2021 Liberty Mutual Insurance Industrial Hygiene Lab sampling guide

AIHA-LAP, LLC Laboratory ID # LAP-100045

Contact us for assistance:

lmihlaboratory@libertymutual.com

or

1-800-230-6263

Liberty Mutual INSURANCE

Liberty Mutual Insurance Industrial Hygiene Laboratory (LMIHL) provides analytical services to assist customers with safety issues related to occupational disease exposure in their workplace.

Comprehensive service includes:

- Method development or validation
- Technical consultation
- Training
- Sample Analyses:
  - Aldehydes
  - Organic and Inorganic acids
  - Amines
  - Pharmaceuticals
  - Asbestos fiber counting and bulk identification
  - Silica
  - Medical gas analysis
  - Common and specialty metals
  - Grade D breathing air analysis
  - Common and specialty organic solvents
  - Scans — metals, solvent, acids, aldehydes, isocyanates, etc.
  - Gravimetrics for total, respirable or inhalable dust

Liberty Mutual SafetyNet™ is your source for chain of custody and media order forms as well as the Fee Schedule. You may also contact the lab.

Telephone assistance: 1-800-230-6263

Telephone assistance is available to all our customers from 7:30AM – 6PM, Eastern Time. We encourage our customers to call us with their technical questions relating to proper sampling and media selection.

Listed below is our support team.

- Ethel T. Patricio, MS, Laboratory Director, ext. 27352 or 508-544-5352
- Laura Melton, MS, Lab. Supervisor, ext 27348 or 508-544-5348
- Eva Longo, MS, Prod/QC Chemist Consultant, ext 27338 or 508-544-5338
- Neela Joshi, MS Prod/QC Chemist Consultant, ext. 27360 or 508-544-5360

Analysis turnaround time

The Laboratory's standard turnaround time is 5 business days or better from the receipt of samples. Samples received after 3PM are considered next day's samples. Results are provided by email only. Rush analysis for routine samples can be arranged with prior notification. Verbal results are also available after data has been approved for release by the QC coordinator.

The following surcharges apply for RUSH requests:

One business day	200% surcharge
Two business days	150% surcharge
Three business days	75% surcharge

Note: Certain Specialty Analysis cannot be done on a rush basis. Contact the laboratory at least 24 hours before shipping your samples for RUSH analysis.

Discounts for multiple analytes on the same media

The price listed for each individual analyte is the price for a single analyte per sample. Analysis for multiple compatible analytes collected on the same media is available at a discounted fee. The higher priced analyte is billed at the published fee with additional analytes discounted as follows:

Organics on OVM/sorbent tubes	$32
Metals by ICP	$26
IC	$44
HPLC/Specialty	see Fee Schedule

Payment terms

The total cost of the services provided by the LMIH Laboratory will be based on the quoted rate. Prices are subject to change without notice. Payment term is net 30 days if you are paying by check.

Blanks

Blanks are required by all analytical methods and are good insurance for dealing with contamination. Contamination can occur during handling, storing or shipping samples. Therefore, as standard good IH practice, field blanks are recommended. The recommended number of field blanks per sample set is 10% of the total number of samples, or a minimum of 1 blank per set of 10 samples. Since blanks are analyzed as any other sample, they are priced according to the analysis requested.

Media

Common media such as charcoal tubes, pre-weighed filters, etc. are provided at no extra cost as long as the samples and unused media are returned to the laboratory for analysis within 30 days. Unreturned media after 30 days will be charged at cost. Specialty media that cannot be reused, such as isocyanate filters, aldehyde badges and tubes, ozone filters, etc. will be invoiced at cost. Media are shipped UPS ground at no charge to the client. Rush and international shipments will be billed to the client at cost.

- Request by email using the media order form.
- Return shipping is the responsibility of the customer.

Please note that there will be media charge for specialty filters (e.g. hydrogen peroxide) and sampling devices such as PPI.

Sample collection and sample submission

Sampling collection supplies

We provide free collection supplies (wipes, templates, gloves, plastic bags, coolers, etc.) and ship them to you via UPS ground. Clients requesting Rush delivery either within or outside the U.S. will be billed at cost. It is the client's responsibility to ensure proper sampling, handling, packing (returning the cooler with frozen packs) and return shipping to the laboratory.

Chain-of-custody forms will be provided with every media and equipment order; please complete the form and submit with your samples. The chain-of-custody forms are also available on Liberty Mutual SafetyNet™.

Sample minimum

When Preparing samples for analysis, please note that some analyses require a three (3) sample minimum fee to cover the cost of method set-up for non-routine analysis.

Special handling and shipping

Most NIOSH and OSHA methods indicate that solvent samples are stable at room temperature. LM IH Laboratory recommends shipping samples cold overnight especially during the summer months. Please refer to the list of Analytes for additional instructions. These guidelines must be followed in order to ensure the integrity and validity of the samples.

Bulk sample submissions

Certain analysis requires the submission of bulks. Bulks should always be packaged and shipped separately from the samples. Safety Data Sheets (SDS) must accompany the bulk samples.

Analytical results

LMIHL reserves the right to determine appropriate format in which the analytical results are reported. All results are provided for the exclusive use of our client. LMIHL accepts no responsibility or liability for the client's use of the analytical results.

LMIHL may release verbal or email results in ahead of the written report. These results are tentative and subject to subsequent confirmation or modification during LMIHL peer review process.

LMIHL requires precise and complete instruction before it releases any reports. Any later request will require written permission from submitter.

Free pump loan program

We loan pre-calibrated sampling pumps and accessories to customers for a period of two (2) weeks at no cost if the samples are returned to the lab for analysis. All equipment is loaned on a first-come, first-serve basis. As a result, there may be instances when the equipment is not available at the time of your request. We suggest submitting your request for equipment at least one week prior to your scheduled sampling activity.

At the end of the two week period, all equipment must be returned and collected samples sent for analysis to the LMIH Lab. Equipment not returned after the two week period will incur an equipment rental charge.

Contact your local Loss Control Representative or the LMIH lab for information/questions (lmihlaboratory@libertymutual.com or 800-230-6263 ext. 27371) regarding your sampling needs.

Scans

The scans performed by the laboratory are listed below. We can also customize scans.

Aldehyde scan (Glutaraldehyde is collected and analyzed separately)			
Acetaldehyde	Benzaldehyde	Formaldehyde	Valeraldehyde
Acrolein	n-Butyraldehyde	Propionaldehyde	

Aliphatic amine scan (NIOSH 2010)		
(Please call Lab for other aliphatic amines)		
Ethylamine	Diethylamine	Triethylamine

Aromatic amine scan		
(Please call Lab for other aromatic amines)		
Aniline	Methyl aniline	o-Toluidine

Anesthetic gases scan (Nitrous oxide is collected and analyzed separately)		
Desflurane (Suprane)	Halothane (Fluothane)	Sevoflurane (Sevofrane)
Enflurane (Ethrane)	Isoflurane (Forane)	

Inorganic acid scan		
Bromide	Fluoride	Phosphate
Chloride	Nitrate	Sulfate

Isocyanate scan	
Hexamethylene diisocyanate (HDI)	Isophorone diisocyanate (IPDI)
4,4-Methylene bisphenyl isocyanate (MDI)	2,4-Toluene diisocyanate (2,4-TDI)
2,6-Toluene diisocyanate (2,6-TDI)	

Metals — Liberty's 20-Metal scan			
Aluminum	Cadmium	Lead	Tin
Antimony	Chromium	Magnesium	Titanium
Arsenic	Cobalt	Manganese	Thallium
Beryllium	Copper	Nickel	Vanadium pentoxide as V
Calcium	Iron	Selenium	Zinc

Metals — 13-Metal scan (welding fume scan)			
Antimony	Cobalt	Manganese	Vanadium pentoxide as V
Beryllium	Copper	Molybdenum	Zinc
Cadmium	Iron	Nickel	
Chromium	Lead		

Organic acid scan			
Acetic acid	Butyric acid	Formic acid	Propionic acid

Organic solvents (GC/MS) scan		
(Qualitative analysis. For quantitative analysis please call lab.)		
Acetone	Dimethyl formamide (DMF)	Methyl amyl ketone (MAK)
Acetonitrile	1,4-Dioxane	Methyl cyclopentane
Acrylonitrile	Epichlorohydrin	Methyl ethyl ketone (MEK)
n-Amyl acetate	Ethanol	Methyl isoamyl ketone (MIAK)
Benzene	Ethyl acetate	Methyl isobutyl ketone (MIBK)
Sec-Butanol	Propylene glycol methyl ether acetate (PGMEA)	Methyl propyl ketone (MPK)
n-Butyl acetate		Methyl t-butyl ether (MTBE)
s-Butyl acetate	Propylene glycol monomethyl ether (PGME)	a-Methyl styrene
n-Butyl acrylate		Methylene chloride
n-Butyl alcohol	Styrene	Methyl methacrylate
Butyl cellosolve (2-Butoxyethanol)	Tetrahydrofuran	Nitromethane
Butyl cellosove acetate	Toluene	3-Pentanone (Diethyl ketone)
Carbon tetrachloride	1,1,1-Trichlorethane	Perchloroethylene
Cellosolve (2-Ethoxyethanol)	Propylene glycol butyl ether (PGBE)	a-Pinene
Cellosolve acetate	Ethyl lactate	n-Propanol
Chlorobenzene	Ethyl benzene	2-Propoxyethanol
Chloroform	1-Ethoxy-2-propyl acetate	n-Propyl acetate
o-Chlorotoluene	Heptane	Ethyl acrylate
Cumene	Hexane	1,1,2-Trichloroethane
Cyclohexanone	Isobutanol	Trichloroethylene
Diacetone alcohol	Isobutyl acetate	1,2,4-Trimethylbenzene
1,1-Dichloroethane	Isopropanol	1,3,5-Trimethylbenzene
1,2-Dichloroethane	Isopropyl acetate	Vinyl acetate
1,2-Dichloroethylene	d-Limonene	Xylene
Diisobutyl ketone	Methyl acetate	

PNAs (NIOSH 5506)			
Acenaphthene	Benzo[b]fluoranthene	Chrysene	Indeno[1,2,3-cd]pyrene
Acenaphthylene	Benzo[k]fluoranthene	Dibenz[a,h]anthracene	Naphthalene
Anthracene	Benzo[ghi]perylene	Fluoranthene	Phenanthrene
Benz[a]anthracene	Benzo[a]pyrene	Fluorene	Pyrene

PNAs (OSHA 58)		
Anthracene	Chrysene	Pyrene
Benzo[a]pyrene	Phenanthrene	

Sampling guide analyte descriptions and abbreviations

The following information is included in the Sample Guide's alphabetical listing of analytes:

Analyte Analytes are listed by their common name in alphabetical order in this sampling guide. The synonyms are listed within parenthesis. TVOC stands for Total Volatile Organic Compounds. VM&P Naphtha stands for Varnish Makers and Painters Naphtha.

CAS# Chemical Abstract Service number for the compound to be sampled.

Analytical method

This specifies the preferred analytical method used by Liberty Mutual for the analysis of the compound.

ASTM American Society for Testing and Materials

Ciba-Geigy Ciba-Geigy In-House Method for 1,3,5-triglycidyl isocyanurate

DuPont DuPont In-House Method for Perfluorooctanoic Acid

HSE MDHS UK Health & Safety Executive Methods for the Determination of Hazardous Substances

LMI Liberty Mutual Insurance "in-house" analytical methods

NIOSH NIOSH Manual of Analytical Methods

OSHA OSHA Manual of Analytical Methods

YAMATE LEVEL II Airborne Asbestos by Transmission Electron Microscopy

Analytical technique

AA Atomic absorption spectrophotometry

AA-CV Cold vapor atomic absorption spectrophotometry

EGA-TDA Evolved gas analysis-thermo dilatometric analyzer

FTIR Fourier Transform Infrared spectrophotometry

GC-DID Gas chromatography with pulsed discharge ionization detector

GC-ECD Gas chromatography with electron capture detector

GC-FID Gas chromatography with flame ionization detector

GC-MS Gas chromatography-mass spectrometry

GC-NPD Gas chromatography with nitrogen phosphorus detector

GC-TCD Gas chromatography with thermal conductivity detector

GC-XSD Gas chromatography with halogen specific detector

GFAA Graphite furnace atomic absorption spectrophotometry

GRAV Gravimetric analysis

HPLC High performance liquid chromatography

IC Ion chromatography

ICP Inductively coupled plasma spectroscopy

ICP-MS Inductively coupled plasma spectroscopy – mass spectrometry

ISE Ion selective electrode

LC-MS	High performance liquid chromatography – mass spectrometry
PCM	Phase contrast microscopy
PLM	Polarized light microscopy
TEM	Transmission Electron Microscopy; Energy dispersive X-ray (EDX) analyzer
UV/VIS	UV/VIS spectrophotometry
XRD	X-ray diffractometry

Sampling media

The recommended sampling media for each of the methods in this sampling guide are:

AgMF	25mm 0.45um Silver membrane filter (SKC 225-1802)
Anasorb708	SKC Anasorb 708 sorbent tube (SKC 226-30-08)
Anasorb747	SKC Anasorb 747 sorbent tube (SKC 226-81A)
Anasorb747/Anasorb747	SKC Anasorb 747 sorbent tube in series (SKC 226-82)
Anasorb747, Treated	SKC Anasorb 747 treated with tert-Butyl catechol (SKC 575-006)
AT Monitor	Assay Technology monitor for aldehydes (N517AT)
AT N2O Monitor	Assay Technology monitor for nitrous oxide (X575AT)
Bulk	Bulk sample tube
Cellulose Nitrate,Na2CO3	Cellulose nitrate filter treated with sodium carbonate (SKC 225-9031)
Carulite	Sorbent tube for mercury, replaces Hopcalite (SKC 226-17-1A/3A)
CS106	Chromosorb 106 sorbent tube (SKC 226-111A)
CT	Charcoal tube (SKC 226-01, 226-09)
CT-CT	2 Charcoal tubes in series
CT, KOH	Potassium hydroxide treated Anasorb CSC coconut charcoal tube (SKC 226-67)
Cylinder	300cc Aluminum cylinder
di H2O	Deionized water
GFF	Glass fiber filter
GFF, 1-2PP	1-(2-Pyridyl)piperazine treated glass fiber filter
GFF, Acid	Sulfuric acid treated glass fiber filter
GFF, HBr	Hydrogen bromide treated glass fiber filter
GFF-Florisil	Millipore Swinnex 13 with glass fiber filter (SX0001300/-01/ AP2001300) -Florisil tube (SKC 226-39) in series
GFF, IOM	IOM sampler with glass fiber filter
GFF-SGT	Millipore Swinnex 13 with glass fiber filter (SX0001300/-01 / AP2001300) -silica gel tube (SKC 226-10) in series
GFF, NaNO2	Sodium nitrite treated glass fiber filter
GFF,Vamine	Glass fiber filter coated with 10 mg of veratrylamine
GFF- PE,HgCl2	Glass fiber filter -polyester filter treated with mercuric chloride in series (SKC 225-9018)
Ghost wipe	SKC wipe for surface lead or other metals (SKC 225-2414)
IABC	Impregnated activated beaded carbon (SKC 226-80)
Impinger 4	Midget fritted glass bubbler containing 0.02% potassium iodide in sodium carbonate/sodium bicarbonate buffer

IOM	Personal inhalable sampler developed at the Institute of Occupational Medicine (IOM) in Scotland
MCE	Mixed cellulose ester filter membrane ((Zefon 728 MCE))
MCE2	Mixed cellulose ester filter membrane, 0.8µm, 25mm (Zefon 528 MCE) Mixed cellulose nitrate (SKC 225-9032)
MCE, 25mm 0.8um	Zefon PCM air sampling cassettes with conductive cowl (ZEFON Z008BA)
MCE, 25mm 0.45um	Zefon TEM air sampling cassettes with conductive cowl (ZEFON Z045BA)
MCE,carbonate	Mixed cellulose ester filter treated with 20:1 sodium carbonate: glycerol solution
MCE-CS102	Mixed cellulose ester filter-Chromosorb 102 tube (SKC 226-104)
MCE, SGT**	Mixed cellulose ester filter — SKC specially cleaned silica gel tube (226-10-03)
ORBO 34	Supelco specially treated charcoal tube for H2S (20211)
ORBO 77	Supelco carbon beads treated with sulfuric acid for ammonia(20036)
ORBO 78	Supelco Carboxen-564 carbon molecular sieve treated with hydrogen bromide (20355)
ORBO 92	Supelco Carboxen-564 carbon molecular sieve (20362)
OVM	3M 3500 organic vapor monitor
OVM 3520	3M 3520 organic vapor monitor with backup section
OVM 3551	3M 3551 organic vapor monitor for ethylene oxide
OVS-2/GFF	SKC XAD-2/glass fiber filter sorbent tube (226-30-16 OVS)
OVS-2/QF	SKC XAD-2/quartz filter sorbent tube (226-58 OVS)
OVS-7	SKC XAD-7/glass fiber filter sorbent tube (226-57 OVS)
OVS-Tenax	SKC tenax/glass fiber filter sorbent tube (226-56 OVS)
Oxidizer	SKC oxidizer with TEA-IMS for nitric oxide sampling
PS	SKC 520 inorganic mercury passive sampler (520-02A/03)
Paint chips	Paint chips sample in polyethylene bag
Porapak-P	SKC Porapak-P tube (226-114)
Porapak-Q	SKC Porapak-Q tube (226-115)
PTFE	25mm 0.5um Polytetrafluoroethylene (PTFE) filter (SKC 225-1708)
PTFE1	37mm 1.0um Polytetrafluoroethylene (PTFE) filter (Zefon FPTFE137)
PTFE3	37mm 5.0um Polytetrafluoroethylene (PTFE) filter (SKC 225-17A)
PTFE4	PALL Life Sciences 47mm, 0.45um polytetrafluoroethylene (Teflon) filter (TF-450, P/N 66149)
PTFE5	25mm 1.0um Polytetrafluoroethylene (PTFE) filter (SKC 225-2714)
PTFE-SGT	Teflon filter-silica gel tube in series
PTFE/XAD2	Teflon filter-XAD-2 tube in series
PTFE-AgMF	SKC polytetrafluoroethylene (Teflon) filter-silver membrane filter in series (225-1708) (225-1802)
PVC	37mm 5.0um pre-weighed polyvinyl chloride filter (SKC 225-5-37-P)
PVC-KOH	Polyvinyl chloride filter- Midget fritted glass bubbler containing 0.1 N potassium hydroxide in series
QFF	Quartz fiber filter (Millipore AQFA03700)
QFF, titanium oxysulfate	Quartz fiber filter (SKC 225-9030)
QFF, Na2CO3	Quartz fiber filter (Millipore AQFA03700) treated with sodium carbonate (SKC 225-9032)

Sep-Pak	Waters dinitrophenylhydrazine (DNPH) treated cartridge for aldehydes (WAT047205)
SGT	Silica gel tube (SKC 226-10) with sorbent 75/150 mg
SGT	Silica gel tube (SKC 226-51) with sorbent 50/100 mg
SGT**	SKC specially cleaned silica gel tube (226-10-03)
SGT/GFF	SKC silver nitrate coated silica gel tube with GFF coated with Na2CO3/glycerol) (SKC 226-177)
SGT,Acid	SKC sulfuric acid treated silica gel tube (226-10-06)
SGT, DNPH	SKC dinitrophenylhydrazine impregnated silica gel tube (226-119)
SGT/GFF-SGT/GFF	2 specially washed and dried silica gel tubes in series (SKC 226-183)
SGT, HgCl2	SKC mercuric chloride coated silica gel tube (226-10-02)
Soda Lime	SKC soda lime tube (226-210)
TEA-IMS	Triethanolamine-impregnated molecular sieve tube (SKC 226-40-02 / 226-40A with oxidizer)
Tenax	SKC tenax tube (226-35/226-35-01)
Whatman 42	Whatman 1442-070
XAD-2	SKC sorbent tube (226-30/226-30-04/226-30-06)
XAD-2,NITC	SKC sorbent tube coated with 10% 1-naphthylisothiocyanate (NITC) (226-30-18)
XAD-2,p-An	SKC sorbent tube (50/100) coated with 0.5mg of p-Anisidine (226-30-07)
XAD-7	SKC sorbent tube (226-95)
XAD-7, Acid	SKC XAD-7 sorbent (1,2-Dichloroethane) t tube treated with 10% phosphoric acid (226-98)

Sampling rate (flow rate)

For passive monitors (OVM and AT monitor): cc/min. For all other compounds listed in the guide: liters per minute (lpm).

The sampling time in minutes for passive monitors and the sampling volume range indicates the minimum and maximum volume in liters. For bulk samples, the amount needed is listed in grams in this column. Minimum volumes are typically calculated to allow quantification at 10% of the occupational exposure limits unless otherwise stated.

LOQ (Limit of Quantitation)/LOD (Limit of Detection)

Limit of Quantification and Limit of Detection are reported to two significant digits: %-Percent for bulk sample, fib/fld- Fibers per field, and µg- Micrograms/sample.

Compatibility code

This code indicates analytes that can be collected and analyzed simultaneously on a single sample. The absence of a code means that the analyte is not compatible with other analytes and would need to be collected on separate samples. The codes are as follows:

1%DMF/CS_2	Desorption in 1% dimethylformamide in carbon disulfide
1%IPA/CS_2	Desorption in 1% isopropanol in carbon disulfide
1%PRO/CS_2	Desorption in 1% n-propanol in carbon disulfide
5%IPA	Desorption in 5% isopropanol in deionized water
5% IPA/ CS_2	Desorption in 5% isopropanol in carbon disulfide
5%PRO/CS_2	Desorption in 5% n-propanol in carbon disulfide
95%EtOH	Desorption in 95% ethanol in deionized water
AC/CS_2	Desorption in 2% acetone in carbon disulfide
AC/MeOH	Desorption in 1% methanol in acetone

Acid1	Inorganic acids group 1 (see List of Scans for Inorganic Acids)
Acid2	Organic acids group 2 (formic acid, acetic acid, butyric acid, and propionic acid)
ACN	Desorption in acetonitrile
ACN/TOL	Desorption in 50% acetonitrile/toluene
ACN/DMSO	Desorption in 90% acetonitrile/dimethylsulfoxide
Acetone	Desorption in acetone
Aldehyde	Aldehyde group
Amine1	Aliphatic amine group by GC-FID
Amine2	Aliphatic amine group by HPLC
Amine3	Aromatic amine group
Benzene	Desorption in benzene
BUT/CS_2	Desorption in 1% 2-butanol in carbon disulfide
CCl_4	Desorption in carbon tetrachloride
Cl_2&Br_2	Chlorine and bromine
CS_2	Desorption in carbon disulfide
dil acid	Diluted sulfuric acid
DMF/CS_2	Desorption in 50% dimethylformamide in carbon disulfide
EA	Ethanolamine/diethanolamine/triethanolamine
Ethyl Acetate	Desorption in ethyl acetate
Ethyl Ether	Desorption in ethyl ether
FA	Desorption in formic acid
Isocyanate	Isocyanate and diisocyanate group
MC	Desorption in methylene chloride
MeOH	Desorption in methanol
MeOH/CS_2	Desorption in 1% methanol in carbon disulfide
%MeOH/MC	Desorption in mixture of methanol and methylene chloride
Metals	Metal group by either NIOSH 7301 or OSHA ID-125G
Metal1	Compatible metal group by modified NIOSH 7300 method
Metal2	Compatible metal group by modified OSHA ID-121 method
NO&NO_2	Nitric oxide and nitrogen dioxide
Phenol&cresol	Phenol and cresol group
PNAs	Polynuclear aromatic hydrocarbons
Silica	Silica by XRD
Tol	Desorption in toluene

Interferences

This column lists the possible interferences as stated in the analytical method.

Comments

This column contains special instructions for sample collection and handling.

Notes for gas analysis in comments

Note 1, Breathing air: Grade D and Grade E, Collected in Cylinders

Use when sampling a compressed gas line at 50 psig (i.e., before it goes into the regulator of the SCBA). If the pressure is lower than 50 psig, be sure to record the line pressure. This method reports CO, CO_2, $\%O_2$, total hydrocarbons as CH_4 (TH), total halogenated hydrocarbons as CCl_4 (HH) and dew point (DP) in ppm and degrees F at 0 psig. See Procedure for Removing the Cylinder and LOQ at end of notes. Gravimetric analysis for condensed oil (total particulate) requires a 47mm Teflon filter.

Note 2, Medical gases – Contamination (NFPA 99)

Use when sampling a compressed medical gas line at 50 psig. When testing medical air, this method reports CO, CO_2, $\%O_2$, total hydrocarbons as CH_4 (TH), total halogenated hydrocarbons as CCl_4 (HH) and dew point (DP) in ppm and degrees C at 50 psig. When testing nitrogen, this method reports CO, CO_2, total hydrocarbons as CH_4 (TH), total halogenated hydrocarbons as CCl_4 (HH) and dew point (DP) in ppm and degrees C at 50 psig. For oxygen, this method reports the same as medical air, except dew point. For nitrous oxide, this method reports CO, % Air and total halogenated hydrocarbons as CCl_4. See Procedure for Removing the Cylinder and LOQ at end of notes. Gravimetric analysis for condensed oil (total particulate) requires a 47-mm Teflon filter. The minimum sampling time for the gravimetric sample is 10 minutes in order to sample at least 1000 liters of gas, at 50 psig.

Procedure for removing the cylinder

A common mistake is removing the cylinder and the “A” fixture together. The correct steps are: Remove fixture “B.” The pop-off valve will activate. Remove the cylinder from fixture “A”, then remove fixture “A” from the gas line. Please refer to sampling instructions. Failure to follow the sampling instructions will result in the cylinder not being pressurized. ***Samples that are not pressurized cannot be analyzed.***

Limits of quantification

	Grav.	Air	CO	CO_2	Dew Pt	O_2	TH	HH
GAS	µg/s	%	ppm	ppm	see notes	%	ppm	ppm
Grade D&E	50	NA	0.50	25	200ppm, -32.6°F	0.30	0.50	0.50
Medical Air	50	NA	0.50	25	200ppm, -21.5°C	0.30	0.50	0.50
Nitrogen	50	NA	0.50	25	200ppm, -21.5°C	NA	0.50	0.50
Oxygen	50	NA	0.50	25	NA	0.30	0.50	0.50
Nitrous Oxide	50	0.15	0.50	NA	NA	NA	NA	0.50

Fee schedule for common analyses

This fee schedule gives a listing of prices for the most frequently requested analyses, effective May 1, 2021 to December 2022.

If the analysis you require is not listed, please contact us for a price estimate.

