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For more details on HAPS
calibration gases
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Hazardous Air Pollutants (HAPS) Monitoring

The helpful chart lists 188 chemical CAS (Chemical Abstracts Service) registry numbers, the HAP compound, and the parameters for the known calibration gas. If a calibration gas is not available, an explanation is provided.

Airgas Calibration Gases

Airgas has the technical expertise and the precise calibration gases you need to help you comply with any HAP monitoring required in your State Title V permit.



HAPS CALIBRATION GASES

Acetaldehyde to p-Cresol

CAS No.	HAP Compound	Airgas Product*	Explanations / Descriptions	
75070	Acetaldehyde	1ppm - 3000ppm		
60355	Acetamide	Not Available	Vapor pressure too low to make gas mixture	Sublimes at 65°C
75058	Acetonitrile	1ppm - 300ppm		
98862	Acetophenone	Not Available	Vapor pressure too low to make gas mixture	
53963	2-Acetylaminofluorene	Not Available	Vapor pressure too low to make gas mixture	
107028	Acrolein	1ppm - 900ppm	Can be produced higher than 900ppm at reduced vapor pressure	
79061	Acrylamide	Not Available	Vapor pressure too low to make gas mixture	
79107	Acrylic acid	Not Available	Polymerizes readily; cannot make gas mixture	
107131	Acrylonitrile	1ppm - 400ppm		
107051	Allyl chloride	1ppm - 1000ppm		
92671	4-Aminobiphenyl	Not Available	Vapor pressure too low to make gas mixture	
62533	Aniline	1ppm - 20ppm		
90040	o-Anisidine	Not Available	Very toxic; too dangerous to handle	
1332214	Asbestos	Not Available	Fibrous solid; cannot make gas mixture	
71432	Benzene (including benzene from gasoline)	90ppb - 300ppm		
92875	Benzidine	Not Available	Solid vapor pressure too low; melting point 125°C	
98077	Benzotrichloride	Not Available	Too toxic	
100447	Benzyl chloride	1ppm - 10ppm		
92524	Biphenyl	Not Available	Solid vapor pressure too low; melting point 69°C	
117817	Bis (2-ethylhexyl) phthalate (DEHP)	Not Available	Vapor pressure too low to make gas mixture	
542881	Bis (chloromethyl) ether	Not Available	Vapor pressure too low to make gas mixture	
75252	Bromoform	1ppm - 10ppm		
106990	1,3-Butadiene	100ppb - 1%		
156627	Calcium cyanamide	Not Available	Vapor pressure too low to make gas mixture	Solid; melting point 1300°C
105602	Caprolactam (See Modification)	Not Available	Boiling point too high (515°C) to make gas mixture	Solid; melting point 68°C
133062	Captan	Not Available	Vapor pressure too low to make gas mixture	Solid; melting point 178°C
63252	Carbaryl	Not Available	Boiling point too high (515°C) to make gas mixture	Solid; melting point 142°C Unstable
75150	Carbon disulfide	100ppb - 1000ppm		
56235	Carbon tetrachloride	1ppm - 300ppm		
463581	Carbonyl sulfide	100ppb - 3%		
120809	Catechol	Not Available	Boiling point too high (474°C) to make gas mixture	Solid; melting point 105°C
133904	Chloramben	Not Available	Vapor pressure too low to make gas mixture	Solid
57749	Chlordane	Not Available	Vapor pressure too low to make gas mixture	Solid
7782505	Chlorine	5ppm - 4000ppm		
79118	Chloroacetic acid	Not Available	Vapor pressure too low to make gas mixture	Solid; melting point 63°C
532274	2-Chloroacetophenone	Not Available	Vapor pressure too low to make gas mixture	
108907	Chlorobenzene	1ppm - 300ppm		
510156	Chlorobenzilate	Not Available	Vapor pressure too low to make gas mixture	
67663	Chloroform	1ppm - 1000ppm		
107302	Chloromethyl methyl ether	Not Available	Too toxic	
126998	Chloroprene	1ppm - 1000ppm		
1319773	Cresols/Cresylic acid (isomers and mixture)	Not Available	Boiling point too high (396°C) to make gas mixture	
95487	o-Cresol	Not Available	Vapor pressure too low to make gas mixture	
108394	m-Cresol	Not Available	Vapor pressure too low to make gas mixture	Solid; melting point 30°C
106445	p-Cresol	Not Available	Vapor pressure too low to make gas mixture	

