

EPA Instrumental Test Methods as Defined by 40 CFR Part 60

# EPA Method	Test Method Determines	Components Tested	Zero Gas*
3A*	O ₂ % & CO ₂ %	O ₂ % &/or CO ₂ % in N ₂ or mixtures of SO ₂ ppm &/or NO ₂ ppm + O ₂ % &/or CO ₂ % in N ₂	Defined by CFR 40 72.2
3 & 3B	O ₂ % & CO ₂ % using an ORSAT	O ₂ % &/or CO ₂ % in N ₂ for Audit	
3C	CO ₂ %, O ₂ %, N ₂ % & CH ₄ ppm using a thermal conductivity detector (TCD) gas chromatograph	CO ₂ , CH ₄ , N ₂ , O ₂ , and other gas components	Carrier Gas. Helium, high-purity
6C*	SO ₂ ppm from stationary sources	SO ₂ ppm in Air or N ₂ SO ₂ ppm &/or O ₂ % &/or CO ₂ % in N ₂	Defined by CFR 40 72.2
7E*	NO _x ppm from stationary sources	NO _x ppm in N ₂ other mixtures may be used if no interference is caused. NO ₂ for Converter Efficiency	Defined by CFR 40 72.2
10*	CO ppm from stationary sources	CO ppm in N ₂ other mixtures may be used if no interference is caused	Defined by CFR 40 72.2
10A	CO ppm CEM at petroleum refinery	CO ppm in N ₂	Defined by CFR 40 72.2
10B	CO ppm from stationary sources	CO ppm in N ₂ & CH ₂ in air	(Helium zero/Hydrogen zero)
15	TRS Emissions from sulfur recovery plants in petroleum refinery	H ₂ S in N ₂ & COS in N ₂ & CS ₂ in N ₂ traceable	<0.5 ppm TRS with <10 ppm H ₂ O & (Oxygen Zero/Zero Nitrogen)
15A	TRS Emissions from sulfur recovery plants in petroleum refinery	COS in N ₂	<50 ppb TRS with <10 ppm Hydrocarbons
16	TRS Emissions from Kraft Pulp Mills	H ₂ S in N ₂ & MeSH in N ₂ & DMS in N ₂ & DMDS in N ₂ traceable	<50 ppb TRS with <10 ppm Hydrocarbons
16A	TRS Emissions from Kraft Pulp Mills	H ₂ S in N ₂	<50 ppb TRS with <10 ppm Hydrocarbons
16B	TRS Emissions from Kraft Pulp Mills	SO ₂ in N ₂ & H ₂ S in N ₂	<50 ppb TRS with <10 ppm Hydrocarbons
18	Gaseous Organic Compound Emissions by Gas Chromatography	VOC ppm in N ₂ <1-2% or NIST traceable	Defined by CFR 51 Appendix M Method 205
21	Volatile Organic Compound Leaks	VOC ppm in N ₂ or Air <2%	<10 ppm VOC
25	Total Gaseous Nonmethane Organic Emissions (TGNMO) as Carbon	CO, CH ₄ , C ₃ H ₈ , CO ₂ , hexane, toluene, and methanol each in air <1%	He, Air & O ₂ <1ppm HC & CO ₂ <1ppm & <0.1ppm HC
25A	Total Gaseous Organic Emissions using FID	C ₂ H ₆ , C ₃ H ₈ , C ₄ H ₁₀ or appropriate in N ₂ or Air <2%	Defined by CFR 51 Appendix M Method 205
25B	Total Gaseous Organic Emissions using NDIR	C ₂ H ₆ , C ₃ H ₈ , C ₄ H ₁₀ or appropriate in N ₂ or Air <2%	Defined by CFR 51 Appendix M Method 205
25C	Non Methane Organic Compounds (NMOC) in MSW landfill gases	CO, CH ₄ , C ₃ H ₈ , CO ₂ , hexane, toluene, and methanol each in air <1%	<10 ppm VOC
25D	Volatile Organic Concentration of Waste Samples	% propane and % 1,1-dichloroethylene in N ₂	N ₂ , Air & O ₂ <1ppm C
25E	Phase Organic Concentration in Waste Samples	% propane in N ₂ or Air NIST traceable	N ₂ , Air & O ₂ zero grade <ppm C
30A	Hg ⁰ µg/m ³ from stationary sources	Hg ⁰ & HgCl ₂ µg/m ³ in N ₂ or Air NIST traceable	No measurable Hg
30B	Hg ⁰ µg/m ³ from stationary sources	Hg ⁰ & HgCl ₂ µg/m ³ in N ₂ or Air NIST traceable	No measurable Hg

