SKC Passive Samplers

New Designs for New Applications

SKC sorbent innovation and research is not limited to sorbent tubes. SKC has carefully designed passive samplers filled with SKC quality sorbents to provide accurate, reliable, and convenient alternatives to active sampling for many compounds. SKC Passive Samplers are specified in OSHA diffusive methods.

webinar
www.skcinc.com

Diffusive TD Tubes

BTEX/Other VOCs

See pages 70-71

VOC Chek 575 and ULTRA

ppb to ppm-Level VOCs

See pages 74-75 and 72-73

Passive Samplers for Health Care

Ethylene Oxide, Isoflurane, Halothane

See page 83

UME^{X} 100

Formaldehyde/Other Aldehydes

See page 84

UME^{X} 200

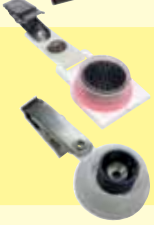
Nitrogen Dioxide/Sulfur Dioxide

See page 85

UME^{X} 300

Ammonia

See page 85



Elemental Mercury and Hydrogen Cyanide

See page 86

Diffusive Thermal Desorption Tubes

Time-averaged Assessment of BTEX and Other VOCs

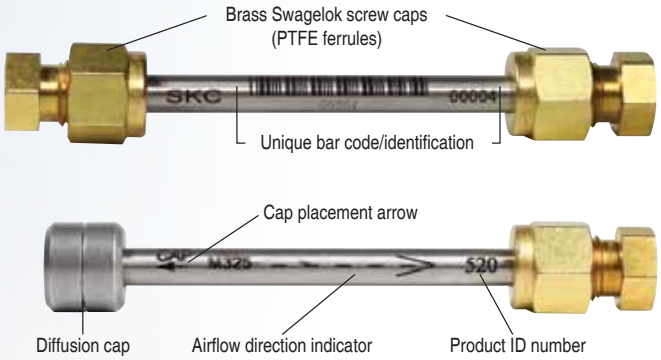
- Validated sampling rates for benzene, toluene, ethylbenzene, xylenes, and many other VOCs
- Contain pre-conditioned Carbopack® X sorbent
- SilcoNert® 2000 deactivated 3.5 x 0.25-inch OD stainless steel tubes
  - Ideal for protecting sample integrity over long sampling periods
- Use to determine average concentration over longer sampling periods up to 14 days
- No pump or training required
- Reusable to keep costs low
- Unique identification number and bar code
- Weatherproof tube shelter available
- Airflow and cap placement arrow indicators printed on tube
- Sealed with brass Swagelok screw caps with PTFE ferrules for transport
- Each collected compound can be analyzed quantitatively

SKC Diffusive Thermal Desorption (TD) Tubes are designed to provide accurate sampling of VOCs at refinery fencelines and for other ambient air monitoring applications without the use of a sample pump. Sampling times of up to 14 days provide an average concentration that eliminates the effects of daily variables such as hazard concentration and temperature. A weatherproof shelter accessory protects samples.

Description	Cat. No.	Qty.
SKC Diffusive TD Tubes,* 3.5 x 0.25-in OD deactivated stainless steel tubes filled with pre-conditioned Carbopack X and supplied with diffusion caps and brass Swagelok screw caps with PTFE ferrules	226-520	10
Diffusion Caps	226-525	10
Shelter	226-526	ea

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

SKC Diffusive Thermal Desorption Tubes for BTEX and Other VOCs



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

More Information

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

U.S. EPA Method 325B: https://goo.gl/B4viuV

www.skcinc.com

Weatherproof shelter accessory protects TD tubes.

