AIR LIQUIDE™
SPECIALTY GASES

Ensure Regulatory Compliance

SCOTT™ EPA Protocol Gases

Reliable World Class Performance

SCOTT RATA Class™ and Compliance Class™ EPA Protocol Gases provide the highest performance, reliability and level of confidence for meeting compliance requirements. Both classes of mixtures are prepared in strict accordance with the latest EPA guidelines.

Our RATA Class protocols exceed EPA specifications by providing guaranteed ±1% accuracy. Our Compliance Class protocols meet EPA's minimum accuracy requirement by providing guaranteed ±2% accuracy. Both classes are traceable either to National Institute of Standards and Technology (NIST) Standard Reference Materials (SRMs) or to NIST-Traceable Reference Materials (NTRMs). RATA Class protocols are directly traceable for added confidence and accuracy.

Air Liquide is the world's largest producer of EPA protocol gases. We also maintain the largest inventory of NIST reference materials, which allows us to prepare and ship mixtures faster than any other supplier. For more information or for a complete catalog of our gas and equipment products, call or visit scottgas.com today.

Benefits and Features

- Reduce RATA testing (with ±1% RATA Class products).
- Calibrate CEMs more accurately—purchase fewer emission credits & sell excess emission credits.
- Avoid noncompliance penalties with guaranteed mixture accuracy.
- Gain an extra level of confidence with multi-component mixtures with guaranteed stability.
- Demonstrate compliance with hardcopy and online Certificates of Accuracy.
- Reduce costs by eliminating excess cylinder inventory.
- Minimize on-site inventory with just-in-time delivery and online cylinder management.
- Avoid accidental use of expired mixtures with automatic expiration notification.

SCOTT™ RATA Class™

Guaranteed ±1% Accurate

SCOTT RATA Class protocol gases are recommended for all environmental applications requiring the highest degree of compliance certainty. These include:

- Primary calibration
- Linearity tests
- RATA tests
- CGAs and audits

RATA Class protocol mixtures provide guaranteed ±1% accuracy that exceeds EPA requirements. It's why most RATA tests are conducted using SCOTT RATA Class protocol gases. Many utilities and other industrial facilities are pushing the performance of their Continuous Emissions Monitoring Systems (CEMS) far below the ±10% RATA requirement of the EPA's Acid Rain Program, saving $30,000 to $70,000/yr. for RATA testing by achieving the EPA ±7.5% accuracy limit. SCOTT RATA Class protocol gases are critical in achieving these savings. They are also essential for CEM measurements when trading SO_2 and NO_x emission credits.

RATA Class mixtures are dual-analyzed. For each reactive component, two separate analyses are performed and analyzed directly against NIST reference standards to determine the concentrations. Air Liquide's proprietary analytical technology created the capability for these two measurements to agree with each other within ±1%, even in two, three or four component mixtures. A detailed, easy-to-read Certificate of Accuracy is provided with each RATA Class mixture and is also available online at scottgas.com.

SCOTT Compliance Class™

Guaranteed ±2% Accurate

SCOTT Compliance Class protocol gases meet EPA ±2% minimum accuracy requirements and are recommended for less demanding environmental measurements.

Compliance Class mixtures also feature dual-analysis and NIST-traceability. A detailed, easy-to-read Certificate of Accuracy is provided with each Compliance Class mixture and is also available online at scottgas.com.

The performance of SCOTT RATA and Compliance Class protocol gases has been recognized and well documented by federal agencies. Air Liquide has a lengthy history of outstanding results in EPA protocol audits. SCOTT EPA protocol gases exhibit reliability and accuracy, making them the obvious choice for environmental compliance needs.

Typical Applications for SCOTT EPA Protocol Gases

- Relative Accuracy Test Audits (RATA)
- SO_2 and NO_x emission trading
- Linearity checks
- Stack monitor calibration
- Cylinder Gas Audits (CGAs)
- Ambient monitor calibration
- Scrubber efficiency verification
- Certification of CEM systems
- Environmental auditing

Typical Users of SCOTT EPA Protocol Gases

- Boilers and furnaces
- Brick manufacturers
- CEM manufacturers
- Cement kilns
- Cogeneration facilities
- Environmental testers
- Facilities with boilers
- Glass manufacturers
- Government agencies
- Incinerators
- Independent power producers
- Petrochemical plants
- Pulp & paper mills
- Refineries
- Sewage plants
- Smelters
- Steel mills
- Utilities

SCOTT™ Emissions Credit Class™

Exclusive ±0.7% Analytical Accuracy

Inaccurate calibration of Continuous Emissions Monitors (CEMs) translates directly into lost NO and SO_2 emissions allowances that could have been sold or banked. Studies have proven that CEM calibration gases are often inaccurate. Therefore, unless you're using SCOTT calibration gases you could be missing out on the hundreds of thousands (even millions) of dollars in added revenue—simply because your CEMs are calibrated inaccurately.