HAPS CALIBRATION GASES

Cumene to Hexachlorocyclopentadiene

CAS No.	HAP Compound	Airgas Product*	Explanations / Descriptions	
98828	Cumene	0.5ppm - 20ppm		
94757	2,4-D, salts and esters	Not Available	Vapor pressure too low to make gas mixture	
3547044	DDE	Not Available	Vapor pressure too low to make gas mixture	
334883	Diazomethane	Not Available	Explosive; poisonous	
132649	Dibenzofurans	Not Available	Vapor pressure too low to make gas mixture	
96128	1,2-Dibromo-3-chloropropane	Not Available	Very toxic; too dangerous to handle	Carcinogen
84742	Dibutylphthalate	Not Available	Toxic irritant	
106467	1,4-Dichlorobenzene (p)	Not Available	Vapor pressure too low to make gas mixture	Melting point 53°C
91941	3,3-Dichlorobenzidene	Not Available	Boiling point too high (387°C) to make gas mixture	
111444	Dichloroethyl ether (Bis (2-chloroethyl) ether)	Not Available	Vapor pressure too low to make gas mixture	
542756	1,3-Dichloropropene	Not Available	Irritant	
62737	Dichlorvos	Not Available	Vapor pressure too low to make gas mixture	
111422	Diethanolamine	Not Available	Vapor pressure too low to make gas mixture	Solid; melting point 28°C
121697	N,N-Diethyl aniline (N,N-Dimethylaniline)	Not Available	Vapor pressure too low to make gas mixture	
64675	Diethyl sulfate	Not Available	Corrosive; poisonous	
119904	3,3-Dimethoxybenzidine	Not Available	Vapor pressure too low to make gas mixture	
60117	Dimethyl aminoazobenzene	Not Available	Vapor pressure too low to make gas mixture	
119937	3,3'-Dimethyl benzidine	Not Available	Insufficient data available to evaluate manufacture	
79447	Dimethyl carbamoyl chloride	Not Available	Insufficient data available to evaluate manufacture	
68122	Dimethyl formamide	Not Available	Vapor pressure too low to make gas mixture	
57147	1,1-Dimethyl hydrazine	Not Available	Too dangerous to handle; teratogen; mutagen	
131113	Dimethyl phthalate	Not Available	Vapor pressure too low to make gas mixture	Solid; vapor pressure too low
77781	Dimethyl sulfate	Not Available	Corrosive; poisonous	
534521	4,6-Dinitro-o-cresol, and salts	Not Available	Boiling point too high (378°C) to make gas mixture	Solid; vapor pressure too low
51285	2,4-Dinitrophenol	Not Available	Vapor pressure too low to make gas mixture	Solid; melting point 108°C
121142	2,4-Dinitrotoluene	Not Available	Explosive; poisonous	
123911	1,4-Dioxane (1,4-Diethyleneoxide)	1ppm - 100ppm		
122667	1,2-Diphenylhydrazine	Not Available	Solid explosive	
106898	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	5ppm - 50ppm		
106887	1,2-Epoxybutane	Not Available	Toxic	
140885	Ethyl acrylate	1ppm - 100ppm		
100414	Ethyl benzene	100ppb - 50ppm		
51796	Ethyl carbamate (Urethane)	Not Available	Polimerizes; unstable	
75003	Ethyl chloride (Chloroethane)	1ppm - 1%		
106934	Ethylene dibromide (Dibromoethane)	1ppm - 50ppm		
107062	Ethylene dichloride (1,2-Dichloroethane)	1ppm - 1000ppm		
107211	Ethylene glycol	Not Available	Cannot recover from cylinder	
151564	Ethylene imine (Aziridine)	Not Available	Acute toxicity	
75218	Ethylene oxide	1ppm - 1000ppm		
96457	Ethylene thiourea	Not Available	Boiling point too high (347°C) to make gas mixture	Solid
75343	Ethylidene dichloride (1,1-Dichloroethane)	1ppm - 500ppm		
50000	Formaldehyde	1ppm - 100ppm		
76448	Heptachlor	Not Available	Vapor pressure too low to make gas mixture	Solid; melting point 95°C
118741	Hexachlorobenzene	Not Available	Vapor pressure too low to make gas mixture	Solid; melting point 231°C
87683	Hexachlorobutadiene	Not Available	Vapor pressure too low to make gas mixture	Solid; melting point 35°C
77474	Hexachlorocyclopentadiene	Not Available	Vapor pressure too low to make gas mixture	