*These test methods were revised in August 2006 and advise using Zero Air / Zero Nitrogen that fits the definition of CFR 40 72.2 as the low point, oppose to a low level concentration pollutant.

EPA PS#	CEM Performance Specification for	Components (recommended but need not be certified)	Zero Gas (need not be certified)
PS 2	SO ₂ ppm &/or NO ₂ ppm	SO ₂ ppm &/or NO ₂ ppm in N ₂	
PS 3	O ₂ % &/or CO ₂ %	O ₂ % &/or CO ₂ % in N ₂ for Audit	
PS 4	CO ppm	1000 CO ppm on N ₂	
PS 4A	CO ppm	<200 CO ppm on N ₂	
PS 5	TRS ppm	H ₂ S ppm or other TRS in N ₂	
PS 7	TRS ppm	H ₂ S ppm or other TRS in N ₂	
PS 8	VOC ppm	CH ₄ , C ₂ H ₆ , C ₃ H ₈ , C ₄ H ₁₀ ppm or appropriate in N ₂ or Air	
PS 9	Specific VOC ppm by GC	Specific VOC ppm in N ₂ or Air <2%	Defined by CFR 40 72.2
PS 12	Hg	Hg in N ₂	
PS 12A	Hg	Hg in N ₂	
PPS 011 ETV Verification	NH ₃ ppm	NH ₃ in N ₂ NIST or N _{mi} <3%	
PS-18	HCl ppm	HCl in N ₂	Defined by CFR 40 72.2

Proposed Method 322 - HCl Emissions from Portland Cement Kilns by GFCIR 3/11/98 (WordPerfect version).

Proposed Method 323 - Measurement of Formaldehyde Emissions from Natural Gas-Fired Stationary Sources - Acetyl Acetone Derivatization

Method (FR Vol. 68, No. 9, Tuesday, Jan. 14, 2003 Pgs. 1925-1929).