Metals	First	Additional
Common metals by ICP [1,4]	$36	$26
Beryllium oxide	$55	
Chromium VI (paint) [1]	$100	
Chromium VI (soluble) [1]	$75	
13 metal scan (welding fume scan) [1,2,4]	$150	
20 metal scan [1,2,4]	$190	

Microscopy		
Asbestos fiber count (PCM)	$35	
Asbestos fiber identification (PLM)	$40	

Gravimetric analysis		
Dust (carbon black (NIOSH 5000), oil mist, respirable, welding fume)	$27	
Inhalable dust [3]	$35	
Condensed oil/particulate	$50	

High performance liquid chromatography (HPLC)		
Common HPLC (aldehydes & isocyanates)	$95	$45
Anhydrides (maleic & trimellitic) [3]	$100	$50
Amines (if collected on NITC tubes) [3]	$90	$45
Aldehyde scan	$230	
Isocyanate scan	$190	
Pharmaceuticals [3]	$110	$50

Ion chromatography (IC)		
Common IC (inorganic acids, anion & cation) [4]	$65	$44
Chlorine dioxide [3]	$80	
Chlorine & bromine [3]	$85	
Fluorides (gaseous and particulate) [3,4]	$115	
Organic acids (such as formic, acetic, butyric, lactic, propionic)	$70	$44
Inorganic and organic acid scan	$165	

Silica (by XRD)	Air	Bulk
Quartz	$70	$100
Quartz and cristobalite	$85	$130
Quartz, Cristobalite and tridymite	$105	$140

Solvents

Common solvents	First	Additional
Solid sorbent tubes (CT, SGT, etc.)	$55	$32
Organic vapor monitors (3M 3500/ 3520)	$72	$32
GC/MS Scan (15 analytes quantified)	$250	

Other solvents

Amines [3]	$85	$50
Diacetyl or acetoin	$95	$45
Ethylene oxide (sorbent tube/passive monitor)	$105/$120	
Glycols and phthalates	$105	$120
Organo sulfur compounds[3]	$105	$55
Mixtures on tubes or sorbent tubes in series	$70	$32
PCBs [3]	$90	$45
1,3,5 Triglycidyl isocyanurate[3]	$105	

Special methods analyses

Aminoethanols	$88	$45
Asphalt fume (NIOSH 5042)	$75	
Carbon black (OSHA 196)	$80	
Coal tar pitch volatile, BSF	$90	
Cyanide (NIOSH 7904)	$75	
Gas analysis (medical and Grade D Air)	$165	
Hydrogen peroxide (OSHA VI-6)/filter [4]	$90	
Metal working fluids (NIOSH 5524)	$80	
Oil mist mineral by FTIR (NIOSH 5026) [3]	$75	
PNA scan (NIOSH 5506)	$280	
PNA scan (OSHA 58)	$190	
Specialty metals by ICP	$55	$32
Specialty metals by AA (includes mercury)	$65	$32
Metals by ICP/MS [3]	$50	$32
Organic tin [3]	$80	
Ozone	$70	

Prices are subject to change without notice.

Special charges

1. Preparation charge applies to bulk and wipes: $10 per sample.
2. Customized reporting: $40 per report.
3. Three sample minimum required.
4. Media charge applies to some specialty media such as PPI and treated filters.

Method development/validation

We partner with our customers to develop new methods for analytical testing, as well as validate existing methods. Please contact the lab for quote on method development or validation costs.

Sample blanks

Sample blanks are recommended for all sampling activities and are charged at the same rate as the sample.

Sampling guide

Sampling Guide provides further information about air sampling and our lab services. The Sampling Guide may be accessed by contacting the lab (lmihlaboratory@libertymutual.com) or for our policy holders via Liberty Mutual SafetyNet™.

Terms and conditions

The following statements describes the terms and conditions under which the Liberty Mutual Industrial Hygiene Laboratory (LMIHL) operates.

The client is responsible for the condition and custody of all samples prior to receipt, inspection and acceptance by LMIHL.

Methods used by LMIHL to analyze your samples are compliant with NIOSH, OSHA and other regulatory agencies. LMIHL reserves the right to interpret these methodologies when applying them to the analysis of client's samples based on reasonable, professional judgment of LMIHL personnel and recognized industry standards.

LMIHL reserves the right to use our standard template in reporting analytical results. Where reasonable, we will make every effort to honor requests for special hardcopy or electronic formats if requested in advance.

LMIHL requires authorization in writing when requesting additional distribution of lab reports to other than the client

LMIHL may release reports upon the request of the client either verbally or by email. Such reports are considered tentative and may be subject to modification after completion of QA/QC review.

Report will only contain analytical data. LMIHL is not in the position to interpret data as they pertain to regulations, calculation of time-weighted average exposures from analytical results, etc.

Equipment rental

Inhalable Samplers: $20 each per week (two week maximum); Calibrator adaptor: $10 per week additional.

Sampling devices and media

Sampling pumps and compressed gas analysis media

Pre-calibrated air sampling pumps and gas analysis (Grade D, E or Medical Gas) air sampling equipment are loaned at no charge for two weeks. At least one week notice prior to your "need by date" is required by the lab. After two weeks, charges of $15 per day, per pump, or per gas cylinder or filter will apply.

Return policy

Media is provided at no cost when returned to laboratory for analysis within 30 days. After 30 days, unreturned media will be invoiced at cost plus shipping. Returned unused specialty media that cannot be reused (isocyanates filters,aldehyde badges,sorbent tubes, ozone filters, etc.) will be charged at cost plus shipping.

Shipping

UPS ground shipping within the 48 states is provided for sampling media at no extra charge. Return shipping is the client's responsibility. Rush and international shipping charges will be added to analysis fees. Media orders for same day shipping must be submitted by 2 p.m. Eastern Time, Monday through Friday. Media requiring cold shipping cannot be delivered over the weekend. Order the media by contacting the lab.

Common analytes

Common aldehydes: Acetaldehyde, acrolein, formaldehyde, benzaldehyde, butyraldehyde, valeraldehyde, and propionaldehyde.

Common Isocyanates: Hexamethylene diisocyanate (HDI), Isophorone diisocyanate (IPDI), Methylene bis-phenyl isocyanate (MDI), Toluene-2,4-diisocyanate (2,4-TDI), Toluene-2,6-diisocyanate (2,6-TDI).

Common metals: Aluminum, Antimony, Arsenic, Barium, Beryllium, Calcium, Cadmium, Chromium, Cobalt, Copper, Iron, Lanthanum, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Platinum, Potassium, Selenium, Sodium, Silver, Strontium, Tellurium, Tin, Titanium, Thallium, Vanadium, Zinc, Zirconium

Specialty metals: Arsenic Trioxide, Arsine, Beryllium Oxide, Bismuth, Boron, Gallium, Germanium, Germane, Gold, Indium, Palladium, Phosphine, Rhodium, Silane, Titanium dioxide, Tungsten, Yttrium

Welding fume: Includes antimony, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, vanadium, zinc.

20 metal scan: Aluminum, Antimony, Arsenic, Beryllium, Calcium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Selenium, Tin, Titanium, Thallium, Vanadium, Zinc. Can be customized. Please contact lab.

Inorganic acid scan: hydrogen bromide, hydrogen chloride, hydrogen fluoride, nitric acid, phosphoric acid, sulfuric acid.

Organic acid scan: acetic acid, butyric acid, formic acid, propionic acid.

Organo sulfur compounds: carbon disulfide, dimethyl sulfide, etc.

Solvent mixtures: mineral spirits, naphthas, Stoddard solvents, TVOC, kerosene, etc.

Alphabetical list of analytes

Acenaphthene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
83-32-9	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.33 µg	0.17 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Acenaphthylene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
208-96-8	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.45 µg	0.23 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Acetaldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-07-0	NIOSH 2016	HPLC	AT Monitor (N571AT)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
11.7	15-480	0.029 µg	0.015 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	Refrigerate media before and after sampling. Ship samples cold overnight.

Acetaldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-07-0	NIOSH 2016	HPLC	SGT, DNPH (SKC 226-119)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	1-15	0.058 µg	0.029 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	**Refrigerate** media before and after sampling. Ship samples cold overnight. **Preferred for STEL sampling**. Sample at 1 lpm for STEL.

†(LPM) (CC/Min) **††(L) (Minutes)**

Acetic Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
64-19-7	NIOSH 2011	IC	PTFE3-SGT** (SKC 225-17A, SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.5	5-100	2.3 µg	1.2 µg	Acid2

Interferences	Comments
Particulate salts of the acid will give a positive interference.	**Preferred method for STEL and also Lab-preferred method.** Use 0.2 lpm for flow rate. Do not sample with inorganic acids.

Acetic Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
64-19-7	OSHA ID-PV2119	IC	CT (SKC 226-01)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2	5-100	2.3 µg	1.2 µg	

Interferences	Comments

Acetic Anhydride

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-24-7	OSHA 102	HPLC	GFF, vamine

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.5	20	14 µg	7.0 µg	ACN/DMSO

Interferences	Comments
	Sampling media has short shelf-life. Please contact the lab at least 5 days prior to survey date to order media. Media are prepared as requested.

Acetone

CAS #	Analytical Method	Analytical Technique	Sampling Media
67-64-1	NIOSH 1300	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	0.5-3	0.91 µg	0.46 µg	CS_2

Interferences	Comments
	Store and ship cold overnight.

†(LPM) (CC/Min) ††(L) (Minutes)

Acetone

CAS #	Analytical Method	Analytical Technique	Sampling Media
67-64-1	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
40.1	15-120	1.4 µg	0.70 µg	CS_2

Interferences	Comments
	Store and ship cold overnight.

Acetonitrile

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-05-8	NIOSH 1606	GC-FID	CT (SKC 226-09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	3-25	1.0 µg	0.50 µg	15%MeOH/MC

Interferences	Comments
Samples containing greater than 15% methanol or other alcohols	Large charcoal tubes are required for analyte collection since breakthrough volume is lower compared with smaller charcoal tubes. If also sampling for aldehydes, use AT monitors or Sep-Paks. **Do not use DNPH tubes as they may off-gas acetonitrile.**

Acetonitrile

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-05-8	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
48.2	15-120	1.5 µg	0.75 µg	DMF/CS_2; CS_2

Interferences	Comments
	Preferred method. Use 3M 3520. Separate front section of the monitor from the back section and cap immediately after sampling. If also sampling for aldehydes, use AT monitors or Sep-Paks. **Do not use DNPH tubes as they may off-gas acetonitrile.**

Acrolein

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-02-8	NIOSH 2016	HPLC	AT Monitor (N571AT)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
10.3	15-480	0.027 µg	0.014 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved	Refrigerate media before and after sampling. Ship samples cold overnight.

†(LPM) (CC/Min) **††(L) (Minutes)**

Acrolein

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-02-8	NIOSH 2016	HPLC	SGT, DNPH (SKC 226-119)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	1-15	0.054 µg	0.027 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	Refrigerate media before and after sampling. Ship samples cold overnight. **Preferred for STEL sampling**. Use flow rate of 1 lpm.

Acrolein

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-02-8	NIOSH 2016	HPLC	Sep-Pak (WAT047205)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	10-100	0.14 µg	0.070 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	Refrigerate media before and after sampling. Ship samples cold overnight. Preferred for STEL sampling. Use flow rate of 1 lpm.

Acrylamide

CAS #	Analytical Method	Analytical Technique	Sampling Media
79-06-1	OSHA 21	GC-FID	GFF-SGT (SKC 225-16; SKC226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	120	0.62 µg	0.31 µg	MeOH

Interferences	Comments
	Sample separately from CS_2 compatible solvents. 2019 NIC, TWA = 0.03ppm(IFV), Skin;DSEN;A2 adopted in 2020.

Acrylic Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
79-10-7	OSHA PV2005	HPLC	Anasorb708/ Anasorb708 (SKC 226-30-08)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	24	0.33 µg	0.17 µg	

Interferences	Comments
Propanoic acid will interfere.	Sample with 2 Anasorb 708 tubes in series. Separate and cap tubes after sampling.

†(LPM) (CC/Min) **††(L) (Minutes)**

Acrylonitrile (Vinyl Cyanide)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-13-1	OSHA 37	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	3.5-20	0.68 µg	0.34 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at 0.2 lpm.

Acrylonitrile (Vinyl Cyanide)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-13-1	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
43.8	15-480	1.0 µg	0.51 µg	DMF/CS_2 CS_2

Interferences	Comments

Aldehyde scan

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 2016	HPLC	

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code

Interferences	Comments
	See List of Scans for individual aldehydes. Refrigerate media before and after sampling. Ship samples cold overnight.

Aliphatic Amine scan

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 2010	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-1	5-30			Amine1

Interferences	Comments
Nitrogen compounds that co-elute will interfere.	Ethylamine, diethylamine and triethylamine are analyzed by this method. Please call Lab for other amines. High moisture will limit collection efficiency.

†(LPM) (CC/Min) **††(L) (Minutes)**

Allyl Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-18-6	NIOSH 1402	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	5-10	0.72 µg	0.36 µg	5% IPA/CS_2

Interferences	Comments
	Sample separately from CS_2 compatible solvents.

Allyl Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-18-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
40.4	15-480	1.1 µg	0.55 µg	MC or CS_2

Interferences	Comments

Allyl Bromide

CAS #	Analytical Method	Analytical Technique	Sampling Media
106-95-6	OSHA 1000	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-1.0	16-100	1.6 µg	0.80 µg	CS_2

Interferences	Comments

Allyl Bromide

CAS #	Analytical Method	Analytical Technique	Sampling Media
106-95-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
32.5	180-480	2.4 µg	1.2 µg	CS_2

Interferences	Comments

Allyl Chloride

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-05-1	NIOSH 1000	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-1.0	16-100	0.96 µg	0.48 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at a flow rate of 1 lpm.

†(LPM) (CC/Min) **††(L) (Minutes)**

Allyl Chloride

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-05-1	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
35.1	15-480	1.4 µg	0.72 µg	CS_2

Interferences	Comments

Aluminum Metal and insoluble compounds

CAS #	Analytical Method	Analytical Technique	Sampling Media
7429-90-5	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	200-1000	5.0 µg	2.5 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Aluminum Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
1344-28-1	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	40-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 LPM, for area sampling up to 15 LPM.

Amines, Aliphatic (see scan for aliphatic amines)

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 2010	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-1	5-30	Varies	Varies	Amine1

Interferences	Comments
Nitrogen compounds that co-elute will interfere.	Ethylamine, diethylamine and triethylamine are analyzed by this method. Please call Lab for other types of amines. High moisture will limit collection efficiency.

†(LPM) (CC/Min) **††(L) (Minutes)**

Amines, Aromatic (see scan for aromatic amines)

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 2002	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.02-0.5	5-30	Varies	Varies	Amine3

Interferences	Comments
Nitrogen compounds that co-elute will interfere	Aniline, methylaniline and o-toluidine are analyzed by this method. Please call Lab for other types of amines. High moisture will limit collection efficiency.

Ammonia

CAS #	Analytical Method	Analytical Technique	Sampling Media
7664-41-7	OSHA ID-188	IC	ORBO 77 (SUPELCO 20036) SKC 226-29

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-0.5	8-100	4.7 µg	2.4 µg	

Interferences	Comments
Particulate ammonium salts will interfere.	Sample at a flow rate of 0.5 lpm for STEL.

Ammonium Chloride Fume

CAS #	Analytical Method	Analytical Technique	Sampling Media
12125-02-9	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	40-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 lpm; for area sampling up to 15 lpm.

Amyl Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
628-63-7	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	2.3 µg	1.2 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Amyl Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
628-63-7	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
26.0	15-480	3.5 µg	1.8 µg	CS_2

Interferences	Comments

Anesthetic Gases scan

CAS #	Analytical Method	Analytical Technique	Sampling Media
	OSHA 103	GC-FID	Anasorb 747 (SKC 226-81A)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05	12	Varies	Varies	

Interferences	Comments
	Analyzes enflurane, halothane and isoflurane. See List of Scans for anesthetic gases. Please call lab for other anesthetic gases. Store and ship cold.

Aniline

CAS #	Analytical Method	Analytical Technique	Sampling Media
62-53-3	NIOSH 2002	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.02-0.5	5-30	1.0 µg	0.50 µg	Amine3

Interferences	Comments
Nitrogen compounds that co-elute will interfere.	

Anthracene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
120-12-7	OSHA 58	HPLC	GFF (SKC 225-7)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	960	0.25 µg	0.13 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, cap and wrap in aluminum foil. Ship and store cold.

†(LPM) (CC/Min) **††(L) (Minutes)**

Anthracene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
120-12-7	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.25 µg	0.13 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Antimony and compounds as Sb

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-36-0	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	50-1000	0.51 µg	0.26 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Antimony and compounds as Sb

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-36-0	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	40-240	0.75 µg	0.38 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

Aromatic 100

CAS #	Analytical Method	Analytical Technique	Sampling Media
64742-95-6	NIOSH 1550	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	1.3-20	0.55 µg	0.28 µg	CS_2

Interferences	Comments
Other aromatic compounds.	Please send bulk sample. Ship bulk samples separately from air samples.

†(LPM) (CC/Min) **††(L) (Minutes)**

Aromatic Amine scan

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 2002	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.02-0.5	5-30	Varies	Varies	Amine3

Interferences	Comments
	Aniline, methylaniline and o-toluidine are analyzed by this method. Please call Lab for other types of amines.

Arsenic and inorganic compounds, as As

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-38-2	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	560-1000	0.56 µg	0.28 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	Use ICP-MS analysis for lower detection limit at an additional cost. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Arsenic and inorganic compounds, as As

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-38-2	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	180-480	0.025 µg	0.012 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

Arsenic and inorganic compounds, as As

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-38-2	OSHA ID-121 OSHA ID-125G	ICP	ghost wipe (SKC 225-2414)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	6.5 µg	3.2 µg	Metals2

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Arsenic Trioxide as As

CAS #	Analytical Method	Analytical Technique	Sampling Media
1327-53-3	NIOSH 7901	ICP-MS	MCE, carbonate

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-3	180-1000	0.033 µg	0.016 µg	

Interferences	Comments
All forms of Arsenic are quantified.	**Media has one week shelf-life**. Media are prepared as requested. Please contact Lab in advance of survey date. As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

Arsine

CAS #	Analytical Method	Analytical Technique	Sampling Media
7784-42-1	NIOSH 6001	ICP	CT (226-01,-09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	10	0.052 µg	0.026 µg	

Interferences	Comments
Other forms of Arsenic compounds (aerosol and gases) are quantified as Arsine.	High moisture may limit collection efficiency. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Arsine

CAS #	Analytical Method	Analytical Technique	Sampling Media
7784-42-1	NIOSH 6001	ICP-MS	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	10	0.026 µg	0.013 µg	

Interferences	Comments
Other forms of Arsenic compounds (aerosol and gases) are quantified as Arsine.	High moisture may limit collection efficiency. As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

Asbestos (bulk), all forms

CAS #	Analytical Method	Analytical Technique	Sampling Media
1332-21-4	NIOSH 9002	PLM	Bulk

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
N.A.	1-10 grams	1.0%	1.0%	

Interferences	Comments
Other fibers with optical properties similar to the asbestos minerals may give positive interferences.	Send bulk samples for asbestos analysis in double bagged ziplock bags with labels and chain of custody form outside the bag.

†(LPM) (CC/Min) **††(L) (Minutes)**

Asbestos (Fibers)

CAS #	Analytical Method	Analytical Technique	Sampling Media
Various	NIOSH 7400	PCM	MCE, 25 mm (ZEFON Z008BA)

Sampling Rate†	Sampling Volume††	LOQ	LOQ	Compatibility Code
0.5-16	50-720	0.050 asb/field	0.01 asb/field	

Interferences	Comments
Chain-like particles may appear fibrous leading to high count and high levels of non-fibrous dust particles may obscure fibers leading to low count.	Sample open faced. Adjust sampling flow rate and time to obtain optimum fiber loading on the filter. Do not overload filter. When shipping your samples, do not pack with untreated polystyrene as it can lead to fiber loss from electrostatic effect.

Asbestos, all forms

CAS #	Analytical Method	Analytical Technique	Sampling Media
1332-21-4	YAMATE LEVEL II	TEM	MCE 25-mm, 0.45-um (ZEFON Z045BA)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2.48-17.62	74-529	0.050 asb/field	0.01 asb/field	

Interferences	Comments
Other amphiboles similar to the asbestos minerals may give positive interferences. High dust background interferes with fiber identification.	Sample open faced. Adjust sampling flow rate and time to obtain optimum fiber loading on the filter. Do not overload filter. This analysis is sub-contracted to an AIHA-LAP, LLC accredited lab. **Standard turnaround time is 10 business days.**

Asbestos, all forms

CAS #	Analytical Method	Analytical Technique	Sampling Media
1332-21-4	NIOSH 7402	TEM	MCE, 25 mm (ZEFON Z008BA)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.5-16	50-720	0.050 asb/field	0.01 asb/field	

Interferences	Comments
Other amphiboles similar to the asbestos minerals may give positive interferences. High dust background interferes with fiber identification.	Sample open faced. Adjust sampling flow rate and time to obtain optimum fiber loading on the filter. Do not overload filter. This method is designed for use with Method 7400 (phase contrast microscopy). This analysis is sub-contracted to an AIHA-LAP, LLC accredited lab. **Standard turnaround time is 10 business days.**

Asphalt Fume

CAS #	Analytical Method	Analytical Technique	Sampling Media
8052-42-4	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	40-7200	50 µg	10 µg	

Interferences	Comments
All types of dusts will interfere.	For personal sampling use a flow rate of 1-2 lpm; for area sampling up to 15 lpm.

†(LPM) (CC/Min) **††(L) (Minutes)**

Asphalt Fume as Benzene-Soluble Aerosol

CAS #	Analytical Method	Analytical Technique	Sampling Media
8052-42-4	NIOSH 5042	GRAV	Pre-weighed PTFE1 (Zefon FPTFE137)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	176-960	130 µg	63 µg	

Interferences	Comments
All substances soluble in benzene will interfere. Changes in humidity pre- and post weighing can affect accuracy.	Benzene extraction is done first. Scan is only done if BSF results are at or above the TLV. For inhalable sampling, please contact Lab for IOM sampler 1 week before intended use. The availability of IOM samplers is limited. Rental charges for use of IOM sampler apply.

Barium and soluble compounds as Ba

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-39-3	NIOSH 7301 NIOSH 7303	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	25-1000	0.50 µg	0.25 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Benz[a]anthracene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
56-55-3	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.082 µg	0.041 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Benzaldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
100-52-7	NIOSH 2016	HPLC	AT Monitor (N571AT)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
6.97	15-480	0.047 µg	0.024 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	Refrigerate media before and after sampling. Ship samples cold overnight.

†(LPM) (CC/Min) ††(L) (Minutes)

Benzaldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
100-52-7	NIOSH 2016	HPLC	Sep-Pak (WAT047205)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	10-100	0.24 µg	0.12 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	Refrigerate media before and after sampling. Ship samples cold overnight. **Preferred for STEL sampling**. Use flow rate of 1 lpm for STEL

Benzaldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
100-52-7	NIOSH 2016	HPLC	SGT, DNPH (SKC 226-119)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	1-15	0.094 µg	0.048 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	Refrigerate media before and after sampling. Ship samples cold overnight. **Preferred for STEL sampling**. Use flow rate of 1 lpm for STEL

Benzene

CAS #	Analytical Method	Analytical Technique	Sampling Media
71-43-2	NIOSH 1501	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	5-30	0.40 µg	0.20 µg	CS_2

Interferences	Comments
	Sample at flow rate of 0.2 lpm for STEL.

Benzene

CAS #	Analytical Method	Analytical Technique	Sampling Media
71-43-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
35.5	15-480	0.60 µg	0.30 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) **††(L) (Minutes)**

Benzo[a]pyrene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
50-32-8	OSHA 58	HPLC	GFF (SKC 225-7)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	960	0.20 µg	0.10 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Benzo[a]pyrene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
50-32-8	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.20 µg	0.10 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Benzo[b]fluoranthene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
205-99-2	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.19 µg	0.095 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Benzo[e]pyrene

CAS #	Analytical Method	Analytical Technique	Sampling Media
192-97-2	NIOSH 5515	GC-MS	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.57 µg	0.29 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

†(LPM) (CC/Min) **††(L) (Minutes)**

Benzo[ghi]perylene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
191-24-2	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.27 µg	0.14 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Benzo[k]fluoranthene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
207-08-9	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.25 µg	0.13 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Benzyl Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
100-51-6	NIOSH 1402	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	1-10	0.72 µg	0.36 µg	5%IPA/CS_2

Interferences	Comments

Benzyl Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
100-51-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.1	15-480	1.1 µg	0.55 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) **††(L) (Minutes)**

Benzyl Chloride

CAS #	Analytical Method	Analytical Technique	Sampling Media
100-44-7	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.73 µg	0.37 µg	CS_2

Interferences	Comments

Benzyl Chloride

CAS #	Analytical Method	Analytical Technique	Sampling Media
100-44-7	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.2	15-480	1.1 µg	0.55 µg	CS_2

Interferences	Comments

Beryllium and compounds as Be

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-41-7	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	400-1000	0.010 µg	0.0050 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	**Minimum air volume required at 1/2 of TLV is 400 L.** As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.** Also indicate in your sample submission form if beryllium oxide is suspected to be present. Beryllium oxide requires analysis by OSHA ID-125G.

Beryllium and Compounds as Be

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-41-7	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	240	0.0012 µg	0.00059 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.** Also indicate in your sample submission form if beryllium oxide is suspected to be present. Beryllium oxide requires analysis by OSHA ID-125G.

†(LPM) (CC/Min) **††(L) (Minutes)**

Beryllium and Compounds as Be

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-41-7	OSHA ID-121 OSHA ID-125G	ICP	ghost wipe (SKC 225-2414)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	0.082 µg	0.041 µg	Metals2

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples. Also indicate in your sample submission form if beryllium oxide is suspected to be present. Beryllium oxide requires analysis by OSHA ID-125G.**

Biphenyl (Diphenyl)

CAS #	Analytical Method	Analytical Technique	Sampling Media
92-52-4	OSHA PV2022	GC-FID	XAD-7 (SKC-226-95)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.20	20	0.46 µg	0.23 µg	CS_2

Interferences	Comments

Bismuth

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-69-9	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	25-1000	0.50 µg	0.25 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Bisphenol A

CAS #	Analytical Method	Analytical Technique	Sampling Media
80-05-7	OSHA 1018	HPLC	GFF

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.0	240	0.32 µg	0.16 µg	

Interferences	Comments
	Samples must be stored and shipped cold.

†(LPM) (CC/Min) **††(L) (Minutes)**

Borate compounds, inorganic

CAS #	Analytical Method	Analytical Technique	Sampling Media
varies	NIOSH 7303	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	25	varies	varies	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	LOQ for boron is 1.1 µg/sample. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.** OEL is as inhalable. Order IOM samplers a week before survey date. Rental charges for IOM samplers apply.

