

# INDUSTRIAL HYGIENE ANALYSES - CHEMICAL CONTAMINANTS



Contaminant(s)	Method	Volume	Rate	Media	Technique	Exposure Limits	Remarks
Acetic Acid	NIOSH 1603	20-300 L	10-100 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	10ppm-TWA 15ppm-STEL	3 sample minimum. Single Sample billed at \$100.00
Acetone	NIOSH 1300	50 ml-3L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	500ppm-TWA 750ppm-STEL	
Acetonitrile	NIOSH 1606	3-25 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	40ppm-TWA 60ppm-STEL	
Acids, Inorganic - HBr, HF, HCl, HNO3, H2SO4, H3PO4	NIOSH 7903	3-100 L	0.2-0.5 L/min	Silica gel/Glass fiber filter ORBO-53,226-10	IC		
Aldehydes (Screening) Acetaldehyde, Acrolein, Crotonaldehyde, Formaldehyde, Furfural, Heptanal, Hexanal, Isovaleraldehyde, Propionaldehyde, Valeraldehyde	NIOSH 2539	5 L	10-50 ml/min	XAD-2c/w 2-HMP ORBO-23,226-01	GC-FID		3 sample minimum. Single sample billed at \$300.00
Aluminum	NIOSH 7300	5-100 L	1-4 L/min	MCE filter	ICP	5mg/m3-fume 10mg/m3-dust	
Amines, Aliphatic	NIOSH 2010	3-30 L	10ml- 1 L/min	silica gel/ORBO-52S, 226-10	GC-FID		3 sample minimum. Single sample billed at \$250.00
Amines, Aromatic	NIOSH 2002	30-150 L	0.2-1 L/min	silica gel/ORBO-52S, 226-10	GC-FID		3 sample minimum. Single sample billed at \$250.00
Ammonia	NIOSH 6016	0.1-96 L	0.1-0.5 L/min	silica gel c/w H2SO4, ORBO-555,226-10-06	IC-CD	25ppm-TWA 35ppm-STEL	3 sample minimum. Single simple sample billed at \$200.00
Arsenic	NIOSH 7300	5-2000 L	3 L/min	MCE filter	ICP	0.01mg/M3-TWA	
Arsine	NIOSH 6001	0.1-10 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	ICP	0.05ppm-TWA	3 sample minimum. Single simple sample billed at \$200.00
Asbestos Bulk	EPA 600/R-93/116	N/A	N/A	N/A	PLM		Volume Discounts for Multiple Samples or Repeat Customers

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Asbestos Air	NIOSH 7400A	400 L+	0.5-16 L/min	MCE filter with cowl (25mm)	PCM	0.1 f/cc-TWA 1.0 f/cc-STEL	Volume Discounts for Multiple Samples or Repeat Customers
Asbestos Dust	EPA 600/R-93/116	N/A	N/A	N/A	PLM		
Barium	NIOSH	180 L	1.5 L/min	MCE filter	ICP	0.5 mg/M3-TWA	
Benzene	NIOSH 1500	2-30 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	0.5ppm-TWA 2.5 ppm-STEL	
Beryllium	NIOSH 7300	1250-2000 L	1-4 L/min	MCE filter	ICP	0.002mg/M3-TWA 0.01mg/M3-STEL	
2-Butanone (MEK)	NIOSH 1500	2-30 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	200ppm-TWA 300ppm-STEL	
Butyl Acetate	NIOSH 1500	2-30 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	150ppm-TWA 250ppm-STEL	
Cadmium	NIOSH 7048	25-1500 L	1-3 L/min	MCE filter	ICP	0.01mg/M3-TWA metal 0.002mg/m3-cmpds	
Calcium	NIOSH 7300	5-200 L	1-4 L/min	MCE filter	ICP	2mg/M3-CaO 10 mg/M3-CaSO4	
Camphor	NIOSH 1301	1-25 L	10-200 L/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	2ppm-TWA 4ppm-STEL	3 sample minimum. Single sample billed at \$200.00
Capsaicin	NIOSH 5041	5-1000 L	1-3 L/min	glass fiber filter, 225-16	HPLC-UV		3 sample minimum. Single sample billed at \$250.00
Carbaryl (Sevin)	OSHA 53	60 L	1 L/min	glass fiber filter, ORBO-49P, 226-30-16	HPLC-UV		3 sample minimum. Single sample billed at \$250.00
Carbon Black	NIOSH 5000	30-570 L	1-2 L/min	PVC filter, 225-8-01	gravimetric	3.5 mg/M3-TWA	