ULTRA Passive Samplers

Convenient Alternative to Canisters and Thermal Desorption Tubes

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**
  - No cleaning or certification costs
  - Lower purchase price
  - No expensive shipping
- **Passive alternative for EPA TO-17 — no pump required**
- **Choose from 5 sorbents for indoor and ambient air sampling (including SVOCs)**
  - Anasorb GCB1
  - Tenax TA
  - Chromosorb 106
  - Carbopack X
  - Charcoal (solvent extraction)
- **Easy on/off sampling**
- **Small, lightweight, and easy to transport**
- **Validated sampling (uptake) rates**
  - See www.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
- **Long-term sampling up to 30 days reduces temporal variability (*see www.skcinc.com/pdf/1812.pdf*)**
- **Ideal for vapor intrusion sampling**
  - See EPA-OSWER technical guide at www.epa.gov, search "vapor intrusion"

ULTRA Passive Samplers

Convenient Alternative to Canisters and Thermal Desorption Tubes

Patented ULTRA — Front 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 www.osha.gov and search "ULTRA" for additional information on sampling rates for Chromosorb 106.*

Sampling Accessories	Cat. No.
Rate Reducer, 12 holes, lowers sampling rate for extended sampling time and higher concentrations	690-300
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, 6.35 x 88.9 mm (0.25 x 3.5 inches), includes screens and end caps	P226530
Analysis Transfer Funnel, facilitates transfer of sorbent from vial to 6.35-mm (0.25-inch) OD thermal desorption tube	590-264

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

See www.skcinc.com/catalog/passive-guide.php for sampling rates for over 50 compounds.

SKC 575 Series Passive Samplers are now...

VOC 575 Series

✓Decrease sampling costs

- More sorbent/capacity + validation to 2x exposure level
  = One sampler per 8-hour shift
  = One analysis of a single layer
  = Savings for you

✓Increase convenience

- No assembly required for sampling
- New design for easier sorbent transfer during analysis
- Reference guides available for laboratories

✓Increase reliability

- Sampling rates for over 300 compounds *(see pages 76-82)*
- Online research reports document performance for legal and compliance issues. Visit www.skcinc.com/reports.asp
- Specialty samplers available for ethylene oxide (EtO), styrene, and methanol
- Validated in OSHA methods

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

New design – easier analysis!

Front of VOC Chek 575 Series Sampler (actual size)

Back of VOC Chek 575 Series Sampler designed for easier analysis

Active/Passive Sampling 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
Xylenes/ethylbenzene	OSHA 1002	226-01	OSHA 1002	575-002

VOC Chek 575 Series Passive Sampler Ordering

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

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

Leader in Passive Sampler Technology

SKC VOC Chek® 575 Series Passive Samplers are identified as a reliable alternative to active sampling for many compounds in OSHA diffusive methods!

Methanol Passive Sampler Cat. No. 575-007
see ordering below left

STOP ***No need to double your costs!***

VOC Chek Series samplers have:

- More sorbent in a single layer
- More capacity
- Validated results to 2x exposure limit
- Lower price than double-layer samplers

See the VOC Chek 575 Series Selection Guide pages 76-82

VOC Chek 575 Series Selection Guide

On-worker 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. Visit www.skcinc.com and download our free SKC Sampling Guide app to access this information on your Android or Apple device.

Validation Levels

See the Validation Level column in this guide to determine the level of scientific testing. Go to www.skcinc.com and search the number in the Research Report column to access online research reports.

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.

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.

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 % §	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		20.3 √	15	4	GC-FID	90.2	575-002
Acetone	Full	1303	1000		15.2 ≈	240	8 ≈	GC-FID	90.2	575-002
Acetonitrile	Calculated		40		22.4			GC-FID	103	575-001
Acetonitrile	Calculated		40		22.4			GC-FID	108	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
Aniline	Calculated		5		14.2			GC-FID		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	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
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

See page 212 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 % §	SKC VOC Chek 575 Cat. No.
n-Butanol (n-butyl alcohol)	Calculated		100	50 #	15.5			GC-FID	100	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	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		8	GC-FID	92.3	575-002
2-Butoxyethanol (butyl CELLOSOLVE solvent)	Calculated		50		12			GC-FID	89.7	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	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	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	575-002
t-Butyl benzene	Calculated				11.3			GC-FID		575-002
Butyl CELLOSOLVE acetate (ethylene glycol monobutyl ether acetate)	Calculated		5		10.4			GC-FID		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/m^3		10.8			GC-FID	94.2	575-001
Camphor	Calculated		2 mg/m^3		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 (parachlorobenzotrifluoride; OXSOL 100)	Bilevel		25 ◊		11.8	15	8	GC-FID	102	575-001
1-Chloro-4-(trifluoromethyl)benzene (parachlorobenzotrifluoride; 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	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
Decamethylcyclopentasiloxane (D5)	Partial	1891	5 †		5.66	15	8	GC-FID	99	575-001
Decamethyltetrasiloxane	Calculated				7.36			GC-FID		575-001
n-Decane	Partial				12.2			GC-FID	103	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	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