ENVIRONMENTAL MONITORING

EPA Protocols and Traceability Standards

EPA Protocol Gas Mixtures					Equipment Recommendations
	Concentration Range	CGA Connection	Cylinder Size*	Contents ft ³ **	Recommended Two-Stage Regulator
Carbon Dioxide in Air	300 ppm - < 1% 1% - 30%	590	150A	143	Y12-T265D590 E23
Carbon Dioxide in Nitrogen	300 ppm - < 1% 1% - 30%	580	150A	140	Y12-T265D580 E23
Carbon Monoxide in Air	2 ppm - <100 ppm 100 ppm - <1% 1% - 6.25%	590	150A	143	Y12-T265D590 E23
Carbon Monoxide in Nitrogen	2 ppm - <100 ppm 100 ppm - <1% 1% - 13%	350	150A	140	Y12-T265D350 E23
Hydrogen Sulfide in Nitrogen	2 ppm - <100 ppm 100 ppm - 1000 ppm	330	150A	140	Y12-C445D330 E28
Methane in Air	0.5 ppm - <100 ppm 100 ppm - 1000 ppm	590	150A	143	Y12-N245D590 E21
Nitric Oxide in Nitrogen	0.4 ppm - <100 ppm 100 ppm - 5000 ppm	660	150A	140	Y12-C445D660 E28
Oxygen in Nitrogen	1000 ppm - <1% 1% - 30%	<5% CGA 580 ≥5% - 23.5% CGA 590 >23.5% CGA 296	150A	140	Y12-N245D (CGA) E21
Propane in Air	0.25 ppm - <100 ppm 100 ppm - <0.1% 0.1% - 1%	590	150A	143	Y12-N245D590 E21
Propane in Nitrogen	0.25 ppm - <100 ppm 100 ppm - <0.1% 0.1% - 1%	350	150A	140	Y12-N245D350 E21
Sulfur Dioxide in Air	2 ppm - <100 ppm 100 ppm - <1000 ppm 1000 ppm - 5000 ppm	660	150A	143	Y12-C445D660 E28
Sulfur Dioxide in Nitrogen	2 ppm - <100 ppm 100 ppm - <1000 ppm 1000 ppm - 5000 ppm	660	150A	140	Y12-C445D660 E28
Sulfur Dioxide, Nitric Oxide in Nitrogen	2 ppm - 5000 ppm 0.4 ppm - 5000 ppm	660	150A	143	Y12-C445D660 E28
Sulfur Dioxide, Oxygen in Nitrogen	2 ppm - 5000 ppm 0.1% - 30%	660	150A	143	Y12-C445D660 E28
Carbon Dioxide, Oxygen in Nitrogen	300 ppm - 30% 0.1% - 30%	<5% CGA 580 ≥5% - 23.5% CGA 590 >23.5% CGA 296	150A	143	Y12-N245D (CGA) E21
Sulfur Dioxide, Nitric Oxide, Carbon Dioxide in Nitrogen	2 ppm - 5000 ppm 2 ppm - 5000 ppm 300 ppm - 30%	660	150A	143	Y12-C445D660 E28
Sulfur Dioxide, Nitric Oxide, Carbon Monoxide in Nitrogen	2 ppm - 5000 ppm 2 ppm - 5000 ppm 2 ppm - 13%	660	150A	143	Y12-C445D660 E28
Sulfur Dioxide, Nitric Oxide, Carbon Dioxide, Carbon Monoxide in Nitrogen	2 ppm - 5000 ppm 2 ppm - 5000 ppm 300 ppm - 30% 2 ppm - 13%	660	150A	143	Y12-C445D660 E28

* Airgas® EPA Protocol gases are supplied in aluminum cylinders, sizes 150A, 80A, and 33A.

** Contents represent approximations; actual volumes are determined by the concentrations of the minor components.

CEM Daily Calibration Standards

ENVIRONMENTAL MONITORING

Where EPA Protocol Standards are not required, Continuous Emissions Monitoring (CEM) Daily Calibration Standards are blended to the same exacting standards, are NIST Traceable, and have an analytical accuracy of $\pm 2\%$. In addition to those

components and combinations of components listed as EPA Protocol Standards, the following mixtures are available as daily calibration standards:

CEM Daily Calibration Gases					Equipment Recommendations
Daily Calibration Standards	Concentration Range	CGA Connection	Cylinder Size	Contents ft ³	Recommended Two-Stage Regulator
Ammonia in Nitrogen	5 ppm - <100 ppm 100 ppm - <1% 1% - 4%	705	150A	140	Y12-T265D705 E23
Carbon Dioxide in Air	300 ppm - <1% 1% - 30%	590	150A	143	Y12-T265D590 E23
Carbon Dioxide in Nitrogen	300 ppm - <1% 1% - 30%	580	150A	140	Y12-T265D580 E23
Carbon Monoxide in Air	2 ppm - <100 ppm 100 ppm - <1% 1% - 6.25%	580	150A	143	Y12-T265D590 E23
Carbon Monoxide in Nitrogen	2 ppm - <100 ppm 100 ppm - <1% 1% - 20%	350	150A	140	Y12-T265D350 E23
Hydrogen Chloride in Nitrogen	2 ppm - <100 ppm 100 ppm - 1000 ppm	330	150A	140	Y12-T265D330 E23
Hydrogen Sulfide in Nitrogen	2 ppm - <100 ppm 100 ppm - 1000 ppm	330	150A	140	Y12-T265D330 E23 E23
Nitric Oxide in Nitrogen	2 ppm - <100 ppm 100 ppm - <1% 1% - 6.25%	660	150A	140	Y12-T265D660 E23
Oxygen in Nitrogen	100 ppm - <1% 1% - 30%	<5% CGA 580 $\geq 5\%$ -23.5% CGA 590 >23.5% CGA 296	150A	140	Y12-T265D590/296 E23
Propane in Air	1 ppm - <100 ppm 100 ppm - <1000 ppm 1000 ppm - 1%	590	150A	143	Y12-T265D590 E23
Propane in Nitrogen	1 ppm - <100 ppm 100 ppm - <1000 ppm 1000 ppm - 2%	350	150A	140	Y12-T265D350 E23
Sulfur Dioxide in Air	5 ppm - <100 ppm 100 ppm - <1000 ppm 1000 ppm - 2%	660	150A	143	Y12-T265D660 E23
Sulfur Dioxide in Nitrogen	5 ppm - <100 ppm 100 ppm - <1000 ppm 1000 ppm - 2%	660	150A	140	Y12-T265D660 E23