Breathing Air Grade D, Grade E

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0500 LMI-A5	GRAV GC-FID GC-ECD GC-TCD GC-XSD	PTFE4 (PALL TF-450) Cylinder

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	40-1000 (gravimetric) 300cc/25 psig (Cylinder)	Note 1	–	BA

Interferences	Comments
At high levels argon interferes with oxygen and nitrous oxide interferes with carbon dioxide.	A particulate blank is required.

Bromine

CAS #	Analytical Method	Analytical Technique	Sampling Media
7726-95-6	NIOSH 6011	IC	PTFE-AgMF (SKC 225-1708, SKC 225-1802)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.3-1.0	70-360	4.5 µg	3.0 µg	Cl_2&Br_2

Interferences	Comments
Hydrobromic acid will interfere.	**Preferred method**.

Bromo(1-)-2-Chloroethane

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-04-0	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	1.0 µg	0.50 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Bromoform

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-25-2	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-50	1.1 µg	0.55 µg	CS_2

Interferences	Comments

Bromoform

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-25-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
29.3	15-480	1.7 µg	0.85 µg	CS_2

Interferences	Comments

Bromopropane(1-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
106-94-5	OSHA PV2061	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	12	1.3 µg	0.65 µg	CS_2

Interferences	Comments

Bromopropane(1-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
106-94-5	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
31.7	15-480	2.0 µg	1.0 µg	CS_2

Interferences	Comments

Butadiene(1,3-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
106-99-0	NIOSH 1024	GC-MS	CT-CT (SKC 226-01)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	10-25	1.1 µg	0.55 µg	MC

Interferences	Comments
High humidity (>80%) or other hydrocarbons present at permissible levels decrease sampler's capacity.	Use two large charcoal tubes in series. Separate and cap tubes after sampling. Ship cold overnight. If unable to ship overnight, store cold and then ship cold the following day.

†(LPM) (CC/Min) ††(L) (Minutes)

Butadiene(1,3-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
106-99-0	3M Method	GC-MS	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
42.8	15-480	1.7 µg	0.85 µg	MC CS_2

Interferences	Comments
	Use 3M 3520. Separate front section of the monitor from the back section and cap immediately after sampling. Ship cold overnight. If unable to ship cold overnight, refrigerate, and then ship cold the following day.

Butanedione(2,3-); (Butadione(2,3-), Diacetyl, Diketobutane, Dimethyl Diketone, Dimethylglyoxal)

CAS #	Analytical Method	Analytical Technique	Sampling Media
431-03-8	LM-GCMS-12	GC-MS	SGT/GFF-SGT/GFF (SKC 226-183)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	9 (TWA) 3 (15-min short term)	0.16 µg	0.080 µg	95% EtOH

Interferences	Comments
	Samples are collected on two specially washed silica gel tubes in series. Samples should be protected from the light during and after sampling. Separate and cap tubes after sampling. Sample separately from CS_2 compatible solvents. Order aluminum foil for wrapping the samples. **For STEL sampling, a minimum of 3.0L is required. For TWA sampling, a minimum of 9.0L is required. Store and ship cold overnight.**

Butanone(2-); (Methyl Ethyl Ketone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
78-93-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
36.3	15-480	1.2 µg	0.59 µg	CS_2

Interferences	Comments
Isopropyl acetate may co-elute with MEK.	Ship and store cold.

Butanone(2-); (Methyl Ethyl Ketone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
78-93-3	NIOSH 2500	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	0.25-12	0.79 µg	0.40 µg	CS_2

Interferences	Comments
Isopropyl acetate may co-elute with MEK.	**Preferred for STEL sampling**. Sample at a flow rate of 0.2 lpm.

†(LPM) (CC/Min) **††(L) (Minutes)**

Butoxyethanol(2-); (Butyl Cellosolve); (EGBE)

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-76-2	NIOSH 1403	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.05	2-10	1.2 µg	0.60 µg	5%MeOH/MC

Interferences	Comments
	Sample separately from other solvents.

Butoxyethanol(2-); (Butyl Cellosolve); (EGBE)

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-76-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.2	15-480	1.8 µg	0.90 µg	MC CS_2

Interferences	Comments
	Sample separately from other solvents.

Butoxyethoxy(2-(2-)) Ethanol

CAS #	Analytical Method	Analytical Technique	Sampling Media
112-34-5	OSHA PV2095	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	2-10	0.58 µg	0.29 µg	5%MeOH/MC

Interferences	Comments
	Sample separately from other solvents.

Butoxyethoxy(2-(2-)) Ethyl Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
124-17-4	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.87 µg	0.44 µg	CS_2

Interferences	Comments

Butoxyethyl(2-) Acetate; (Butyl Cellosolve Acetate); (EGBEA)

CAS #	Analytical Method	Analytical Technique	Sampling Media
112-07-2	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.94 µg	0.47 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Butoxyethyl(2-) Acetate; (Butyl Cellosolve Acetate); (EGBEA)

CAS #	Analytical Method	Analytical Technique	Sampling Media
112-07-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
24.3	15-480	1.4 µg	0.70 µg	CS_2

Interferences	Comments

Butyl Acrylate

CAS #	Analytical Method	Analytical Technique	Sampling Media
141-32-3	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.69 µg	0.35 µg	CS_2

Interferences	Comments

Butyl Acrylate

CAS #	Analytical Method	Analytical Technique	Sampling Media
141-32-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.3	15-480	1.0 µg	0.50 µg	CS_2

Interferences	Comments

Butyl Cellosolve Acetate; (2-Butoxyethyl acetate); (EGBEA)

CAS #	Analytical Method	Analytical Technique	Sampling Media
112-07-2	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.94 µg	0.47 µg	CS_2

Interferences	Comments

Butyl Cellosolve Acetate; (2-Butoxyethyl acetate); (EGBEA)

CAS #	Analytical Method	Analytical Technique	Sampling Media
112-07-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
24.3	15-480	1.4 µg	0.70 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Butyl Cellosolve; (2-Butoxyethanol); (EGBE)

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-76-2	NIOSH 1403	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.05	2-10	1.2 µg	0.60 µg	5%MeOH/MC

Interferences	Comments

Butyl Cellosolve; (2-Butoxyethanol); (EGBE)

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-76-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.2	15-480	1.8 µg	0.90 µg	MC

Interferences	Comments
	Sample separately from other solvents.

Butyl(n-) Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-86-4	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.84 µg	0.42 µg	CS_2

Interferences	Comments

Butyl(n-) Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-86-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
31.6	15-480	1.3 µg	0.65 µg	CS_2

Interferences	Comments

Butyl(n-) Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
71-36-3	NIOSH 1401	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	2-10	0.67 µg	0.34 µg	1%IPA/CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Butyl(n-) Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
71-36-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
34.3	15-480	1.0 µg	0.50 µg	MC

Interferences	Comments
	Sample separately from other solvents.

Butyl(n-) Glycidyl Ether

CAS #	Analytical Method	Analytical Technique	Sampling Media
2426-08-6	NIOSH 1616	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	15-30	1.1 µg	0.55 µg	CS_2

Interferences	Comments

Butyl(n-) Glycidyl Ether

CAS #	Analytical Method	Analytical Technique	Sampling Media
2426-08-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.0	15-480	1.7 µg	0.85 µg	CS_2

Interferences	Comments

Butyl(sec-) Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
105-46-4	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.71 µg	0.36 µg	CS_2

Interferences	Comments

Butyl(sec-) Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
105-46-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.6	15-480	1.1 µg	0.55 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Butyl(sec-) Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
78-92-2	NIOSH 1401	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	2-10	1.0 µg	0.50 µg	1%IPA/CS_2

Interferences	Comments

Butyl(sec-) Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
78-92-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
34.8	15-480	1.5 µg	0.75 µg	MC CS_2

Interferences	Comments

Butyl(tert-) Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
540-88-5	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.84 µg	0.42 µg	CS_2

Interferences	Comments

Butyl(tert-) Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
540-88-5	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
29.4	15-480	1.3 µg	0.65 µg	CS_2

Interferences	Comments

Butyl(tert-) Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-65-0	NIOSH 1400	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	2-10	0.55 µg	0.28 µg	BUT/CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Butyl(tert-) Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-65-0	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
35.2	15-480	0.83 µg	0.42 µg	CS_2

Interferences	Comments

Butyraldehyde(n-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-72-8	NIOSH 2016	HPLC	AT Monitor (N571AT)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
8.20	15-480	0.037 µg	0.019 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	Refrigerate media before and after sampling. Ship samples cold overnight.

Butyraldehyde(n-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-72-8	NIOSH 2016	HPLC	Sep-Pak (WAT047205)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	10-100	0.19 µg	0.095 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	Refrigerate media before and after sampling. Ship samples cold overnight. **Preferred for STEL sampling**. Sample at 1.0 lpm for STEL.

Butyraldehyde(n-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-72-8	NIOSH 2016	HPLC	SGT, DNPH (SKC 226-119)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	1-15	0.073 µg	0.037 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	Refrigerate media before and after sampling. Ship samples cold overnight. **Preferred for STEL sampling**. Sample at 1.0 lpm for STEL.

†(LPM) (CC/Min) **††(L) (Minutes)**

Butyric Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-92-6	NIOSH 2011	IC	PTFE3-SGT** (SKC 225-17A, SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.5	15-100	2.3 µg	1.2 µg	Acid2

Interferences	Comments
	Preferred method for STEL and also Lab-preferred method. Use 0.2 lpm flow rate. DO NOT sample with inorganic acids.

Cadmium and compounds as Cd

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-43-9	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	500-1000	0.10 µg	0.050 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples**.

Cadmium and compounds as Cd

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-43-9	OSHA ID-121 OSHA ID-125G	ICP	ghost wipe (SKC 225-2414)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	0.50 µg	0.25 µg	Metals2

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Cadmium and compounds as Cd

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-43-9	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	160-240	0.032 µg	0.016 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Calcium

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-70-2	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	100-1000	7.9 µg	4.0 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	All forms of calcium are quantified. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Calcium Carbonate

CAS #	Analytical Method	Analytical Technique	Sampling Media
1317-65-3	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	100-1000	20 µg	10 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	All forms of calcium are quantified. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples. If client wants different calcium salts speciated, please indicate in sample submission form or call/email Lab.**

Calcium Carbonate

CAS #	Analytical Method	Analytical Technique	Sampling Media
1317-65-3	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	20-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 lpm, for area sampling up to 15 lpm.

†(LPM) (CC/Min) **††(L) (Minutes)**

Calcium Hydroxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
1305-62-0	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	100-1000	15 µg	7.5 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	All forms of calcium are quantified. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples. If client wants different calcium salts speciated, please indicate in sample submission form or call/email Lab.**

Calcium Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
1305-78-8	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	100-1000	11 µg	5.5 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	All forms of calcium are quantified. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples. If client wants different calcium salts speciated, please indicate in sample submission form or call/email Lab.**

Calcium Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
1305-78-8	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	40-240	4.6 µg	2.3 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.

†(LPM) (CC/Min) **††(L) (Minutes)**

Calcium Silicate Synthetic Nonfibrous

CAS #	Analytical Method	Analytical Technique	Sampling Media
1344-95-2	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	40-7200	50 µg	10 µg	

Interferences	Comments

Calcium Sulfate (Gypsum)

CAS #	Analytical Method	Analytical Technique	Sampling Media
7778-18-9	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	20-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 lpm, for area sampling up to 15 lpm.

Camphor

CAS #	Analytical Method	Analytical Technique	Sampling Media
76-22-2	NIOSH 1301	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-25	0.53 µg	0.27 µg	MeOH/CS_2

Interferences	Comments
	Preferred method. Sample at 0.2 lpm for STEL. Sample separately from CS_2 compatible solvents.

Camphor

CAS #	Analytical Method	Analytical Technique	Sampling Media
76-22-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
21.4	15-480	0.80 µg	0.40 µg	CS_2

Interferences	Comments
	Sample separately from CS_2 compatible solvents.

Caprolactam

CAS #	Analytical Method	Analytical Technique	Sampling Media
105-60-2	OSHA PV2012	HPLC	OVS 7 (SKC 226-57)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	100	2.1 µg	1.1 µg	

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Carbaryl (SEVIN)

CAS #	Analytical Method	Analytical Technique	Sampling Media
63-25-2	OSHA 63	HPLC	OVS-2 (SKC 226-30-16)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	10-60	0.45 µg	0.23 µg	

Interferences	Comments

Carbon Black

CAS #	Analytical Method	Analytical Technique	Sampling Media
1333-86-4	NIOSH 5000	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-2	30-570	50 µg	30 µg	

Interferences	Comments
All other dusts will interfere.	**Preferred method**. For personal sampling use a flow rate of 1-2 lpm, for area sampling up to 15 lpm.

Carbon Black

CAS #	Analytical Method	Analytical Technique	Sampling Media
1333-86-4	OSHA ID-196	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	460-960	850 µg	420 µg	

Interferences	Comments
Particulates that are insoluble in THF and that either vaporize or lose weight between 150°C and 600°C will interfere.	Please notify lab prior to sample collection.

Carbon Disulfide

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-15-0	NIOSH 1600	GC-MS	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	2-10	0.52 µg	0.26 µg	Tol

Interferences	Comments
	Sample separately from CS_2 compatible solvents. Store and ship cold.

†(LPM) (CC/Min) ††(L) (Minutes)

Carbon Disulfide

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-15-0	3M Method	GC-MS	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
42.8	15-480	0.78 µg	0.39 µg	Tol

Interferences	Comments
	Use 3M 3520. Separate front section of the monitor from the back section and cap immediately after sampling. Sample separately from CS_2 compatible solvents. Store and ship cold.

Carbon Tetrachloride (tetrachloromethane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
56-23-5	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1.5-40	11 µg	5.5 µg	CS_2

Interferences	Comments
	Use a flow rate of 0.2 lpm for STEL. **Preferred method for STEL sampling.**

Carbon Tetrachloride (tetrachloromethane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
56-23-5	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
30.2	15-480	17 µg	8.5 µg	CS_2

Interferences	Comments

Cellosolve (2-Ethoxyethanol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-80-5	NIOSH 1403	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.05	1-6	0.54 µg	0.27 µg	5%MeOH/MC

Interferences	Comments
	Sample separately from other solvents.

†(LPM) (CC/Min) **††(L) (Minutes)**

Cellosolve (2-Ethoxyethanol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-80-5	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
32.4	15-480	0.81 µg	0.41 µg	MC CS_2

Interferences	Comments
	Sample separately from other solvents.

Ceramic Fibers

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 7400	PCM	MCE, 25 mm (ZEFON Z008BA)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.5-16	50-720	0.050 fiber/ field	0.01 fiber/field	

Interferences	Comments
Chain-like particles which may appear fibrous cause positive interference. High levels of non-fibrous dust particles may obscure fibers.	Adjust sampling flow rate and time to obtain optimum fiber loading on the filter. Do not overload filter. Sample open faced. When shipping your samples, do not pack with untreated polystyrene as can lead to fiber loss from electrostatic effect.

Chlorine

CAS #	Analytical Method	Analytical Technique	Sampling Media
7782-50-5	NIOSH 6011	IC	PTFE-AgMF (SKC 225-1708, SKC 225-1802)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.3-1.0	80-360	2.3 µg	1.2 µg	Cl_2&Br_2

Interferences	Comments
Hydrochloric acid will interfere.	**Preferred method**. Use a flow rate of 1.0 lpm for STEL. Order media one week ahead, media is prepared when ordered.

Chlorine Dioxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
10049-04-4	OSHA ID-202	IC	Impinger 4

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.5	35-120	0.75 µg	0.38 µg	

Interferences	Comments
	Shelf-life of impinger solution is 3 months. Transfer sample solution to labeled vials before shipping. To avoid “freezing” of glass to glass, rinse impinger with distilled water before returning to the lab.

†(LPM) (CC/Min) **††(L) (Minutes)**

Chloro(2-)naphthalene

CAS #	Analytical Method	Analytical Technique	Sampling Media
91-58-7	NIOSH 5515	GC-MS	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.60 µg	0.30 µg	PNAs

Interferences	Comments
	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Chlorobenzene

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-90-7	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1.5-40	0.57 µg	0.29 µg	CS_2

Interferences	Comments

Chlorobenzene

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-90-7	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
29.3	15-480	0.86 µg	0.43 µg	CS_2

Interferences	Comments

Chlorodiphenyl (Polychlorobiphenyl, 42% Chlorine)

CAS #	Analytical Method	Analytical Technique	Sampling Media
53469-21-9	NIOSH 5503	GC-MS	GFF-Florisil (Millipore SX0001300/01 /AP2001300 SKC 226-39)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	1-50	0.97 µg	0.49 µg	

Interferences	Comments
Other chlorinated pesticides may interfere in the quantification of PCB.	

†(LPM) (CC/Min) ††(L) (Minutes)

Chlorodiphenyl (Polychlorobiphenyl, 54% Chlorine)

CAS #	Analytical Method	Analytical Technique	Sampling Media
11097-69-1	NIOSH 5503	GC-MS	GFF-Florisil(Millipore SX0001300/01/ AP2001300 SKC 226-39)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	1-50	1.1 µg	0.55 µg	

Interferences	Comments
Other chlorinated pesticides may interfere in the quantification of PCB.	

Chloroform (Trichloromethane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
67-66-3	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-50	5.9 µg	3.0 µg	CS_2

Interferences	Comments

Chloroform (Trichloromethane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
67-66-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
33.5	15-480	8.9 µg	4.5 µg	CS_2

Interferences	Comments

Chlorophenol(p-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
106-48-9	NIOSH 2014	HPLC	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	10-40	0.10 µg	0.050 µg	

Interferences	Comments

Chloroprene(beta-); (2-Chloro-1,3-butadiene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
126-99-8	NIOSH 1002	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.1	1.5-8	0.43 µg	0.22 µg	CS_2

Interferences	Comments
	Store and ship cold.

†(LPM) (CC/Min) ††(L) (Minutes)

Chloroprene(beta-); (2-Chloro-1,3-butadiene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
126-99-8	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
32.2	15-480	0.65 µg	0.33 µg	CS_2

Interferences	Comments
	Store and ship cold.

Chlorotoluene(o-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
95-49-8	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1.5-40	0.47 µg	0.24 µg	CS_2

Interferences	Comments

Chlorotoluene(o-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
95-49-8	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.3	15-480	0.70 µg	0.35 µg	CS_2

Interferences	Comments

Chlorpyrifos (Dursban)

CAS #	Analytical Method	Analytical Technique	Sampling Media
2921-88-2	NIOSH 5600	GC-NPD	OVS-2/QF (SKC 226-58)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2-1	12-240	0.039 µg	0.020 µg	

Interferences	Comments
Organophosphate compounds may interfere.	

†(LPM) (CC/Min) ††(L) (Minutes)

Chromium and Inorganic Compounds as Cr

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-47-3	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	670-1000	1.0 µg	0.50 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	Minimum air volume required at ½ of TLV is 670 L. This applies to Cr III compounds. See chromium VI and chromate entries for special instructions on collection for this form of chromium. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Chromium and Inorganic compounds as Cr

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-47-3	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	240-500	0.75 µg	0.38 µg	Metals

Interferences	Comments
	Minimum air volume required at ½ of TLV is 500 L. This applies to Cr III compounds. See chromium VI and chromate entries for special instructions on collection for this form of chromium. As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

Chromium and Inorganic compounds as Cr

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-47-3	OSHA ID-121 OSHA ID-125G	ICP	ghost wipe (SKC 225-2414)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	1.0 µg	0.50 µg	Metals2

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Chromium, Hexavalent compounds as Cr

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-47-3	OSHA ID-215	IC	PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	500-960	0.050 µg	0.020 µg	

Interferences	Comments
Fe (II) appears to cause a negative interference during sampling and storage.	**Please indicate in sample submission form the operation sampled** (e.g., spray paint, chrome plating, welding, etc.) as the extraction method is different for spray paint samples. Refrigerate samples and ship *overnight* as soon as possible. 500 liters is the minimum air volume at 50% TLV. Samples from plating operations must be analyzed within 6 days from date of sampling. Samples from welding operations must be analyzed within 8 days from date of sampling. If sampling CrVI as inhalable, order IOM samplers a week ahead of survey date. **Remember IOM samplers are not stock items to be kept indefinitely.**

Chromium, Hexavalent Compounds as Cr

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-47-3	OSHA W4001	IC	QFF (Millipore AQFA03700) Wipes

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	0.050 µg	0.020 µg	

Interferences	Comments
Fe (II) appears to cause a negative interference during sampling and storage.	**Please follow "Hexavalent Chromium Wipe Sampling Instructions."** Do not use ghost wipes, Whatman, mixed cellulose ester (MCE) or glass fiber filters as they convert Cr(VI) to Cr(III). **Please indicate in sample submission form the operation sampled as the extraction method is different for spray paint samples.** Refrigerate samples and ship *overnight* as soon as possible. If sampling a chromium plating operation, request vials containing 10% Na_2CO_3 with 2%$NaHCO_3$ to stabilize the samples. Samples from welding operations must be analyzed within 8 days from date of sampling.

Chrysene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
218-01-9	OSHA 58	HPLC	GFF (SKC 225-7)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	960	0.11 µg	0.055 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, cap and wrap in aluminum foil. Ship and store cold.

†(LPM) (CC/Min) **††(L) (Minutes)**

Chrysene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
218-01-9	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.11 µg	0.055 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Coal Dust – Anthracite

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0600	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.7	50-816	50 µg	10 µg	

Interferences	Comments
All other respirable dusts will interfere.	Use pre-weighed PVC 2-piece cassette for MSA (Dorr-Oliver) cyclones at 1.7 lpm and 3-piece cassette for BMRC (SKC) cyclones at 2.5 lpm and for BGI-4L at 2.2 lpm.

Coal Dust – Bituminous

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0600	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.7	50-816	50 µg	10 µg	

Interferences	Comments
All other respirable dusts will interfere.	Use pre-weighed PVC 2-piece cassette for MSA (Dorr-Oliver) cyclones at 1.7 lpm and 3-piece cassette for BMRC (SKC) cyclones at 2.5 lpm and for BGI-4L at 2.2 lpm.

Coal Tar Pitch Volatiles, as Benzene Soluble Aerosol

CAS #	Analytical Method	Analytical Technique	Sampling Media
65996-93-2	OSHA 58	GRAV	GFF (SKC 225-7)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	960	130 µg	28 µg	

Interferences	Comments
The method is non-specific and measures all substances soluble in benzene.	This method is used to air monitor coke oven emissions, petroleum combustion products & asphalt fumes. If the BSF exceeds the PEL, then the sample is analyzed by HPLC to determine the presence of selected polynuclear aromatic hydrocarbons (PAHs). Wrap sample cassettes with aluminum foil.

†(LPM) (CC/Min) ††(L) (Minutes)

Cobalt and Inorganic compounds as Co

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-48-4	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	140-1000	0.10 µg	0.050 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Cobalt and Inorganic compounds as Co

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-48-4	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	75-240	0.025 µg	0.013 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

Cobalt and Inorganic compounds as Co

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-48-4	OSHA ID-121	ICP	Ghost wipe (225-2414)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	0.5 µg	0.25 µg	Metals 2

Interferences	Comments
Spectral interferemces are the primary interferences encountered in the ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in ICP analysis. Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.

†(LPM) (CC/Min) **††(L) (Minutes)**

Copper (Fume, Dusts and Mists) as Cu

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-50-8	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	70-1000	1.4 µg	0.70 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Copper (Fume, Dusts and Mists) as Cu

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-50-8	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	40-240	0.10 µg	0.050 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

Copper (Fume, Dusts and Mists) as Cu

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-50-8	OSHA ID-121	ICP	Ghost wipe (225-2414)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	5.0 µg	2.5 µg	Metals 2

Interferences	Comments
Spectral interferences are the primary interferences encountered in the ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in ICP analysis. Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.

†(LPM) (CC/Min) **††(L) (Minutes)**

Cotton Dust, Raw

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0500	GRAV	PVC See Comment

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
See Comment	1000-3600	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	OSHA: Open-faced sampling with 3-piece pre-weighed PVC cassette on a vertical elutriator, cotton-dust sampler at 7.4 lpm. ACGIH: Use BGI GK2.69 cyclone at 1.6 lpm; sample 768 liters for 65% of new thoracic TLV.

Cresol, all Isomers

CAS #	Analytical Method	Analytical Technique	Sampling Media
1319-77-3 95-48-7 108-39-4 106-44-5	OSHA 32	HPLC	XAD-7 (SKC 226-95)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	5-24	0.39 µg	0.20 µg	Phenol & cresol

Interferences	Comments
	This method is applicable for all isomers of cresol (ortho-, meta-, and para-).

Cumene

CAS #	Analytical Method	Analytical Technique	Sampling Media
98-82-8	NIOSH 1501	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01 -0.2	2-30	0.55 µg	0.28 µg	CS_2

Interferences	Comments
	Under conditions of high humidity, the breakthrough volumes may be reduced by as much as 50%. **2020 NIC of 5 ppm TWA, A3 was adopted in 2021.**

Cumene

CAS #	Analytical Method	Analytical Technique	Sampling Media
98-82-8	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
24.5	15-480	0.83 µg	0.42 µg	CS_2

Interferences	Comments
	2020 NIC of 5 ppm TWA, A3 was adopted in 2021.

†(LPM) (CC/Min) **††(L) (Minutes)**

Cyclohexane

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-82-7	NIOSH 1500	GC-MS	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	2.5-5	0.17 µg	0.083 µg	CS_2

Interferences	Comments

Cyclohexane

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-82-7	3M Method	GC-MS	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
32.4	15-360	0.25 µg	0.13 µg	CS_2

Interferences	Comments

Cyclohexanol

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-93-0	NIOSH 1402	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	1.1 µg	0.55 µg	5%PRO/CS_2

Interferences	Comments

Cyclohexanol

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-93-0	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
29.5	15-480	1.7 µg	0.85 µg	MC

Interferences	Comments
	Sample separately from other solvents.

Cyclohexanone

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-94-1	NIOSH 1300	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.72 µg	0.36 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at a flow rate of 0.2 lpm.

†(LPM) (CC/Min) **††(L) (Minutes)**

Cyclohexanone

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-94-1	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.9	15-480	1.1 µg	0.54 µg	CS_2

Interferences	Comments

Cyclohexylamine

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-91-8	NIOSH 2010	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-1	5-30	5.9 µg	3.0 µg	Amine1

Interferences	Comments
Methanol could interfere in low level analysis.	

