLD 225-1 118 CYC 225-01-02 129
Silica, fused *(see silica, respirable crystalline)*	OSHA ID 142										
Silica, respirable crystalline (as quartz, cristobalite, tridymite) using Aluminum Cyclone	OSHA ID 142	50 µg/m³		1200		2500		8		XRD	FLT 225-5-37-P 109 CST 225-3050LF 113 C/HLD 225-1 118 CYC 225-01-02 129
Silica, respirable crystalline (as quartz, cristobalite, tridymite) using GS-3 Cyclone	OSHA ID 142	50 µg/m³		1320		2750		8		XRD	FLT 225-5-37-P 109 CST 225-3050LF 113 C/HLD 225-1 118 CYC 225-100 128
Silica, respirable crystalline (as quartz, cristobalite, tridymite) using PPI Samplers	OSHA ID 142	50 µg/m³		960		2000		8		XRD	FLT 225-5-37-P 109 PPI 225-385 130
Silicon (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Silicon (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Silicon carbide (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Silicon carbide (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Silver (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	0.01 mg/m³		6-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Silver (Elements by ICP Aqua Regia Ashing)	NIOSH 7301			250-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 109 C/HLD 225-1 118
Silver (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.01 mg/m³ (metal, soluble)		250-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Silver (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Silver, metal & soluble compounds (as Ag)	OSHA ID 121	0.01 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Silver, metal & soluble compounds (ICP analysis of metal/metalloid particulates from solder operations)	OSHA ID 206	0.01 mg/m³		960		2000		8		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Simazine	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF 226-92 56
Simazine	NIOSH 5602			480		1000		8		GC-ECD	ST 226-58 51
Sodium azide	OSHA ID 211			5		1000		5		IC-UV	ST 226-55 51 FLT 225-5-37-P 109 CST 225-2LF 113 SPC 225-23 119 C/HLD 225-1 118
Sodium bisulfite	OSHA ID 121			960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Sodium fluoride (fluorides)	NIOSH 7902	2.5 mg/m³		480	30	1000	2000	8	15	ISE	CF/CST 225-9001 70 C/HLD 225-1 118
Sodium fluoride (fluorides)	NIOSH 7906	2.5 mg/m³		960	30	2000	2000	8	15	IC-CD	CF/CST 225-9031 70 C/HLD 225-1 118
Sodium hexafluoroaluminate (fluorides)	NIOSH 7902	2.5 mg/m³		480	30	1000	2000	8	15	ISE	CF/CST 225-9001 70 C/HLD 225-1 118
Sodium hexafluoroaluminate (fluorides)	NIOSH 7906	2.5 mg/m³		960		2000		8		IC-CD	CF/CST 225-9031 70 C/HLD 225-1 118

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

		SAMPLING ∞																	
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time											
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number								
Sodium hydroxide	OSHA ID 121	2 mg/m³		960	30	2000	2000	8	15	AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Sodium hydroxide (alkaline dust)	NIOSH 7401		2 mg/m³ (15 min)	360		1500		4		TITRA	F/CST	225-1715	110	C/HLD	225-1	118			
Sodium metabisulfite	OSHA ID 121			960		2000		8		AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Sodium polyacrylate *(see super absorbent polymer)*																			
Solanesol (environmental tobacco smoke, respirable particles)	ASTM D 6271			150-3600		2500		1-24		HPLC-UV	FLT CYC	225-3705 225-01-02	110 129	CST C/HLD	225-3LF 225-1	113 118			
Solder fume (ICP analysis of metal/metalloid particulates from solder operations)	OSHA ID 206			480		2000		4		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Soot *(see elemental carbon)*	NIOSH 5040									TOA-FID									
Spores (bacterial, fungal) (in air)				15-150		15000		1-10 min		varies	STC	225-9820	117						
Spores (bacterial, fungal) (in air)	NON 48			62.5-375		12,500 +		5-30		varies	BS	225-9595	140	VT	225-9598A	140			
Starch (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT CYC	225-5-37-P 225-01-02	109 129	C/HLD CST	225-1 225-3LF	118 113			
Starch (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT CST	225-5-37-P 225-2LF	109 113	C/HLD	225-1	118			
Starch *(see Particulates Not Otherwise Regulated, total and respirable)*																			
Stoddard solvent	OSHA 48	500		3		200		15 min		GC-FID	ST	226-01	50						
Stoddard solvent (naphthas)	NIOSH 1550	350 mg/m³	1800 mg/m³	10	1.5	20(50)	100	8(3.3)	15	GC-FID	ST	226-01	50						
Strontium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306			Varies		1000-4000		varies		ICP-AES	SC	225-8517	105	C/HLD	225-1	118			
Strontium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301			10-1000		1000-4000		varies		ICP-AES	F/CST C/HLD	225-3-01 225-1	or 118	F/CST	225-803 ¥	109			
Strontium (Elements by ICP HNO_3 Digestion)	NIOSH 7303			300-100,000,000		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Strontium (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.5 mg/m³		10-1000		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Strontium (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W	225-2414	172	TMP	225-2415	172			
Strychnine	NIOSH 5016	0.15 mg/m³ (10 hrs)		180		1500		2		HPLC-UV	F/CST	225-706	112	C/HLD	225-1	118			
Styrene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39			
Styrene (phenylethylene)	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
Styrene (phenylethylene)	NON 54			10	3	20	200	8	15	GC-FID	ST	226-81A	51						
Styrene (phenylethylene)	OSHA 09	100	200 (C)	10	3	20(50)	200	8(3.3)	15	GC-FID	ST	226-01	50						
Styrene (phenylethylene)	OSHA 1014	100	200 (C)			13.55	13.55	8	15	HPLC-UV	PS	575-006	84						
Styrene (phenylethylene)	OSHA 89	100	200 (C)	12	0.75	50	50	4	15	GC-FID	ST	226-73	51						
Styrene (phenylethylene) (Hydrocarbons, Aromatic)	NIOSH 1501	50	100	1-14	1-14	10-1000	10-1000	varies	varies	GC-FID	ST	226-01	50						
Sucrose (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT CYC	225-5-37-P 225-01-02	109 129	C/HLD CST	225-1 225-3LF	118 113			
Sucrose (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT CST	225-5-37-P 225-2LF	109 113	C/HLD	225-1	118			
Sulfur *(seeParticulates Not Otherwise Regulated, total and respirable)*																			
Sulfur dioxide	NIOSH 6004	2	5	180	15	1000	1000	3	15	IC	CF/CST	225-9005	70	C/HLD	225-1	118			
Sulfur dioxide	OSHA 1011	5 ppm		12	7.5	50	500	4	15	IC	ST	226-177	53						
Sulfur dioxide	OSHA ID 104	5		60	15	1000	1000	1	15	IC	F/CST IT	225-3-01 225-22	104 72	IMP	225-36-2	72			
Sulfur dioxide	OSHA ID 200	5		12	1.5	100	100	2	15	IC	ST	226-80	51						
Sulfur dioxide (using prefilter)	OSHA ID 200	5		12	1.5	100	100	2	15	IC	ST CST	226-80 225-3-23	51 113	FLT C/HLD	225-3708 225-1	110 118			