See page 212 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 % §	SKC VOC Chek 575 Cat. No.
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	240	8 π	GC-FID	96	575-001
Dichloromethane (methylene chloride)	Full	1323	25	125	16	15	4	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
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	575-002
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	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

See page 212 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 % §	SKC VOC Chek 575 Cat. No.
Ethanol (ethyl alcohol)	Partial	1876	1000		20.3	15	8	GC-FID	99	575-002
2-Ethoxyethanol	Calculated		200		14.4			GC-FID	100.8	575-001
2-Ethoxyethanol	Calculated		200		14.4			GC-FID	111.2	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	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	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		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/m^3 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	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
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	575-002
2-Hexanone (methyl butyl ketone MBK)	Partial	1873	100		14.3	15	8	GC-FID	104	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		8	GC-FID	92.9	575-002
sec-Hexyl acetate	Calculated		50		11.1			GC-FID		575-002
Hexyl alcohol (hexanol)	Calculated				12.64			GC-FID	92.9	575-002
Hexylene	Calculated				14.5			GC-FID		575-001

See page 212 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 % §	SKC VOC Chek 575 Cat. No.
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	575-001
Isobutyl alcohol	Calculated		100		15.6			GC-FID	100	575-002
Isoflurane	Full	1893			13.2	15	8	GC-FID	96	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	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	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
Lauryl alcohol (1-dodecanol)	Calculated				8.7			GC-FID	107.5	575-001
Lauryl alcohol (1-dodecanol)	Calculated				8.7			GC-FID	103	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
Methanol (methyl alcohol)	Partial	1895	200	250	1.2	15	8	GC-FID	101	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	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	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	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	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	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	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		8	GC-FID	92.3	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
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		8	GC-FID	92.9	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

See page 212 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 % §	SKC VOC Chek 575 Cat. No.
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	16	15	4	GC-FID	96	575-001
Methylene chloride (dichloromethane)	Full	1323	25	125	14.7	240	8 π	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	15	8	GC-FID	91.8	575-001
Monochlorotoluene (1-chloro-2-methylbenzene; OXSOL 10)	Bilevel		50 ‡		13	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	96.8	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	5	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	575-002
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	575-002

See page 212 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 % §	SKC VOC Chek 575 Cat. No.
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	575-002
Sevoflurane	Partial	1893		2	12.8	30	4		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	5	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	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	5	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			GC-FID	91.1	575-001
1,2,3-Trimethylbenzene	Calculated		25 ¶		12	15	8	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
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		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		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		8	GC-FID	95.3	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*
≈ *Valid for PEL samples greater than 4 hours duration. If more than 1000 ppm of other contaminants are present, reduce maximum sample time to 4 hours.*
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 www.skcinc.com for details on the desorption solvent used.*
¶ *OSHA construction industry standards*
√ *Valid for STEL samples up to 4 hours duration*
π *If more than 1000 ppm contaminants are present, reduce maximum sample time to 4 hours.*
▼ *OARS-WEEL TWA Level (Occupational Alliance for Risk Science - Workplace Environmental Exposure Levels)*
EL Excursion Limit
LFC Lowest feasible concentration

More information at www.skcinc.com – search "Passive"

See page 212 for abbreviations.

Passive Samplers for Health Care
Anesthetic Gases

Halogenated Ethers

Isoflurane and enflurane are used primarily in veterinary procedures. Isoflurane and halothane are being replaced by desflurane and sevoflurane, which have fewer health effects. Exposure to halogenated ethers can cause eye, skin, and respiratory tract irritation; eye damage; and other serious health effects.