Cyclopentane

CAS #	Analytical Method	Analytical Technique	Sampling Media
287-92-3	NIOSH 1500	GC-FID	CT (SKC 226-01)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	2.5-5.0	0.40 µg	0.20 µg	CS_2

Interferences	Comments
	2021 NIC TWA 1000 ppm$^{(EX)}$, A4.

Cyclopentane

CAS #	Analytical Method	Analytical Technique	Sampling Media
287-92-3	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
36.2	15-60	0.60 µg	0.30 µg	CS_2

Interferences	Comments
	Use 3M 3520. Separate front section of the monitor from the back section and cap immediately after sampling. 2021 NIC, TWA 1000 ppm $^{(EX)}$, A4.

†(LPM) (CC/Min) **††(L) (Minutes)**

Desflurane (Suprane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
57041-67-5	OSHA 106	GC-FID	Anasorb 747 (SKC 226-81A)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05	3	6.1 µg	3.1 µg	CS_2

Interferences	Comments
	Store and ship cold overnight.

Desflurane (Suprane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
57041-67-5	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
30.1	15-480	9.1 µg	4.6 µg	CS_2

Interferences	Comments
	Use 3M 3520. Separate front section of the monitor from the back section and cap immediately after sampling. Store and ship cold overnight.

Diacetone Alcohol (4-Hydroxy-4-methyl-2-pentanone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-42-2	NIOSH 1402	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.98 µg	0.49 µg	5%PRO/CS_2

Interferences	Comments

Diacetone Alcohol (4-Hydroxy-4-methyl-2-pentanone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-42-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.2	15-480	1.5 µg	0.75 µg	MC

Interferences	Comments
	Sample separately from other solvents.

†(LPM) (CC/Min) ††(L) (Minutes)

Diacetyl (Biacetyl, 2,3-Butadione, 2,3-Butanedione, Diketobutane, Dimethyl Diketone, Dimethylglyoxal)

CAS #	Analytical Method	Analytical Technique	Sampling Media
431-03-8	LM-GCMS-12	GC-MS	SGT/GFF-SGT/GFF (SKC 226-183)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	9 (TWA) 3 (15-min short term)	0.16 µg	0.080 µg	95%EtOH

Interferences	Comments
	Samples are collected on two specially washed silica gel tubes in series. Samples should be protected from the light during and after sampling. Order aluminum foil for wrapping the samples during and after sampling. Separate and cap tubes after sampling. Sample separately from CS_2 compatible solvents. For STEL sampling, a minimum of 3.0L is required. For TWA sampling, a minimum of 9.0L is required. Store and ship cold overnight.

Dibenzo[a,h]anthracene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
53-70-3	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.93 µg	0.47 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Dibromochloropropane (DBCP)

CAS #	Analytical Method	Analytical Technique	Sampling Media
96-12-8	OSHA In-house	GC-FID	Anasorb 747/ Anasorb 747 (SKC 226-81A)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.20	20	0.41 µg	0.205 µg	CS_2

Interferences	Comments
	Sample with 2 Anasorb 747 tubes in series. Separate and cap tubes after sampling. Ship cold overnight.

Dibutyl Ether

CAS #	Analytical Method	Analytical Technique	Sampling Media
142-96-1	NIOSH 1610	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	1-10	0.85 µg	0.43 µg	CS_2

Interferences	Comments
	Store and ship cold.

†(LPM) (CC/Min) ††(L) (Minutes)

Dibutyl Phthalate

CAS #	Analytical Method	Analytical Technique	Sampling Media
84-74-2	NIOSH 5020	GC-FID	MCE (SKC 225-5)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-3	10-200	0.46 µg	0.23 µg	CS_2

Interferences	Comments
	Sample at 1.0 lpm for STEL.

Dichlorobenzene(o-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
95-50-1	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.50 µg	0.25 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at a flow rate of 0.2 lpm.

Dichlorobenzene(o-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
95-50-1	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.8	15-480	0.75 µg	0.38 µg	CS_2

Interferences	Comments

Dichlorobenzene(p-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
106-46-7	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-8	0.45 µg	0.23 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at a flow rate of 0.2 lpm.

Dichlorobenzene(p-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
106-46-7	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.8	15-480	0.68 µg	0.34 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Dichloroethane(1,1)

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-34-3	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	0.5-15	1.7 µg	0.83 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at a flow rate of 0.2 lpm.

Dichloroethane(1,1)

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-34-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
33.2	15-480	2.5 µg	1.3 µg	CS_2

Interferences	Comments

Dichloroethylene(1,2-)(trans); (Acetylene dichloride)

CAS #	Analytical Method	Analytical Technique	Sampling Media
540-59-0	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
35.2	15-360	2.1 µg	1.1 µg	CS_2

Interferences	Comments

Dichloroethylene(1,2-)(cis); (Acetylene dichloride)

CAS #	Analytical Method	Analytical Technique	Sampling Media
540-59-0	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	0.2-5	1.6 µg	0.80 µg	CS_2

Interferences	Comments

Dichloroethylene(1,2-)(cis); (Acetylene dichloride)

CAS #	Analytical Method	Analytical Technique	Sampling Media
540-59-0	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
35.2	15-480	2.4 µg	1.2 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) **††(L) (Minutes)**

Dichloroethylene(1,2-)(trans); (Acetylene dichloride)

CAS #	Analytical Method	Analytical Technique	Sampling Media
540-59-0	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	15-360	1.4 µg	0.70 µg	CS_2

Interferences	Comments

Dichloromethane (Methylene chloride)

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-09-2	NIOSH 1005	GC-FID	CT-CT (SKC 226-01)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	0.5-2.5	3.7 µg	1.9 µg	CS_2

Interferences	Comments
	Separate tubes and cap immediately after sampling. Ship cold immediately.

Dichloromethane (Methylene chloride)

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-09-2	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
37.9	15-240	5.6 µg	2.8 µg	CS_2

Interferences	Comments
	Use 3M 3520. Separate front section of the monitor from the back section and cap immediately after sampling. Ship cold immediately.

Diesel Exhaust

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 5040	EGA-TDA	QFF

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2-4	142-19000	1.3 µg	NA	

Interferences	Comments
	This analysis is sub-contracted to an AIHA-LAP, LLC accredited lab. We require a week's notice to procure the media. Media has short shelf-life. For underground mines, use diesel particulate matter (DPM) cassettes (SKC 225-317). Turnaround time is 10 working days.

†(LPM) (CC/Min) ††(L) (Minutes)

Diethanolamine

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-42-2	NIOSH 2007	IC	ORBO 53 or SGT** (SUPELCO 20265) (SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.5	30	3.0 µg	1.5 µg	EA

Interferences	Comments
	Store in freeezer after sampling. Ship cold.

Diethyl Ketone (3- Pentanone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
96-22-0	NIOSH 1300	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.67 µg	0.34 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at a flow rate of 0.2 lpm.

Diethyl Ketone

CAS #	Analytical Method	Analytical Technique	Sampling Media
96-22-0	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
32.7	15-480	1.0 µg	0.50 µg	CS_2

Interferences	Comments

Diethyl Phthalate

CAS #	Analytical Method	Analytical Technique	Sampling Media
84-66-2	OSHA 104	GC-FID	OVS-Tenax (SKC 226-56)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	240	0.58 µg	0.29 µg	Tol

Interferences	Comments

Diethyl Sulfate

CAS #	Analytical Method	Analytical Technique	Sampling Media
64-67-5	NIOSH 2524	GC-FID	Porapak-P (SKC 226-114)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	0.25-12	7.2 µg	3.6 µg	Ethyl Ether

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Diethylamine

CAS #	Analytical Method	Analytical Technique	Sampling Media
109-89-7	NIOSH 2010	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-1.0	5-30	0.31 µg	0.16 µg	Amine1

Interferences	Comments
Nitrogen compounds that co-elute will interfere.	

Diethylenetriamine

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-40-0	OSHA 60	HPLC	XAD-2, NITC (SKC 226-30-18)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	10	0.10 µg	0.050 µg	Amine2

Interferences	Comments
Nitrogen compounds that co-elute will interfere.	

Diglycidyl Ether of Bisphenol A

CAS #	Analytical Method	Analytical Technique	Sampling Media
1675-54-3	OSHA 1018	HPLC	GFF

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.5	270	0.50 µg	0.25 µg	

Interferences	Comments

Dimethyl Acetamide

CAS #	Analytical Method	Analytical Technique	Sampling Media
127-19-5	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
32.0	15-480	0.99 µg	0.50 µg	MC

Interferences	Comments
	Sample separately from CS_2 compatible solvents.

†(LPM) (CC/Min) **††(L) (Minutes)**

Dimethyl Acetamide

CAS #	Analytical Method	Analytical Technique	Sampling Media
127-19-5	NIOSH 2004	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-1	15-80	0.66 µg	0.33 µg	MeOH

Interferences	Comments
	Silica gel has a high affinity for water; high relative humidity may adversely affect the efficiency of analyte adsorption.

Dimethyl Disulfide

CAS #	Analytical Method	Analytical Technique	Sampling Media
624-92-0	LM-GC-59	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	5	1.6 µg	0.80 µg	CS_2

Interferences	Comments
	Turnaround is 10 business days.

Dimethyl Sulfide

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-18-3	LM-GC-59	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	5	1.1 µg	0.55 µg	CS_2

Interferences	Comments
	Turnaround is 10 business days.

Dimethyl(2,6-)-4-heptanone (Diisobutyl ketone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-83-8	NIOSH 1300	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.59 µg	0.30 µg	CS_2

Interferences	Comments

Dimethyl(2,6-)-4-heptanone (Diisobutyl ketone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-83-8	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
24.6	15-480	0.89 µg	0.45 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Dimethylformamide

CAS #	Analytical Method	Analytical Technique	Sampling Media
68-12-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
35.5	15-480	1.7 µg	0.83 µg	MC

Interferences	Comments
	Sample separately from CS_2 compatible solvents.

Dimethylformamide

CAS #	Analytical Method	Analytical Technique	Sampling Media
68-12-2	NIOSH 2004	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-1	15-80	1.5 µg	0.75 µg	MeOH

Interferences	Comments
	Silica gel has a high affinity for water; high relative humidity may adversely affect the efficiency of analyte adsorption.

Dioctyl Phthalate

CAS #	Analytical Method	Analytical Technique	Sampling Media
117-84-1	OSHA 104	GC-FID	OVS-Tenax (SKC 226-56)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.0	1-240	0.27 µg	0.14 µg	Tol

Interferences	Comments

Dioxane(p-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-91-1	NIOSH 1602	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	1-10	1.3 µg	0.65 µg	CS_2

Interferences	Comments

Dioxane(p-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-91-1	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
34.5	15-480	2.0 µg	1.0 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Diphenyl (Biphenyl)

CAS #	Analytical Method	Analytical Technique	Sampling Media
92-52-4	OSHA PV2022	GC-FID	XAD-7 (SKC 226-95)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.20	20	0.46 µg	0.23 µg	CS_2

Interferences	Comments

Dipropylene Glycol Methyl Ether (DPGME)

CAS #	Analytical Method	Analytical Technique	Sampling Media
34590-94-8	NIOSH 2554	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	2-10	3.0 µg	1.5 µg	MC

Interferences	Comments
	2021 NIC 50 ppm TWA.

Dipropylene Glycol Methyl Ether (DPGME)

CAS #	Analytical Method	Analytical Technique	Sampling Media
34590-94-8	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
25.3	15-480	4.5 µg	2.3 µg	CS_2

Interferences	Comments
	2021 NIC 50 ppm TWA.

Dipropylene Glycol Methyl Ether Acetate (DPGMEA)

CAS #	Analytical Method	Analytical Technique	Sampling Media
88917-22-0	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
22.8	15-480	1.5 µg	0.75 µg	CS_2

Interferences	Comments

Divinyl Benzene

CAS #	Analytical Method	Analytical Technique	Sampling Media
1321-74-0	NIOSH 1501	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.57 µg	0.29 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Divinyl Benzene

CAS #	Analytical Method	Analytical Technique	Sampling Media
1321-74-0	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
23.3	15-480	0.86 µg	0.43 µg	CS_2

Interferences	Comments

Enflurane (Ethrane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
13838-16-9	OSHA 103	GC-FID	Anasorb 747 (SKC 226-81A)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	1-10	2.6 µg	1.3 µg	CS_2

Interferences	Comments
	Store and ship cold overnight.

Enflurane (Ethrane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
13838-16-9	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.3	15-480	4.0 µg	2.0 µg	CS_2

Interferences	Comments
	Store and ship cold overnight.

Epichlorohydrin (1-Chloro-2,3-epoxy propane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
106-89-8	NIOSH 1010	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	2-30	1.5 µg	0.75 µg	CS_2

Interferences	Comments

Epichlorohydrin (1-Chloro-2,3-epoxy propane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
106-89-8	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
29.6	15-480	2.3 µg	1.2 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Ethanolamine (2-Aminoethanol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
141-43-5	NIOSH 2007	IC	ORBO 53 or SGT** (SUPELCO 20265) (SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.5	5	3.0 µg	1.5 µg	EA

Interferences	Comments
	Store in freezer after sampling. Ship cold.

Ethoxyethanol(2-) (Cellosolve)

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-80-5	NIOSH 1403	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.05	1-6	0.54 µg	0.27 µg	5%MeOH/MC

Interferences	Comments

Ethoxyethanol(2-) (Cellosolve)

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-80-5	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
32.4	15-480	0.81 µg	0.41 µg	MC

Interferences	Comments
	Sample separately from other solvents.

Ethoxyethyl(2-) Acetate (Cellosolve acetate)

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-15-9	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	2.8 µg	1.4 µg	CS_2

Interferences	Comments

Ethoxyethyl(2-) Acetate (Cellosolve acetate)

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-15-9	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
26.6	15-480	4.2 µg	2.1 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Ethyl 2-cyanoacrylate

CAS #	Analytical Method	Analytical Technique	Sampling Media
7085-85-0	OSHA 55	HPLC	XAD-7, Acid (SKC 226-98)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	12	0.70 µg	0.35 µg	

Interferences	Comments
	Ship and store cold.

Ethyl 3-ethoxypropionate

CAS #	Analytical Method	Analytical Technique	Sampling Media
763-69-9	OSHA PV2025	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	1-10	1.1 µg	0.55 µg	CS_2

Interferences	Comments

Ethyl 3-ethoxypropionate

CAS #	Analytical Method	Analytical Technique	Sampling Media
763-69-9	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
25.8	15-480	1.7 µg	0.85 µg	CS_2

Interferences	Comments

Ethyl Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
141-78-6	NIOSH 1457	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	1.2 µg	0.60 µg	CS_2

Interferences	Comments

Ethyl Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
141-78-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
34.5	15-360	1.8 µg	0.90 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Ethyl Acrylate

CAS #	Analytical Method	Analytical Technique	Sampling Media
140-88-5	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.98 µg	0.49 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at a flow rate of 0.2 lpm. Store and ship cold overnight.

Ethyl Acrylate

CAS #	Analytical Method	Analytical Technique	Sampling Media
140-88-5	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
32.2	15-480	1.5 µg	0.75 µg	CS_2

Interferences	Comments
	Store and ship cold overnight.

Ethyl Alcohol (Ethanol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
64-17-5	NIOSH 1400	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	0.1-1	1.2 µg	0.60 µg	BUT/CS_2

Interferences	Comments
	Store and ship cold overnight.

Ethyl Alcohol (Ethanol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
64-17-5	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
43.7	15-120	1.8 µg	0.90 µg	ACN

Interferences	Comments
	Use 3M 3520. Separate the front section of the monitor from the back section and cap immediately after sampling. Store and ship cold overnight. Sample separately from other solvents.

†(LPM) (CC/Min) **††(L) (Minutes)**

Ethyl Benzene

CAS #	Analytical Method	Analytical Technique	Sampling Media
100-41-4	NIOSH 1501	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-30	0.5 µg	0.25 µg	CS_2

Interferences	Comments
	Under conditions of high humidity, the breakthrough volumes may be reduced by as much as 50%. 2021 NIC 20 ppm TWA, OTO; A3; BEI.

Ethyl Benzene

CAS #	Analytical Method	Analytical Technique	Sampling Media
100-41-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.3	15-480	0.75 µg	0.36 µg	CS_2

Interferences	Comments
	2021 NIC 20 ppm TWA, OTO; A3; BEI.

Ethyl Ether

CAS #	Analytical Method	Analytical Technique	Sampling Media
60-29-7	NIOSH 1610	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.75 µg	0.38 µg	Ethyl Acetate

Interferences	Comments
Hexane may co-elute with the analyte of interest.	High humidity may greatly decrease breakthrough volume. Store and ship cold.

Ethyl Ether

CAS #	Analytical Method	Analytical Technique	Sampling Media
60-29-7	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
36.8	15-240	1.1 µg	0.55 µg	CS_2

Interferences	Comments
	Use 3M 3520. Separate the front section of the monitor from the back section and cap immediately after sampling. Store and ship cold.

†(LPM) (CC/Min) ††(L) (Minutes)

Ethyl Lactate

CAS #	Analytical Method	Analytical Technique	Sampling Media
687-47-8	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.85 µg	0.43 µg	CS_2

Interferences	Comments

Ethyl Methacrylate

CAS #	Analytical Method	Analytical Technique	Sampling Media
97-63-2	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.65 µg	0.33 µg	CS_2

Interferences	Comments
	Ship and store cold.

Ethylamine

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-04-7	NIOSH 2010	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-1	5-30	NA	NA	Amine1

Interferences	Comments
Nitrogen compounds that co-elute will interfere.	

Ethylene Chlorohydrin (2-Chloroethanol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-07-3	NIOSH 2513	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.51 µg	0.26 µg	5%IPA/CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at flow rate of 0.2 lpm. High humidity may greatly decrease the breakthrough volume.

†(LPM) (CC/Min) **††(L) (Minutes)**

Ethylene Chlorohydrin (2-Chloroethanol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-07-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
33.9	15-480	0.77 µg	0.39 µg	MC CS_2

Interferences	Comments

Ethylene Dichloride (1,2-Dichloroethane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-06-2	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-50	1.5 µg	0.74 µg	CS_2

Interferences	Comments

Ethylene Dichloride (1,2-Dichloroethane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-06-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
33.2	15 -480	2.3 µg	1.1 µg	CS_2

Interferences	Comments

Ethylene Glycol

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-21-1	NIOSH 5523	GC-FID	OVS 7 (SKC 226-57)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.5-2	5-60	2.2 µg	1.1 µg	MeOH

Interferences	Comments

Ethylene Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-2-8	ASTM D5578-04	GC-FID	N555AT

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
12.4	15 – 480	0.69 µg	0.35 µg	ACN/TOL

Interferences	Comments
	Sample separately from CS_2 compatible solvents.

†(LPM) (CC/Min) ††(L) (Minutes)

Ethylene Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-21-8	ASTM D5578-04	GC-FID	ORBO 78 (SUPELCO 20355)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.15	1-24	0.64 µg	0.32 µg	ACN/TOL

Interferences	Comments
	Store and ship cold. Sample separately from CS_2 compatible solvents.

Ethylene Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-21-8	3M Method	GC-FID	OVM (3M 3551)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
49.3	15 -480	0.96 µg	0.48 µg	ACN/TOL

Interferences	Comments
	Store and ship cold. Sample separately from CS_2 compatible solvents.

Ethylenediamine

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-15-3	OSHA 60	HPLC	XAD-2, NITC (SKC 226-30-18)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	10	0.080 µg	0.040 µg	Amine2

Interferences	Comments
Nitrogen compounds that co-elute will interfere.	

Flour Dust

CAS #	Analytical Method	Analytical Technique	Sampling Media
	HSE MDHS-14	GRAV	PVC, IOM

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	960	100 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	Use IOM sampler with pre-weighed PVC. Contact Lab one week before intended use. The availability of IOM samplers is limited. **Rental charge for the IOM samplers applies**.

†(LPM) (CC/Min) **††(L) (Minutes)**

Fluoranthene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
206-44-0	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.30 µg	0.15 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Fluorene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
86-73-7	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.32 µg	0.16µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Fluorides, Particulate/Hydrogen Fluoride

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 7906	IC	Cellulose Nitrate,Na_2CO_3 (SKC 225-9031)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-2	70-1000	13 µg	6.5 µg	Acid1

Interferences	Comments
Recovery of gaseous HF is reduced at high humidity.	Treated filter is stable for 14 days. Order media one week ahead of survey date. Media are prepared when ordered. Store and ship cold. **Specialty filter. Media charge applies.**

Forane (Isoflurane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
26675-46-7	OSHA 103	GC-FID	Anasorb 747 (SKC 226-81A)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05	12	4.9 µg	2.5 µg	CS_2

Interferences	Comments
	Store and ship cold overnight. 2021 NIC, 50ppm TWA, A4.

†(LPM) (CC/Min) **††(L) (Minutes)**

Forane (Isoflurane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
26675-46-7	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.3	15-480	7.1 µg	3.6 µg	CS_2

Interferences	Comments
	Store and ship cold overnight. 2021 NIC, 50ppm TWA, A4.

Formaldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
50-00-0	NIOSH 2016	HPLC	AT Monitor (N571AT)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
16.2	15-480	0.018 µg	0.0090 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	**Refrigerate** media before and after sampling. Ship samples cold overnight.

Formaldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
50-00-0	NIOSH 2016	HPLC	Sep-Pak (WAT047205)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	10-100	0.090 µg	0.045 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	**Refrigerate** media before and after sampling. Ship samples cold overnight. **Preferred for STEL sampling**. Use a flow rate of 1.0 lpm for STEL.

Formaldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
50-00-0	NIOSH 2016	HPLC	SGT, DNPH (SKC 226-119)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	1-15	0.036 µg	0.018 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	**Refrigerate** media before and after sampling. Ship samples cold overnight. **Preferred for STEL sampling**. Use a flow rate of 1.0 lpm for STEL. For IAQ and LEED sampling where TVOC and formaldehyde are collected, do not sample with Charcoal Tubes and DNPH tubes in tandem. The sorbent in the DNPH tubes may off-gas acetonitrile which can cause a positive interference in the TVOC results.

†(LPM) (CC/Min) **††(L) (Minutes)**

Formamide

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-12-7	NIOSH 2004	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-1	15-80	3.1 µg	1.6 µg	MeOH

Interferences	Comments
	Silica gel has a high affinity for water; high relative humidity may adversely affect the efficiency of analyte adsorption. 2019 NIC, TWA = 1ppm, Skin; A3 adopted in 2020.

Formic Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
64-18-6	NIOSH 2011	IC	PTFE3-SGT** (SKC 225-17A, SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.5	5-100	1.5 µg	0.75 µg	Acid2

Interferences	Comments
	Do not sample with inorganic acids.

Furfural

CAS #	Analytical Method	Analytical Technique	Sampling Media
98-01-1	OSHA 72	GC-FID	SKC 226-81A

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1	180	0.96 µg	0.48 µg	1%DMF/CS_2

Interferences	Comments
Furfuryl Alcohol is a sampling interference.	

Furfuryl Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
98-00-0	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
30.6	15-480	0.96 µg	0.48 µg	MC

Interferences	Comments
	Sample separately from CS_2 compatible solvents.

†(LPM) (CC/Min) ††(L) (Minutes)

Gasoline

CAS #	Analytical Method	Analytical Technique	Sampling Media
8006-61-9	NIOSH 1550	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1.3-20	1.1 µg	0.55 µg	CS_2

Interferences	Comments
	Please send bulk sample. Please ship bulk sample separately from the air samples. **Preferred for STEL sampling**. Use a flow rate of 0.2 lpm for STEL.

Gasoline

CAS #	Analytical Method	Analytical Technique	Sampling Media
8006-61-9	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
30.5	15-480	1.7 µg	0.85 µg	CS_2

Interferences	Comments
	Please send bulk sample. Please ship bulk sample separately from the air samples.

Germanium

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-56-4	NIOSH 7300	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	100-1000	0.38 µg	0.19 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Glutaraldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-30-8	OSHA 64	HPLC	AT Monitor (N571AT)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
7.24	15-480	0.011 µg	0.0055 µg	

Interferences	Comments
	Refrigerate media before and after sampling. Ship cold overnight.

†(LPM) (CC/Min) **††(L) (Minutes)**

Glutaraldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-30-8	NIOSH 2016	HPLC	Sep-Pak (WAT047205)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	10-100	0.055 µg	0.028 µg	

Interferences	Comments
	Refrigerate media before and after sampling. Ship cold overnight. **Preferred for STEL sampling**.

Glutaraldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-30-8	NIOSH 2532	HPLC	SGT, DNPH (SKC 226-119)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.5	1-30	0.022 µg	0.011 µg	

Interferences	Comments
	Refrigerate media before and after sampling. Ship cold overnight. **Preferred for STEL sampling**.

Gold

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-57-5	NIOSH 7301 NIOSH 7303	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	50-1000	0.28 µg	0.14 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples**.

Grain Dust

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	50-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 lpm, for area sampling up to 15 lpm.

†(LPM) (CC/Min) **††(L) (Minutes)**

Graphite

CAS #	Analytical Method	Analytical Technique	Sampling Media
7782-42-5	NIOSH 0600	GRAV	PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.7	100-816	50 µg	10 µg	

Interferences	Comments
All other respirable dusts will interfere.	Use pre-weighed PVC 2-piece cassette for MSA (Dorr-Oliver) cyclones at 1.7 lpm and 3-piece cassette for BMRC (SKC) cyclones at 2.5 lpm and for BGI-4L at 2.2 lpm.

Halothane (Fluothane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
151-67-7	OSHA 103	GC-FID	Anasorb 747 (SKC 226-81A)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05	12	3.4 µg	1.7 µg	CS_2

Interferences	Comments
	Store and ship cold overnight.

Halothane (Fluothane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
151-67-7	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
30.2	15-480	5.1 µg	2.5 µg	CS_2

Interferences	Comments
	Store and ship cold overnight.

Heptane

CAS #	Analytical Method	Analytical Technique	Sampling Media
142-82-5	NIOSH 1500	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.45 µg	0.23 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at 0.2 lpm.

Heptane

CAS #	Analytical Method	Analytical Technique	Sampling Media
142-82-5	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.9	15-480	0.68 µg	0.34 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Heptanone(2-) (Methyl Amyl Ketone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-43-0	NIOSH 1301	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-25	0.64 µg	0.32 µg	MeOH/CS_2

Interferences	Comments

Heptanone(2-) (Methyl Amyl Ketone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-43-0	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.9	15-480	0.96 µg	0.48 µg	CS_2

Interferences	Comments

Hexamethylene Diisocyanate (1,6-) Homopolymer (HDI Homo)

CAS #	Analytical Method	Analytical Technique	Sampling Media
28182-81-2	OSHA PV2125	HPLC	GFF, 1-2PP

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	15	0.30 µg	0.15 µg	Isocyanate

Interferences	Comments
Any compound having the same retention time as the analyte is a possible interference. However, chromatographic conditions can be altered to separate an interference.	Sample open-faced. Media must be stored cold before and after sampling. Filter is stable for 6 months if kept cold. Ship cold overnight.