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Sulfur hexafluoride by portable GC	NIOSH 6602	1000		varies		20-100		varies		P GC-ECD	SB 232-03 or SB 231-03 62
Sulfur tetrafluoride	OSHA ID 110			5		1000		5		ISE	IMP 225-36-2 72 IT 225-22 72
Sulfuric acid	NIOSH 7908	1 mg/m³		960		2000		8		IC-CD	CF/CST 225-9033 70 C/HLD 225-1 118
Sulfuric acid	NIOSH 7908	0.2 mg/m³ ∑		960		2000		8		IC	PPI 225-381 130 FLT 225-1827 111 IS 225-388 130 SP 225-27 119
Sulfuric acid	OSHA ID 113	1 mg/m³		480		2000		4		IC	F/CST 225-3-01 104 C/HLD 225-1 118
Sulfuric acid	OSHA ID 113	0.2 mg/m³ ∑		480		2000		4		IC	PPI 225-381 130 FLT 225-5 104 IS 225-388 130 SP 225-27 119
Sulfuric acid	OSHA ID 165SG	1 mg/m³		96		200		8		IC	ST 226-10-03 50
Sulfuric acid mist	ASTM D 4856			40		1000		40 min		IC	F/CST 225-3-01 104 C/HLD 225-1 118
Sulfuryl fluoride	NIOSH 6012	5	10	varies		50-100		varies		IC-CD	ST 226-16 50
Sulprofos	OSHA PV2037			240		1000		4		GC-FPD	ST 226-30-16 50
Sulprofos (Organophosphorus Pesticides)	NIOSH 5600	1 mg/m³		240		1000		4		GC-FPD	ST 226-58 51
Super absorbent polymers	NIOSH 5035			960		2000		8		ICP-AES or AA	F/CST 225-802 109 C/HLD 225-1 118
Systox *(see demeton)*											
Talc (containing asbestos) *(see asbestos)*	OSHA ID 160										
Talc (respirable, no asbestos)	OSHA PV2121	20 mppcf		varies		varies		varies		GR	CYC 225-105 128 F/CST 225-803 109 C/HLD 225-1
2,4-TDI (toluene diisocyanate)	ASTM D 5932			15		1000		15		HPLC-UV-FD	CF/CST 225-9022 70 C/HLD 225-1 118
2,4-TDI (toluene diisocyanate)	NIOSH 5522	LFC		360	20	1000	2000	6	10	HPLC-FD	IMP 225-36-1 72 IT 225-22 72
2,4-TDI (toluene diisocyanate)	OSHA 42		0.02 (C)	240	15	1000	1000	4	15	HPLC-UV or HPLC-FD	CF/CST 225-9002 or CF/CST 225-9013 70 C/HLD 225-1 118
2,6-TDI (toluene diisocyanate)	ASTM D 5932			15		1000		15		HPLC-UV-FD	CF/CST 225-9022 70 C/HLD 225-1 118
2,6-TDI (toluene diisocyanate)	NIOSH 5522	LFC		360	20	1000	2000	6	10	HPLC-FD	IMP 225-36-1 72 IT 225-22 72
2,6-TDI (toluene diisocyanate)	OSHA 42				15		2000		15	HPLC-UV or HPLC-FD	CF/CST 225-9002 or CF/CST 225-9013 70 C/HLD 225-1 118
2,4-TDI (Toluene diisocyanate) (isocyanates)	OR-OSHA 1010	0.02	0.005	45	5	1000	1000	45 min	5	HPLC	IMP 225-36-1 72 IT 225-22 72 CF/CST 225-9029 70
2,6-TDI (Toluene diisocyanate) (isocyanates)	OR-OSHA 1010	0.02	0.005	45	5	1000	1000	45 min	5	HPLC	IMP 225-36-1 72 IT 225-22 72 CF/CST 225-9029 70
2, 4-TDI (toluene diisocyanate) (isocyanates, total)	NIOSH 5525	LFC		1-500		1000-2000		varies		HPLC-UV	FLT 225-7 ‡ 112 CST 225-4 113 SP 225-27 or IOM 225-76A 124 FLT 225-702 ‡ 112
2, 6-TDI (toluene diisocyanate) (isocyanates, total)	NIOSH 5525	LFC		1-500		1000-2000		varies		HPLC-UV	FLT 225-7 ‡ 112 CST 225-4 113 SP 225-27 or IOM 225-76A 124 FLT 225-702 ‡ 112
Tellurium	OSHA ID 121	0.1 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Tellurium	OSHA ID 132SG	0.1 mg/m³		100 to 1000		1500 to 2000		varies		AA-GF	F/CST 225-3-01 104 C/HLD 225-1 118
Tellurium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306			7-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Tellurium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	0.1 mg/m³		25-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Tellurium (Elements by ICP HNO_3 Digestion)	NIOSH 7303	0.1 mg/m³		125-500,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Tellurium (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.1 mg/m³		25-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Tellurium (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Temephos (respirable dust)	OSHA PV2056	5 mg/m³		varies		varies		varies		GC-FPD	F/CST 225-706 112 C/HLD 225-1 118
Temephos (total dust)	OSHA PV2056	15 mg/m³		60		1000				HPLC-UV	F/CST 225-802 109 C/HLD 225-1 118

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Abbreviations and references are found on pages 244-245.

		SAMPLING ∞																	
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time											
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number								
Terbufos (Organophosphorus Pesticides)	NIOSH 5600			240		1000		4		GC-FPD	ST	226-58	51						
Terbuthiuron	ASTM D 4861			240-7200		1000-5000		4-24		HPLC-UV	PUF	226-92	56						
Terpenes (screening)	NIOSH 2549			5		20		4		GC-MS	ST	226-330	54						
Terpenes *(see specific compounds)*	NIOSH 1552			24		50		8		GC-FID	ST	226-01	50						
o-Terphenyl	NIOSH 5021	0.5		30		2000		15		GC-FID	F/CST	225-1713	110	C/HLD	225-1	118			
Testosterone	OSHA PV2001			60		1000		1		HPLC-UV	F/CST	225-706	112	C/HLD	225-1	118			
1,1,2,2-Tetrabromoethane	NIOSH 2003			96		200		8		GC-FID	ST	226-10	50						
Tetrabutyltin (organotin compounds as Sn)	NIOSH 5504	0.1 mg/m³		480		1000		8		HPLC & AA-GF	ST C/HLD	226-30 225-1	50 118	F/CST	225-709	112			
1,1,2,2-Tetrachloro-1,2-difluoroethane	NIOSH 1016	500		2		20		1.5		GC-FID	ST	226-01	50						
1,1,1,2-Tetrachloro-2,2-difluoroethane	NIOSH 1016	500		2		20		1.5		GC-FID	ST	226-01	50						
1,2,3,4-Tetrachlorobenzene	ASTM D 4861			240-7200		1000-5000		4-24		GC-ECD	PUF	226-124	56						
1,2,4,5-Tetrachlorobenzene (polychlorobenzenes)	NIOSH 5517			12		25		8		GC-ECD	FLT ST	225-17-03 226-30-04	110 50	CST C/HLD	Special order 225-1	118			
1,1,1,2-Tetrachloroethane	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39			
1,1,2,2-Tetrachloroethane	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
1,1,2,2-Tetrachloroethane	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39			
1,1,2,2-Tetrachloroethane	NIOSH 1019	1		24		50		8		GC-FID	ST	226-81A	51						
1,1,2,2-Tetrachloroethane	NIOSH 2562	1		3-30		10-200		varies		GC-FID	ST	NA SKC							
Tetrachloroethylene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39			
Tetrachloroethylene	Indoor					13.1 ml/min		8-24 hrs		TD, GC	PS PS	690-101 690-104	or 100	PS	690-103	or			
Tetrachloroethylene (hydrocarbons, halogenated)	NIOSH 1003	LFC		3		10-200		varies		GC-FID	ST	226-01	50						
Tetrachloroethylene (perchloroethylene)	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
Tetrachloroethylene (perchloroethylene)	OSHA 1001	100	200 (C)			13.06		8	5	GC-FID	PS	575-002	84						
Tetrachloroethylene (perchloroethylene)	OSHA 1001	100	200 (C)	12	0.75	50	50	4	5	GC-FID	ST	226-01	50						
Tetrachloroethylene (perchloroethylene) (portable GC)	NIOSH 3704	LFC		1		20-5000		varies		P GC	SB PT	232-01 NA SKC	or with	SB SBLK	249-01-PP NA SKC	with			
2,3,4,6-Tetrachlorophenol	OSHA 45			48		200		4		HPLC-UV	ST	226-97	52						
Tetraethyl lead (as Pb)	NIOSH 2533	0.075 mg/m³		30-200		10-1000				GC-PID	ST	226-30-04	50						
Tetraethyl pyrophosphate	NIOSH 2504	0.05 mg/m³		24		50		8		GC-FPD	ST	NA SKC							
Tetraethyl tin	OSHA 110	0.1 mg/m³		48	3	200	200	4	15	GC-FID	ST	226-95	52						
Tetraethylene glycol	NIOSH 5523			60		1000		1		GC-FID	ST	226-57	51						
Tetrahydrofuran	NIOSH 1609	200	250	9	1.5	20(50)	100	7(3)	15	GC-FID	ST	226-01	50						
Tetrahydrofurfuryl acrylate	OSHA PV2131	1 mg/m³		48		200		4		GC-FID	ST	226-110	52						
Tetrakis(hydroxymethyl)phosphonium chloride	NIOSH 5046			1-480		1000-1700		varies		HPLC-UV	CF/CST	225-9003	70						
Tetramethyl lead (as Pb)	NIOSH 2534	0.075 mg/m³		15-100		10-200				GC-PID	ST	226-30-06	50						
Tetramethyl thiouram disulfide *(see thiram)*																			
Tetramethyl thiourea	NIOSH 3505			96		200		8		VAS	IMP	225-36-1	72	IT	225-22	72			
Tetramethyl tin	OSHA PV2057	0.1 mg/m³		20		200		100 min		GC-FID	ST	226-01	50						
Tetranitromethane	NIOSH 3513	1		240		1000		4		GC-NPD	IMP	225-36-1	72	IT	225-22	72			
Thalium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	0.1 mg/m³ (skin, soluble)		25-2000		1000-4000		varies		ICP-AES	F/CST C/HLD	225-3-01 225-1	or 118	F/CST	225-803	109			
Thallium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	0.1 mg/m³ (skin)		7-2000		1000-4000		varies		ICP-AES	SC	225-8517	105	C/HLD	225-1	118			