CEM Zero Gases					Equipment Recommendations
Gas	Purity Specifications	CGA Connection	Cylinder Size	Contents ft ³	Recommended Two-Stage Regulator
CEM Zero Air*	O ₂ 20% - 21% CO ≤ 0.5 ppm CO ₂ ≤ 1 ppm NO _x ≤ 0.1 ppm SO ₂ ≤ 0.1 ppm THC ≤ 0.1 ppm	80A	150A 76	144 E23	Y12-T265D590
CEM Zero Nitrogen*	CO ≤ 0.5 ppm CO ₂ ≤ 1 ppm NO _x ≤ 0.1 ppm SO ₂ ≤ 0.1 ppm THC ≤ 0.1 ppm	580	150A 80A	140 76	Y12-T265D580 E23
Follows CFR Specifications for zero ambient air material. Batch Certificates of Analysis included with each cylinder. *Meets the requirements of CFR 72.2					

ENVIRONMENTAL MONITORING

Non EPA Protocol Calibration Gases

Elemental Mercury Gas Specifications

- Concentrations range from 1 $\mu\text{g}/\text{M}^3$ to 60 $\mu\text{g}/\text{M}^3$ (100ppT to 6ppB)
- Balance Air or Nitrogen
- Pressure (depending on cylinder size) 300A's = 2000 PSIG (5500 Usable Liters) 150A's = 1800 PSIG (3600 Usable Liters)
- Directly traceable to NIST certified Vendor Prime Mercury Generator
- Analytical Accuracy $\pm 5\%$ (currently)
- 6 month stability

How will elemental mercury calibration gas cylinders be used

- Traceability Protocol for Elemental Mercury Gas Generators routine audit test.
- Instrumental Test method 30b (spiking)
- Substitute for mercury gas generators (broken, failures, etc.)
- Overall independent spot check for systems.

Ammonia Calibration Standards

Accurate to keep you compliant and safe

- Comply with your Title V monitoring requirements.
- Traceable to VSL (Dutch National Laboratory) and NIST
- Non Traceable available
- Meets the requirements of EPA tests for stationary source monitoring such as:
Preliminary Performance Specification 001 (PPS-001) Ammonia CEMS
<http://www.epa.gov/ttn/emc/prelim.html>
Molybdenum vs. Stainless Steel differential converter test Method 7E – NOx – Instrumental
<http://www.epa.gov/ttn/emc/promgate.html>
- OSHA monitoring test gas for:
OSHA permissible exposure limit (PEL) of 50 parts per million (ppm)
The OSHA (former) standard of 35 ppm (as a 15 minute Short Term Exposure Limit (STEL))
http://www.ufcw.org/your_industry/manufacturing/safety_health_news_and_facts/ammonia_hazards.cfm

FEATURES:

- Ranges from 5 ppm to 1,000 ppm
- 12 month stability
- Traceable to VSL and NIST
- Available in Air and Nitrogen

ZERO GAS

EPA requires the use of Zero gas that meets the requirements of 40 CFR 72.2 in EPA CFR 40 part 60 EPA test methods, and EPA CFR 40 Part 75.

Airgas® Standard Operating Procedures assure that we provide a certification verifying that the contents meet CFR 40 72.2 that the calibration gas does not contain concentrations of SO₂, NO_x, or total hydrocarbons above 0.1 parts per million (ppm), a concentration of CO above 1 ppm, or a concentration of CO₂ above 400 ppm.