SKC VOC Chek 575 Passive Samplers

- Validated sampling rates for each gas
- Lightweight and miniature size
- No pump or assembly required
- Easy sorbent transfer during analysis

Description	Pkg. of 5 Cat. No.	Pkg. of 25 Cat. No.
Organic Vapors Passive Sampler contains 500 mg Anasorb 747	575-002†	575-002A†

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

See details on pages 80-81.

Ethylene Oxide (EtO)

Ethylene oxide is used to sterilize medical equipment and supplies. Exposure health effects can range from respiratory irritation to cancer and reproductive/mutagenic effects.

SKC Ethylene Oxide Passive Sampler

- Uses same sorbent as active OSHA Method 1010
- Fully validated for 8-hour and 15-minute sampling
- Lightweight and miniature size
- No pump or assembly required

Description	Pkg. of 5 Cat. No.	Pkg. of 25 Cat. No.
Ethylene Oxide Passive Sampler contains 500 mg Anasorb 747 treated with hydrobromic acid	575-005†	575-005A†

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

For passive samplers for Aldehydes, see page 84.

ABOUT

Sampling Anesthetic Gases

OSHA Anesthetic Gases Guidelines for Workplace Exposures recommend air sampling for anesthetic gases every six months to measure worker exposures and to check control measure effectiveness. Personal sampling provides the best estimate of exposure level and is the preferred method for determining worker time-weighted average (TWA) exposure during anesthetic administration and in the post-anesthesia care unit (PACU). *Go to www.osha.gov/dts/osta/anestheticgases/index.html for detailed guidelines.*

ABOUT

Sampling Peracetic Acid (PAA) — an Alternate Sterilant

While no passive sampler is available for PAA, SKC offers treated sorbent tubes Cat. Nos. 226-193-UC and 226-199-UC (page 42) and coated filter Cat. No. 225-9030 (page 63) to be used in a sampling train for PAA and hydrogen peroxide. *See page 42 for details.*

Research Reports available at www.skcinc.com

UME^{X}100 Passive Sampler for Formaldehyde

Occupational and Indoor Air Exposure Monitoring

- Meets OSHA Method 1007 specifications
- Conforms to EU ISO 16000-4-2004
- Accuracy exceeds OSHA standards
- Highly selective 2,4-DNPH chemistry; easy analysis
- Documented formaldehyde uptake rates for 15-minute to 24-hour and 7-day samples
  - Sampling rates available for other aldehydes *(see left)*
- Samples 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 www.skcinc.com*

Versatile UME^{X} 100 Sampler

*Easy **personal formaldehyde sampling** (15 minutes to 8 hours) — OSHA 1007*

*Convenient **indoor air formaldehyde sampling** (24 hours or 7 days) with UME^{X} 100 and stand accessory*

Tech Tips

Q: ***Why is my lab finding higher background levels of formaldehyde on sampling media than those reported by SKC?***

A: *Page 3 of OSHA 1007 reports that storing samplers at elevated temperatures will cause DNPH to decompose. The decomposition product, 2,4-dinitroaniline, may be seen as formaldehyde by some labs if they are using a short/fast HPLC column with inadequate plate count. EPA TO-11A, Section 13.2.2 recommends an HPLC column efficiency of > 5000 theoretical plates. This column will allow for the effective separation of the formaldehyde peak from interfering peaks.*

Professionals' #1 Choice!