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Thallium (Elements by ICP HNO_3 Digestion)	NIOSH 7303	0.1 mg/m³ (skin, soluble)		35-500,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Thallium (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.1 mg/m³ (skin, soluble)		25-2000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Thallium (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Thallium (soluble compounds) (as Tl)	OSHA ID 121	0.1 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Thiobencarb (Organonitrogen Pesticides)	NIOSH 5601			240		1000		4		HPLC-UV	ST 226-58 or ST 226-30-16 50
Thiophanate-methyl	OSHA PV2058			240		1000		4		HPLC-UV	F/CST 225-709 112 C/HLD 225-1 118
Thiophanate-methyl in air	NIOSH 5606			20-480		10-1000		varies		HPLC-UV	ST 226-58 51
Thiourea	OSHA PV2059			480		2000		4		HPLC-UV	F/CST 225-706 112 C/HLD 225-1 118
Thiram	NIOSH 5005	5 mg/m³		120		1000		2		HPLC-UV	FLT 225-17-01 110 CST 225-2LF 113 C/HLD 225-1 118
L-Thyroxine	OSHA PV2117			240		1000		4		HPLC-UV	F/CST 225-709 112 C/HLD 225-1 118
Tin (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	2 mg/m³		1-2000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Tin (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	2 mg/m³		5-1000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Tin (Elements by ICP HNO_3 Digestion)	NIOSH 7303	2 mg/m³		1-25,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Tin (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	2 mg/m³		5-1000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Tin (ICP analysis of metal/metalloid particulates from solder operations)	OSHA ID 206	2 mg/m³		480		2000		4		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Tin (inorganic compounds, except oxides) (as Sn)	OSHA ID 121	2 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Tin (organic compounds) (as Sn) (organotin compounds)	NIOSH 5504	0.1 mg/m³		480		1000		8		HPLC & AA-GF	ST 226-30 50 F/CST 225-706 112 C/HLD 225-1 118
Tin oxide ((Stannous Oxide) as Sn)	OSHA ID 121	0.1 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Titanium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306			Varies		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Titanium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301			5-1000		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Titanium (Elements by ICP HNO_3 Digestion)	NIOSH 7303			0.1-10,000		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Titanium (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300			5-100		1000-4000		varies		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Titanium dioxide (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Titanium dioxide (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Titanium dioxide (total dust)	OSHA PV2121	15 mg/m³		480-960		2000		4-8		GR	F/CST 225-802 109 C/HLD 225-1 118
TNT (2,4,6-trinitrotoluene)	OSHA 44	1.5 mg/m³		60		1000		1		GC-TEA-EAP	ST 226-56 51
o-Tolidine	OSHA 71			100		1000		100 min		GC-ECD	CF/CST 225-9004 70 C/HLD 225-1 118
o-Tolidine dyes (dyes, benzidine)	NIOSH 5013	LFC		480		1000		8		HPLC-UV	FLT 225-17A 110 CST 225-3LF 113 C/HLD 225-1 118
m-Tolualdehyde	ASTM D 5197			varies		500-1200		5 min-24 hrs		HPLC-UV	ST 226-120 ° or ST 226-119 52
o-Tolualdehyde	ASTM D 5197			varies		500-1200		5 min-24 hrs		HPLC-UV	ST 226-120 ° or ST 226-119 52
p-Tolualdehyde	ASTM D 5197			varies		500-1200		5 min-24 hrs		HPLC-UV	ST 226-120 ° or ST 226-119 52
Toluene	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Toluene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Toluene	OSHA 111	200	300 (C)	12	0.5	50	50	4	10	GC-FID	ST 226-81A 51 ST 226-01 50
Toluene (Hydrocarbons, Aromatic)	NIOSH 1501	100	150	1-8	1-8	10-200	10-200	varies	varies	GC-FID	ST 226-01 50
Toluene *(see online Passive Sampling Guide)*	OSHA 111	200	300 (C)			14.89		8	10	GC-FID	PS 575-002 84

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

		SAMPLING ∞																	
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time											
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number								
2,4-Toluene diisocyanate	ASTM D 5836			15		1000		15		HPLC-UV or HPLC-FD	CF/CST	225-9002	70	C/HLD	225-1	118			
2,4-Toluene diisocyanate	ASTM D 5932			15		1000		15		HPLC-UV-FD	CF/CST	225-9022	70	C/HLD	225-1	118			
2,4-Toluene diisocyanate	OSHA 42		0.02 (C)	240	15	1000	1000	4	15	HPLC-UV or HPLC-FD	CF/CST C/HLD	225-9002 225-1	or 118	CF/CST	225-9013	70			
2,6-Toluene diisocyanate	ASTM D 5836			15		1000		15		HPLC-UV or HPLC-FD	CF/CST	225-9002	70	C/HLD	225-1	118			
2,6-Toluene diisocyanate	ASTM D 5932			15		1000		15		HPLC-UV-FD	CF/CST	225-9022	70	C/HLD	225-1	118			
2,6-Toluene diisocyanate	OSHA 42			240		1000		4		HPLC-UV or HPLC-FD	CF/CST C/HLD	225-9002 225-1	or 118	CF/CST	225-9013	70			
2,4-Toluene diisocyanate (isocyanates)	NIOSH 5521	LFC		480	10	1000	1000	8	10	HPLC-ELCHM & HPLC-UV	IMP	225-36-1	72	IT	225-22	72			
2,4-Toluene diisocyanate (isocyanates)	OR-OSHA 1010	0.02	0.005	45	5	1000	1000	45 min	5	HPLC	IMP CF/CST	225-36-1 225-9029	72 70	IT	225-22	72			
2,6-Toluene diisocyanate (isocyanates)	NIOSH 5521	LFC		480		1000		8		HPLC-ELCHM & HPLC-UV	IMP	225-36-1	72	IT	225-22	72			
2,6-Toluene diisocyanate (isocyanates)	OR-OSHA 1010	0.02	0.005	45	5	1000	1000	45 min	5	HPLC	IMP CF/CST	225-36-1 225-9029	72 70	IT	225-22	72			
2,4-Toluene diisocyanate (isocyanates, total)	NIOSH 5525	LFC		1-500		1000-2000		varies		HPLC-UV	FLT SP FLT	225-7 ‡ 225-27 225-702 ‡	112 or 112	CST IOM	225-4 225-76A	113 124			
2,6-Toluene diisocyanate (isocyanates, total)	NIOSH 5525	LFC		1-500		1000-2000		varies		HPLC-UV	FLT SP FLT	225-7 ‡ 225-27 225-702 ‡	112 or 112	CST IOM	225-4 225-76A	113 124			
p-Toluene sulfonic acid	NIOSH 5043			960	45	2000	3000	8	15	HPLC-UV	FLT	225-16	112	CST	225-32	118			
Toluene-2,4-diamine	OSHA 65		0.02 (C)	100		1000		100 min		GC-ECD	CF/CST	225-9004	70	C/HLD	225-1	118			
2,4-Toluenediamine	NIOSH 5516	LFC		480		1000		8		HPLC-UV	IMP	225-36-1	72	IT	225-22	72			
2,4-Toluenediamine	OSHA 65		0.02 (C)	100		1000		100 min		GC-ECD	CF/CST	225-9004	70	C/HLD	225-1	118			
2,6-Toluenediamine	NIOSH 5516	LFC		480		1000		8		HPLC-UV	IMP	225-36-1	72	IT	225-22	72			
2,6-Toluenediamine	OSHA 65			100		1000		100 min		GC-ECD	CF/CST	225-9004	70	C/HLD	225-1	118			
2,6-Toluenediamine	OSHA 65			100		1000		100 min		GC-ECD	CF/CST	225-9004	70	C/HLD	225-1	118			
m-Toluidine	OSHA 73			100		1000		100 min		GC-ECD	CF/CST	225-9004	70	C/HLD	225-1	118			
o-Toluidine	NIOSH 2017	LFC		24		200		2		GC-FID	CF/CST	225-9004	70	ST	226-15	50			
o-Toluidine	OSHA 73	5		100		1000		100 min		GC-ECD	CF/CST	225-9004	70	C/HLD	225-1	118			
p-Toluidine	OSHA 73			100		1000		100 min		GC-ECD	CF/CST	225-9004	70	C/HLD	225-1	118			
o-Toluidine (Amines, Aromatic)	NIOSH 2002	LFC		48		100		8		GC-FID or GC-NSD	ST	226-10	50						
Toxaphene *(see chlorinated camphene)*																			
Tremolite *(see asbestos fibers)*	NIOSH 7400																		
Tremolite fibers *(see asbestos)*	OSHA ID 160																		
Triazine pesticides	ASTM D 4861			960		2000		8		GC-ECD	PUF	226-92	56						
Tributyl phosphate	NIOSH 5034	0.2		90		1500		1		GC-FPD	F/CST	225-3-01	104	C/HLD	225-1	118			
Tributyltin benzoate {tin, organic compounds (as Sn)}	OSHA ID 222SG			200		2000		100 min		AA-GF	F/CST	225-803	109	C/HLD	225-1	118			
Tributyltin chloride (organotin compounds as Sn)	NIOSH 5504	0.1 mg/m^3		480		1000		8		HPLC & AA-GF	ST C/HLD	226-30 225-1	50 118	F/CST	225-709	112			
Tributyltin fluoride {tin, organic compounds (as Sn)}	OSHA ID 223SG			200		2000		100 min		AA-GF	F/CST	225-803	109	C/HLD	225-1	118			