Hydrogen Chloride (HCl)

Airgas has performed extensive stability studies and has documented the stability of HCl mixtures supporting the 12 month certification period. Airgas provided HCl mixtures pass the stringent PADEP requirements for HCl used for calibration of CEMS as well as many applications including incineration, waste to energy facilities, and industrial hygiene.

HCl mixture specifications:

Cylinder size: 150A

300A

Concentrations: 2 ppm–1000 ppm

Shelf Life: 6 months for PADEP HCl (or other states requiring 6 months)
12 months elsewhere

Meets the requirements of US EPA HCl Performance Specification PS-18

Certification Periods for EPA Protocol gases in accordance with the May 2012 “EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards”

Certified Component	Balance Gas	Applicable range	Certification period (months)
Ammonia	Nitrogen	≥5 ppm	12
Carbon dioxide	Air	≥360 ppm	96
Carbon Dioxide	Nitrogen	≥100 ppm	96
Carbon monoxide	Nitrogen or Air	≥2 ppm	96
Hydrogen Sulfide	Nitrogen	≥2 ppm	36
Methane	Nitrogen or Air	≥1 ppm	96
Nitric Oxide	Nitrogen (O ₂ -free)	0.5 to 50 ppm	36
Nitric Oxide	Nitrogen (O ₂ -free)	≥50 ppm	96
Nitrous Oxide	Air	≥0.3 ppm	96
Oxides of Nitrogen (NO ₂)	Air	≥3 ppm	36
Oxides of Nitrogen (NO ₂)	Nitrogen (O ₂ doped)	≥3 ppm	36
Oxygen	Nitrogen	≥0.2%	96
Propane	Air	>0.25 ppm	96
Propane	Nitrogen	>0.25 ppm	96
Sulfur Dioxide	Nitrogen or Air	1 to 50 ppm	48
Sulfur Dioxide	Nitrogen or Air	≥50 ppm	96

Mixtures with lower concentrations are certified for 6 months.

An EPA Protocol mixture can be recertified if the residual pressure after analysis is >100psig

EPA Protocol mixtures are certified down to a minimum use pressure of 100psig

O₂-free Nitrogen contains <100ppB of oxygen

Check your Certificates of Analysis (COA):

The contents of the Certification of Analysis and sidewall label that are provided with each EPA Protocol gas cylinder are extremely important. These are frequently reviewed by local, state and EPA air quality enforcement personnel to ensure they meet mandatory requirements. A quick check of your COA can save you fines and aggravation. The following are the minimum requirements for information on an EPA Protocol gases COA:

1. Cylinder identification number (e.g. stamped cylinder number)
2. The certified concentrations for the assayed components of the Protocol gas, with values provided to at least 3 significant figures, and the balance gas
3. The calculated estimate of 95% uncertainty for each named component
4. Cylinder pressure at certification and statement that the Protocol gas cannot be used below 100psig, i.e. 0.7 megapascals
5. Dates of the assays and certification. The certification date is the date of the last assay
6. Certification expiration date
7. Information about each reference standard used in the assay:
 - a. For an NTRM, RGM or PRM: standard type, cylinder number, certified concentration, expanded uncertainty, certification expiration date
 - b. For a GMIS: cylinder number, certified concentration, expanded uncertainty, expiration date – plus information (7.a.) about the reference material used in certifying the GMIS
8. Statement that the assay/certification was performed according to EPA Protocol document EPA 600/R-12/531 – plus the Procedure used: G1 or G2
9. The analytical method(s) used in the assays and date of the most recent multipoint calibration for each instrument used in the assays
10. Identification of the specialty gas producer: Company, laboratory name, city and state, PGVP vendor ID
11. Chronological record of all certifications for the standard

* As required by “EPA Traceability Protocol Assay and Certification of Gaseous Calibration Standard (EPA 600/R-12/531 May 2012) Documentation”

** In some cases the states and local air agencies can ask for more information on a Certificate of Analysis.

ENVIRONMENTAL MONITORING

Air Toxics Monitoring

EPA TO-14 Calibration Standard - 42 Components, 100 ppb or 1 ppm each in Nitrogen