Hexamethylene Diisocyanate (1,6-) Homopolymer (HDI Homo)

CAS #	Analytical Method	Analytical Technique	Sampling Media
28182-81-2	OSHA PV2125	HPLC	GFF Wipes

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
N/A	N/A	0.30 µg	0.15 µg	Isocyanate

Interferences	Comments
Potential interferences include anhydrides, amines, alcohols and carboxylic acids.	Follow “Isocyanate Wipe Sampling Procedure”. Immediately after sampling, glass fiber filters must be placed in a vial containing derivatizing solution. Order media one week ahead of survey. Media are prepared when ordered. Derivatizing solution has a shelf life of 1 month if kept cold.

†(LPM) (CC/Min) ††(L) (Minutes)

Hexamethylene Diisocyanate (1,6-) (HDI)

CAS #	Analytical Method	Analytical Technique	Sampling Media
822-06-0	OSHA 42	HPLC	GFF, 1-2PP

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	15-240	0.020 µg	0.010 µg	Isocyanate

Interferences	Comments
Potential interferences include anhydrides, amines, alcohols and carboxylic acids.	Sample open-faced. Media must be stored cold before and after sampling. Filter is stable for 6 months if kept cold. Ship cold overnight.

Hexamethylene Diisocyanate (1,6-) (HDI)

CAS #	Analytical Method	Analytical Technique	Sampling Media
822-06-0	OSHA 42	HPLC	GFF Wipes

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
N/A	N/A	0.020 µg	0.010 µg	Isocyanate

Interferences	Comments
Potential interferences include anhydrides, amines, alcohols and carboxylic acids.	Follow “Isocyanate Wipe Sampling Procedure”. Immediately after sampling, glass fiber filters must be placed in a vial containing derivatizing solution. Order media one week ahead of survey. Media are prepared when ordered. Derivatizing solution has a shelf life of 1 month if kept cold.

Hexane(n-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-54-3	NIOSH 1500	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.45 µg	0.23 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at 0.2 lpm.

Hexane(n-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-54-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
32.0	15-480	0.72 µg	0.36 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Hexyl Acrylate

CAS #	Analytical Method	Analytical Technique	Sampling Media
2499-95-8	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.90 µg	0.45 µg	CS_2

Interferences	Comments
	Store and ship cold overnight.

Hexylene Glycol (2-Methyl-2,4-pentanediol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-41-5	NIOSH 5523	GC-FID	OVS 7 (SKC 226-57)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.5-2	5-60	2.5 µg	1.3 µg	MeOH

Interferences	Comments

Hydrazine

CAS #	Analytical Method	Analytical Technique	Sampling Media
302-01-2	OSHA 108	HPLC	GFF, Acid

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	240	0.025 µg	0.013 µg	

Interferences	Comments
	Media have short shelf-life. Media are prepared on request. Please contact the Lab 5 days before survey.

Hydrogen Bromide

CAS #	Analytical Method	Analytical Technique	Sampling Media
10035-10-6	NIOSH 7903	IC	MCE2, SGT** (SKC 225-19, SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2-0.5	10-100	4.6 µg	2.3 µg	Acid1

Interferences	Comments
Particulate salts of the acid will give a positive interference.	Use a flow rate of 0.5 lpm for STEL sampling.

†(LPM) (CC/Min) ††(L) (Minutes)

Hydrogen Bromide

CAS #	Analytical Method	Analytical Technique	Sampling Media
10035-10-6	NIOSH 7907	IC	SKC 225-9032

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	35-600	3.8 µg	1.9 µg	

Interferences	Comments
Inorganic acids can react with co-sampled particulate matter on the pre-filter, leading to low results.	Order media one week ahead of survey. Ship and store cold. **Specialty Filter. Media charge applies.**

Hydrogen Chloride

CAS #	Analytical Method	Analytical Technique	Sampling Media
7647-01-0	NIOSH 7903	IC	MCE2, SGT** (SKC 225-19, SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2-0.5	10-100	2.3 µg	1.2 µg	Acid1

Interferences	Comments
Particulate salts of the acid will give a positive interference.	Use a flow rate of 0.5 lpm for STEL sampling.

Hydrogen Chloride

CAS #	Analytical Method	Analytical Technique	Sampling Media
7647-01-0	NIOSH 7907	IC	SKC 225-9032

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	40-600	13 µg	6.4 µg	

Interferences	Comments
Inorganic acids can react with co-sampled particulate matter on the pre-filter, leading to low results. Potentially interfering particulate chlorides and nitrates removed by the pre-filter can react with the sampled acids and liberate HCl and HNO_3, which gets collected on the sampling filter, leading to high results.	Order media one week ahead of survey. Ship and store cold. **Specialty Filter. Media charge applies.**

Hydrogen Cyanide

CAS #	Analytical Method	Analytical Technique	Sampling Media
74-90-8	NIOSH 7904	ISE	Soda Lime Tube (SKC 226-210)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2	10-90	5.2 µg	2.6 µg	

Interferences	Comments
Sulfide, chloride, iodide, bromide, cadmium, zinc, silver, nickel, cuprous iron and mercury interfere.	Use a flow rate of 0.2 lpm for STEL sampling. Method is not covered under our AIHA-LAP, LLC scope of accreditation.

†(LPM) (CC/Min) **††(L) (Minutes)**

Cyanide Salts as CN

CAS #	Analytical Method	Analytical Technique	Sampling Media
74-90-8	NIOSH 7904	ISE	PVC

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	15-100	5.2 µg	2.6 µg	

Interferences	Comments
Sulfide, chloride, iodide, bromide, cadmium, zinc, silver, nickel, cuprous iron and mercury interfere.	**Preferred for STEL sampling**. Method is not covered under our AIHA-LAP, LLC scope of accreditation.

Hydrogen Fluoride, as F

CAS #	Analytical Method	Analytical Technique	Sampling Media
7664-39-3	NIOSH 7903	IC	MCE2, SGT** (SKC 225-19, SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2-0.5	30-100	3.0 µg	1.5 µg	Acid1

Interferences	Comments
Particulate salts of the acid will give a positive interference.	Use the maximum flow rate for STEL sampling.

Hydrogen Peroxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
7722-84-1	OSHA ID-1019	UV/VIS	QFF, titanium oxysulfate (SKC 225-9030)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.0	240	10.0 µg	5.0 µg	

Interferences	Comments
Any compound with a response, or that reacts with the titanium oxysulfate to produce a response, at 410nm is a potential interferent.	After sampling seal the cassette with the end plugs and wrap each cassette with tin foil. Order tin foil for wrapping the samples. Filters have limited shelf-life. This method is not covered under our AIHA-LAP, LLC scope of accreditation. **Specialty Filter. Media charge applies.**

Hydrogen Sulfide

CAS #	Analytical Method	Analytical Technique	Sampling Media
7783-06-4	NIOSH 6013	IC	ORBO 34 (SUPELCO 20211)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	30-70	8.9 µg	4.4 µg	

Interferences	Comments
Sulfur dioxide gas may give a positive interference for hydrogen sulfide.	Use a flow rate of 0.5 lpm for STEL.

†(LPM) (CC/Min) **††(L) (Minutes)**

Hydroquinone (Dihydroxybenzene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-31-9	NIOSH 5004	HPLC	MCE (SKC 225-5)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	30-180	10 µg	5 µg	

Interferences	Comments
	Hydroquinone is unstable on the collecting media. Stabilize immediately after collecting by transferring filter into a vial containing 1% acetic acid.

Hydroquinone (Dihydroxybenzene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-31-9	OSHA PV2094	HPLC	XAD-7, Acid (SKC 226-98)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2	20	0.30 µg	0.15 µg	

Interferences	Comments
	Preferred method.

Indium and Compounds as In

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-74-6	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	150-1000	1.5 µg	0.75 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Inorganic Acid Scan

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 7903	IC	MCE2, SGT** (SKC 225-19, SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2-0.5	50-100	N/A	N/A	

Interferences	Comments
	See List of Scans for list of individual inorganic acid/anion.

†(LPM) (CC/Min) **††(L) (Minutes)**

Iodine and Iodides as I

CAS #	Analytical Method	Analytical Technique	Sampling Media
7553-56-2	NIOSH 6005	IC	CT, KOH (SKC 226-67)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.5-1.0	50-200	5.4 µg	2.7 µg	

Interferences	Comments
Particulate iodide salts, hydrogen iodide or organic iodides may give a positive interference.	Use a flow rate of 1.0 lpm for STEL.

Iron Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
1309-37-1	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	25-1000	4.3 µg	2.2 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	All forms of iron are quantified. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Iron Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
1309-37-1	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	25-1000	3.6 µg	1.8 µg	Metals

Interferences	Comments
	All forms of iron are quantified. As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

Iron

CAS #	Analytical Method	Analytical Technique	Sampling Media
1309-37-1	OSHA ID-121	ICP	Ghost wipe (225-2414)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	30 µg	15 µg	Metals 2

Interferences	Comments
Spectral interferemces are the primary interferences encountered in the ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in ICP analysis. Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.

†(LPM) (CC/Min) **††(L) (Minutes)**

Isobutyl Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-19-0	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.81 µg	0.41 µg	CS_2

Interferences	Comments

Isobutyl Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-19-0	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
31.0	15-480	1.2 µg	0.60 µg	CS_2

Interferences	Comments

Isobutyl Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
78-83-1	NIOSH 1401	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.59 µg	0.30 µg	1%PRO/CS_2

Interferences	Comments

Isobutyl Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
78-83-1	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
35.9	15-480	0.89 µg	0.45 µg	MC CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Isocyanate Scan

CAS #	Analytical Method	Analytical Technique	Sampling Media
	OSHA 42	HPLC	GFF, 1-2PP

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code

Interferences	Comments
Potential interferences include anhydrides, amines, alcohols and carboxylic acids.	See List of Scans for individual isocyanates. Sample open-faced. Media must be stored cold before and after sampling. Filter is stable for 6 months if kept cold. Ship cold overnight.

Isoflurane (Forane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
26675-46-7	OSHA 103	GC-FID	Anasorb 747 (SKC 226-81A)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05	12	4.9 µg	2.5 µg	CS_2

Interferences	Comments
	Store and ship cold overnight. 2021 NIC, 50ppm TWA, A4

Isoflurane (Forane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
26675-46-7	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.3	15-480	7.4 µg	3.2 µg	CS_2

Interferences	Comments
	Store and ship cold overnight. 2021 NIC, 50ppm TWA, A4.

Isooctane

CAS #	Analytical Method	Analytical Technique	Sampling Media
540-84-1	NIOSH 1500	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.52 µg	0.26 µg	CS_2

Interferences	Comments

Isooctane

CAS #	Analytical Method	Analytical Technique	Sampling Media
540-84-1	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.1	15-480	0.78 µg	0.39 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Isophorone

CAS #	Analytical Method	Analytical Technique	Sampling Media
78-59-1	NIOSH 2508	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.90 µg	0.45 µg	CS_2

Interferences	Comments
	Use a flow rate of 0.2 lpm for STEL. High humidity may greatly decrease the breakthrough volume.

Isophorone

CAS #	Analytical Method	Analytical Technique	Sampling Media
78-59-1	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
21.7	15-480	1.4 µg	0.70 µg	CS_2

Interferences	Comments

Isophorone Diisocyanate (IPDI)

CAS #	Analytical Method	Analytical Technique	Sampling Media
4098-71-9	OSHA 42	HPLC	GFF, 1-2PP

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	15-240	0.034 µg	0.017 µg	Isocyanate

Interferences	Comments
Potential interferences include anhydrides, amines, alcohols and carboxylic acids.	Sample open-faced. Media must be stored cold before and after sampling. Filter is stable for 6 months if kept cold. Ship cold overnight.

Isophorone Diisocyanate (IPDI)

CAS #	Analytical Method	Analytical Technique	Sampling Media
4098-71-9	OSHA 42	HPLC	GFF Wipes

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
N/A	N/A	0.034 µg	0.017 µg	Isocyanate

Interferences	Comments
Potential interferences include anhydrides, amines, alcohols and carboxylic acids	Follow “Isocyanate Wipe Sampling Procedure”. Immediately after sampling, glass fiber filters must be placed in a vial containing derivatizing solution. Order media one week ahead of survey. Media are prepared when ordered. Derivatizing solution has a shelf life of 1 month if kept cold.

†(LPM) (CC/Min) ††(L) (Minutes)

Isopropyl Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-21-4	NIOSH 1454	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.02-0.2	0.1-9	1.0 µg	0.50 µg	CS_2

Interferences	Comments
	Use a flow rate of 0.2 lpm for STEL.

Isopropyl Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-21-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
31.7	15-480	1.5 µg	0.75 µg	CS_2

Interferences	Comments

Isopropyl Alcohol (Isopropanol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
67-63-0	NIOSH 1400	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	0.3-3	1.0 µg	0.51 µg	BUT/CS_2

Interferences	Comments

Isopropyl Alcohol (Isopropanol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
67-63-0	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
39.4	15-240	1.5 µg	0.77 µg	ACN CS_2

Interferences	Comments
	Use 3M 3520. Separate the front section of the monitor from the back section and cap immediately after sampling. Ship cold.

†(LPM) (CC/Min) **††(L) (Minutes)**

Kaolin

CAS #	Analytical Method	Analytical Technique	Sampling Media
1332-58-7	NIOSH 0600	GRAV	PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.7	100-816	50 µg	10 µg	

Interferences	Comments
All other respirable dusts will interfere.	Use pre-weighed PVC 2-piece cassette for MSA (Dorr-Oliver) cyclones at 1.7 lpm and 3-piece cassette for BMRC (SKC) cyclones at 2.5 lpm and for BGI-4L at 2.2 lpm.

Kerosene

CAS #	Analytical Method	Analytical Technique	Sampling Media
8008-20-6	NIOSH 1550	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1.3-20	2.9 µg	1.5 µg	CS_2

Interferences	Comments
	Please send bulk sample; ship it separately from the air samples.

Kerosene

CAS #	Analytical Method	Analytical Technique	Sampling Media
8008-20-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
24.3	15-480	4.4 µg	2.2 µg	CS_2

Interferences	Comments
	Please send bulk sample; ship it separately from the air samples.

Lactic Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
50-21-5	NIOSH 2011	IC	SGT**(SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2-0.5	5-100	3.0 µg	1.2 µg	Acid2

Interferences	Comments
	Do not sample for inorganic acids using the same tube.

†(LPM) (CC/Min) ††(L) (Minutes)

Lanthanum

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-91-0	NIOSH 7301	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	120-1000	0.10 µg	0.050 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Lead and Inorganic Compounds as Pb

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-92-1	OSHA ID-121	ICP	ghost wipe (SKC 225-2414)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	1.0 µg	0.50 µg	Metals2

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Lead and Inorganic Compounds as Pb

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-92-1	NIOSH 7301 NIOSH 7303	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	120-1000	0.25 µg	0.13 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Lead and Inorganic Compounds as Pb

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-92-1	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	40-240	0.032 µg	0.016 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Lead and Inorganic Compounds as Pb

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-92-1	OSHA ID-121 NIOSH 7301	ICP	Paint chips

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	0.25 µg	0.13 µg	Metals2

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	Needs at least 1 gram of bulk sample. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Lead Chromate as Cr(VI)

CAS #	Analytical Method	Analytical Technique	Sampling Media
7758-97-6	OSHA ID-215	IC	PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	500-960	0.05 µg	0.02 µg	

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	Please indicate in sample submission form the operation sampled (e.g., spray paint, chrome plating, welding, etc.) as the extraction method is different for spray paint samples. Refrigerate samples and ship overnight as soon as possible. 500 liters is the minimum air volume at 50% TLV. Samples from plating operations must be analyzed within 6 days from date of sampling. Samples from welding operations must be analyzed within 8 days from date of sampling. Hexavalent chromium compounds, including Chromite ore processing as Chrome (VI).

Limonene(d-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
138-86-3	NIOSH 1552	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.52 µg	0.26 µg	CS_2

Interferences	Comments

Limonene(d-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
138-86-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
24.7	15-480	0.78 µg	0.39 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Lithium Salts

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-93-1	NIOSH 7301	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	250-1000	0.10 µg	0.050µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	All forms of lithium are quantified. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Magnesium

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-95-4	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	25-1000	1.0 µg	0.50 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	All forms of magnesium are quantified. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples**.

Magnesium Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
1309-48-4	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	25-1000	1.7 µg	0.85 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	All forms of magnesium are quantified. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples**.

†(LPM) (CC/Min) **††(L) (Minutes)**

Magnesium Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
1309-48-4	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	40-240	2.5 µg	1.3 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.

Magnesium Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
1309-48-4	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	40-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 lpm, for area sampling up to 15 lpm.

Maleic Anhydride

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-31-6	OSHA 86	HPLC	GFF, Vamine

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.5	60	0.74 µg	0.37 µg	ACN/DMSO

Interferences	Comments
Both phthalic amd trimellitic anhydride should be considered as potential sampling interferences.	Sampling media has short shelf-life, so media is prepared when ordered. Please order filters at least 5 days prior to survey date.

Maleic Anhydride

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-31-6	OSHA 25	HPLC	XAD-2,p-An/XAD-2 (SKC 226-30-07, SKC 226-30)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	20	0.030 µg	0.015 µg	

Interferences	Comments
Both phthalic amd trimellitic anhydride should be considered as potential sampling interferences.	Sample with XAD-2 treated tube and XAD-2 untreated tube in series. Separate and cap tubes after sampling. Media has short shelf-life. Please contact the Lab before survey date for more info. Preferred method.

†(LPM) (CC/Min) ††(L) (Minutes)

Manganese, Elemental and Inorganic compounds as Mn

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-96-5	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	125-1000	0.15 µg	0.075 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples. Manganese may be sampled using respirable PPI. Use a flow rate of 2 lpm. Please indicate in your request if you want the filter inside the PPI pre-weighed. Please contact lab a week before your survey if using respirable PPI. Media charge applies for PPIs.**

Manganese, Elemental and Inorganic compounds as Mn

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-96-5	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	75-240	0.15 µg	0.075µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples. Manganese may be sampled using respirable PPI. Use a flow rate of 2 lpm. Please indicate in your request if you want the filter inside the PPI pre-weighed. Please contact lab a week before your survey if using respirable PPI. Media charge applies for PPIs.**

Manganese, elemental and Inorganic compounds as Mn

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-96-5	OSHA ID-121 OSHA ID-125G	ICP	ghost wipe (SKC 225-2414)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	0.60 µg	0.30 µg	Metals2

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Medical Gases

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0500 LMI-A5	GRAV, GC-FID GC-ECD, GC-TCD GC-XSD, GC-DID	PTFE4 (PALL TF-450) Cylinder

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
Note 2* see Comments	1000 (gravimetric) 300cc/25 psig (Cylinder)	Note 2* see Comments	Note 2* see Comments	

Interferences	Comments
At high levels argon interferes with oxygen and carbon dioxide interferes with nitrous oxide.	*See Note 2 in the Comments section of "IH Lab Sampling Guide Analyte Descriptions and Abbreviations"

Mercury as Hg (Elemental and inorganic forms)

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-97-6	NIOSH 6009	AA-CV	Carulite/ Anasorb C300 (SKC 226-17-1A/3A)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.15-0.25	50-120	0.12 µg	0.060 µg	

Interferences	Comments
Inorganic and organic mercury compounds may cause a positive interference. Oxidizing gases, including chlorine, do not interfere.	A 37-mm, cellulose ester membrance filter in a cassette preceding the sorbent may be used if particulate mercury is to be determined separately.

Mercury as Hg (Elemental and inorganic forms)

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-97-6	OSHA ID-140	AA-CV	PS (SKC 520-02A/03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.020	9.6	0.12 µg	0.060 µg	

Interferences	Comments
Particulate mercury compounds are a positive interference.	Call Lab one week before sampling. Lab has limited number of passive mercury monitor holders. Refer to OSHA ID-145 if sampling in workplaces containing both mercury vapor and particulate. Specialty media. Media charge applies.

Mercury as Hg Particulate

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-97-6	OSHA ID-145	AA-CV	Air MCE (SKC225-5) Wipe (Whatman#42) Bulk

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	50	0.12 µg	0.060 µg	

Interferences	Comments
	If mercury vapor is suspected to be present, please refer to OSHA ID-140 or NIOSH 6009 for additional sampling information.

†(LPM) (CC/Min) ††(L) (Minutes)

Mesityl Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
141-79-7	NIOSH 1301	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2	25	1.3 µg	0.65 µg	CS_2

Interferences	Comments

Metalworking Fluids

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 5524	GRAV	Pre-weighed PTFE1 (Zefon FPTFE137)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	768-960	75 µg	15 µg	

Interferences	Comments
The method is non-specific and measures all substances extractable by organic solvents.	NIOSH 5524 recommends submitting one bulk sample of each type of fluid for solubility testing. Refrigerate samples if unable to ship immediately. Ship cold. Please note that samples must be analyzed within 2 weeks after collection.

Methanol (Methyl alcohol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
67-56-1	OSHA 5001	GC-FID	Anasorb747/Anasorb747 (SKC 226-82)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05	1-5	2.3 µg	1.1 µg	DMF/CS_2

Interferences	Comments
	Preferred method. Sample with 2 Anasorb 747 tubes in series ("Part A" as the front section and "Part B" as the back section. Please order as a set.) Recommended air volume is 5 liters when relative humidity is >50% and 3 liters when relative humidity is <50% at 25°C. Separate and cap tubes after sampling. Store and ship cold overnight.

Methanol (Methyl alcohol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
67-56-1	NIOSH 2000	GC-FID	SGT-SGT (SKC 226-51)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.02-0.2	1-5	2.5 µg	1.3 µg	5%IPA

Interferences	Comments
	Sample using 2 SGT tubes in series. Separate and cap tubes after sampling. Use a flow rate of 0.2 lpm for STEL. **Do not use in area where humidity is high.** Store and ship cold overnight.

†(LPM) (CC/Min) **††(L) (Minutes)**

Methoxy(1-)-2-propanol (Propylene glycol monomethyl ether, PGME)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-98-2	NIOSH 1403	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.05	1-10	1.3 µg	0.65 µg	MeOH/MC

Interferences	Comments

Methoxy(1-)-2-propanol (Propylene glycol monomethyl ether, PGME)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-98-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
32.4	15-480	2.0 µg	1.0 µg	MC CS_2

Interferences	Comments

Methoxyethanol(2-) (Methyl cellosolve, EGME)

CAS #	Analytical Method	Analytical Technique	Sampling Media
109-86-4	NIOSH 1403	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.05	1-50	1.7 µg	0.85 µg	%MeOH/MC

Interferences	Comments
	Preferred method for STEL sampling. Sample at 0.05 lpm.

Methoxyethanol(2-) (Methyl cellosolve, EGME)

CAS #	Analytical Method	Analytical Technique	Sampling Media
109-86-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
36.3	120-480	2.6 µg	1.3 µg	MC CS_2

Interferences	Comments

Methoxyethoxy(2-(2-)) Ethanol (Diethylene glycol methyl ether)

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-77-3	NIOSH 1403	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.05	1-10	1.3 µg	0.65 µg	5%MeOH/MC

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Methoxyethoxy(2-(2-)) Ethanol (Diethylene glycol methyl ether)

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-77-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.8	15-480	2.0 µg	1.0 µg	MC CS_2

Interferences	Comments

Methoxyethyl(2-) Acetate (Methyl cellosolve acetate, EGMEA)

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-49-6	NIOSH 1451	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	0.2-20	0.46 µg	0.23 µg	CS_2

Interferences	Comments
	Preferred method for STEL sampling.

Methoxyethyl(2-) Acetate (Methyl cellosolve acetate, EGMEA)

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-49-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
29.0	120-480	0.67 µg	0.34 µg	CS_2

Interferences	Comments

Methoxyethyl(2-) Ether (Diethylene glycol dimethyl ether)

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-96-6	NIOSH 1403	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.05	1-10	0.58 µg	0.29 µg	5%MeOH/MC

Interferences	Comments

Methoxyethyl(2-) Ether (Diethylene glycol dimethyl ether)

CAS #	Analytical Method	Analytical Technique	Sampling Media
111-96-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
26.7	15-480	0.87 µg	0.44 µg	MC CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Methyl Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
79-20-9	NIOSH 1458	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	0.2-10	1.5 µg	0.75 µg	CS_2

Interferences	Comments
	Preferred method for STEL sampling. Sample at 0.2 lpm.

Methyl Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
79-20-9	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
37.0	15-480	2.3 µg	1.2 µg	CS_2

Interferences	Comments
	Use 3M 3520. Separate the front section of the monitor from the back section and cap immediately after sampling. Ship cold.

Methyl Acrylate

CAS #	Analytical Method	Analytical Technique	Sampling Media
96-33-3	NIOSH 1459	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-5	1.1 µg	0.55 µg	CS_2

Interferences	Comments

Methyl Acrylate

CAS #	Analytical Method	Analytical Technique	Sampling Media
96-33-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
35.8	15-480	1.7 µg	0.85 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) **††(L) (Minutes)**

Methyl Alcohol (Methanol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
67-56-1	OSHA 5001	GC-FID	Anasorb747/Anasorb747 (SKC 226-82)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05	1-5	2.3 µg	1.1 µg	DMF/CS_2

Interferences	Comments
	Preferred method. Sample Anasorb 747 tubes in series (with "Part A" in front and "PART B" in back section. Recommended air volume is 5 liters when relative humidity is >50% and 3 liters when relative humidity is <50% at 25° C. Separate and cap tubes after sampling. Store and ship cold overnight.

Methyl Alcohol (Methanol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
67-56-1	NIOSH 2000	GC-FID	SGT-SGT (SKC 226-51)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.02-0.2	1-5	2.3 µg	1.7 µg	5%IPA

Interferences	Comments
	Sample using 2 SGT tubes in series. Use a flow rate of 0.2 lpm for STEL. Separate and cap tubes immediately after sampling. **Do not use in area where humidity is high.** Store and ship cold overnight

Methyl Amyl Ketone (2-Heptanone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-43-0	NIOSH 1301	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-25	0.61 µg	0.31 µg	MeOH/CS_2

Interferences	Comments
	Use a flow rate of 0.2 lpm for STEL.

Methyl Amyl Ketone (2-Heptanone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-43-0	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.9	15-480	0.92 µg	0.46 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Methyl Aniline

CAS #	Analytical Method	Analytical Technique	Sampling Media
100-61-8	NIOSH 2002	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.02-0.5	5-30	NA	NA	Amine3

Interferences	Comments
Nitrogen compounds that co-elute will interfere.	