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Sampling Guide

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Tributyltin neodecanoate *(see tin, organic compounds)*											
1,1,2-Trichloro-1,2,2-trifluoroethane	OSHA 113	1000		1		50		20 min		GC-FID	ST NA SKC
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	NIOSH 1020	1000	1250	2.4	0.3	20	20	2	15	GC-FID	ST 226-01 50
Trichloroacetic acid	OSHA PV2017			10		200		50		HPLC-UV	ST 226-10 50
1,2,3-Trichlorobenzene	ASTM D 4861			240-7200		1000-5000		4 to 24		GC-ECD	PUF 226-124 56
1,2,3-Trichlorobenzene	OSHA in house file			12		200				GC-ECD	F/CST NA SKC ST 226-30-04 50 C/HLD 225-1 118
1,2,4-Trichlorobenzene	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
1,2,4-Trichlorobenzene (polychlorobenzenes)	NIOSH 5517		5	12	3	25	200	8	15	GC-ECD	FLT 225-17-03 110 CST Special order ST 226-30-04 50 C/HLD 225-1 118
1,1,2-Trichloroethane	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
1,1,2-Trichloroethane	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
1,1,2-Trichloroethane	OSHA 11	10		10		200		1		GC-FID	ST 226-01 50
1,1,2-Trichloroethane (hydrocarbons, halogenated)	NIOSH 1003	10 (skin)		10		10-200		varies		GC-FID	ST 226-01 50
1,1,1-Trichloroethane (methyl chloroform)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
1,1,1-Trichloroethane (methyl chloroform) (hydrocarbons, halogenated)	NIOSH 1003		350		3		10-200		varies	GC-FID	ST 226-01 50
Trichloroethylene	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Trichloroethylene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 TH 224-26-02 39 CPC 224-26-CPC 39
Trichloroethylene	NIOSH 1022	25	2 (1 hrs)	10	2	20(50)	200	8(3.3)	10	GC-FID	ST 226-01 50
Trichloroethylene	OSHA 1001	100	200 (C)			14.24		8	5	GC-FID	PS 575-002 84
Trichloroethylene	OSHA 1001	100	200 (C)	12	0.75	50	50	4	5	GC-FID	ST 226-01 50
Trichloroethylene (hydrocarbons, halogenated)	NIOSH 1003			10		10-200		varies		GC-FID	ST 226-01 50
Trichloroethylene by portable GC	NIOSH 3701	25	2 (1 hrs)	varies	varies	20-50	varies	varies	varies	P GC-PID	SB 232 Series 63
Trichlorofluoromethane (fluorotrichloromethane)	NIOSH 1006		1000		5		20		240	GC-FID	ST 226-09 50
Trichloronitromethane	NON 51	0.1		144		100		24		GC-MSD	ST 226-175 53
2,4,5-Trichlorophenol	ASTM D 4861			240-7200		1000-5000		4 to 24		GC-ECD	PUF 226-92 56
2,4,5-Trichlorophenoxyacetic acid *(see 2,4,5-T)*											
1,2,3-Trichloropropane (hydrocarbons, halogenated)	NIOSH 1003	10 (skin)		0.6-60		10-200		varies		GC-FID	ST 226-01 50
Tricyclohexyltin hydroxide (organotin compounds as Sn)	NIOSH 5504	0.1 mg/m³		480		1000		8		HPLC & AA-GF	ST 226-30 50 F/CST 225-709 112 C/HLD 225-1 118
Tridymite *(see silica, respirable crystalline)*	OSHA ID 142										
Tridymite (silica, cystalline (respirable) by XRD)	NIOSH 7500	0.05 mg/m³		400-1000		2500		varies		XRD	F/CST 225-803 109 CYC 225-01-02 129 C/HLD 225-1 118
Tridymite (silica, crystalline by IR)	NIOSH 7602	0.05 mg/m³		1000		2000-4000		varies		IR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-309 113
Triethanolamine (TEA)	OSHA PV2141			120		1000		2		GC-FID	F/CST 225-709 112 C/HLD 225-1 118
Triethanolamine (TEA) (aminoethanol compounds II)	NIOSH 3509			240		1000		4		IC	IMP 225-36-1 72 IT 225-22 72
Triethylamine	OSHA PV2060	25		5	3	100	200	50 min	15	GC-FID	ST 226-98 52
Triethylene glycol	NIOSH 5523			60		1000		1		GC-FID	ST 226-57 51
Triethylenetetramine (TETA)	OSHA 60			10		100		100 min		HPLC-UV	ST 226-30-18 50
Trifluorobromomethane	NIOSH 1017	1000		1		20		50 min		GC-FID	ST 226-01 50 ST 226-09 50
Trifluoromonobromomethane (trifluorobromomethane)	NIOSH 1017	1000		1		20		50 min		GC-FID	ST 226-01 50 ST 226-09 50

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

		SAMPLING ∞																			
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time													
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number										
Trifluralin	ASTM D 4861			240-7200		1000-5000		4 to 24		GC-ECD	PUF	226-92	56								
1,3,5-Triglycidyl isocyanurate	OSHA PV2055			60		1000		1		GC-ECD	CF/CST	225-9027	70	C/HLD	225-1	118					
Trimellitic anhydride (TMA)	NIOSH 5036	0.005 (10 hrs)		960		2000		8		GC-FID	F/CST	225-802	109	C/HLD	225-1	118					
Trimellitic anhydride (TMA)	OSHA 98			480		2000		4		HPLC-UV	CF/CST	225-9010	70	C/HLD	225-1	118					
2,2,4-Trimethyl-1,3-pentanediol diisobutyrate	OSHA PV2002			10		100		100 min		GC-FID	ST	226-110	52								
1,2,3-Trimethylbenzene	OSHA 1020	25		2.78		11.6		4	15	GC-FID	PS	575-002	84								
1,2,3-Trimethylbenzene	OSHA 1020	25		12		50		4		GC-FID	ST	226-01	50								
1,2,4-Trimethylbenzene	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series						
1,2,4-Trimethylbenzene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39					
1,2,4-Trimethylbenzene	OSHA 1020	25		2.81		11.7		4	15	GC-FID	PS	575-002	84								
1,2,4-Trimethylbenzene	OSHA 1020	25		12		50		4		GC-FID	ST	226-01	50								
1,3,5-Trimethylbenzene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39					
1,3,5-Trimethylbenzene (mesitylene)	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series						
1,3,5-Trimethylbenzene (mesitylene)	OSHA 1020	25		2.9		12.1		4	15	GC-FID	PS	575-002	84								
1,3,5-Trimethylbenzene (mesitylene)	OSHA 1020	25		12		50		4		GC-FID	ST	226-01	50								
3,5,5-Trimethylcyclohex-2-enone (isophorone)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39					
Trimethyltin dichloride	NIOSH 5526	0.1 mg/m³		60	60	250	1000	4	60	GC-FPD	ST	226-30-16	50								
2,4,7-Trinitrofluoren-9-one	NIOSH 5018			480		3000		2.7		HPLC-UV	FLT C/HLD	225-17-04 225-1	110 118	CST	225-3LF	113					
2,4,6-Trinitrotoluene (TNT)	OSHA 44	1.5 mg/m³		60		1000		1		GC-TEA-EAP	ST	226-56	51								
Triorthocresyl phosphate	NIOSH 5037	0.1 mg/m³		90		1000		1.5		GC-FPD	F/CST	225-3-01	104	C/HLD	225-1	118					
Triphenyl phosphate	NIOSH 5038	3 mg/m³		240		1000		4		GC-FPD	F/CST	225-3-01	104	C/HLD	225-1	118					
Triphenyl tin chloride (as Sn)	NIOSH 5527	0.1 mg/m³ (skin)		100-2000		1000-4000		varies		HPLC & ICP-AES	FLT	225-5-37-P	109	C/HLD	225-1	118					
Triphenyltin hydroxide {tin, organic compounds (as Sn)}	OSHA ID 225SG	0.1 mg/m³		200		2000		100 min		AA-GF	F/CST	225-709	112	C/HLD	225-1	118					
Tripoli *(see silica, respirable crystalline)*	OSHA ID 142																				
Tripropylene glycol diacrylate (TPGDA)	NON 39			480		1000		8		GC-FID	ST	226-56	51								
Tuberculosis (mycobacterium tuberculosis), airborne	NIOSH 0900			1920		4000		8		PCR	FLT CST	225-3705 225-3LF	110 113	SP C/HLD	225-27 225-1	119 118					
Tungsten & compounds (insoluble) (as W)	OSHA ID 213			480	30	2000	2000	4	15	ICP	F/CST	225-3-01	104	C/HLD	225-1	118					
Tungsten & compounds (soluble) (as W)	OSHA ID 213			480	30	2000	2000	4	15	ICP	F/CST	225-3-01	104	C/HLD	225-1	118					
Tungsten (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	5 mg/m³	10 mg/m³	Varies		1000-4000		varies		ICP-AES	SC	225-8517	105	C/HLD	225-1	118					
Tungsten (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	5 mg/m³	10 mg/m³	50-1000	50-1000	1000-4000	1000-4000	varies	varies	ICP-AES	F/CST C/HLD	225-3-01 225-1	or 118	F/CST	225-803 ¥	109					
Tungsten (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	5 mg/m³	10 mg/m³	5-1000	5-1000	1000-4000	1000-4000	varies	varies	ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118					
Tungsten insoluble	NIOSH 7074	5 mg/m³	10 mg/m³	480		1000		8		AA-F	F/CST	225-3-01	104	C/HLD	225-1	118					
Tungsten soluble	NIOSH 7074	1 mg/m³	3 mg/m³	480		1000		8		AA-F	F/CST	225-3-01	104	C/HLD	225-1	118					
Turpentine	NIOSH 1551	100		10		20(50)		8(3.3)		GC-FID	ST	226-01	50								
n-Undecane	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39					
n-Undecane (hydrocarbons, BP 36 to 216 C)	NIOSH 1500	2		2		10-50		varies		GC-FID	ST	226-01	50								
Uranium (soluble compounds)	OSHA ID 170SG	0.05 mg/m³		240		2000		2		POL	F/CST	225-803	109	C/HLD	225-1	118					