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Carbon Dioxide	EPA IP-3A	N/A	N/A	N/A	direct reading	5000ppm-TWA 30,000ppm-STEL	requires set-up and take down by Legend personnel at \$65/hr
Carbon Monoxide	EPA IP-3A	N/A	N/A	N/A	direct reading	25ppm-TWA	requires set-up and take down by Legend personnel at \$65/hr
Chlordane	NIOSH 5510	10-200 L	0.5-1 L/min	XAD-2, MCE filter stainless Steel screen, ORBO-44, 226-30-04,225-5	GC-ECD	0.5mg/m3-TWA	3 sample minimum. Single sample billed at \$250.00
Chlorides	NIOSH 7903	10-500 L	0.5-1.5 L/min	MCE filter	IC		
Chlorine	NIOSH 6011	2-90 L	0.3-1 L/min	PTFE filter + Ag Membrane, 225-9006	IC-CD	0.5ppm-TWA 1ppm-STEL	3 sample minimum. Single sample billed at \$150.00
Chlorobenzene	NIOSH 1003	1.5-40 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	10ppm-TWA	3 sample minimum. Single sample billed at \$90.00
Chlorpyrifos (Dursban)	NIOSH 5600			OVS-2 tube/13 mm quartz filter/XAD-2	GC-FPD		3 sample minimum. Single sample billed at \$250.00
Chromium	NIOSH 7300	5-1000 L	1-4 L/min	MCE filter	ICP	0.5mg/m3-metal 0.05 mg/m3 water sol. Cmpds	
Copper	NIOSH 7300	5-1000 L	1-3 L/min	MCE filter	ICP	0.2 mg/m3-TWA	
Cumene	NIOSH 1501	1-30 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	50ppm-TWA	
Cyclohexane	NIOSH 1500	2.5-5 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	300ppm-TWA	
Dichlorobenzene	NIOSH 1003	1-60 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	25ppm-TWA	

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Dichloromethane	NIOSH 1005	0.5-2.5 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	50ppm-TWA	
Dioxane	NIOSH 1602	0.5-15 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	20ppm-TWA	
Dust, Respirable	NIOSH 0600	75-1000L	1.7 L/min with cyclone	PVC filter, 225-8-01	gravimetric	5mg/m3-TWA	
Dust, Total	NIOSH 0500	7-133 L	1-2 L/min	PVC filter, 225-8-01	gravimetric	10mg/m3-TWA	
Epichlorohydrin	NIOSH 1010	2-30 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	0.5ppm-TWA	
Ethanol	NIOSH 1400	0.1-1 L	10-50 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	1000ppm-TWA	
Ethyl Acetate	NIOSH 1457	0.1-10 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	400ppm-TWA	
Ethyl Acrylate	NIOSH 1450	1-10 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	5ppm-TWA 15ppm-STEL	
Ethyl Benzene	NIOSH 1501	1-24 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	100ppm-TWA 125ppm-STEL	
Ethyl Butyl Ketone	NIOSH 1301	1-25 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	50ppm-TWA 75ppm-STEL	
Ethylene Glycol	NIOSH 5523	5-60 L	0.5-2 L/min	XAD-7/glass fiber filter (OVS), ORBO-47P,226-57	GC-FID	100ppm-TWA	
Fiberglass	NIOSH 7400B	400+L	0.5-16 L/min	MCE filter	PCM	1f/cc-TWA	
Formaldehyde	NIOSH 3500	1-100 L	0.2-1 L/min	impinger	visible	0.3ppm-TWA	
Formaldehyde	OSHA ID 205	N/A	0.0614 liters/min	3M #3721 diffusive sampler	Visible	0.3ppm-TWA	