Methyl Chloroform (1,1,1-Trichloroethane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
71-55-6	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	2.2 µg	1.1 µg	CS_2

Interferences	Comments

Methyl Chloroform (1,1,1-Trichloroethane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
71-55-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
30.9	15-480	3.3 µg	1.7 µg	CS_2

Interferences	Comments

Methyl Cyclopentane

CAS #	Analytical Method	Analytical Technique	Sampling Media
96-37-7	NIOSH 1500	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.38 µg	0.19 µg	CS_2

Interferences	Comments

Methyl Cyclopentane

CAS #	Analytical Method	Analytical Technique	Sampling Media
96-37-7	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
31.5	15-480	0.57 µg	0.29 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Methyl Ethyl Ketone (2-Butanone, MEK)

CAS #	Analytical Method	Analytical Technique	Sampling Media
78-93-3	NIOSH 2500	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	0.25-12	0.86 µg	0.43 µg	CS_2

Interferences	Comments
Isopropyl acetate may co-elute with MEK.	**Preferred for STEL sampling**. Sample at a flow rate of 0.2 lpm. Ship and store cold.

Methyl Ethyl Ketone (2-Butanone, MEK)

CAS #	Analytical Method	Analytical Technique	Sampling Media
78-93-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
36.3	15-480	1.3 µg	0.65 µg	CS_2

Interferences	Comments
Isopropyl acetate may co-elute with MEK.	Ship and store cold.

Methyl Isoamyl Ketone

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-12-3	NIOSH 1300	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.66 µg	0.33 µg	CS_2

Interferences	Comments

Methyl Isoamyl Ketone

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-12-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.0	15-480	0.99 µg	0.50 µg	CS_2

Interferences	Comments

Methyl Isobutyl Ketone (MIBK)

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-10-1	NIOSH 1300	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.54 µg	0.27 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at 0.2 lpm.

†(LPM) (CC/Min) ††(L) (Minutes)

Methyl Isobutyl Ketone (MIBK)

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-10-1	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
30.0	15-480	0.80 µg	0.40 µg	CS_2

Interferences	Comments

Methyl Isopropyl Ketone

CAS #	Analytical Method	Analytical Technique	Sampling Media
563-80-4	NIOSH 1300	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	1.0 µg	0.50 µg	CS_2

Interferences	Comments
	Ship and store cold.

Methyl Isopropyl Ketone

CAS #	Analytical Method	Analytical Technique	Sampling Media
563-80-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
32.8	15-480	1.5 µg	0.75 µg	CS_2

Interferences	Comments
	Ship and store cold.

Methyl Methacrylate

CAS #	Analytical Method	Analytical Technique	Sampling Media
80-62-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
31.8	15-480	1.5 µg	0.75 µg	CS_2

Interferences	Comments
	Ship cold.

Methyl Propyl Ketone (2-Pentanone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-87-9	NIOSH 1300	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.73 µg	0.37 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Methyl Propyl Ketone (2-Pentanone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-87-9	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
33.0	15-480	1.1 µg	0.55 µg	CS_2

Interferences	Comments

Methyl Styrene(a-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
98-83-9	NIOSH 1501	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-30	0.41 µg	0.21 µg	CS_2

Interferences	Comments
	Under conditions of high humidity, the breakthrough volumes may be reduced by as much as 50%. Store and ship cold overnight.

Methyl Styrene(a-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
98-83-9	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
25.0	15-480	0.62 µg	0.31 µg	CS_2

Interferences	Comments
	Store and ship cold overnight.

Methyl Tert-butyl Ether (MTBE)

CAS #	Analytical Method	Analytical Technique	Sampling Media
1634-04-4	NIOSH 1615	GC-FID	CT-CT (SKC 226-01)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-0.2	2-96	0.67 µg	0.34 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at 0.2 lpm. Store and ship cold immediately.

†(LPM) (CC/Min) ††(L) (Minutes)

Methyl Tert-butyl ether (MTBE)

CAS #	Analytical Method	Analytical Technique	Sampling Media
1634-04-4	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
30.8	15-480	1.0 µg	0.50 µg	CS_2

Interferences	Comments
	Use 3M 3520. Separate the front section of the monitor from the back section and cap immediately after sampling. Store and ship cold immediately.

Methyl Vinyl Ketone

CAS #	Analytical Method	Analytical Technique	Sampling Media
78-94-4	NIOSH 1300	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.27 µg	0.14 µg	CS_2

Interferences	Comments
	Store and ship cold overnight.

Methyl(1-)-2-pyrrolidinone

CAS #	Analytical Method	Analytical Technique	Sampling Media
872-50-4	NIOSH 1302	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	0.5-125	1.1 µg	0.55 µg	5%MeOH/MC

Interferences	Comments

Methyl(1-)-2-pyrrolidinone

CAS #	Analytical Method	Analytical Technique	Sampling Media
872-50-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.8	15-480	1.7 µg	0.85 µg	MC CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Methylacrylonitrile

CAS #	Analytical Method	Analytical Technique	Sampling Media
126-98-7	NIOSH 1604	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	3.5-20	1.0 µg	0.50 µg	AC/CS_2

Interferences	Comments

Methylcyclohexane

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-87-2	NIOSH 1500	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	4	0.45 µg	0.23 µg	CS_2

Interferences	Comments

Methylcyclohexane

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-87-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.9	15-420	0.68 µg	0.34 µg	CS_2

Interferences	Comments

Methylene Bis(4-cyclohexylisocyanate) (HMDI)

CAS #	Analytical Method	Analytical Technique	Sampling Media
5124-30-1	OSHA 47	HPLC	GFF, 1-2PP

Sampling Rate†	Sampling Volume††	LOQ	LOQ	Compatibility Code
1	15-240	0.070 µg	0.035 µg	Isocyanate

Interferences	Comments
Potential interferences include anhydrides, amines, alcohols and carboxylic acids.	Keep media refrigerated before and after sampling. Sample open-faced. Ship cold overnight. Filter is stable for 6 months if kept cold.

†(LPM) (CC/Min) **††(L) (Minutes)**

Methylene Bisphenyl Isocyanate (MDI)

CAS #	Analytical Method	Analytical Technique	Sampling Media
101-68-8	OSHA 47	HPLC	GFF, 1-2PP

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	15-240	0.014 µg	0.0070 µg	Isocyanate

Interferences	Comments
Potential interferences include anhydrides, amines, alcohols and carboxylic acids.	Keep media refrigerated before and after sampling. Sample open-faced. Ship cold overnight. Filter is stable for 6 months if kept cold.

Methylene Bisphenyl Isocyanate (MDI)

CAS #	Analytical Method	Analytical Technique	Sampling Media
101-68-8	OSHA 47	HPLC	GFF Wipes

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
N/A	N/A	0.014 µg	0.0070 µg	Isocyanate

Interferences	Comments
Potential interferences include anhydrides, amines, alcohols and carboxylic acids.	Follow “Isocyanate Wipe Sampling Procedure”. Immediately after sampling, glass fiber filters must be placed in a vial containing derivatizing solution. Order media one week ahead of survey. Media are prepared when ordered. Derivatizing solution has a shelf life of 1 month if kept cold.

Methylene Chloride (Dichloromethane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-09-2	NIOSH 1005	GC-FID	CT-CT (SKC 226-01)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	0.5-2.5	2.8 µg	1.4 µg	CS_2

Interferences	Comments
	Sample using two CT in series. Separate and cap tubes after sampling. Ship and store cold immediately.

Methylene Chloride (Dichloromethane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-09-2	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
37.9	15-240	4.2 µg	2.1 µg	CS_2

Interferences	Comments
	Use 3M 3520. Separate the front section of the monitor from the back section and cap immediately after sampling. Ship and store cold immediately.

†(LPM) (CC/Min) ††(L) (Minutes)

Methylene(4,4'-) Dianiline (MDA)

CAS #	Analytical Method	Analytical Technique	Sampling Media
101-77-9	NIOSH 5029	HPLC	GFF, Acid

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-2	10-1000	0.68 µg	0.34 µg	

Interferences	Comments
4,4'-Diphenyl methane diisocyanate (MDI) will interfere.	**Media has short shelf life so it is not kept in stock. Please contact the lab one week before sampling to order media. Within 4 hours of sampling, transfer the filter to a glass vial containing 4 ml 0.1 N methanolic KOH. This method can also be used for wipe sampling.**

Methylene(4,4'-)-bis(2 chloroaniline) (MOCA)

CAS #	Analytical Method	Analytical Technique	Sampling Media
101-14-4	NIOSH P&CAM 236	HPLC	GFF-SGT (SKC 225-16, SKC226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2-1	50	0.50 µg	0.25 µg	

Interferences	Comments

Methylnaphthalene(2-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
91-57-6	NIOSH 5515	GC-MS	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.66 µg	0.33 µg	PNAs

Interferences	Comments
	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Mica

CAS #	Analytical Method	Analytical Technique	Sampling Media
12001-26-2	NIOSH 0600	GRAV	PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.7	500-1200	50 µg	10 µg	

Interferences	Comments
All other respirable dusts will interfere.	Use pre-weighed PVC 2-piece cassette for MSA (Dorr-Oliver) cyclones at 1.7 lpm and 3-piece cassette for BMRC (SKC) cyclones at 2.5 lpm and BGI-4L at 2.2 lpm. 2020 NIC of 0.1mg/m^3 $^{(R)}$ was adopted in 2021.

†(LPM) (CC/Min) **††(L) (Minutes)**

Mineral Oil (Oil mist)

CAS #	Analytical Method	Analytical Technique	Sampling Media
8012-95-1	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	40-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	**This method is not for oil mist containing PNAs; it does not collect vapor.**

Mineral Oil, excluding Metal Working Fluids, Pure, highly and severely refined.

CAS #	Analytical Method	Analytical Technique	Sampling Media
8012-95-1	NIOSH 5026	FTIR	PVC, IOM

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	100-500	32 µg	16 µg	

Interferences	Comments
Any aerosol (e.g. tobacco smoke) which absorbs infrared radiation near 2950 cm-1 interferes.	**Concentrated bulk oil sample required for analysis. Request IOMs one week before survey date. Rental charges for use of IOM samplers apply**. This method is not covered under our AIHA-LAP, LLC scope of accreditation.

Mineral Oil, used in metal working

CAS #	Analytical Method	Analytical Technique	Sampling Media
8012-95-1	NIOSH 5524	GRAV	Pre-weighed PTFE1 (Zefon FPTFE137)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	768-960	75 µg	38 µg	

Interferences	Comments
The method is non-specific and measures all substances extractable by organic solvents.	Bulk is recommended to test solubility. Refrigerate samples if unable to ship immediately. Ship cold. Samples must be analyzed within two weeks of collection.

Mineral Spirits (Stoddard Solvent)

CAS #	Analytical Method	Analytical Technique	Sampling Media
8052-41-3	NIOSH 1550	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1.3-20	1.4 µg	0.71 µg	CS_2

Interferences	Comments
	Please send bulk sample. Ship bulk sample separately from air samples.

†(LPM) (CC/Min) **††(L) (Minutes)**

Mineral Spirits (Stoddard Solvent)

CAS #	Analytical Method	Analytical Technique	Sampling Media
8052-41-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
24.3	15-480	2.1 µg	1.1 µg	CS_2

Interferences	Comments
	Please send bulk sample. Ship bulk sample separately from air samples.

Mineral Wool Fiber

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	40-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 lpm, for area sampling up to 15 lpm.

Molybdenum as Mo

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-98-7	NIOSH 7301 NIOSH 7303	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	25-1000	0.10 µg	0.050 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Molybdenum as Mo

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-98-7	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	40-240	0.025 µg	0.013 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Molybdenum as Mo

CAS #	Analytical Method	Analytical Technique	Sampling Media
7439-98-7	OSHA ID-121	ICP	Ghost wipe (225-2414)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	1.0 µg	0.5 µg	Metals 2

Interferences	Comments
Spectral interferemces are the primary interferences encountered in the ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in ICP analysis. Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.

Morpholine

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-91-8	NIOSH S-150	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	10	2.8 µg	1.4 µg	dil acid

Interferences	Comments

Naphthalene

CAS #	Analytical Method	Analytical Technique	Sampling Media
91-20-3	NIOSH 1501	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.47 µg	0.24 µg	CS_2

Interferences	Comments
	Under conditions of high humidity, the breakthrough volumes may be reduced by as much as 50%.

Naphthalene

CAS #	Analytical Method	Analytical Technique	Sampling Media
91-20-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
24.6	15-480	0.70 µg	0.35 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Naphthalene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
91-20-3	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.32 µg	0.16 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Naproxen Sodium

CAS #	Analytical Method	Analytical Technique	Sampling Media
22204-53-1	LM-Pharma-4	LC-MS	PTFE5

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200	0.0010 µg	0.00050 µg	

Interferences	Comments
	It is critical that the PTFE filter used for sampling must have a pore size of 1.0um. Contact the lab to determine the minimum air volume required.

Naproxen Sodium

CAS #	Analytical Method	Analytical Technique	Sampling Media
22204-53-1	LM-Pharma-4	LC-MS	GFF Wipes

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
N/A	N/A	0.0020 µg	0.0010 µg	

Interferences	Comments
	Follow “Naproxen Sodium Wipe Sampling Procedure. Order media one week ahead of survey. Media are prepared when ordered.

Nickel and inorganic compounds as Ni

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-02-0	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	50-1000	0.10 µg	0.05 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab’s QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Nickel and inorganic compounds as Ni

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-02-0	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	40-240	0.16 µg	0.080 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

Nickel and inorganic compounds as Ni

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-02-0	OSHA ID-121 OSHA ID-125G	ICP	ghost wipe (SKC 225-2414)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	0.50 µg	0.25 µg	Metals2

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Nicotine

CAS #	Analytical Method	Analytical Technique	Sampling Media
54-11-5	NIOSH 2544	HPLC	XAD-2 (SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	60-400	2.0 µg	1.0 µg	

Interferences	Comments

Nitric Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
7697-37-2	NIOSH 7903	IC	MCE2, SGT** (SKC 225-19, SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2-0.5	5-100	2.3 µg	1.2 µg	

Interferences	Comments
Particulate salts of the acid will give a positive interference.	Use the maximum flow rate for STEL sampling.

†(LPM) (CC/Min) **††(L) (Minutes)**

Nitric acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
7697-37-2	NIOSH 7907	IC	SKC 225-9032

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	35-600	3.8 µg	1.9 µg	Acid1

Interferences	Comments
Inorganic acids can react with co-sampled particulate matter on the pre-filter, leading to low results. Potentially interfering particulate chlorides and nitrates removed by the pre-filter can react with the sampled acids and liberate HCl and HNO_3, which gets collected on the sampling filter, leading to high results.	Order media one week ahead of survey. Media are prepared when ordered. Ship and store cold. **Specialized filter. Media charge applies.**

Nitric Oxide and Nitrogen Dioxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
10102-43-9	OSHA ID-190 (NO), OSHA ID-182 (NO2)	IC	SKC 226-40A

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	3-24	0.78 µg	0.39 µg	NO&NO_2

Interferences	Comments
	Use SKC 226-40A (2TEA coated tubes + oxidizer) to sample NO only or NO2 and NO. **Store and ship cold.**

Nitroethane

CAS #	Analytical Method	Analytical Technique	Sampling Media
79-24-3	NIOSH 2526	GC-FID	XAD-2 (SKC 226-3002A) (Part A + Part B)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.05	1.5-3	1.8 µg	0.90 µg	Ethyl Acetate

Interferences	Comments
	Sample using 2 XAD-2, (front 600 mg and backup 300 mg), tubes in series. After sampling, separate and cap sorbent tubes.

Nitrogen Dioxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
10102-44-0	OSHA ID-182	IC	TEA-IMS (SKC 226-40-02)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2	35	1.2 µg	0.60 µg	

Interferences	Comments
	Sample with TEA IMS (226-40-02) for NO_2 only. **Store and ship cold.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Nitromethane

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-52-5	NIOSH 2527	GC-FID	CS 106 (SKC 226-111A)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.05	5-10	2.3 µg	1.2 µg	Ethyl Actate

Interferences	Comments

Nitrous Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
10024-97-2	OSHA ID-166	GC-ECD	AT N_2O Monitor (X575AT)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.75	15-480	0.20 µg	NA	

Interferences	Comments
Halogenated anesthetic gases, CFC's and HCFC's do not interfere when tested at their PELs.	Monitors must be received by Lab within one week after sampling and stored at controlled room temperature. Do not use after expiration date. This analysis is sub-contracted to an AIHA-LAP, LLC accredited lab.

Organic Solvent Scan

CAS #	Analytical Method	Analytical Technique	Sampling Media
	LM-GCMS-13		

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code

Interferences	Comments
	See List of Scans for list of individual organic solvents.

Oxalic Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
144-62-7	OSHA ID-PV2115	IC	GFF (SKC 225-7)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.0	30-100	3.0 µg	1.5 µg	

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Ozone

CAS #	Analytical Method	Analytical Technique	Sampling Media
10028-15-6	OSHA ID-214	IC	GFF, $NaNO_2$

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.25-0.5	See Comments section.	4.8 µg	2.4 µg	

Interferences	Comments
Particulate salts of nitrate and nitric acid give positive interferences for ozone. SO_2 will cause a negative interference.	**Treated filter is stable for 1 month.** Use flow rate of 1.5 lpm for short term sampling. For longer sampling time, use a flow rate of 0.5 lpm. For 25% of TLV, you will need 125L. Order media one week ahead of survey. Media are prepared when ordered. Sulfur dioxide (SO_2) has a negative interference on ozone. If SO_2 is suspected, check for its presence using a SO_2 detector tube. If present, request oxidizer tubes in addition to the ozone filters. Oxidizer tube precedes the ozone filter in the sampling train. After sampling seal the cassette with the end plugs and wrap each cassette with aluminum foil.

Palladium

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-05-3	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	50-1000	0.32 µg	0.16 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Paraffin Wax Fume

CAS #	Analytical Method	Analytical Technique	Sampling Media
8002-74-2	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	100-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 lpm, for area sampling up to 15 lpm.

†(LPM) (CC/Min) **††(L) (Minutes)**

Particles (insoluble or poorly soluble) Not otherwise specified; inhalable

CAS #	Analytical Method	Analytical Technique	Sampling Media
	HSE MDHS 14	GRAV	PVC, IOM

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	40-960	100 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	Use IOM sampler with pre-weighed PVC. Contact Lab 1 week before intended use. The availability of IOM samplers is limited. Rental charge for the IOM samplers applies.

Particles (insoluble or poorly soluble) Not otherwise specified; respirable

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0600	GRAV	PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.7	100-816	50 µg	10 µg	

Interferences	Comments
All other respirable dusts will interfere.	Use pre-weighed PVC 2-piece cassette for MSA (Dorr-Oliver) cyclones at 1.7 lpm and 3-piece cassette for BMRC (SKC) cyclones at 2.5 lpm and for BGI-4L at 2.2 lpm.

Particles (insoluble or poorly soluble) Not otherwise specified; total

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	40-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 lpm, for area sampling up to 15 lpm.

Pentane(n-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
109-66-0	NIOSH 1500	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	4	0.48 µg	0.24 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Pentane(n-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
109-66-0	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
35.3	15-180	0.73 µg	0.37 µg	CS_2

Interferences	Comments
	Use 3M 3520. Separate front section of the monitor from the back section and cap immediately after sampling. Ship and store cold immediately.

Pentanedione(2,3-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
600-14-6	OSHA 1016	GC-MS	SGT/GFF-SGT/GFF (SKC 226-183)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	10L (TWA); 3L (short term)	0.59 µg	0.30 µg	95% EtOH

Interferences	Comments
	Samples are collected on two specially washed silica gel tubes in series. Samples should be protected from the light during and after sampling. Separate and cap tubes after sampling. Sample separately from CS2 compatible solvents. Order aluminum foil for wrapping the samples.

Pentanedione(2,4-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-54-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
31.7	15-300	2.7 µg	1.3 µg	CS_2

Interferences	Comments

Pentanone(2-) (Methyl propyl ketone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-87-9	NIOSH 1300	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.70 µg	0.35 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Pentanone(2-) (Methyl propyl ketone)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-87-9	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
33.0	15-480	1.1 µg	0.53 µg	CS_2

Interferences	Comments

Peracetic Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
79-21-0	NON 57	HPLC	SKC 225-9030 (Hydrogen Peroxide) + SKC-226-193-UC (Peracetic Acid)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1 LPM	15 Liters Max	0.50 µg/ sample	N/A	Sample with hydrogen peroxide

Interferences	Comments
Must sample for hydrogen peroxide	This analysis is sub-contracted to another laboratory. This method is not covered under the laboratory's AIHA-LAP, LLC scope of accreditation. Turnaround time is 10 business days.

Perchloroethylene (Tetrachloroethylene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
127-18-4	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-40	1.8 µg	0.90 µg	CS_2

Interferences	Comments

Perchloroethylene (Tetrachloroethylene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
127-18-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.3	15-480	2.7 µg	1.4 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Perfluorooctanoic Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
335-67-1	DuPont-PFOA	LC-MS	OVS-2 (SKC 226-30-16)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.0	480	1.4 µg	0.70 µg	

Interferences	Comments
	Sample 480 L if possible; 280 L will give 50% of recommended exposure limit.

Petroleum Ether

CAS #	Analytical Method	Analytical Technique	Sampling Media
8032-32-4	NIOSH 1550	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1.3-20	0.50 µg	0.25 µg	CS_2

Interferences	Comments
	Please send bulk sample. Ship bulk sample separately from air samples.

Petroleum Ether

CAS #	Analytical Method	Analytical Technique	Sampling Media
8032-32-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
33.1	15-480	0.75 µg	0.38 µg	CS_2

Interferences	Comments
	Please send bulk sample. Ship bulk sample separately from air samples.

Phenanthrene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
85-01-8	OSHA 58	HPLC	GFF (SKC 225-7)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	960	0.12 µg	0.060 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, cap and wrap in aluminum foil. Ship and store cold.

†(LPM) (CC/Min) ††(L) (Minutes)

Phenanthrene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
85-01-8	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.12 µg	0.060 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Phenol

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-95-2	OSHA 32	HPLC	XAD-7 (SKC 226-95)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	5-24	0.20 µg	0.10 µg	Phenol and cresol

Interferences	Comments

Phenylcyclohexene(4-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
4994-16-5	NIOSH 1500	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-60	0.38 µg	0.18 µg	CS_2

Interferences	Comments
	Please indicate if samples are for “LEED” compliance. Minimum sample volume for “LEED” samples is 60 L. Preferred air sampling method.

Phenylcyclohexene (4-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
4994-16-5	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
20.3	15-480	0.57 µg	0.28 µg	CS_2

Interferences	Comments
	Please indicate if samples are for “LEED” compliance. Minimum sample volume for “LEED” samples is 60 L.

†(LPM) (CC/Min) ††(L) (Minutes)

Phenylene(1,3-) diamine

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-45-2	OSHA 87	HPLC	GFF, Acid

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	10-1000	0.83 µg	0.42 µg	

Interferences	Comments
	Sampling media has a short shelf-life so it is not kept in stock. Contact lab one week before sampling to order media.

Phosphine

CAS #	Analytical Method	Analytical Technique	Sampling Media
7803-51-2	OSHA 1003	ICP	GFF- PE,$HgCl_2$ (SKC 225-9018)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	250	3.6 µg	1.8 µg	

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	Minimum air volume required at ¼ of TLV is 250. Sampling media has a shelf-life of only two weeks so it is not kept in stock. Contact lab one week before sampling to order media. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Phosphoric Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
7664-38-2	NIOSH 7903	IC	MCE2, SGT** (SKC 225-19, SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2-0.5	25-100	2.3 µg	1.2 µg	Acid1

Interferences	Comments
Particulate salts of the acid will give a positive interference.	Sample at a flow rate of 0.5 lpm for STEL.

Phosphoric Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
7664-38-2	NIOSH 7908	IC	SKC 225-9033

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-5	50-1000	3.8 µg	1.9 µg	

Interferences	Comments
Particulate salts of sulfate or phosphate will give positive interference.	Ship and store cold. **Specialty filter. Media charge applies.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Phosphorus (elements)

CAS #	Analytical Method	Analytical Technique	Sampling Media
7723-14-0	NIOSH 7301 NIOSH 7303	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	330-1000	3.3 µg	1.7 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples**.

Phthalic Anhydride

CAS #	Analytical Method	Analytical Technique	Sampling Media
85-44-9	OSHA 90	HPLC	GFF, Vamine

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.0	75	0.13 µg	0.065 µg	

Interferences	Comments
Isocyanates, acid chlorides and other anhydrides will give a positive interference.	Sample open-faced. Order filters one week ahead, filters are prepared when ordered and have one month shelf-life.

Piperazine

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-85-0	OSHA In-house IMIS P250	HPLC	XAD-2, NITC (SKC 226-30-18)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	10	0.12 µg	0.060 µg	

Interferences	Comments

Platinum Metal and Soluble Salts as Pt

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-06-4	NIOSH 7301 NIOSH 7303	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	500-1000	0.25 µg	0.13 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal **standard in metal analysis. Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

PNA Scan (NIOSH 5506)

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000			

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold. Analysis price is for the filter and tube together.

PNA Scan (OSHA 58)

CAS #	Analytical Method	Analytical Technique	Sampling Media
	OSHA 58	HPLC	GFF (SKC 225-7)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	960			

Interferences	Comments
Asphalt fumes will interfere.	After sampling, cap and wrap in aluminum foil. Ship and store cold.

Polychlorobiphenyl (Chlorodiphenyl, 54% Chlorine) (PCB)

CAS #	Analytical Method	Analytical Technique	Sampling Media
11097-69-1	NIOSH 5503	GC-MS	GFF-Florisil (Millipore SX0001300/01/ AP2001300 SKC 226-39)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	1-50	1.1 µg	0.55 µg	

Interferences	Comments
Other chlorinated pesticides may interfere in the quantification of PCB.	

Polychlorobiphenyl (Chlorodiphenyl, 42% Chlorine) (PCB)

CAS #	Analytical Method	Analytical Technique	Sampling Media
53469-21-9	NIOSH 5503	GC-MS	GFF-Florisil (Millipore SX0001300/01/ AP2001300 SKC 226-39)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	1-50	0.97 µg	0.49 µg	

Interferences	Comments
Other chlorinated pesticides may interfere in the quantification of PCB.	

†(LPM) (CC/Min) ††(L) (Minutes)

Polyvinyl Chloride (PVC)

CAS #	Analytical Method	Analytical Technique	Sampling Media
9002-86-2	NIOSH 0600	GRAV	PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.7	100-816	50 µg	10 µg	

Interferences	Comments
All other respirable dusts will interfere.	Use pre-weighed PVC 2-piece cassette for MSA (Dorr-Oliver) cyclones at 1.7 lpm and 3-piece cassette for BMRC (SKC) cyclones at 2.5 lpm and for BGI-4L at 2.2 lpm.