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

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Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	CLG/STEL (ppm)	Vol. (liter) TWA	CLG/STEL	Rate (ml/min) TWA	CLG/STEL	Time TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Urea pesticides	ASTM D 4861			240-7200		1000-5000		4 to 24		GC-ECD	PUF 226-92 56
n-Valeraldehyde	ASTM D 5197			varies		500-1200		5 min to 24 hrs		HPLC-UV	ST 226-120 or ST 226-119 52
n-Valeraldehyde	NIOSH 2536	50		10		20		8		GC-FID	ST 226-118 52
n-Valeraldehyde	OSHA 85			3		50		1		HPLC-UV	CF/CST 225-9020 70 C/HLD 225-1 118
n-Valeraldehyde (Aldehydes, Screening)	NIOSH 2539	50		5		20		4		GC-FID & GC-MS	ST 226-118 52
Vanadium (Elements by ICP HNO_3 Digestion)	NIOSH 7303	0.05 mg/m³			2.5-500,000		1000-4000		varies	ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Vanadium (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	0.05 mg/m³			5-2000		1000-4000		varies	ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Vanadium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	0.05 mg/m³ (as pentoxide)	C	Varies		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Vanadium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	0.05 mg/m³			5-2000		1000-4000		varies	ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Vanadium (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Vanadium fume (as V2O5)	OSHA ID 125G	0.05 mg/m³	0.1	480	20	2000	1000	4	20	ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Vanadium oxides	NIOSH 7504	0.05 mg/m³ (15 min)		600		2600		4		XRD	F/CST 225-803 109 C/HLD 225-01-02 129
Vanadium pentoxide (V2O5) *(see vanadium oxides)*	NIOSH 7504										
Vanadium pentoxide (V2O5) (confirmation of)	OSHA ID 185	0.05 mg/m³	0.05 mg/m³	varies		varies		varies		XRD	F/CST 225-803 109 C/HLD 225-1 118 CYC 225-105 128
Vanadium respirable dust (as V2O5)	OSHA ID 125G	0.5 mg/m³			varies		varies		varies	ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118 CYC 225-105 128
Vanadium trioxide *(see vanadium oxides)*	NIOSH 7504										
Vermiculite *(see Particulates Not Otherwise Regulated, total and respirable)*											
Vinyl acetate	NON 21			24		50		8		GC	ST 226-68 51
Vinyl acetate	OSHA 51			24	3	100	200	4	15	GC-FID	ST NA SKC
Vinyl bromide	NIOSH 1009	LFC		10		20(50)		8(3.3)		GC-FID	ST 226-09 50
Vinyl bromide	OSHA 08			5		20		4		GC-FID	ST 226-01 50
Vinyl chloride	ASTM D 4766			24		100 or 50		4 or 8		GC-FID	ST 226-16 50
Vinyl chloride	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Vinyl chloride	NIOSH 1007	LFC		5		50		1.6		GC-FID	ST 226-01 50
Vinyl cyclohexene dioxide	OSHA PV2083			10		20(50)		8(3.3)		GC-FID	ST 226-30 50
Vinyl toluene	NIOSH 1501	100		30		200		2.5		GC-FID	ST 226-01 50
Vinyl toluene (methyl styrene)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST 226-300 Series 54 CPC 224-26-CPC 39 TH 224-26-02 39
N-Vinyl-2-pyrrolidinone	OSHA PV2106			10		100		100 min		GC-FID	ST 226-01 50
Vinylidene chloride	ASTM D 5466			6		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Vinylidene chloride	NIOSH 1015	LFC		5		20		4		GC-FID	ST 226-01 50
Vinylidene chloride	OSHA 19			3	3	200	200	15 min	15	GC-FID	ST 226-01 50
Viruses (in air)	NON 48			62.5-375		12,500 +		5-30		varies	BS 225-9595 140 VT 225-9598A 140
VM&P naphtha	OSHA 48			3	3	20	200	2.5	15	GC-FID	ST 226-01 50
VM&P naphtha (naphthas)	NIOSH 1550	350 mg/m³	1800 mg/m³	10	3	20(50)	200	8(3.3)	15	GC-FID	ST 226-01 50
Volatile organic compounds (screening)	NIOSH 2549			5		20		4		GC-MS	ST 226-330 54
Volatile organic compounds (VOCs) (canister)	EPA TO-14A			varies		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Volatile organic compounds (VOCs) (canister)	EPA TO-15			varies		varies		varies		GC-MS	CAN 228 Series PK 228 Series
Volatile organic compounds (VOCs) (sample bag)	EPA 0040					250-1000 ml/min		1-2 hrs		GC-MS	VAC 231-939 or VAC 231-940 with SB 236-004 or SB 232-939