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Glutaraldehyde	NIOSH 2532	4-39 L	10-80 ml/min	silica gel c/w DNPH LpDNPH H10, 226-119	HPLC-UV	0.05ppm-TWA	
n-Hexane	NIOSH 1500	4 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	50ppm-TWA	
Hydrazine	OSHA 108	240 L	1 L/min	glass fiber filters c/w H2SO4	HPLC-UV	0.01ppm-TWA	3 sample minimum. Single sample billed at \$350.00
Hydrogen Bromide	NIOSH 7903	3-100 L	0.2-0.5 L/min	silica gel/glass fiber filter ORBO-53,226-10-03	IC	3ppm-TWA	
Hydrocarbons, General				Coconut Charcoal ORBO-32S,226-01	GC-FID		See VOC List
Hydrogen Chloride	NIOSH 7903	3-100 L	0.2-0.5 L/min	silica gel/glass fiber filter ORBO-53,226-10-03	IC	5ppm-TWA	
Hydrogen Fluoride	NIOSH 7903	3-100 L	0.2-0.5 L/min	silica gel/glass fiber filter ORBO-53,226-10-03	IC	3ppm-TWA	
Hydrogen Sulfide	NIOSH 6013	1.2-40 L	0.1-1.5 L/min	coconut charcoal, ORBO-34	IC-CD	10ppm-TWA 15ppm-STEL	3 sample minimum. Single sample billed at \$110.00
Iodine	NIOSH 6005	15-225 L	0.5-1 L/min	charcoal c/w KOH, ORBO-354,226-27	IC	0.1ppm-TWA	3 sample minimum. Single sample billed at \$100.00
Iron	NIOSH 7300	5-100 L	1-4 L/min	MCE filter	ICP	5 mg/m3-TWA 1mg/m3-STEL	
Iron Oxide Fume	NIOSH 7300	5-100 L	1-4 L/min	MCE filter	ICP	5 mg/m3-TWA	
Isopropyl Alcohol	NIOSH 2549	1-6 L	10-50 L/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	400ppm-TWA 500ppm-STEL	
Kerosene	NIOSH 1550	1.3-20 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	100ppm-TWA	
Lead (Air)	NIOSH 7105	1-1500 L	1-4 L/min	MCE filter	ICP	0.05mg/m3-TWA	Volume Discounts for Multiple Samples or Repeat Customers

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Lead (Wipes)	EPA	N/A	N/A	Ghost™wipes	ICP		Volume Discounts for Multiple Samples or Repeat Customers
Lead (Dust)	EPA	N/A	N/A	bulk	ICP		Volume Discounts for Multiple Samples or Repeat Customers
Lead (Paint)	EPA	N/A	N/A	bulk	ICP	0.5%bywt-MN,EPA	Volume Discounts for Multiple Samples or Repeat Customers
Limonene	NIOSH 1552	2-30 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID		
Lithium	NIOSH 7300	100-2000 L	1-4 L/min	MCE filter	ICP	0.025 mg/m3-TWA	
Magnesium	NIOSH 7300	5-67 L	1-4 L/min	MCE filter	ICP	10mg/m3-TWA MgO fume	
Manganese	NIOSH 7300	5-200 L	1-4 L/min	MCE filter	ICP	0.2 mg/m3-TWA	
Mercury	NIOSH 6009	2-100 L	0.15-0.25 L/min	Hopcalite, ORBO-1002,226-17-1A	Mercury Analyzer	0.025 mg/m3-TWA	
Mercury	OSHA ID 140	8 hr max	20 ml/min	Anasorb C300, 52002A,520-03	Mercury Analyzer	0.025 mg/m3-TWA	
Metals (General)	NIOSH 7300	up to 2000 L	1-4 L/min	MCE filter	ICP		multiple metals analysis on a single sample.
Methanol	NIOSH 2000	1-5 L	20-200 L/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	200ppm-TWA 250ppm-STEL	
Methyl Ethyl Ketone	NIOSH 2549	1-6 L	10-50 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	200ppm-TWA 300ppm-STEL	
MEK Peroxide	NIOSH 3508	52-520 L	0.5-2 L/min	impinger, 225-36-1	visible	0.2ppm-TWA	
Methylene Bisphenyl Isocyanate (MDI)	OSHA 47	15 L	1 L/min	glass fiber filter c/w12PP,ORBO-80,225-9002	HPLC-UV	0.005ppm-TWA	3 sample minimum. Single sample billed at \$150.00