Portland Cement

CAS #	Analytical Method	Analytical Technique	Sampling Media
65997-15-1	NIOSH 0600	GRAV	PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.7 (See comment)	500-816	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	Use pre-weighed PVC 2-piece cassette for MSA (Dorr-Oliver) cyclones at 1.7 lpm and 3-piece cassette for BMRC (SKC) cyclones at 2.5 lpm and for BGI-4L at 2.2 lpm.

Potassium Hydroxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
1310-58-3	NIOSH 7301 NIOSH 7303	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	85-100	17 µg	8.5 µg	Metals

Interferences	Comments
All forms of potassium are quantified. Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Propanol(n-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
71-23-8	NIOSH 1401	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.83 µg	0.42 µg	1%IPA/CS_2

Interferences	Comments
	Store and ship cold overnight.

†(LPM) (CC/Min) ††(L) (Minutes)

Propanol(n-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
71-23-8	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
39.7	15-420	1.2 µg	0.60 µg	MC CS_2

Interferences	Comments
	Store and ship cold overnight.

Propionaldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-38-6	NIOSH 2016	HPLC	AT Monitor (N571AT)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
9.58	15-480	0.029 µg	0.015 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	Keep media refrigerated before and after sampling. Ship cold overnight.

Propionaldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-38-6	NIOSH 2016	HPLC	Sep-Pak (WAT047205)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	10-100	0.15 µg	0.075 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	Keep media refrigerated before and after sampling. Ship cold overnight. **Preferred for STEL sampling**.

Propionaldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
123-38-6	NIOSH 2016	HPLC	SGT, DNPH (SKC 226-119)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	1-15	0.059 µg	0.030 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	Keep media refrigerated before and after sampling. Ship cold overnight. **Preferred for STEL sampling**.

†(LPM) (CC/Min) **††(L) (Minutes)**

Propionic Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
79-09-4	NIOSH 2011	IC	PTFE3-SGT** (SKC 225-17A, SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.5	15-100	2.3 µg	1.2 µg	Acid2

Interferences	Comments
	Do not sample with inorganic acids.

Propoxyethanol(2-) (Ethylene glycol monopropyl ether)

CAS #	Analytical Method	Analytical Technique	Sampling Media
2807-30-9	NIOSH 1403	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.05	1-10	1.1 µg	0.55 µg	5%MeOH/MC

Interferences	Comments

Propoxyethanol(2-) (Ethylene glycol monopropyl ether)

CAS #	Analytical Method	Analytical Technique	Sampling Media
2807-30-9	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
29.4	15-480	1.7 µg	0.85 µg	MC CS_2

Interferences	Comments

Propyl Bromide

CAS #	Analytical Method	Analytical Technique	Sampling Media
106-94-5	OSHA PV2061	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	12	1.3 µg	0.65 µg	1%DMF/CS_2

Interferences	Comments

Propyl Bromide

CAS #	Analytical Method	Analytical Technique	Sampling Media
106-94-5	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
31.7	15-480	2.0 µg	1.0 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Propyl(n-) Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
109-60-4	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	1-10	0.78 µg	0.39 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Use a flow rate of 0.2 lpm for STEL.

Propyl(n-) Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
109-60-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
30.1	15-480	1.2 µg	0.60 µg	CS_2

Interferences	Comments

Propyl(n-) Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
71-23-8	NIOSH 1401	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.83 µg	0.42 µg	1%IPA/CS_2

Interferences	Comments
	Store and ship cold overnight.

Propyl(n-) Alcohol

CAS #	Analytical Method	Analytical Technique	Sampling Media
71-23-8	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
39.7	15-420	1.2 µg	0.60 µg	MC CS_2

Interferences	Comments
	Store and ship cold overnight.

Propylene Glycol Monomethyl Ether (PGME, 1-Methoxy-2-propanol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-98-2	NIOSH 1403	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.05	1-10	1.3 µg	0.65 µg	5%MeOH/MC

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Propylene Glycol Monomethyl Ether (PGME, 1-Methoxy-2-propanol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
107-98-2	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
32.4	15-480	2.0 µg	1.0 µg	MC CS_2

Interferences	Comments

Propylene Glycol Monomethyl Ether Acetate (PGMEA)

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-65-6	NIOSH 1450	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	1.1 µg	0.55 µg	CS_2

Interferences	Comments

Propylene Glycol Monomethyl Ether Acetate (PGMEA)

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-65-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
25.2	15-480	1.7 µg	0.85 µg	CS_2

Interferences	Comments

Propylene Glycol (1,2-Propanediol)

CAS #	Analytical Method	Analytical Technique	Sampling Media
57-55-6	NIOSH 5523	GC-FID	OVS 7 (SKC 226-57)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.5-2	5-60	6.2 µg	3.1 µg	MeOH

Interferences	Comments

Propylene Oxide (1,2-Epoxypropane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-56-9	ASTM D5578-04	GC-FID	ORBO 78 (SUPELCO 20355)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.15	1-24	0.51 µg	0.25 µg	ACN/TOL

Interferences	Comments
	Sample separately from CS_2 compatible solvents. Store and ship cold overnight.

†(LPM) (CC/Min) ††(L) (Minutes)

Propylene Oxide (1,2-Epoxypropane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-56-9	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
37.7	15-480	0.76 µg	0.38 µg	

Interferences	Comments
	Use 3M 3520. Separate front section of the monitor from the back section and cap immediately after sampling. Sample separately from CS_2 compatible solvents. Store and ship cold overnight.

Pyrene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
129-00-0	OSHA 58	HPLC	GFF (SKC 225-7)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	960	0.60 µg	0.30 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, cap and wrap in aluminum foil. Ship and store cold.

Pyrene (see PNA scan)

CAS #	Analytical Method	Analytical Technique	Sampling Media
129-00-0	NIOSH 5506	HPLC	PTFE2/XAD-2 (PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000	0.60 µg	0.30 µg	PNAs

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold.

Pyrethrum

CAS #	Analytical Method	Analytical Technique	Sampling Media
8003-34-7	NIOSH 5008	HPLC	GFF (SKC 225-7)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	20-400	0.13 µg	0.065 µg	

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Pyridine

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-86-1	NIOSH 1613	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-1.0	18-150	0.23 µg	0.12 µg	MC

Interferences	Comments
	Sample separately from CS_2 compatible solvents.

Resin Acids

CAS #	Analytical Method	Analytical Technique	Sampling Media
8050-09-7	LM-LC-30	HPLC	GFF, IOM

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200 (minimum)	0.091 µg	0.045 µg	

Interferences	Comments
	2019 NIC Resin acids as total resin acids, TWA = 0.001mg/cu m (I), DSEN;RSEN adopted in 2020. Resin Acids include Abietic Acid and Dehydroabietic Acid. 200-L will give you 46% (0.00046 mg/cu m) of TLV. 400-L will give you 23% (0.00023 mg/cu m) of TLV. 900-L will give you 10% (0.00010 mg/cu m) of TLV. 2019 NIC adopted.

Resorcinol

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-46-3	OSHA PV2053	GC-FID	OVS 7 (SKC 226-57)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	20-400	5.0 µg	2.5 µg	MeOH

Interferences	Comments

Rhodium as Rh

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-16-6	OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	500-1000	0.50 µg	0.25 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.

†(LPM) (CC/Min) ††(L) (Minutes)

Scan for Aldehydes

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 2016	HPLC	

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code

Interferences	Comments
	See List of Scans for individual aldehydes. Ship and store cold.

Scan for Aliphatic Amines

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 2010	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-1	5-30			Amine1

Interferences	Comments
	Ethylamine, diethylamine and triethylamine can also be analyzed using this method. Please call Lab for other types of amines.

Scan for Anesthetic Gases

CAS #	Analytical Method	Analytical Technique	Sampling Media
	OSHA 103	GC-FID	Anasorb 747 (SKC 226-81A)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05	12			

Interferences	Comments
	Analyzes enflurane, halothane and isoflurane. See individual anesthetic gases. Please call lab for additional anesthetic gases.

Scan for Aromatic Amines

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 2002	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.02-0.5	5-30			Amine3

Interferences	Comments
	Analyze for aniline, methyl aniline and o-toluidine. Please call Lab for other types of amines.

†(LPM) (CC/Min) ††(L) (Minutes)

Scan for Inorganic Acids

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 7903	IC	MCE2, SGT** (SKC 225-19, SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2-0.5	50-100			

Interferences	Comments
	See List of Scans for individual inorganic acids/anions.

Scan for Isocyanates

CAS #	Analytical Method	Analytical Technique	Sampling Media
	OSHA 42	HPLC	GFF, 1-2PP

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code

Interferences	Comments
	Keep media refrigerated before and after sampling. Sample open-faced. Ship cold overnight. Filter is stable for 6 months if kept cold. See List of Scans at the back of the guide for list of individual isocyanate.

Scan for Organic Solvents

CAS #	Analytical Method	Analytical Technique	Sampling Media
	LM-GCMS-13	GC-FID GC-MS	

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code

Interferences	Comments
	See List of Scans for individual organic solvents.

Scan for PNAs (NIOSH 5506)

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 5506	HPLC	PTFE2/XAD-2 (SKC PALL P5PJ037, SKC 226-30-04)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	200-1000			

Interferences	Comments
Asphalt fumes will interfere.	After sampling, separate filter from sorbent tube. Cap and wrap individually in aluminum foil. Ship and store cold. Price is for the analysis of filter and tube together.

†(LPM) (CC/Min) ††(L) (Minutes)

Scan for PNAs (OSHA 58)

CAS #	Analytical Method	Analytical Technique	Sampling Media
	OSHA 58	HPLC	GFF (SKC 225-7)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	960			

Interferences	Comments
Asphalt fumes will interfere.	After sampling, cap and wrap in aluminum foil. Ship and store cold.

Selenium and Compounds as Se

CAS #	Analytical Method	Analytical Technique	Sampling Media
7782-49-2	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	120-1000	1.0 µg	0.50 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Selenium and Compounds as Se

CAS #	Analytical Method	Analytical Technique	Sampling Media
7782-49-2	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	75-240	0.75 µg	0.38 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

Sevoflurane (Sevofrane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
28523-86-6	OSHA 106	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05	3	2.9 µg	1.5 µg	CS_2

Interferences	Comments
	Store and ship cold overnight.

†(LPM) (CC/Min) ††(L) (Minutes)

Sevoflurane (Sevofrane)

CAS #	Analytical Method	Analytical Technique	Sampling Media
28523-86-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.3	15-480	4.4 µg	2.2 µg	CS_2

Interferences	Comments
	Store and ship cold overnight.

Silica Cristobalite

CAS #	Analytical Method	Analytical Technique	Sampling Media
14464-46-1	NIOSH 7500	XRD	PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
see comments	600-1200	7.5 µg	5.0 µg	Silica

Interferences	Comments
Mica, potash, feldspars, zircon, graphite and aluminosilicates will interfere. Bulk sample is required for interference check.	Use pre-weighed PVC 2-piece cassette for MSA (Dorr-Oliver) cyclones at 1.7 lpm; 3-piece cassette for BMRC (SKC) cyclones at 2.5 lpm and for BGI-4L at 2.2 lpm. Dusty atmospheres require much smaller sample volumes (<600 L) to obtain optimum dust loading of 2 mg on filter. 600-L will give you 52% (0.013 mg/cu m) of TLV and 900-L for 33% (0.0083 mg/cu m) of TLV. Sample 600-L to quantify at 25% of the new OSHA PEL.

Silica Quartz

CAS #	Analytical Method	Analytical Technique	Sampling Media
14808-60-7	NIOSH 7500	XRD	PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
see comments	600-1200	7.5 µg	5.0 µg	Silica

Interferences	Comments
Mica, potash, feldspars, zircon, graphite and aluminosilicates will interfere. Bulk sample is required for interference check.	Use pre-weighed PVC 2-piece cassette for MSA (Dorr-Oliver) cyclones at 1.7 lpm; 3-piece cassette for BMRC (SKC) cyclones at 2.5 lpm and for BGI-4L at 2.2 lpm. Dusty atmospheres require much smaller sample volumes (<600 L) to obtain optimum dust loading of 2 mg on filter. Sample 600-L for 52% (0.013 mg/cu m) of the TLV and 900-L for 33% (0.0083 mg/cu m) of TLV. Sample 600-L to quantify at 25% of the new OSHA PEL.

Silver Metal and Soluble Compounds as Ag

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-22-4	NIOSH 7300	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	250-1000	0.50 µg	0.25 µg	Metals1

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Soapstone

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	34-7200	10 µg	5.0 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 lpm, for area sampling up to 15 lpm.

Soapstone

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0600	GRAV	PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.7	67-816	50 µg	25 µg	

Interferences	Comments
All other respirable dusts will interfere.	Use pre-weighed PVC 2-piece cassette for MSA (Dorr-Oliver) cyclones at 1.7 lpm and 3-piece cassette for BMRC (British Medical Research Council-SKC) cyclones at 2.5 lpm and for BGI-4L at 2.2 lpm.

Sodium

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-23-5	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	60-1000	7.5 µg	3.8 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Sodium Hydroxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
1310-73-2	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	60-1000	13 µg	6.5 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	All forms of sodium are quantified. Use a flow rate of 2 lpm for STEL. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Starch

CAS #	Analytical Method	Analytical Technique	Sampling Media
9005-25-8	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	20-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 LPM, for area sampling up to 15 LPM.

Stoddard Solvent

CAS #	Analytical Method	Analytical Technique	Sampling Media
8052-41-3	NIOSH 1550	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1.3-20	2.3 µg	1.1 µg	CS_2

Interferences	Comments
	Please send bulk sample. Ship bulk sample separately from air samples.

Stoddard Solvent

CAS #	Analytical Method	Analytical Technique	Sampling Media
8052-41-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
24.3	15-480	3.4 µg	1.7 µg	CS_2

Interferences	Comments
	Please send bulk sample. Ship bulk sample separately from air samples.

Strontium

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-24-6	NIOSH 7301 NIOSH 7303	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	620-1000	0.052 µg	0.026 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Strontium Chromate as Cr

CAS #	Analytical Method	Analytical Technique	Sampling Media
7789-06-2	NIOSH 7301 NIOSH 7303	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	620-1000	0.031 µg	0.016 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	Samples are analyzed as strontium and calculated as strontium chromate as Cr. Other forms of strontium will interfere. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Styrene (Vinyl benzene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
100-42-5	NIOSH 1501	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.02-1	1-10	0.43 µg	0.22 µg	CS_2

Interferences	Comments
	Under conditions of high humidity, the breakthrough volumes may be reduced by as much as 50%. Store and ship cold overnight. 2019 NIC, TWA = 10ppm, STEL = 20 ppm, OTO, A3 , BEI adopted in 2020.

Styrene (Vinyl benzene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
100-42-5	3M Method	GC-FID	OVM (3M 3500) SKC 575-006

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.9 13.55	15-480 15-240	0.65 µg	0.33 µg	CS_2 Tol

Interferences	Comments
	Store and ship cold overnight. 2019 NIC, TWA = 10ppm, STEL = 20 ppm, OTO, A3 , BEI adopted in 2020.

Sulfur Dioxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
7446-09-5	OSHA ID 1011	IC	IABC (SKC 226-177)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05 for TWA, 0.5 for STEL	12 – 25	2.3 µg	1.2 µg	

Interferences	Comments
Particulate salts of sulfate, sulfur trioxide and sulfuric acid may give positive interferences for sulfur dioxide.	Media charge applies.

†(LPM) (CC/Min) **††(L) (Minutes)**

Sulfuric Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
7664-93-9	OSHA ID-113	IC	PPI Thoracic-MCE (225-3861)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2.0	90-230	4.6 µg	2.3 µg	Acid1

Interferences	Comments
Particulate salts of sulfate will give a positive interference.	**The TLV for sulfuric acid is as thoracic particulate mass. Use 37-mm MCE 3 piece cassette for BGI GK2.69 cyclone at 1.6 lpm or request thoracic PPI pre-loaded with 0.8um MCE filter. Media charge applies.**

Sulfuric Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
7664-93-9	NIOSH 7903	IC	MCE2, SKC 226-10-03

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.2-0.5	50-150	4.6 µg	2.3 µg	

Interferences	Comments
Particulate salts of sulfate will give a positive interference.	If using 226-10-03 in a very humid environment, use two sorbent tubes in series.

Sulfuric Acid

CAS #	Analytical Method	Analytical Technique	Sampling Media
7664-93-9	NIOSH 7908	IC	SKC 225-9033

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-5	50-500	4.6 µg	2.3 µg	

Interferences	Comments
Particulate salts of sulfate or phosphate will give positive interference.	Ship and store cold. **Specialty filter. Media charge applies.**

Synthetic Vitreous Fibers

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 7400	PCM	MCE, 25 mm (ZEFON Z008BA)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.5-16	50-720	0.050 fiber/fld	0.01 fib/fld	

Interferences	Comments
Chain-like particles may appear fibrous and high levels of non-fibrous dust particles may obscure fibers.	Adjust sampling flow rate and time to obtain optimum fiber loading on the filter. Do not overload filter. Sample open faced. When shipping your samples, do not pack with untreated polystyrene as can lead to fiber loss from electrostatic effect.

†(LPM) (CC/Min) **††(L) (Minutes)**

Talc

CAS #	Analytical Method	Analytical Technique	Sampling Media
14807-96-6	NIOSH 0600	GRAV	PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1.7	100-816	50 µg	10 µg	

Interferences	Comments
All other respirable dusts will interfere.	Use pre-weighed PVC 2-piece cassette for MSA (Dorr-Oliver) cyclones at 1.7 lpm and 3-piece cassette for BMRC (British Medical Research Council-SKC) cyclones at 2.5 lpm and for BGI-4L at 2.2 lpm. **TWA of 2 mg/cu m as respirable fraction is for particulate matter containing no asbestos and <1% crystalline silica.**

Tantalum and Tantalum Oxide Dust as Ta

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-25-7	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	100-1000	50 µg	25 µg	

Interferences	Comments
All other dusts will interfere.	

Tellurium and Compounds as Te

CAS #	Analytical Method	Analytical Technique	Sampling Media
13494-80-9	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	160-1000	0.54 µg	0.27 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	Excludes hydrogen telluride. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.

Tetrachloroethylene (Perchloroethylene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
127-18-4	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-40	1.8 µg	0.90 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Tetrachloroethylene (Perchloroethylene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
127-18-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
28.3	15-480	2.7 µg	1.4 µg	CS_2

Interferences	Comments

Tetrahydrofuran [THF]

CAS #	Analytical Method	Analytical Technique	Sampling Media
109-99-9	NIOSH 1609	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-9	0.83 µg	0.42 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at a flow rate of 0.2 lpm. High humidity may greatly decrease breakthrough volume.

Tetrahydrofuran

CAS #	Analytical Method	Analytical Technique	Sampling Media
109-99-9	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
37.2	15-480	1.2 µg	0.62 µg	CS_2

Interferences	Comments

Thallium and Compounds, as Tl

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-28-0	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	PVC, IOM MCE, IOM

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	500-1000	1.0 µg	0.50 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples. Contact Lab 1 week before intended use. The availability of IOM samplers is limited. rental charge for IOM samplers applies.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Thallium and Compounds, as Tl

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-28-0	NIOSH 7301 NIOSH 7303	ICP-MS	PVC, IOM MCE, IOM

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	750-1000	1.3 µg	0.65 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples. Contact Lab one week before intended use. The availability of IOM samplers is limited. Rental charge for IOM samplers applies.**

Thiram

CAS #	Analytical Method	Analytical Technique	Sampling Media
137-26-8	NIOSH 5005	HPLC	PTFE1 (SKC 225-1705)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	20-400	0.79 µg	0.40 µg	

Interferences	Comments
	Return to Lab immediately after sampling.

Tin and Compounds as Sn

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-31-5	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	25-1000	0.52 µg	0.26 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	Includes metal, metal oxide, inorganic tin compounds (except tin hydride) and organic compounds. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Tin and Compounds as Sn

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-31-5	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	40-240	0.025 µg	0.013 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples..**

Tin Organic Compounds as Sn

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-31-5	NIOSH 5504	GFAA	GFF/XAD-2 (SKC 225-7) (SKC 226-30)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-1.5	50-500	0.050 µg	0.025 µg	Metals

Interferences	Comments
All forms of tin organic compounds are quantified.	Ship assembled sampler in dry ice overnight. This method is not covered under our AIHA-LAP, LLC scope of accreditation.

Titanium

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-32-6	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	25-1000	0.25 µg	0.13 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Titanium

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-32-6	NIOSH 7301	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	25-500	0.15 µg	0.075 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.

Titanium Dioxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
13463-67-7	OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	25-1000	0.42 µg	0.21 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	All forms of titanium are quantified. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. Please indicate in your sample submission form if yttrium is present in the area where you collected your samples. 2021 NIC, Titanium dioxide TWA as Nanoscale particles = 0.2mg/m3 (R), A3 and as Finescale particles = 2.5mg/m3(R), A3

Toluene

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-88-3	NIOSH 1501	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.44 µg	0.22 µg	CS_2

Interferences	Comments
	Under conditions of high humidity, the breakthrough volumes may be reduced by as much as 50%." 2020 NIC, TWA = 20ppm, OTO;A4;BEI adopted in 2021.

Toluene

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-88-3	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
31.4	15-480	0.67 µg	0.33 µg	CS_2

Interferences	Comments
	2020 NIC, TWA = 20ppm, OTO;A4;BEI adopted in 2021.

†(LPM) (CC/Min) ††(L) (Minutes)

Toluene-2,4-diioscyanate (2,4-TDI)

CAS #	Analytical Method	Analytical Technique	Sampling Media
584-84-9	OSHA 42	HPLC	GFF, 1-2PP

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	15-240	0.010 µg	0.0050 µg	Isocyanate

Interferences	Comments
Potential interferences include anhydrides, amines, alcohols and carboxylic acids.	Keep media refrigerated before and after sampling. Sample open-faced. Ship cold overnight. Filter is stable for 6 months if kept cold.

Toluene-2,4- diisocyanate (2,4-TDI)

CAS #	Analytical Method	Analytical Technique	Sampling Media
584-84-9	OSHA 42	HPLC	GFF Wipes

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
N/A	N/A	0.010 µg	0.0050 µg	Isocyanate

Interferences	Comments
Potential interferences include anhydrides, amines, alcohols and carboxylic acids.	Follow “Isocyanate Wipe Sampling Procedure”. Immediately after sampling, glass fiber filters must be placed in a vial containing derivatizing solution. Order media one week ahead of survey. Media are prepared when ordered. Derivatizing solution has a shelf life of 1 month if kept cold.

Toluene-2,6-diisocyanate (2,6-TDI)

CAS #	Analytical Method	Analytical Technique	Sampling Media
91-08-7	OSHA 42	HPLC	GFF, 1-2PP

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	15-240	0.010 µg	0.0050 µg	Isocyanate

Interferences	Comments
Potential interferences include anhydrides, amines, alcohols and carboxylic acids.	Keep media refrigerated before and after sampling. Sample open-faced. Ship cold overnight. Filter is stable for 6 months if kept cold.

Toluene-2,6- diisocyanate (2,6-TDI)

CAS #	Analytical Method	Analytical Technique	Sampling Media
91-08-7	OSHA 42	HPLC	GFF Wipes

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
N/A	N/A	0.010 µg	0.0050 µg	Isocyanate

Interferences	Comments
Potential interferences include anhydrides, amines, alcohols and carboxylic acids.	Follow “Isocyanate Wipe Sampling Procedure”. Immediately after sampling, glass fiber filters must be placed in a vial containing derivatizing solution. Order media one week ahead, media is prepared when ordered. Derivatizing solution has a shelf life of 1 month if kept cold.

†(LPM) (CC/Min) **††(L) (Minutes)**

Toluidine(o-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
95-53-4	NIOSH 2002	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.02-0.5	5-30	1.4 µg	0.70 µg	Amine3

Interferences	Comments
Nitrogen compounds that co-elute will interfere.	

Tributyl Phosphate

CAS #	Analytical Method	Analytical Technique	Sampling Media
126-73-8	NIOSH 5034	GC-FID	MCE (SKC 225-5)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-3	2-100	0.41 µg	0.20 µg	Ethyl Ether

Interferences	Comments
	Sample separately from CS_2 compatible solvents.

Trichloro(1,1,2-)-1,2,2-trifluoroethane

CAS #	Analytical Method	Analytical Technique	Sampling Media
76-13-1	NIOSH 1020	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.05	1-10	2.9 µg	1.5 µg	CS_2

Interferences	Comments

Trichloro(1,1,2-)-1,2,2-trifluoroethane

CAS #	Analytical Method	Analytical Technique	Sampling Media
76-13-1	3M Method	GC-FID	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
29.1	15-480	4.4 µg	2.2 µg	CS_2

Interferences	Comments

Trichlorobenzene(1,2,4-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
120-82-1	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.29 µg	0.15 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at a flow rate of 0.2 lpm.

†(LPM) (CC/Min) ††(L) (Minutes)

Trichlorobenzene(1,2,4-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
120-82-1	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
24.8	15-480	0.44 µg	0.22 µg	CS_2

Interferences	Comments
	Use 3M 3520. Separate the front section of the monitor from the back section and cap immediately after sampling.

Trichloroethane(1,1,1-) (Methyl Chloroform)

CAS #	Analytical Method	Analytical Technique	Sampling Media
71-55-6	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	2.2 µg	1.1 µg	CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at a flow rate of 0.2 lpm.

Trichloroethane(1,1,1-) (Methyl Chloroform)

CAS #	Analytical Method	Analytical Technique	Sampling Media
71-55-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
30.9	15-480	3.3 µg	1.7 µg	CS_2

Interferences	Comments

Trichloroethane(1,1,2-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
79-00-5	NIOSH 1003	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	2-60	1.6 µg	0.80 µg	CS_2

Interferences	Comments

Trichloroethane(1,1,2-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
79-00-5	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
29.7	15-480	2.9 µg	1.4 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Trichloroethylene

CAS #	Analytical Method	Analytical Technique	Sampling Media
79-01-6	NIOSH 1022	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	2.0 µg	1.0 µg	CS_2

Interferences	Comments

Trichloroethylene

CAS #	Analytical Method	Analytical Technique	Sampling Media
79-01-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
31.1	15-480	3.0 µg	1.5 µg	CS_2

Interferences	Comments

Triethanolamine

CAS #	Analytical Method	Analytical Technique	Sampling Media
102-71-6	NIOSH 2007	IC	ORBO 53 or SGT** (SUPELCO 20265) (SKC 226-10-03)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.5	15-25	7.5 µg	3.8 µg	EA

Interferences	Comments
	Store in freezer after sampling. Ship and store cold.