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

		SAMPLING ∞																	
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time											
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number								
Volatile organic compounds (VOCs) (thermal desorption tube)	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39			
VOST (volatile organic sampling train)	EPA 0031			20 min		1 L/min		20 min		TD, GC-MS	ST	226-134 £	53	ST	Special Order				
Warfarin	NIOSH 5002	0.1 mg/m³		360		1500		4		HPLC-UV	FLT C/HLD	225-17-01 225-1	110 118	CST	225-2LF	113			
Welding fumes (total particulate)	OSHA ID 125G			480		2000		4		ICP-AES	F/CST F/CST C/HLD	225-3-01 225-803 225-1	or or 118	F/CST F/CST	225-3100 225-8215	or 109			
Wood alcohol (methanol)	NIOSH 2000	200	250	5	3	20	200	4	15	GC-FID	ST	226-51	51						
Wood dust	OSHA PV2121	15 mg/m³		960		2000		4-8		GR	F/CST	225-802	109	C/HLD	225-1	118			
Wood dust, hardwood	OSHA PV2121	15 mg/m³		960		2000		4-8		GR	F/CST	225-802	109	C/HLD	225-1	118			
Wood dust, softwood	OSHA PV2121	15 mg/m³		960		2000		4-8		GR	F/CST	225-802	109	C/HLD	225-1	118			
Wood spirit (methanol)	NIOSH 2000	200	250	5	3	20	200	4	15	GC-FID	ST	226-51	51						
m-Xylene	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
m-Xylene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39			
m-Xylene	OSHA 1002	100				13.82		8		GC-FID	PS	575-002	84						
o-Xylene	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
o-Xylene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39			
o-Xylene	OSHA 1002	100				14.24		8		GC-FID	PS	575-002	84						
p-Xylene	ASTM D 5466			6		varies		varies		GC-MS	CAN	228 Series		PK	228 Series				
p-Xylene	EPA TO-17			1 L & 4 L		16.7 ml/min & 66.7 ml/min				TD, GC	ST CPC	226-300 Series 224-26-CPC	54 39	TH	224-26-02	39			
p-Xylene	OSHA 1002	100				13.94		8		GC-FID	PS	575-002	84						
m-Xylene (Hydrocarbons, Aromatic)	NIOSH 1501	100		2-23		10-200		varies		GC-FID	ST	226-01	50						
o-Xylene (Hydrocarbons, Aromatic)	NIOSH 1501	100	150	2-23	2-23	10-200	10-200	varies	varies	GC-FID	ST	226-01	50						
p-Xylene (Hydrocarbons, Aromatic)	NIOSH 1501	100		2-23		10-200		varies		GC-FID	ST	226-01	50						
Xylene (o-, m-, & p-isomers)	OSHA 1002	100		12		50		4		GC-FID	ST	226-01	50						
m-Xylenediamine (mXDA)	OSHA 105				15		1000		15	HPLC-UV	CF/CST	225-9004	70	C/HLD	225-1	118			
p-Xylenediamine (pXDA)	OSHA 105				15		1000		15	HPLC-UV	CF/CST	225-9004	70	C/HLD	225-1	118			
2,4-Xylidine (Amines, Aromatic)	NIOSH 2002	2		10		20(50)		8(3.3)		GC-FID or GC-NSD	ST	226-10	50						
Yttrium	OSHA ID 121	1 mg/m³		960		2000		8		AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Yttrium (Elements by ICP HNO_3 Digestion)	NIOSH 7303			0.1-50,000		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Yttrium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	1 mg/m³		1-2000		1000-4000		varies		ICP-AES	SC	225-8517	105	C/HLD	225-1	118			
Yttrium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301			5-1000		1000-4000		varies		ICP-AES	F/CST C/HLD	225-3-01 225-1	or 118	F/CST	225-803 ¥	109			
Yttrium (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300			5-1000		1000-4000		varies		ICP-AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Yttrium (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W	225-2414	172	TMP	225-2415	172			
Zinc	OSHA ID 121			960		2000		8		AA or AES	F/CST	225-3-01	104	C/HLD	225-1	118			
Zinc	OSHA ID 125G			480		2000		4		ICP-AES	F/CST F/CST C/HLD	225-3-01 225-803 225-1	or or 118	F/CST F/CST	225-3100 225-8215	or 109			
Zinc & compounds (as Zn)	NIOSH 7030	5 mg/m³ (ZnO)	15 mg/m³ (ZnO)	240	30	1000	2000	4	15	AA-F	F/CST	225-3-01	104	C/HLD	225-1	118			

Agency standards for OSHA listings represent the OSHA PELs reported in the 29 CFR 1910.1000 Part 1910, Section 1000.

Abbreviations and references are found on pages 244-245.

Chemical Hazard	Agency Reference	SAMPLING ∞ Agency Standard TWA (ppm)	Agency Standard CLG/STEL (ppm)	Vol. (liter) TWA	Vol. (liter) CLG/STEL	Rate (ml/min) TWA	Rate (ml/min) CLG/STEL	Time TWA (hrs)	Time CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Zinc (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	5 mg/m³	15 mg/m³ C (dust) 10 mg/m³ (fume)	Varies		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118
Zinc (Elements by ICP Aqua Regia Ashing)	NIOSH 7301			5-200		1000-4000		varies		ICP-AES	F/CST 225-3-01 or F/CST 225-803 ¥ 109 C/HLD 225-1 118
Zinc (Elements by ICP HNO_3 Digestion)	NIOSH 7303	5 mg/m³ (ZnO)	15 mg/m³ (ZnO)	0.5-10,000	0.5-10,000	1000-4000	1000-4000	varies	varies	ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Zinc (Elements by ICP HNO_3/$HClO_4$ Ashing)	NIOSH 7300	5 mg/m³ (ZnO)	10 mg/m³ (ZnO)	5-200	5-200	1000-4000	1000-4000	varies	varies	ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Zinc (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Zinc bromide *(see Particulates Not Otherwise Regulated, total and respirable)*											
Zinc chloride fume	OSHA ID 121	1 mg/m³		960	30	2000	2000	8	15	AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Zinc chloride fume	OSHA ID 125G	1 mg/m³		480	30	2000	2000	4	15	ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Zinc chromate (CR(VI))	OSHA ID 215 (V2)	0.005 mg/m³		960		2000		8		IC-UV	F/CST 225-802 Ω 109 C/HLD 225-1 118
Zinc chromates (as CrO_3)	OSHA ID 215 (V2)	0.005 mg/m³		960		2000			15	IC-UV	F/CST 225-802 Ω 109 C/HLD 225-1 118
Zinc dibutyldithiocarbamate	OSHA PV2065			180		1000		3		HPLC-UV	ST 226-30-16 50
Zinc oxide	NIOSH 7502	5 mg/m³	15 mg/m³ (15 min)	240	30	1000	2000	4	15	XRD	FLT 225-3705 110 CST 225-3-23 113
Zinc oxide (Elements by ICP HNO_3 Digestion)	NIOSH 7303	5 mg/m³	15 mg/m³	0.5-10,000	0.5-10,000	1000-4000	1000-4000	varies	varies	ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Zinc oxide (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Zinc oxide (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Zinc oxide dust (respirable dust)	OSHA PV2121	5 mg/m³		varies		varies		varies		GR	F/CST 225-803 109 C/HLD 225-1 118 CYC 225-105 128
Zinc oxide dust (total dust)	OSHA PV2121	15 mg/m³		960		2000		4-8		GR	F/CST 225-802 109 C/HLD 225-1 118
Zinc oxide fume	OSHA ID 121	5 mg/m³		960	30	2000	2000	8	15	AA or AES	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Zinc oxide fume	OSHA ID 125G	5 mg/m³		480	30	2000	2000	4	15	ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Zinc oxide fume	OSHA ID 143	5 mg/m³		960	30	2000	2000	8	15	XRD	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Zinc oxide fume (ICP analysis of metal/metalloid particulates from solder operations)	OSHA ID 206	5 mg/m³		480		2000		4		ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Zinc stearate (particulates, respirable)	NIOSH 0600			375		2500		2.5		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CYC 225-01-02 129 CST 225-3LF 113
Zinc stearate (particulates, total)	NIOSH 0500			120		2000		1		GR	FLT 225-5-37-P 109 C/HLD 225-1 118 CST 225-2LF 113
Zinc stearate (respirable dust)	OSHA PV2121	5 mg/m³		varies		varies		varies		GR	F/CST 225-803 109 C/HLD 225-1 118 CYC 225-105 128
Zinc stearate (total dust)	OSHA ID 121	15 mg/m³		960		2000		8		AA or AES	F/CST 225-3-01 104 C/HLD 225-1 118
Zinc stearate (total dust)	OSHA ID 125G	15 mg/m³		480		2000		4		ICP-AES	F/CST 225-3-01 or F/CST 225-3100 or F/CST 225-803 or F/CST 225-8215 109 C/HLD 225-1 118
Zineb	OSHA 107			500		2000		250 min		HPLC-UV	F/CST 225-3-01 104 C/HLD 225-1 118
Ziram	OSHA PV2073			120		1000		2		HPLC-UV	ST 226-30-16 50
Zirconium (Elements by Cellulosic Internal Capsule Sampler)	NIOSH 7306	5 mg/m³	10 mg/m³	1-1000		1000-4000		varies		ICP-AES	SC 225-8517 105 C/HLD 225-1 118

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Abbreviations and references are found on pages 244-245.

		SAMPLING ∞									
		Agency Standard		Vol. (liter)		Rate (ml/min)		Time			
Chemical Hazard	Agency Reference	TWA (ppm)	CLG/STEL (ppm)	TWA	CLG/STEL	TWA	CLG/STEL	TWA (hrs)	CLG/STEL (min)	Analytical Method	SKC Collecting Equipment & Page Number
Zirconium (Elements by ICP Aqua Regia Ashing)	NIOSH 7301	5 mg/m³	10 mg/m³	5-200	5-200	1000-4000	1000-4000	varies	varies	ICP-AES	F/CST 225-3-01 or 118 F/CST 225-803 109 C/HLD 225-1
Zirconium (Elements by ICP $HNO_3/HClO_4$ Ashing)	NIOSH 7300	5 mg/m³	10 mg/m³	5-200	5-200	1000-4000	1000-4000	varies	varies	ICP-AES	F/CST 225-3-01 104 C/HLD 225-1 118
Zirconium (Elements on Wipes)	NIOSH 9102			wipe						ICP-AES	W 225-2414 172 TMP 225-2415 172
Zirconium compounds (as Zr)	OSHA ID 121	5 mg/m³		960	30	2000	2000	8	15	AA or AES	F/CST 225-803 109 C/HLD 225-1 118