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Mineral Spirits	NIOSH 1550	1.3-20 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	100ppm-TWA	
Molybdenum	NIOSH 7300	5-67 L	1-4 L/min	MCE filter	ICP	5 mg/m3-TWA sol cmpd 10mg/m3- metal, insol.	
Naptha	NIOSH 1550	1.3-20 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID		
Nickel	NIOSH 7300	25-1000 L	1-4 L/min	MCE filter	ICP	1.5 mg/m3-TWA metal 0.1 mg/m3- sol.	
Nicotine	NIOSH 3/S293	100 L	1 L/min	XAD-2, ORBO-605	GC-MS	0.5 mg/M3-TWA	
Nitric Oxide	OSHA ID 190	6 L	0.025 L/min	molecular sieve c/w TEA+oxidizer tube, ORBO-	IC-CD	25ppm-TWA	
Nitrobenzene	NIOSH 2017	5-50 L	200 ml/min	silica gel, ORBO-52S,226-10	GC-FID	1ppm-TWA	
Nitrogen Dioxide	OSHA ID 190	6 L	0.025 L/min	molecular sieve c/w TEA+oxidizer tube, ORBO-	IC-CD	3ppm-TWA 5ppm- STEL	
Nitrogen Dioxide		N/A	N/A	N/A	direct reading	3ppm-TWA 5ppm- STEL	set-up and take down done by Legend personnel at \$65/hr
Oil Mist	ASTM PS42-97	500+L	1L/min	PVC filter, 225-8-01	gravimetric	5mg/m3-TWA	
Oxygen		N/A	N/A	N/A	direct reading		set-up and take down done by Legend personnel at \$65/hr
Ozone	OSHA ID 214	22.5-90 L	0.25-1.5 L/min	glass fiber filter c/w NaNO2,K2CO3, glycerol	IC-UV	0.2ppm-TWA	
Phenols: Cresol, Phenol, Pentachlorophenol, p-Chlorophenol, Dinitro-o-cresol, o-chlorolphenol, p-Nitrophenol	NIOSH 2546	1-24 L	10-100 ml/min	XAD-7,ORBO-47,226-95	GC-FID		

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Phthalates-Dibutyl, Diethyl, Dimethyl, Di-n-octyl	OSHA 104	240 L	1 L/min	Tenax/glass fiber filter, ORBO-410P,226-56	GC-MS		
Polynuclear Aromatics: Naphthalene, Acenaphthene, Acenaphthylene, Chrysene, Benz(a)pyrene, Fluoranthene, Fluorene, Pyrene, Phenanthrene, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Benzo(e)pyrene, Benz(b)fluoranthene, Benz(a)anthracene, Anthracene	NIOSH 5515	200-1000L	2 L/min	XAD-2,PTFE filter,ORBO-43,226-30-04,225-17-07	HPLC-UV/Fluor. Or GC/MS		
Polychlorinated Biphenyls (PCBs)	NIOSH 5503	1-50 L	50-200 L/min	glass fiber filter, florisis, ORBO-60,225-16,226-39	GC-ECD	0.001mg/M3-TWA	
Potassium	NIOSH 1173	180 L	1.5 L/min	MCE filter	ICP	2 mg/M3-TWA	
Quartz (Respirable Silica)	NIOSH 7603	300-1000L	1.7 or 2.2 L/min	PVCfilter/ cyclone	IR	0.1mg/m3-TWA	3 sample minimum. Single sample billed at \$100.00
Silver	NIOSH 7300	250-2000L	1-4 L/min	MCE filter	ICP	0.1 mg/m3-TWA metal 0.01 mg/m3-sol.cmpds	
Sodium Hydroxide	OSHA ID 206	480 L	2 L/min	MCE filter	ICP	2 mg/M3-TWA	
Stoddard Solvent	NIOSH 1550	1.3-20 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	100ppm-TWA	
Styrene	NIOSH 1501	1-14 L	0.01-1 L/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	20ppm-TWA 40ppm-STEL	
Sulfur Dioxide	OSHA ID200	1.5-200L	100 ml/min	carbon c/w KOH ORBO-1010,226-80	IC	2ppm-TWA 5ppm-STEL	3 sample minimum. Single sample billed at \$110.00