HAPS CALIBRATION GASES

Hexachloroethane to Phthalic anhydride

CAS No.	HAP Compound	Airgas Product*	Explanations / Descriptions
67721	Hexachloroethane	Not Available	Vapor pressure too low to make gas mixture
822060	Hexamethylene-1,6-diisocyanate	Not Available	Vapor pressure too low to make gas mixture
680319	Hexamethylphosphoramide	Not Available	Vapor pressure too low to make gas mixture
110543	Hexane	100ppb - 500ppm	
302012	Hydrazine	Not Available	Too dangerous to handle; teratogen; mutagen
7647010	Hydrochloric acid (hydrogen chloride)	5ppm - 10%	
7664393	Hydrogen fluoride (Hydrofluoric acid)	10ppm - 1000ppm	100ppm lowest concentration considered stable in cylinder
7783064	Hydrogen sulfide	250ppb - 5%	
123319	Hydroquinone	Not Available	Vapor pressure too low to make gas mixture
78591	Isophorone	Not Available	Vapor pressure too low; unstable
58899	Lindane (all isomers)	Not Available	Neotoxin
108316	Maleic anhydride	Not Available	Vapor pressure too low to make gas mixture
67561	Methanol	1ppm - 400ppm	
72435	Methoxychlor	No	Very toxic; vapor pressure too low to make gas mixture
74839	Methyl bromide (Bromomethane)	1ppm - 5000ppm	
74873	Methyl chloride (Chloromethane)	1ppm - 1%	
71556	Methyl chloroform (1,1,1-Trichloroethane)	1ppm - 400ppm	
78933	Methyl ethyl ketone (2-Butanone) (See Modification)	1ppm - 400ppm	
60344	Methyl hydrazine	Not Available	Too dangerous to handle; teratogen; mutagen
74884	Methyl iodide (Iodomethane)	1ppm - 20ppm	
108101	Methyl isobutyl ketone (Hexone)	1ppm - 10ppm	
624839	Methyl isocyanate	Not Available	Very toxic; too dangerous to handle
80626	Methyl methacrylate	1ppm - 100ppm	
1634044	Methyl tert butyl ether	1ppm - 1000ppm	
101144	4,4-Methylene bis (2-chloroaniline)	Not Available	Boiling point too high (399°C) to make gas mixture
75092	Methylene chloride (Dichloromethane)	1ppm - 1000ppm	
101688	Methylene diphenyl diisocyanate (MDI)	Not Available	Solid vapor pressure too low
101779	4,4'-Methylenedianiline	Not Available	Solid vapor pressure too low
91203	Naphthalene	Not Available	Solid vapor pressure too low
98953	Nitrobenzene	Not Available	Solid vapor pressure too low
92933	4-Nitrobiphenyl	Not Available	Solid vapor pressure too low
100027	4-Nitrophenol	Not Available	Vapor pressure too low to make gas mixture
79469	2-Nitropropane	10ppm - 30ppm	
684935	N-Nitroso-N-methylurea	Not Available	Vapor pressure too low to make gas mixture
62759	N-Nitrosodimethylamine	Not Available	Vapor pressure too low to make gas mixture
59892	N-Nitrosomorpholine	Not Available	Vapor pressure too low to make gas mixture
56382	Parathion	Not Available	Very toxic; vapor pressure too low to make gas mixture
82688	Pentachloronitrobenzene (Quintobenzene)	Not Available	Very toxic; vapor pressure too low to make gas mixture
87865	Pentachlorophenol	Not Available	Vapor pressure too low to make gas mixture
108952	Phenol	Not Available	Very toxic; vapor pressure too low to make gas mixture
106503	p-Phenylenediamine	Not Available	Very toxic; vapor pressure too low to make gas mixture
75445	Phosgene	1ppm - 1000ppm	
7803512	Phosphine	1ppm - 1000ppm	
7723140	Phosphorus	Not Available	Ignites spontaneously in air
85449	Phthalic anhydride	Not Available	Vapor pressure too low to make gas mixture