Symbols and Notes

∞ ..... *The sampling parameters shown are suggestions based on the ranges of volume, flow, and time specified in the methods. It is the responsibility of the analyst performing the sampling and analysis to adjust parameters so that the required detection limits can be obtained. It is the responsibility of the user to research published methods to determine validation level and suitability for unique applications.*

C ..... *Ceiling Value*

EL ..... *Excursion Limit*

LFC ..... *NIOSH standard: Lowest Feasible Concentration*

LOQ..... *Limit of Quantitation*

NA SKC ..... *Not available from SKC*

NON ..... *Non-agency reference*

OEL ..... *U.S. Army Occupational Exposure Limit*

OR-OSHA..... *Oregon OSHA method and target concentrations*

PV..... *Provisional Method*

Special order ..... *Because of limited shelf-life, certain sampling media are available only as special order items.*

** ..... *Optional, use filter if particulates are present*

‡ ..... *Filter or tube must be chemically treated before sampling.*

♠ ..... *Modified procedure or sampler*

◊ ..... *Other collection liquids may be more suited to target microorganisms.*

¥ ..... *This method does not digest PVC filter (Cat. No. 225-803) completely.*

Δ ..... *1.0-micron PTFE filter is a NIOSH recommended substitute filter for the 0.8-micron PVC filter originally recommended in NIOSH Method 7904.*

∑ ..... *ACGIH Thoracic TWA. Use PPI for thoracic fraction TWA.*

+ ..... *Sonic flow*

○ ..... *Use sorbent tube Cat. No. 226-120 when sampling in atmospheres containing ozone.*

†† ..... *Special order/limited shelf-life; contact SKC*

▼ ..... *The MOPIP Derivatizing Solution, Cat. No. 225-9050, is needed to analyze for monomer/oligimer aerosol.*

Ω ..... *For sampling in chromium plating operations, PVC filters (Cat. No. 225-802) require special treatment after receipt at the laboratory. Alternatively quartz fiber filters (Cat. No. 225-1827) treated with NaOH may be used. Refer to the method for details.*

π ..... *SKC recommends the AirChek TOUCH or XR5000 Sampling Pump when using a silica gel sorbent tube along with the coated filter at flows above 500 ml/min.*

● ..... *NIOSH Method 5524 analysis requires a Filter Funnel, which is available from Case Custom Environmental Equipment, Erlanger, KY, Telephone 859-250-8558.*

£..... *Collect six samples at 20 minutes each. Use two Cat. No. 226-134 per sample.*

#..... *Diacetyl and Acetoin are determined simultaneously. OSHA 1012 is for ppb levels, OSHA 1013 is for low ppm levels. OSHA 1013 samples can be reanalyzed using OSHA 1012 to achieve quantitation limits.*

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Abbreviations

Collecting Equipment

AC	Accu-CAP Capsule
BI	Bioaerosol Impactor
BS	BioSampler
C	Capsule
C/HLD	Filter Cassette and Cyclone Holder
CAN	Canister
CF/CST	Coated Filter in Preloaded Cassette
CH	Capsule Holder
CI	Cascade Impactor
CPC	Constant Pressure Controller
CST	Filter Cassette
CYC	Cyclone
DR	Direct-reading
DRI	Direct-reading Instrument
DRT	Drying Tube
DT	Detector Tube, Color
EPAM	Environmental Particulate Monitor
F/CST	Filter in Preloaded Cassette
FLT	Filter
FLT/CL	Filter Cassette with Cowl
FOAM	Foam
IMP	Impinger
IOM	IOM Particulate Sampler
IS	Impaction Substrate
IT	Impinger Trap
JAR	Jar
MVC	Microvacuum Cassette
PK	Passive Kit
PPI	Parallel Particle Impactor
PS	Passive Sampler
PT	Plastic Tubing
PUF	PUF Cartridge
SB	Sample Bag
SBLK	Bulk Sorbent
SC	Solu-CAP
SCN	Screen
SCRN	Stainless Steel Screen
SH	Sampling Head
SM TB	Smear Tab
SP	Support Pads
SPC	Spacer
SSC	Stainless Steel Cassette
ST	Sorbent Tube
STC	Spore Trap Cassette
SV	Sorbent Vial
T	Tape
TH	Tube Holder
TK	Test Kit
TMP	Template
VAC	Vac-U-Chamber
VT	ViaTrap for use with BioSampler
W	Wipe

Analytical Methods

AA	Atomic absorption
AAS	Atomic absorption spectroscopy
AED	Atomic emission detection
AES	Atomic emission spectroscopy
CA	Chromotropic acid assay
CD	Conductivity detection
CI	Colorimetric
CLR	Spectrophotometric method or colorimeter
DET TB	Detector tube, color-indicating
DID	Discharge ionization detector
DPCSP	Differential pulse cathodic stripping polarography
DPP	Differential pulse polarography
DR	Direct-reading
DRI	Direct-reading instrument
EAP	Explosives analysis package
ECD	Electron capture detector
ECN	Electrolytic conductivity detector
EGA-TOS	Evolved gas analysis with thermal-optical sensor
ELCHM	Electrochemical detector
F	Flame
FAME	Fatty acid methyl ester
FD	Fluorescence detector
FID	Flame ionization detector
FLAG	Flame arsine generation
FLUOR	Fluorescence
FPD	Flame photometric detector
FPDS	Flame photometric detector sulfur specific
GC	Gas chromatography
GF	Graphite furnace
GR	Gravimetric analysis
HGA	Heated graphite atomizer
HPLC	High-performance liquid chromatography
HRGC	High resolution gas chromatography
HRMS	High resolution mass spectrometry
IC	Ion chromatography
IC-CD	Ion chromatography detector
ICP	Inductively coupled plasma
ICP-DCP	Inductively coupled plasma-directly coupled plasma spectroscopy
IR	Infrared spectrophotometry
IRA	Immunoradiometric assay
ISE	Ion-specific electrode
MAS	Molecular absorption spectometry
MD	Multi-detector
MS	Mass spectrometry
MSD	Mass selective detector
N ACT	Neutron activation
NCD	Nitrogen chemiluminescence detector
NPD	Nitrogen-phosphorus detector
NSD	Nitrogen-specific detector
NVM	No validated method
P FLUOR	Portable fluorescence
P GC	Portable gas chromatography
P IR	Portable infrared spectro-photometry
P IS	Portable infrared spectrophotometer
P VAS	Portable visible absorption spectrophotometry
PASV	Portable anodic stripping voltammetry
PCD	Post-column derivatization
PCM	Phase contrast microscopy
PCR	Polymerase chain reaction
PDA	Photo diode array detector
PES	Plasma emission spectrometry
PID	Photoionization detector
PLM	Polarized light microscopy
POL	Polarography
SCD	Sulfur chemiluminescence detector
SEM	Scanning electron microscopy
SPOT	Chemical spot test
TCD	Thermal conductivity detector
TD	Thermal desorption
TEA	Thermal energy analyzer
TEM	Transmission electron microscopy
TITRA	Titration
TOA	Thermal-optical analysis
UV	Ultraviolet detector
VAS	Visible absorption spectrophotometry
VIS	Visual
W	Wipe
XRD	X-ray diffraction
XRF	X-ray fluorescence
XRFS	X-ray fluorescence spectroscopy

References

SKC Sampling Guides are abstracted from publications by the National Institute of Occupational Safety and Health (NIOSH), the Occupational Safety and Health Administration (OSHA), American Society for Testing and Materials (ASTM) International, the Environmental Protection Agency (EPA), Health and Safety Executive (HSE), and published non-agency methods.

NIOSH, OSHA, EPA, HSE, and ASTM International Agency References

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Tech Tips

- *Access online SKC Sampling Guides for the most up-to-date sampling information. Visit skcinc.com or skcltd.com/hazard-search.*
- *Get fast access to agency and organization websites from skcinc.com.*

Need Sampling Solutions?

SKC Sampling Solutions are available as interactive PDFs for easy access to concise information on sampling for targeted applications. Learn to recognize, evaluate, and sample with SKC Sampling Solutions. Go to skcinc.com/Training.