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Terpenes	NIOSH 1552	2-30 L	0.1-2 L/min	Coconut Charcoal ORBO-32S,226-01	GC-FID		
Tetrahydrofuran	NIOSH 1609	1-9 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	200ppm-TWA 250ppm-STEL	
Thallium	NIOSH 7300	25-2000 L	1-4 L/min	MCE filter	ICP	0.1mg/m3-TWA	
Tin Oxide	OSHA ID 121	480-960 L	2 L/min	MCE filter	ICP	2mg/m3-TWA	
Tin Organic Cmpds	NIOSH 5504	50-500 L	1-1.5 L/min	XAD-2,glass fiber filter,ORBO-614,226-30,225-7	ICP	0.1mg/m3-TWA	
Toluene	NIOSH 1501	2-8 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	50ppm-TWA	
2,4-Toluene Diisocyanate (TDI)	OSHA 42	15 L	1 L/min	glass fiber filter c/w 1-2PP	HPLC-UV	0.005ppm-TWA 0.02ppm-STEL	3 sample minimum. Single sample billed at \$100.00
1,2,4-Trichlorobenzene	NIOSH 5517	3-12 L	10-200 ml/min	XAD-2,PTFE filter,ORBO-43,226-30-04,225-17-07	GC-ECD	5ppm-TWA	3 sample minimum. Single sample billed at \$100.00
Trichloroethylene	NIOSH 1022	1-30 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	50ppm-TWA 100ppm-STEL	
Turpentine	NIOSH 1551	1-10 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	100ppm-TWA	
V,M & P Naptha	NIOSH 1550	1.3-20 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	100ppm-TWA	
Vanadium	NIOSH 7300	5-2000 L	1-4 L/min	MCE filter	MCE filter	0.05mg/m3-TWA	

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Volatile Organic Compounds - Acetone, Isopropanol, Methylene Chloride, MEK, Hexane, THF, Ethyl Acetate, 1,1,1-Trichloroethane, Benzene, MIBK, 1,4-Dioxane, Perchloroethylene, Toluene, Butyl Acetate, Styrene, Xylene, Trichloroethylene, 1,3,5-Trimethylbenzene, 1,2,4-Trimethylbenzene	NIOSH 1500	2-8 L	10-200 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID		
Volatile Organic Compounds - Acetone, Isopropanol, Methylene Chloride, MEK, Hexane, THF, Ethyl Acetate, 1,1,1-Trichloroethane, Benzene, MIBK, 1,4-Dioxane, Perchloroethylene, Toluene, Butyl Acetate, Styrene, Xylene, Trichloroethylene, 1,3,5-Trimethylbenzene, 1,2,4-Trimethylbenzene		N/A	N/A	3M 3500 Organic Vapor Monitor	GC-FID		3M 3500 OVM monitor not included in analytical price.
Welding Fumes - Iron, Copper, Manganese, Nickel, Zinc, Lead, Chromium	NIOSH 7300	480 L	2 L/min	MCE filter	ICP		
Xylene	NIOSH 2549	1-6 L	10-50 ml/min	Coconut Charcoal ORBO-32S,226-01	GC-FID	100ppm-TWA	
Zinc	NIOSH 7300	5-200 L	1-4 L/min	MCE filter	ICP	5mg/m3-TWA ZnOfume 10mg/m3-dust	