Benzene	Dichlorodifluoromethane	4-Ethyltoluene	Trichloroethylene
1,3-Butadiene	1,1-Dichloroethane	Ethyl Chloride	Trichlorofluoromethane
Carbon Tetrachloride	1,2-Dichloroethane	Hexachloro-1,3-butadiene	1,1,2-Trichloro-1,2,2-trifluoroethane
Chlorobenzene	1,1-Vinylidene Chloride	Methyl Bromide	1,2,4-Trimethylbenzene
Chloroform	cis-1,2-Dichloroethylene	Styrene	1,3,5-Trimethylbenzene
Chloromethane	Dichloromethane	1,1,2,2-Tetrachloroethane	Vinyl Chloride
3-Chloropropylene	1,2-Dichloropropane	Tetrachloroethylene	m-Xylene
1,2-Dibromoethane	cis-1,3-Dichloropropene	Toluene	o-Xylene
1,2-Dichlorobenzene	trans-1,3-Dichloropropene	1,2,4-Trichlorobenzene	p-Xylene
1,3-Dichlorobenzene	1,2-Dichloro-1,1,2,2-tetrafluoroethane	1,1,1-Trichloroethane	
1,4-Dichlorobenzene	Ethylbenzene	1,1,2-Trichloroethane	

EPA TO-14 Chlorinated Hydrocarbon Mixture (16 Components, 100 ppb or 1 ppm each in Nitrogen)

Carbon Tetrachloride	Chloromethane	1,2-Dichloroethane	cis-1,2-Dichloroethylene
1,2-Dichloropropane	Hexachloro-1,3-butadiene	Tetrachloroethylene	Trichloroethylene
Chloroform	1,1-Dichloroethane	1,1-Dichloroethylene	Dichloromethane
cis-1,3-Dichloropropene	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	Vinyl Chloride

EPA TO-14 Aromatics Mixture (14 Components, 100 ppb or 1 ppm each in Nitrogen)

Benzene	1,2-Dichlorobenzene	1,4-Dichlorobenzene	Styrene
Toluene	1,2,4-Trimethylbenzene	m-Xylene	p-Xylene
Chlorobenzene	1,3-Dichlorobenzene	Ethylbenzene	
1,2,4-Trichlorobenzene	1,3,5-Trimethylbenzene	o-Xylene	

EPA TO-14 CFC/HCFC Mixture (4 Components, 100 ppb or 1 ppm each in Nitrogen)

Halocarbon 11	Halocarbon 113
Halocarbon 12	Halocarbon 114

EPA TO-14 GC/MS Internal Standard (3 Components, 100 ppb or 1 ppm each in Nitrogen)

Bromochloromethane	Chlorobenzene - D5	1,4-Difluorobenzene
--------------------	--------------------	---------------------

EPA TO-14 Internal/Tuning Standard (3 Components, 100 ppb or 1 ppm each in Nitrogen)

Bromochloromethane	Chlorobenzene - D5	Bromofluorobenzene
--------------------	--------------------	--------------------

BTEX Mixture (6 Components, 100 ppb or 1 ppm each in Nitrogen)

Benzene	m-Xylene
Ethylbenzene	o-Xylene
Toluene	p-Xylene

Airgas® provides a complete range of certified California BAR (Bureau of Automotive Repair) blends for emissions certification, state vehicle inspection and IM testing, and independent testing laboratories. Products include both standard and enhanced emission monitoring gases, multiple component gases for test equipment calibration, and Vehicle Emission Zero Air used prior to every vehicle test. Gases are produced in California BAR-certified facilities using a dynamic blending process that ensures repeatable calibration accuracy.