Air Sampling Terms

8-Hour Time-weighted Average (TWA)
The average full-shift exposure level calculated by weighting concentrations throughout a workday with respect to time. The denominator "eight hours" is used because OSHA standards are based on an 8-hour workday. OSHA and ACGIH use the following formula to calculate TWA:

$$TWA = \frac{C1T1 + C2T2 + C3T3 \ldots CnTn}{8\ hrs}$$

TWA = Time-weighted average concentrations in ppm or mg/m³
C = Concentration of contaminant during an incremental exposure time
T = Time — incremental exposure time

Absorption
The penetration of airborne chemicals into a collection medium, such as impinger fluid, where the chemicals will dissolve or react chemically

Active Sampling
The collection of airborne contaminants by means of a forced movement of air by a sample pump through appropriate collection media

Adsorption
The collection of gases and vapors onto the surface of a collection medium such as the sorbent material in sorbent tubes

Aerodynamic Diameter
A description of the shapes and densities of dust particles; the diameter of a unit-density sphere having the same settling velocity as the particle in question

Aerosol
Microscopic liquid or solid particles dispersed into the air

Air Volume
The total amount of air passed through a sampling medium; determined by multiplying flow rate in ml/min or L/min by the sample time in minutes

Ambient Air
Air that is external to buildings and accessible to the general public

Back Pressure
The pressure drop, i.e., resistance to flow created by the collected sample or the sample media itself

Bioaerosols
Airborne particles, molecules, or volatile compounds ranging in size from 100 microns to 0.01 micron that are living, contain living organisms, or were released from living organisms

Blank Sample
A representative sampling medium sent as a control with the actual sample to a lab. Blanks are subjected to the same procedures as samples, except no air is drawn through them.

Ceiling Value
The concentration that should not be exceeded during any part of the work day

Closed-face Sampling
Filter sampling using a two or three-piece cassette with the cassette inlet section in place and the sealing plugs removed

Constant Flow
A feature available on air sample pumps that allows the pump to automatically compensate for flow restrictions and variations, ensuring the set and calibrated flow rate is maintained throughout the sampling period

50% Cut-point
Describes the performance of cyclones and other particle size-selective devices. For personal sampling, the 50% cut-point is the size of the dust that the device collects with 50% efficiency.

Cyclone


A sampling device used to collect and separate respirable particulate mass. The cyclone functions as a centrifuge; the rapid circulation of air separates particles according to size.

Desorption Efficiency
A measure of how much analyte can be recovered from sorbent

Dust
Solid particles rendered airborne during the crushing or grinding of hard, rock-like materials

Fugitive Emissions
Emissions that could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening

Fume
Solid airborne particles formed by the vaporization of solid materials, oxidation of the vapor, and condensation of the oxide

Gas
A state of matter consisting of molecules in constant random motion that is neither a defined volume nor shape and remains in this state at normal temperature (25 C) and pressure (1 atmosphere)

Grab Sampling


The direct collection of an air-contaminant mixture into a device such as a sample bag or detector tube over a brief period

Gravimetric Analysis
Sample analysis of filters by determining sample weight

Hearing Conservation Program
A program to prevent occupational hearing loss, preserve and protect hearing, and provide workers with knowledge and hearing protection necessary to safeguard themselves.

High Flow Sampling
The collection of airborne contaminants (typically particulates) at flow rates greater than 1000 ml/min

Inhalable Fraction and Vapor (IFV)
An ACGIH endnote designation on a compound that exerts sufficient vapor pressure such that it may be present in both particle and vapor phases, with each contributing a significant portion of the dose at the TLV-TWA concentration. Such compounds require simultaneous sampling of both aerosol and vapor phases.

Indoor Environmental Quality
The impacts of the indoor environment including, but not limited to, air quality, lighting, and temperature on occupant health, comfort, and performance

Integrated Sampling
The collection of air contaminants over an extended period

LEED
The Leadership in Energy and Environmental Design (LEED) program provides building owners/operators with a framework for identifying and implementing practical and measurable green building design, construction, operation, and maintenance solutions.

Low Flow Sampling
The sampling of airborne contaminants (typically gases and vapors) at flow rates less than 500 ml/min

Matched-weight Filters
Two filters that match in weight; the top filter collects contaminants, the bottom filter serves as a control. After sampling, both filters are weighed and the difference between weights is the sample weight.

Mist
Droplets rendered airborne by rubbing, boiling, splashing, or otherwise agitating a liquid

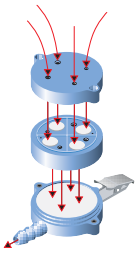
Air Sampling Terms

Nanoparticle
Intentionally manufactured particles of a consistent composition and/or size with at least one dimension in the size range of 1 to 100 nanometers (nm)

Noise Exposure Measurement
Noise is measured using unique instruments such as noise dosimeters and sound level meters to assess areas that are above the occupational exposure limits.

Noise vs Sound
***Noise** is unwanted sound. **Sound** is a rapid variation of atmospheric pressure caused by some disturbance of the air.*

Open-face Sampling
Filter sampling using a three-piece cassette with the cassette inlet section removed; this is typically used for sampling asbestos and other fibers

Parallel Particle Impactor (PPI) Samplers


Small impaction-based particulate samplers that precisely select for thoracic or respirable dust. Comprised of four small impactors arranged in parallel in the inlet plate, each with unique 50% cut-point to target a specific one-quarter segment of the ISO 7708/CEN curve. Used with a sample pump at 2, 4, or 8 L/min (2 L/min only for thoracic). Larger particles are scrubbed and retained by porous oiled impaction substrate located immediately beneath each inlet nozzle. Smaller particles continue to a standard 37-mm collection filter for analysis.

Particulate Matter (PM)
A mix of solid particles and liquid droplets suspended in air. Origin, shape, size, and composition vary. Standards exist for PM10 (diameter ≤ 10 µm) and PM2.5 (diameter ≤ 2.5 µm) because they are easily trapped in the lungs and are most likely to cause adverse health effects. Additional particles of concern are PM1.0 (diameter ≤ 1 µm) and PM Coarse (diameter < 10 µm and > 2.5 µm).

Passive (Diffusive) Samplers


Small air samplers or "badges" that collect airborne gases or vapors without the use of a pump. Chemicals diffuse through a diffusion barrier onto a sorbing medium inside the sampler at a fixed rate that can be scientifically determined.

Preloaded Filter Cassettes
Ready-to-use cassettes that comprise a cassette, filter, support pad, and sealing plugs

Preweighed Filters
Individual filters that are weighed to within 5 decimals before they are loaded into a cassette

Sampling Parameters — Rate, Time, and Volume
Consult specific methods to determine the range given for each parameter. In the SKC Sampling Guide under "Sampling," some chemicals have two different recommendations for sampling rates and times; the sampling rate for an 8-hour sample is listed with the shorter period rate in parentheses. The choice of rate depends on sampling requirements.

Sampling Train
The entire sampling system: sampling medium (sorbent tube, filter, cyclone, IOM, etc.) connected to a sample pump with flexible tubing

Short-term Exposure Limit (STEL)
A 15-minute time-weighted average exposure that should not be exceeded during any part of the workday

Smoke
Particles resulting from the incomplete combustion of organic matter and consisting predominantly of carbons and oxides of carbon

Solvent Desorption
The process of extracting adsorbed chemicals from sorbent material through the use of solvents

Source Emissions
Particulate or gaseous emissions generated from a stationary source, such as a stack

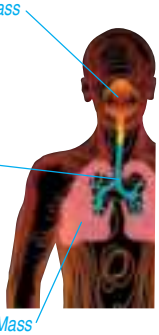
Thermal Desorption
The process of extracting adsorbed chemicals from sorbent material through the use of heat

TLV-TWA
An ACGIH-defined concentration level in air, typically for inhalation or skin exposure, to which it is believed a worker can be exposed day after day (8 hours per day, 40 hours per work week) for a working lifetime without adverse health effects

Traditional Workplace Exposure Guidelines
- *Total Dust*
  Dust that is collected using closed-face 37-mm cassettes fitted with suitable filters
- *Respirable Dust*
  Particles that penetrate to the gas exchange regions of the lung; collected using a filter cassette with suitable filter and a cyclone

Ultrafine Particulate Matter
Ultrafine particles less than 100 nanometers (0.1 micron) result from combustion, friction, or natural processes in the air or water. While nano-sized, ultrafine particles are not nanoparticles because they are neither intentionally manufactured nor of a constant composition or size.

Updated Workplace Exposure Guidelines
The concept of size-selective sampling of industrial aerosol is based on the measurement of particles associated with a specific human health effect, i.e., how deeply particles penetrate into the respiratory tract. ACGIH recommends that particle size-selective threshold limit values (TLVs) be expressed in three forms:



- ***Inhalable** Particulate Mass*
  (100-µm 50% cut-point), hazardous when deposited anywhere in the respiratory tract
- ***Thoracic** Particulate Mass*
  (10-µm 50% cut-point), hazardous when deposited anywhere in the lung airways and the gas exchange regions
- ***Respirable** Particulate Mass*
  (4-µm 50% cut-point), hazardous when deposited in the gas exchange regions of the lungs

Vapor
The gaseous form of a substance that is typically a liquid at normal temperature (25 C) and pressure (1 atmosphere)

Vapor Intrusion
Volatile chemicals in buried wastes and/or contaminated groundwater emit vapors that migrate through subsurface soils into indoor air spaces of overlying buildings.

Whole Air Sampling
The collection of air into a sealable container such as a stainless steel canister or sampling bag for subsequent analysis

Index

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Accu-CAP
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AirLite
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BestChek
BioSampler
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