Triethylamine

CAS #	Analytical Method	Analytical Technique	Sampling Media
121-44-8	NIOSH 2010	GC-FID	SGT (SKC 226-10)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-1	5-30	0.29 µg	0.15 µg	Amine1

Interferences	Comments
Nitrogen compounds that co-elute will interfere.	

†(LPM) (CC/Min) ††(L) (Minutes)

Triethylamine

CAS #	Analytical Method	Analytical Technique	Sampling Media
121-44-8	OSHA PV2060	GC-FID	XAD-7, Acid (SKC 226-98)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	10	4.0 µg	2.0 µg	

Interferences	Comments
Nitrogen compounds that co-elute will interfere.	

Triethylenetetramine

CAS #	Analytical Method	Analytical Technique	Sampling Media
112-24-3	OSHA 60	HPLC	XAD-2, NITC (SKC 226-30-18)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1	10	0.24 µg	0.12 µg	Amine2

Interferences	Comments
Nitrogen compounds that co-elute will interfere.	

Triglycidyl Isocyanurate(1,3,5)

CAS #	Analytical Method	Analytical Technique	Sampling Media
2451-62-9	Ciba-Geigy C321A	GC-MS	PTFE1 or PTFE5

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1	100-240	4.0 µg	2.0 µg	Acetone

Interferences	Comments
	Samples can be collected using either 25mm or 37mm filters.

Trimellitic Anhydride

CAS #	Analytical Method	Analytical Technique	Sampling Media
552-30-7	OSHA 98	HPLC	GFF, Vamine

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	480	0.050 µg	0.025 µg	

Interferences	Comments
	Order media one week ahead of survey. Media are prepared when ordered. Sample open-faced.

†(LPM) (CC/Min) ††(L) (Minutes)

Trimethylbenzene(1,2,4-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
95-63-6	NIOSH 1501	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.44 µg	0.22 µg	CS_2

Interferences	Comments
	2021 NIC, trimethyl benzene all isomers 10 ppm TWA, A4.

Trimethylbenzene(1,2,4-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
95-63-6	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
24.4	15-480	0.66 µg	0.33 µg	CS_2

Interferences	Comments
	2021 NIC, trimethyl benzene all isomers 10 ppm TWA, A4.

Trimethylbenzene(1,3,5-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-67-8	NIOSH 1501	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.45 µg	0.23 µg	CS_2

Interferences	Comments
	2021 NIC, trimethyl benzene all isomers 10 ppm TWA, A4.

Trimethylbenzene(1,3,5-)

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-67-8	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
26.3	15-480	0.68 µg	0.34 µg	CS_2

Interferences	Comments
	2021 NIC, trimethyl benzene all isomers 10 ppm TWA, A4.

†(LPM) (CC/Min) **††(L) (Minutes)**

Tungsten and Compounds as W (in the absence of Cobalt)

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-33-7	OSHA ID-213	ICP	MCE (SKC 225-5)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	30-480	0.25 µg	0.12 µg	

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	Recommended air volume for STEL is 30L. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Tungsten, as W Soluble Compounds

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-33-7	OSHA ID-213	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
2	30-480	0.25 µg	0.12 µg	

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	Recommended air volume for STEL is 30L. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

TVOC as n-Hexane

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 1500	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-10	0.40 µg	0.20 µg	CS_2

Interferences	Comments
	For IAQ and LEED sampling where TVOC and formaldehyde are collected, do not sample with Charcoal Tubes and DNPH tubes in tandem. The sorbent in the DNPH tubes may off-gas acetonitrile which can cause a positive interference in the TVOC results.

TVOC as n-Hexane

CAS #	Analytical Method	Analytical Technique	Sampling Media
	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
32.0	15-480	0.60 µg	0.30 µg	CS_2

Interferences	Comments

†(LPM) (CC/Min) ††(L) (Minutes)

Valeraldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-62-3	NIOSH 2016	HPLC	AT Monitor (N571AT)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
7.21	15-480	0.043 µg	0.022 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	Keep media refrigerated before and after sampling. Ship cold overnight.

Valeraldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-62-3	NIOSH 2016	HPLC	Sep-Pak (WAT047205)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	10-100	0.22 µg	0.11 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	**Keep media refrigerated before and after sampling. Ship cold overnight. Preferred for STEL sampling**. Sample at 1.5 lpm for STEL.

Valeraldehyde

CAS #	Analytical Method	Analytical Technique	Sampling Media
110-62-3	NIOSH 2016	HPLC	SGT, DNPH (SKC 226-119)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-1.5	1-15	0.087 µg	0.044 µg	Aldehyde

Interferences	Comments
Other aldehydes and ketones will react with the 2,4-DNPH but can be chromatographically resolved.	**Keep media refrigerated before and after sampling. Ship cold overnight. Preferred for STEL sampling**. Sample at 1.5 lpm for STEL.

Vanadium Pentoxide as V

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-62-2	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	40-480	0.20 µg	0.10 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Vanadium Pentoxide as V

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-62-2	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	120-1000	0.10 µg	0.050 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	All forms of vanadium are quantified. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Vanadium

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-62-2	OSHA ID-121	ICP	Ghost wipe (225-2414)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	0.22 µg	0.11 µg	Metals 2

Interferences	Comments
Spectral interferemces are the primary interferences encountered in the ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in ICP analysis. Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.

Vegetable Oil Mist

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	20-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 lpm, for area sampling up to 15 lpm. TLV withdrawn.

Vinyl Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-05-4	NIOSH 1453	GC-FID	CT(SKC 226-01,-09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.1-0.2	0.75-24	1.2 µg	0.60 µg	5%MeOH/MC CS_2

Interferences	Comments
	Preferred for STEL sampling. Sample at a flow rate of 0.2 lpm.

†(LPM) (CC/Min) **††(L) (Minutes)**

Vinyl Acetate

CAS #	Analytical Method	Analytical Technique	Sampling Media
108-05-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
35.8	15-480	1.8 µg	0.90 µg	CS_2

Interferences	Comments

Vinyl Chloride (Chloroethylene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-01-4	NIOSH 1007	GC-FID GC-MS	CT-CT (SKC 226-01)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05	0.7-5	0.29 µg	0.14 µg	CS_2

Interferences	Comments
	Sample using 2 charcoal tubes in series. Separate and cap tubes before shipping. Possible loss of sample after 2 or more weeks of storage at room temperature. Ship and store cold immediately.

Vinyl Chloride (Chloroethylene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-01-4	3M Method	GC-FID GC-MS	OVM (3M 3520)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
40.8	15-480	0.43 µg	0.22 µg	CS_2

Interferences	Comments
	Use OVM 3520. Separate front and back section of the monitor immediately after sampling. Ship cold immediately.

Vinyl(1-)-2-pyrrolidinone

CAS #	Analytical Method	Analytical Technique	Sampling Media
88-12-0	NIOSH 1302	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.05-0.2	3-125	0.39 µg	0.20 µg	5%MeOH/MC

Interferences	Comments
	Sample separately from CS_2 compatible solvents.

†(LPM) (CC/Min) ††(L) (Minutes)

Vinyl(1-)-2-pyrrolidinone

CAS #	Analytical Method	Analytical Technique	Sampling Media
88-12-0	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
26.7	120-480	0.59 µg	0.30 µg	MC

Interferences	Comments
	Sample separately from CS_2 compatible solvents. Sampling for 480 minutes allows quantification at 40% of the TLV.

Vinylidene Chloride (1,1-Dichloroethylene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
75-35-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
35.1	15-480	0.60 µg	0.30 µg	CS_2

Interferences	Comments
	Store and ship cold.

VM & P Naphtha

CAS #	Analytical Method	Analytical Technique	Sampling Media
8032-32-4	NIOSH 1550	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1.3-28	1.8 µg	0.90 µg	CS_2

Interferences	Comments
	Please send bulk sample. Ship bulk sample separately from air samples.

VM & P Naphtha

CAS #	Analytical Method	Analytical Technique	Sampling Media
8032-32-4	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
33.2	15-480	2.7 µg	1.4 µg	CS_2

Interferences	Comments
	Please send bulk sample. Ship bulk sample separately from air samples.

†(LPM) (CC/Min) ††(L) (Minutes)

Welding Fume Scan

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 7301 NIOSH 7303	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	400-1000			

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	See List of Scans for individual metals. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Welding Fumes, Total

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	40-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 lpm, for area sampling up to 15 lpm.

Wood Dust

CAS #	Analytical Method	Analytical Technique	Sampling Media
	NIOSH 0500	GRAV	Pre-weighed PVC (SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-15	40-7200	50 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	For personal sampling use a flow rate of 1-2 lpm, for area sampling up to 15 lpm.

Wood Dust

CAS #	Analytical Method	Analytical Technique	Sampling Media
	HSE MDHS-14	GRAV	PVC, IOM

Sampling Rate†	Sampling Volume††	LOQ	LOQ	Compatibility Code
2	960	100 µg	10 µg	

Interferences	Comments
All other dusts will interfere.	Use IOM sampler with pre-weighed PVC. Contact Lab one week before intended use. The availability of IOM samplers is limited. Rental charge for the IOM samplers applies.

†(LPM) (CC/Min) **††(L) (Minutes)**

Xylene (Dimethyl benzene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
1330-20-7	NIOSH 1501	GC-FID	CT (SKC 226-01, -09)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
0.01-0.2	1-30	1.0 µg	0.50 µg	CS_2

Interferences	Comments
	Under conditions of high humidity, the breakthrough volumes may be reduced by as much as 50%. 2021 NIC xylene (all isomers) 20 ppm TWA, OTO; A4; BEI

Xylene (Dimethyl benzene)

CAS #	Analytical Method	Analytical Technique	Sampling Media
1330-20-7	3M Method	GC-FID	OVM (3M 3500)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
27.3	15-480	1.5 µg	0.75 µg	CS_2

Interferences	Comments
	2021 NIC, xylene (all isomers) 20 ppm TWA, OTO; A4; BEI

Yttrium and compounds, as Y

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-65-5	NIOSH 7301 NIOSH 7303	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	25-1000	0.025 µg	0.013 µg	Metals

Interferences	Comments
	Spectral interferences are the primary interferences encountered in ICP-AES analysis.

Zinc

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-66-6	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	120-1000	3.0 µg	1.5 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Zinc

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-66-6	NIOSH 7301 NIOSH 7303	ICP-MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	40-240	0.75 µg	0.38 µg	Metals

Interferences	Comments
	As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

Zinc

CAS #	Analytical Method	Analytical Technique	Sampling Media
7440-66-6	OSHA ID-121	ICP	Ghost wipe (225-2414)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
NA	NA	160 ug	80 ug	Metals 2

Interferences	Comments
Spectral interferemces are the primary interferences encountered in the ICP-AES analysis.	As part of the Lab's QC protocol, yttrium is used as internal standard in ICP analysis. Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.

Zinc Chloride Fume

CAS #	Analytical Method	Analytical Technique	Sampling Media
7646-85-7	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	120-1000	6.3 µg	3.1 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	Analysis is for water soluble zinc compounds. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

Zinc Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
1314-13-2	NIOSH 7301 NIOSH 7303 OSHA ID-125G	ICP	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	120-1000	3.7 µg	1.9 µg	Metals

Interferences	Comments
Spectral interferences are the primary interferences encountered in ICP-AES analysis.	Samples are analyzed for zinc and calculated as zinc oxide. Current TLV is for respirable sampling. As part of the Lab's QC protocol, yttrium is used as internal standard in metal analysis. **Please indicate in your sample submission form if yttrium is present in the area where you collected your samples.**

Zinc Oxide

CAS #	Analytical Method	Analytical Technique	Sampling Media
1314-13-2	NIOSH 7301 NIOSH 7303	ICP -MS	MCE or PVC (SKC 225-5 or SKC 225-5-37-P)

Sampling Rate†	Sampling Volume††	LOQ	LOD	Compatibility Code
1-4	40-240	0.93 µg	0.46 µg	Metals

Interferences	Comments
	Samples are analyzed for zinc and calculated as zinc oxide. Current TLV is for respirable sampling. As part of the Lab's QC protocol, yttrium, rhodium, and lutetium are used as internal standards in ICP-MS analysis. **Please indicate in your sample submission form if yttrium, rhodium, and/or lutetium are present in the area where you collected your samples.**

†(LPM) (CC/Min) **††(L) (Minutes)**

List of analytes by CAS

50-00-0	Formaldehyde
50-21-5	Lactic acid
50-32-8	Benzo[a]pyrene
53-70-3	Dibenzo[ah]anthracene (see PNA scan)
54-11-5	Nicotine
56-23-5	Carbon tetrachloride
56-55-3	Benz[a]anthracene
57-55-6	Propylene glycol (1,2-Propanediol)
60-29-7	Ethyl ether
62-53-3	Aniline
63-25-2	Carbaryl (SEVIN)
64-17-5	Ethyl alcohol (Ethanol)
64-18-6	Formic acid
64-19-7	Acetic acid
67-56-1	Methyl alcohol (Methanol)
67-63-0	Isopropyl alcohol
67-64-1	Acetone
67-66-3	Chloroform
68-12-2	Dimethylformamide
71-23-8	Propyl(n-) alcohol
71-36-3	Butyl(n-) alcohol
71-43-2	Benzene
71-55-6	Trichloroethane(1,1,1-) (Methyl Chloroform)
74-90-8	Hydrogen cyanide
75-01-4	Vinyl chloride
75-04-7	Ethyl amine
75-05-8	Acetonitrile
75-07-0	Acetaldehyde
75-09-2	Methylene chloride (Dichloromethane)
75-12-7	Formamide
75-15-0	Carbon disulfide
75-18-3	Dimethyl sulfide
75-21-8	Ethylene oxide
75-25-2	Bromoform
75-34-3	Dichloroethane(1,1-)
75-35-4	Vinylidene chloride (1,1-Dichloroethylene)
75-52-5	Nitromethane
75-56-9	Propylene oxide
75-65-0	Butyl(tert-) alcohol
76-13-1	Trichloro(1,1,2-)-1,2,2-trifluoroethane
76-22-2	Camphor
77-73-6	Dicyclopentadiene
78-59-1	Isophorone
78-83-1	Isobutyl alcohol
78-92-2	Butyl(sec-) alcohol
78-93-3	Butanone(2-) (Methyl ethyl ketone)
78-94-4	Methyl vinyl ketone
79-00-5	Trichloroethane(1,1,2-)
79-01-6	Trichloroethylene
79-06-1	Acrylamide
79-08-3	Bromoacetic acid
79-09-4	Propionic acid
79-10-7	Acrylic Acid
79-11-8	Chloroacetic acid
79-20-9	Methyl acetate
79-21-0	Peracetic Acid
79-24-3	Nitroethane
79-43-6	Dichloroacetic acid
80-05-7	Bisphenol A
80-62-6	Methyl methacrylate
83-32-9	Acenaphthene
84-66-2	Diethyl phthalate
84-74-2	Dibutyl phthalate
85-01-8	Phenanthrene
85-44-9	Phthalic anhydride
86-73-7	Fluorene
88-12-0	Vinyl(1-)-2-pyrrolidinone
91-08-7	Toluene-2,6-diisocyanate (2,6-TDI)
91-20-3	Naphthalene
91-57-6	Methylnaphthalene(2-)
91-58-7	Chloro(2-)naphthalene
92-52-4	Biphenyl
95-49-8	Chlorotoluene(o-)
95-50-1	Dichlorobenzene(o-)
95-53-4	Toluidine(o-)
95-63-6	Trimethylbenzene(1,2,4-)
96-12-8	Dibromochloropropane
96-22-0	Diethyl ketone
96-33-3	Methyl acrylate
96-37-7	Methyl cyclopentane
97-63-2	Ethyl methacrylate
98-00-0	Furfuryl alcohol
98-01-1	Furfural
98-82-8	Cumene
98-83-9	Methyl styrene(a-)
98-86-2	Acetophenone
100-41-4	Ethyl benzene
100-42-5	Styrene
100-44-7	Benzyl chloride
100-51-6	Benzyl alcohol
100-52-7	Benzaldehyde
100-61-8	Methyl aniline

101-14-4	Methylene(4,4'-)-bis(2 chloroaniline) (MOCA)
101-68-8	Methylene bisphenyl isocyanate (MDI)
101-77-9	Methylene(4,4'-) dianiline (MDA)
102-71-6	Triethanolamine
105-46-4	Butyl(sec-) acetate
105-60-2	Caprolactam
106-46-7	Dichlorobenzene(p-)
106-48-9	Chlorophenol(p-)
106-89-8	Epichlorohydrin
106-94-5	Bromopropane(1-)
106-95-6	Allyl bromide
106-99-0	Butadiene(1,3-)
107-02-8	Acrolein
107-04-0	Bromo(1-)-2-chloroethane
107-05-1	Allyl chloride
107-06-2	Ethylene dichloride (1,2-Dichloroethane)
107-07-3	Ethylene chlorohydrin
107-13-1	Acrylonitrile
107-15-3	Ethylenediamine
107-18-6	Allyl alcohol
107-21-1	Ethylene glycol
107-41-5	Hexylene glycol (2-Methyl-2,4-pantanediol)
107-87-9	Pentanone(2-) (Methyl propyl ketone)
107-98-2	Propylene glycol monomethyl ether
108-05-4	Vinyl acetate
108-10-1	Methyl isobutyl ketone
108-21-4	Isopropyl acetate
108-24-7	Acetic anhydride
108-45-2	Phenylene(1,3-) diamine
108-46-3	Resorcinol
108-65-6	Propylene glycol monomethyl ether acetate
108-67-8	Trimethylbenzene(1,3,5-)
108-83-8	Dimethyl(2,6-)-4-heptanone
108-87-2	Methylcyclohexane
108-88-3	Toluene
108-90-7	Chlorobenzene
108-91-8	Cyclohexylamine
108-93-0	Cyclohexanol
108-94-1	Cyclohexanone
108-95-2	Phenol
109-60-4	Propyl(n-) acetate
109-66-0	Pentane(n-)
109-86-4	Methoxyethanol(2-) (Methyl cellosolve)
109-89-7	Diethylamine
109-99-9	Tetrahydrofuran
110-12-3	Methyl isoamyl ketone
110-19-0	Isobutyl acetate
110-43-0	Heptanone(2-)
110-49-6	Methoxyethyl(2-) acetate (Methyl cellosolve acetate)
110-54-3	Hexane(n-)
110-62-3	Valeraldehyde
110-80-5	Ethoxyethanol(2-) (Cellosolve)
110-82-7	Cyclohexane
110-85-0	Piperazine
110-86-1	Pyridine
110-91-8	Morpholine
111-15-9	Ethoxyethyl(2-) acetate
111-30-8	Glutaraldehyde
111-40-0	Diethylene triamine
111-42-2	Diethanolamine
111-76-2	Butoxyethanol(2-) (Butyl cellosolve)
111-77-3	Methoxyethoxy(2-(2-)) ethanol
111-96-6	Methoxyethyl(2-) ether
112-07-2	Butoxyethyl(2-) acetate
112-24-3	Triethylenetetramine
112-34-5	Butoxyethoxy(2-(2-)) ethanol
117-84-1	Dioctyl phthalate
120-12-7	Anthracene
120-82-1	Trichlorobenzene(1,2,4-)
121-44-8	Trimethylamine
123-31-9	Hydroquinone
123-38-6	Propionaldehyde
123-42-2	Diacetone alcohol
123-54-6	Pentanedione(2,4-)
123-72-8	n-Butyraldehyde
123-86-4	Butyl(n-) acetate
123-91-1	Dioxane(p-)
124-17-4	Butoxyethoxy(2-(2-)) ethyl acetate
126-73-8	Tributyl phosphate
126-98-7	Methylacrylonitrile
126-99-8	Chloroprene(b-)
127-18-4	Perchloroethylene
127-19-5	Dimethyl acetamide
129-00-0	Pyrene
137-26-8	Thiram
138-86-3	Limonene(d-)
140-88-5	Ethyl acrylate
141-32-3	Butyl acrylate
141-43-5	Ethanolamine (2-Aminoethanol)
141-78-6	Ethyl acetate
141-79-7	Mesityl oxide
142-82-5	Heptane

142-96-1	Dibutyl ether
151-67-7	Halothane (Fluothane)
191-24-2	Benzo[ghi]perylene
192-97-2	Benzo[e]pyrene
193-39-5	Indeno[1,2,3-cd]pyrene
205-99-2	Benzo[b]fluoranthene
206-44-0	Fluoranthene
207-08-9	Benzo[k]fluoranthene
208-96-8	Acenaphthylene
218-01-9	Chrysene
287-92-3	Cyclopentane
302-01-2	Hydrazine
335-67-1	Perfluorooctanoic acid
431-03-8	Diacetyl
540-59-0	Dichloroethylene(1,2-)
540-84-1	Isooctane
540-88-5	Butyl(tert-) acetate
552-30-7	Trimellitic anhydride
563-80-4	Methyl isopropyl ketone
584-84-9	Toluene-2,4-diioscyanate (2,4-TDI)
624-92-0	Dimethyl disulfide
628-63-7	Amyl acetate
631-64-1	Dibromoacetic acid
687-47-8	Ethyl lactate
763-69-9	Ethyl 3-ethoxypropionate
822-06-0	Hexamethylene diisocyanate (HDI)
872-50-4	Methyl(1-)-2-pyrrolidinone
1304-82-1	Bismuth telluride
1305-62-0	Calcium hydroxide
1305-78-8	Calcium oxide
1309-37-1	Iron oxide
1309-48-4	Magnesium oxide (fume)
1310-58-3	Potassium hydroxide
1310-73-2	Sodium hydroxide
1314-13-2	Zinc oxide
1314-62-1	Vanadium pentoxide
1317-65-3	Calcium carbonate
1319-77-3	Cresol, all isomers
1321-74-0	Divinyl benzene
1327-53-3	Arsenic Trioxide as As
1330-20-7	Xylene
1332-21-4	Asbestos
1332-58-7	Kaolin
1333-86-4	Carbon black
1344-28-1	Aluminum oxide
1344-95-2	Calcium silicates synthetic nonfibrous
1634-04-4	Methyl tert-butyl ether (MTBE)
1675-54-3	Diglycidyl Ether of Bisphenol A
2426-08-6	Butyl(n-) glycidyl ether
2451-62-9	Triglycidyl isocyanurate
2499-95-8	Hexyl acrylate
2807-30-9	Propoxyethanol(2-)
2921-88-2	Chlorpyrifos (Dursban)
4098-71-9	Isophorone diisocyanate (IPDI)
4994-16-5	Phenylcyclohexene(4-)
5124-30-1	Methylene bis(4-cyclohexylisocyanate)
7085-85-0	Ethyl 2-cyanoacrylate
7429-90-5	Aluminum Metal and insoluble compounds
7439-91-0	Lanthanum
7439-92-1	Lead and inorganic compounds as Pb
7439-93-1	Lithium
7439-95-4	Magnesium
7439-96-5	Manganese, elemental and Inorganic compounds as Mn
7439-97-6	Mercury as Hg (Elemental and inorganic forms)
7439-98-7	Molybdenum
7440-02-0	Nickel and inorganic compounds as Ni
7440-05-3	Palladium
7440-06-4	Platinum
7440-16-6	Rhodium as Rh
7440-22-4	Silver
7440-23-5	Sodium
7440-24-6	Strontium
7440-28-0	Thallium
7440-31-5	Tin
7440-32-6	Titanium
7440-33-7	Tungsten and Compounds as W (in the absence of Cobalt)
7440-36-0	Antimony
7440-38-2	Arsenic and inorganic compounds, as As
7440-39-3	Barium and soluble compounds as Ba
7440-41-7	Beryllium and compounds as Be
7440-42-8	Boron, sodium salts
7440-43-9	Cadmium
7440-47-3	Chromium
7440-48-4	Cobalt and inorganic compounds as Co
7440-50-8	Copper (Fume, Dusts and Mists) as Cu
7440-56-4	Germanium
7440-57-5	Gold
7440-62-2	Vanadium
7440-65-5	Yttrium and compounds, as Y
7440-66-6	Zinc
7440-67-7	Zirconium

7440-69-9	Bismuth
7440-70-2	Calcium
7440-74-6	Indium
7440-09-5	Sulfur dioxide
7553-56-2	Iodine
7646-85-7	Zinc chloride fume
7647-01-0	Hydrogen chloride
7664-38-2	Phosphoric acid
7664-39-3	Hydrogen fluoride or fluorides as F
7664-41-7	Ammonia
7664-93-9	Sulfuric acid
7697-37-2	Nitric Acid
7722-84-1	Hydrogen peroxide
7723-14-0	Phosphorus
7726-95-6	Bromine
7758-97-6	Lead chromate as Cr
7778-18-9	Calcium sulfate
7782-42-5	Graphite
7782-49-2	Selenium and compounds as Se
7782-50-5	Chlorine
7782-65-2	Germanium tetrahydride
7783-06-4	Hydrogen sulfide
7784-42-1	Arsine
7789-06-2	Strontium chromate as Cr
7803-51-2	Phosphine
8002-74-2	Paraffin wax fume
8003-34-7	Pyrethrum
8006-61-9	Gasoline
8008-20-6	Kerosene
8012-95-1	Mineral Oil
8032-32-4	VM&P Naphtha
8050-09-7	Resin Acids
8052-41-3	Stoddard solvent
8052-42-4	Asphalt fume
9002-86-2	Polyvinyl chloride (PVC)
9005-25-8	Starch
10024-97-2	Nitrous oxide
10028-15-6	Ozone
10035-10-6	Hydrogen bromide
10049-04-4	Chlorine dioxide
10102-43-9	Nitric oxide
10102-44-0	Nitrogen dioxide
11097-69-1	Chlorodiphenyl (54% chlorine)
12001-26-2	Mica
12125-02-9	Ammonium chloride
13463-67-7	Titanium dioxide
13494-80-9	Tellurium
13765-19-0	Calcium chromate as Cr
13838-16-9	Enflurane (Ethrane)
14464-46-1	Silica cristobalite
14807-96-6	Talc
14808-60-7	Silica quartz
22204-53-1	Naproxen sodium
26675-46-7	Forane (Isoflurane)
28182-81-2	Hexamethylene diisocyanate(1,6-) Homopolymer (HDI Polymer)
28523-86-6	Sevoflurane (Sevofrane)
34590-94-8	Dipropylene glycol methyl ether
53469-21-9	Chlorodiphenyl (42% chlorine)
57041-67-5	Desflurane (Suprene)
64742-95-6	Aromatic 100
65996-93-2	Coal tar pitch volatiles
65997-15-1	Portland cement
88917-22-0	Dipropylene glycol methyl ether acetate (DPGMEA)