HAPS CALIBRATION GASES

Polychlorinated biphenyls (Aroclors) to p-Xylene

CAS No.	HAP Compound	Airgas Product*	Explanations / Descriptions
1336363	Polychlorinated biphenyls (Aroclors)	Not Available	PCB's
1120714	1,3-Propane sultone	Not Available	Boiling point too high (300°C) to make gas
57578	beta-Propiolactone	Not Available	Toxic; too unstable
123386	Propionaldehyde	1ppm - 500ppm	
114261	Propoxur (Baygon)	Not Available	Vapor pressure too low to make gas mixture
78875	Propylene dichloride (1,2-Dichloropropane)	1ppm - 500ppm	
75569	Propylene oxide	1ppm - 1000ppm	
75558	1,2-Propylenimine (2-Methyl aziridine)	Not Available	
91225	Quinoline	Not Available	Air and water reactive
106514	Quinone	Not Available	Boiling point too high (293°C) to make gas mixture
100425	Styrene	1ppm - 30ppm	
96093	Styrene oxide	Not Available	Vapor pressure too low
1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin	Not Available	Boiling point too high (500°C) to make gas mixture
79345	1,1,2,2-Tetrachloroethane	1ppm - 30ppm	
127184	Tetrachloroethylene (Perchloroethylene)	1ppm - 100ppm	
7550450	Titanium tetrachloride	Not Available	Solid
108883	Toluene	0.5ppm - 100ppm	
95807	2,4-Toluene diamine	Not Available	Boiling point too high (292°C) to make gas mixture
584849	2,4-Toluene diisocyanate	Not Available	Boiling point too high (251°C) to make gas mixture
95534	o-Toluidine	Not Available	Vapor pressure too low to make gas mixture
8001352	Toxaphene (chlorinated camphene)	Not Available	Very toxic; vapor pressure too low to make gas mixture
120821	1,2,4-Trichlorobenzene	1ppm - 10ppm	
79005	1,1,2-Trichloroethane	1ppm - 100ppm	
79016	Trichloroethylene	1ppm - 200ppm	
95954	2,4,5-Trichlorophenol	Not Available	Boiling point too high (248°C) to make gas mixture
88062	2,4,6-Trichlorophenol	Not Available	Boiling point too high (251°C) to make gas mixture
121448	Triethylamine		
1582098	Trifluralin	Not Available	Vapor pressure too low to make gas mixture
540841	2,2,4-Trimethylpentane	100ppb - 100ppm	
108054	Vinyl acetate	1ppm - 100ppm	
593602	Vinyl bromide	1ppm - 100ppm	
75014	Vinyl chloride	1ppm - 1%	
75354	Vinylidene chloride (1,1-Dichloroethylene)	1ppm - 1000ppm	
1330207	Xylenes (isomers and mixture)	0.5ppm - 20ppm	
95476	o-Xylene	0.5ppm - 20ppm	
108383	m-Xylene	0.5ppm - 20ppm	
106423	p-Xylene	0.5ppm - 20ppm	

The following compounds are on a case by case determination**:

- Antimony Compounds
- Arsenic Compounds
- Manganese Compounds
- Mercury Compounds
- Beryllium Compounds
- Cadmium Compounds
- Fine Mineral Fibers 3
- Polycyclic Organic Matter 4
- Chromium Compounds
- Coke Oven Emissions
- Radionuclides (including radon 5)
- Cobalt Compounds
- Cyanide Compounds 1
- Higher concentrations are usually available, although may be at reduced pressure.
- Glycol Ethers 2
- Lead Compounds
- ** Due to the variability and broad definition of the compounds. Ask your sales representative for details.