Bar-97 Calibration Gases

State auto emissions programs using either 2-speed idle testing or loaded mode testing

Calibration & Audit Gases Concentrations

Low-Range BAR-97 with Nitric Oxide (NO) Blend Code 32	200 ppm	Propane (HC)
	0.50%	Carbon Monoxide (CO)
	6.0%	Carbon Dioxide (CO ₂)
	300 ppm	Nitric Oxide (NO) (< 3 ppm NO ₂)
	Balance:	Oxygen-free Nitrogen (N ₂)

High-Range BAR-97 with Nitric Oxide (NO) Blend Code 35	3200 ppm	Propane (HC)
	8.00%	Carbon Monoxide (CO)
	12.0%	Carbon Dioxide (CO ₂)
	3000 ppm	Nitric Oxide (NO) (< 3 ppm NO ₂)
	Balance:	Oxygen-free Nitrogen (N ₂)

BAR-97 Vehicle Emission Zero Air Blend Code 37	<1 ppm	Total Hydrocarbons (THC)
	<1 ppm	Carbon Monoxide (CO)
	<400 ppm	Carbon Dioxide (CO ₂)
	<1 ppm	Nitric Oxide (NO)
	20.9%	Oxygen (O ₂)
	Balance:	Oxygen-free Nitrogen (N ₂)

High-Range BAR-97 Blend Code 34	3200 ppm	Propane (HC)
	8.00%	Carbon Monoxide (CO)
	12.0%	Carbon Dioxide (CO ₂)
	Balance:	Oxygen-free Nitrogen (N ₂)

IM240 NOx Converter Efficiency Test Mix

A mixture of 200 ppm Nitrogen Dioxide (NO₂) in Air, which is used for the weekly check of the NOx converter in a Chemiluminescent analyzer.

Blend tolerance: \pm 100 ppm absolute

Analytical tolerance: \pm 2%

Expiration date: 12 months

IM240 FID CHECK GAS

The mixture is 50 ppm Methane in Air used for the monthly check of the response of the Hydrocarbon analyzer.

Blend tolerance: \pm 5% relative

Analytical tolerance: \pm 2% relative

Expiration date: 36 months

IM240 SPAN GAS*

Components	Balance Gas	Accuracy	Expiration
Carbon Monoxide	Air or Nitrogen	\pm 2%	36 months
Carbon Dioxide	Air or Nitrogen	\pm 2%	36 months
Propane	Air only	\pm 2%	36 months
Nitric Oxide	Nitrogen only	\pm 2%	24 months

Analytical results are directly traceable to NIST.

Blend tolerance shall be no more than \pm 5% relative.

Mobile Emissions Monitoring

ENVIRONMENTAL MONITORING



Bar-90ET & Earlier Calibration Gases

Used for auto emissions inspection and IM programs using 2-speed idle testing

Calibration & Audit Gases Concentrations

Low-Range BAR-90ET Blend Code 11	300 ppm	Propane (HC)
	1.00%	Carbon Monoxide (CO)
	6.0%	Carbon Dioxide (CO ₂)
	Balance:	Nitrogen (N ₂)

Mid-Range BAR-90ET Blend Code 12	1200 ppm	Propane (HC)
	4.00%	Carbon Monoxide (CO)
	12.0%	Carbon Dioxide (CO ₂)
	Balance:	Nitrogen (N ₂)

Low-Range BAR-84 Blend Code 13	600 ppm	Propane (HC)
	1.60%	Carbon Monoxide (CO)
	11.0%	Carbon Dioxide (CO ₂)
	Balance:	Nitrogen (N ₂)

Note: For a complete listing of blends and audit standards contact your local Airgas® representative.

IM240 Audit Gas IM240 Calibration Gas*

These products can be single or multicomponent gases with the following limitations:

Components	Balance Gas	Accuracy	Expiration
Carbon Monoxide	Air or Nitrogen	\pm 1%	36 months
Carbon Dioxide	Air or Nitrogen	\pm 1%	36 months
Propane	Air only	\pm 1%	36 months
Nitric Oxide	Nitrogen only	\pm 1%	24 months

Analytical results are directly traceable to NIST.

Blend tolerance shall be no more than \pm 5% relative.

IM240 FID OXIDIZER

A mixture of 18-21% Oxygen in Nitrogen or Argon, used as the oxidant gas for the Hydrocarbon analyzer.

THC < 1 ppm

IM240 FID FUEL GAS

A mixture of 40% Hydrogen in Helium used as the fuel gas for the Hydrocarbon analyzer. Blend tolerance: \pm 2% absolute

THC < 1 ppm

*IM240 Calibration and Span gases will be supplied with a Certificate of Analysis.