



VOC, Toxic Organic and Ozone Precursor Reference Standards

Volatile Organic Compounds (VOCs) and toxic organic chemicals aid in ground level ozone formation in the atmosphere. AREAL (EPA Atmospheric Research and Exposure Laboratory) has developed a number of methods for measuring these components in ambient air. These methods provide a standardized format for sampling and analysis of VOCs.

MATHESON manufactures stable, consistent and accurate Toxic Organic and Ozone Precursor Reference Standards. Each mixture is manufactured and measured using state-of-the-art measuring and mixing techniques such as:

- High precision gravimetric and multi-gravimetric techniques providing the lowest direct weight additions
- Multi-range VOC reference standards from our proven internal standards inventory

- NIST weight traceability
- State-of-the-art GC/MS and GC/FID instruments and U.S. EPA's GC methods
- VSL PRM VOC reference standards

MATHESON manufactures calibration mixtures for TO-15, TO-14A, and the Ozone Precursor Methods. All are filled in our Microshield treated aluminum cylinders for extra stability, and are guaranteed with a minimum 12-month shelf life. Custom mixtures can be produced depending on your specific chemical and concentration requirements. MATHESON VOC mixture experts will review custom mixture compositions.

TO-14A STANDARD MIXTURE PROFILE

NOTE: All cylinder sizes may not be available for all standard mixtures due to component weight constraints as the cylinder size gets smaller.

Shipping Information

UN Number:	UN 1956
DOT Proper Shipping Name:	Compressed Gas, nos, (List of Components)
DOT Classification:	2.2 (Nonflammable Gas)
DOT Label:	NON-FLAMMABLE GAS
TC Shipping Name:	Compressed Gas, nos, (List of Components)
TC Classification:	2.2
TC Label:	NON-FLAMMABLE GAS, NON-POISONOUS GAS

Cylinder Specifications

Cylinder Size	Valve Outlet CGA No.	Pressure psig @ 70°F	Pressure kPa @ 21.1°C	Approximate Ship Weight	
				lb	kg
1I	350	1,800	12,410	69	36
2I	350	1,800	12,410	48	22
6I	180	1,775	12,238	5	2

39 Minor Component TO-14A

• Benzene [71-43-2]	• 1,1-Dichloroethene [75-35-4]	• 1,1,1-Trichloroethane [71-55-6]
• Bromomethane [74-83-9]	• cis-1,2-Dichloroethene [156-59-2]	• 1,1,2-Trichloroethane [79-00-5]
• Carbon tetrachloride [56-23-5]	• 1,2-Dichloropropane [78-87-5]	• Trichloroethene [79-01-6]
• Chlorobenzene [108-90-7]	• cis-1,3-Dichloropropene [10061-01-5]	• Trichlorofluoromethane [75-69-4]
• Chloroethane [75-00-3]	• trans-1,3-Dichloropropene [10061-02-6]	• 1,1,2-Trichlorotrifluoroethane [76-13-1]
• Chloroform [67-66-3]	• 1,2-Dichlorotetrafluoroethane [76-14-2]	• 1,2,4-Trimethylbenzene [95-63-6]
• Chloromethane [74-87-3]	• Ethylbenzene [100-41-4]	• 1,3,5-Trimethylbenzene [108-67-8]
• 1,2-Dibromoethane [106-93-4]	• Hexachloro-1,3-Butadiene [87-68-3]	• Vinyl chloride [75-01-4]
• 1,2-Dichlorobenzene (ortho) [95-50-1]	• Methylene chloride [75-09-2]	• m-Xylene [108-38-3]
• 1,3-Dichlorobenzene (meta) [541-73-1]	• Styrene [100-42-5]	• o-Xylene [95-47-6]
• 1,4-Dichlorobenzene (para) [106-46-7]	• 1,1,2,2-Tetrachloroethane [79-34-5]	• p-Xylene [106-42-3]
• Dichlorodifluoromethane [75-71-8]	• Tetrachloroethene [127-18-4]	• Balance VOC Free Nitrogen
• 1,1-Dichloroethane [75-34-3]	• Toluene [108-88-3]	
• 1,2-Dichloroethane [107-06-2]	• 1,2,4-Trichlorobenzene [120-82-1]	

1 ppm Mix Product Code	Cylinder Size	Content US	Content Metric	Equipment Recommendations	Model No.
39 Minor Component TO-14A					
G0819368	1I	128 ft ³	3.64 m ³	For VOC < 1 ppm in 1I, 2I Cylinders ULTRA Line UHP Regulator	SEQ9303-350V2T
G0819372	2I	68 ft ³	2.40 m ³	For VOC < 1 ppm in 6I Cylinders Micro Regulator SS	SEQ3373-180-1T
G0819353	6I	3.67 ft ³	104 L	For VOC ≥ 1 ppm in 1I, 2I Cylinders Miniature Regulator SS	SEQ3571-350-2T
41 Minor Component TO-14A					
Includes the 39 Component TO-14A PLUS Acrylonitrile [107-13-1] and 1,3 Butadiene [106-99-0]					
G0822068	1I	128 ft ³	3.64 m ³	For VOC ≥ 1 ppm in 6I Cylinders Miniature Regulator SS	SEQ3571-180-2T
G0822072	2I	68 ft ³	2.40 m ³	6I Cylinder Stand	700
G2691408	6I	3.67 ft ³	104 L		
43 Minor Component TO-14A					
Includes the 41 Component TO-14A PLUS 3-Chloroprene (Allyl Chloride) [107-05-1] and 4-Ethyl Toluene [622-96-8]					
G0824068	1I	128 ft ³	3.64 m ³		
G0824072	2I	68 ft ³	2.40 m ³		
G0824053	6I	3.67 ft ³	104 L		

Please refer to MATHESON Brochure BR-201 for more information.



TO-14A STANDARD MIXTURE PROFILE *(continued)*

⚠ WARNING: This product can expose you to chemicals including Ethylbenzene, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Styrene, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including p-Dichlorobenzene, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Ethylene Dibromide, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Ethylene Dichloride (1,2-Dichloroethane), which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Acrylonitrile, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Toluene, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Tetrachloroethylene (Perchloroethylene), which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Carbon Tetrachloride, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Chloroform, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Benzene, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Methyl Bromide, as a structural fumigant, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Methyl Chloride, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Chloroethane (Ethyl Chloride), which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Vinyl Chloride, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Dichloromethane (Methylene Chloride), which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including 1,1-Dichloroethane, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Vinylidene Chloride (1,1-Dichloroethylene), which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including 1,2-Dichloropropane, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Vinyl Trichloride (1,1,2-Trichloroethane), which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Trichloroethylene, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including 1,1,2,2-Tetrachloroethane, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING: This product can expose you to chemicals including Hexachlorobutadiene, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.