Description	Cat. No.	Price/Qty.
UME^{X}100 Passive Sampler for Formaldehyde*†Δ	500-100	$ 159.00/10
Suitable for sampling other aldehydes	500-100A	379.00/25
Treated Tape for QC - UME^{X} 100††	P20084	35.00/50

Accessory	Cat. No.	Price/Qty.
Stand for Area Sampling	690-302	$ 8.00/ea

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

UME^X 200 Passive Sampler for NO_2 and SO_2

Occupational Sampling and Near-road/Urban Air Monitoring

- Same chemistry as active OSHA Method ID-182
- Accurately measures exposures to 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.	Price/Qty.
UME^X 200 Passive Sampler for Nitrogen Dioxide and/or Sulfur Dioxide*	500-200	$ 159.00/10
Treated Tape for QC - UME^X 200*	P20098	29.00/25

Accessory	Cat. No.	Price/Qty.
Stand for Area Sampling	690-302	$ 8.00/ea

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

Personal SO_2/NO_2 sampling *(15 minutes to 8 hours)*

Fenceline monitoring *(up to 24 hours) with UME^X 200 and shelter*

ABOUT UME^X 200 Sampler Applications

Occupational exposure monitoring in:

- Chemical plants
- Textile manufacturing
- Food industry
- Copper smelting
- Power plants
- Paper pulp mills
- Cement manufacturing
- Mines
- Welding
- Construction
- Fertilizer production
- Explosives production

UME^X 200 is ideal for:

- Near-road monitoring
- Fenceline applications
- Urban air studies by community action groups

UME^X 300 Passive Sampler for Ammonia

Occupational Sampling and Fenceline/Odor Monitoring

- Chemistry similar to active OSHA Method ID-188 and NIOSH 6016
- Safe – no glass or sulfuric acid liquid in the sampler
- No particulate interference
- Enhanced sensitivity with documented 39.92 ml/min uptake rate
- Detects ammonia to:
  - 2.4 ppm for a 15-minute sample
  - 0.075 ppm for an 8-hour sample
  - 0.025 ppm for a 24-hour sample

Description	Cat. No.	Price/Qty.
UME^X 300 Passive Sampler for Ammonia*†	500-300	$ 169.00/10
Treated Tape for QC - UME^X 300*†	P20083	39.00/25

Accessory	Cat. No.	Price/Qty.
Stand for Area Sampling	690-302	$ 8.00/ea

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

Personal ammonia sampling *(15 minutes to 8 hours)*

Fenceline monitoring *(24 hours) with UME^X 300 and stand accessory*

ABOUT UME^X 300 Sampler Applications

Ammonia is one of the most commonly produced industrial chemicals in the U.S and is found in the following industries:

- Agricultural (fertilizers, poultry, swine, dairy)
- Janitorial services (cleaners)
- Food and beverage (refrigeration and fermentation)
- Remediation
- Fuel
- Manufacturing (plastics, explosives, pesticides, textiles, dyes)

Standard of Good Practice

Store and prepare sampling media in solvent-free environments.

Elemental Mercury Passive Sampler

For OSHA Method ID-140

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 www.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**
- **High accuracy, sensitivity, and capacity**
  - Positive analysis of mercury
  - Removable sorbent capsule eliminates false high readings due to contamination of capsule holder

The SKC Elemental Mercury Passive Sampler measures worker exposure level as a time-weighted average (TWA) and permits positive analysis for mercury vapor. This economical and reliable passive sampler is designed for analysis by atomic absorption. The capsule holder can be cleaned and reused to reduce sampling costs.

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 Passive Sampler

For OSHA Method 1015

- **More accurate than previous methods**
- **Lightweight miniature sampler for unobtrusive sampling**
- **Samples hydrogen cyanide from 0.44 to 20 ppm**
  - Suitable for 15-minute and 8-hour samples
- **Unique sampler design for direct transfer of sorbent into and out of the sampler**
  - Load and unload sorbent easily in the field
  - Sorbent transfers directly to vial for solvent extraction

Back view *Front view*

SKC offers the Hydrogen Cyanide (HCN) Passive Sampler specified in OSHA 1015. The HCN Passive Sampler operates at a sampling rate of 28.4 ml/min and provides accurate HCN exposure results. The sampler design allows field loading of sorbent from vial to sampler housing before sampling and field transfer of sorbent from sampler to vial after sampling. Samples are extracted with water and analyzed by ion chromatography/electrochemical detector (IC/ELCHM).

Description	Cat. No.	Qty.
Hydrogen Cyanide Passive Sampler includes empty sampler housing and sealed glass vial of 600-mg soda lime sorbent	590-400	5