Emissions Credit Class™ Gold Standard EPA Protocols

Solve CEM Inaccuracy	Exclusive ±0.7% analytical accuracy makes these the most accurate CEM calibration gases in the world—even better than our RATA Class™ Protocols

Laboratory analytical instrumentation, standard reference material, blend method, cylinder preparation, raw material quality, ambient production environment and other factors all combine to affect integrity of EPA protocol gases. Only Air Liquide, world's largest and most experienced producer of EPA protocols, has demonstrated the ability to accurately interpret the mathematics of analytical uncertainties and control the many variable dynamics involved when preparing high accuracy calibration gases.

- Available in NO or SO_2
- ±1% blend tolerance
- Balance nitrogen
- SRM, NTRM or PRM analytical traceability
- Laboratory analysis of all minor components
- EPA G1 Standard Industry Method

EPA Protocol Gas Preparation

Air Liquide maintains the world's largest and most extensive inventory of low-uncertainty Standard Reference Materials (SRMs) and NIST-Traceable Reference Materials (NTRMs).

This specialized inventory, along with state-of-the-art analytical technology, enables Air Liquide to achieve strict linearity, sensitivity and reproducibility necessary to significantly reduce uncertainty of analysis.

SCOTT CEM Zero Gases

We engineer our CEM Zero Nitrogen and Air to meet Title 40, CFR 72.2 specifications. Both zero gases are recommended for use in power plants, and with CEM systems and portable stack gas instrumentation.

SCOTT TITLE V Ammonia Calibration Standards

Air Liquide is the only gas manufacturer offering SCOTT Title V Ammonia Standards in nitrogen or air. Designed to facilitate compliance with EPA Conditional Method 27e and Differential Method 7e for measuring ammonia slip, they are traceable to NMi PRMs (Netherlands Measurement Institute Primary Reference Materials), meet EPA Preliminary Performance Specification 001 for Ammonia CEMs, and provide guaranteed 12-month stability.

Calibration Standards*

EPA protocol gases are recommended for improved confidence in the certification, audit and calibration of CEMS for ongoing compliance with environmental regulations.

SCOTT EPA Protocol Gas	Cylinder Size	Cylinder Contents (SCF)	Dual-Analyzed Standards		EPA Certification Period (mos.)†	CGA Valve	Recommended Two-Stage Regulator
			RATA Class	Compliance Class			
Ammonia in Air	30AL	142	**	**	12	660	Model 215 Series
Ammonia in Nitrogen	30AL	142	**	**	12	705	Model 215 Series
Carbon Dioxide in Air	30AL	142	•	•	6 – 36	590	Model 318 Series
Carbon Dioxide in Nitrogen	30AL	142	•	•	6 – 36	580	Model 318 Series
Carbon Monoxide in Air	30AL	142	•	•	6 – 36	590	Model 318 Series
Carbon Monoxide in Nitrogen	30AL	142	•	•	6 – 36	350	Model 318 Series
Hydrogen Sulfide in Air	30AL	143	—	•	6	660	Model 215 Series
Hydrogen Sulfide in Nitrogen	30AL	143	—	•	6 – 12	330	Model 215 Series
Methane in Air	30AL	143	•	•	36	590	Model 318 Series
Nitric Oxide in Nitrogen	30AL	128	•	•	6 – 24	660	Model 215 Series
Nitrogen Dioxide in Air	30AL	143	—	•	6 – 24	660	Model 215 Series
Oxygen in Nitrogen	30AL	142	•	•	6 – 36	580 (≤5%) 590 (>5%)	Model 318 Series
Propane in Air	30AL	142	•	•	36	590	Model 318 Series
Propane in Nitrogen	30AL	142	•	•	36	350	Model 318 Series
Sulfur Dioxide in Air	30AL	142	•	•	6 – 36	660	Model 215 Series
Sulfur Dioxide in Nitrogen	30AL	142	•	•	6 – 36	660	Model 215 Series
Carbon Dioxide and Sulfur Dioxide in Nitrogen	30AL	140	•	•	6 – 36	660	Model 215 Series
Nitric Oxide and Sulfur Dioxide in Nitrogen	30AL	140	•	•	6 – 24	660	Model 215 Series
Oxygen and Sulfur Dioxide in Nitrogen	30AL	140	•	•	6 – 36	660	Model 215 Series
Carbon Dioxide, Nitric Oxide and Sulfur Dioxide in Nitrogen	30AL	140	•	•	6 – 24	660	Model 215 Series
Carbon Monoxide, Nitric Oxide and Sulfur Dioxide in Nitrogen	30AL	140	•	•	6 – 24	660	Model 215 Series
Carbon Dioxide, Carbon Monoxide, Nitric Oxide and Sulfur Dioxide in Nitrogen	30AL	140	•	•	6 – 24	660	Model 215 Series

* *See Air Liquide Reference Guide for our complete line of protocol gas mixtures and concentration ranges.*

** *Available in Title V class only.*

† *EPA certification period may be shorter at lower concentrations—please inquire.*

NOTE: Trace concentrations of other criteria pollutants in the mixture can be certified on request.

EPA Methods: Part 60 Test Methods/Gases

(defined in 40 CFR, Part 60 Guide)

Shown below are EPA methods and the most commonly used gas mixtures. Air Liquide produces these and many other multi-component mixtures with either ±1% or ±2% guaranteed accuracy. All EPA protocol gases supplied by Air Liquide strictly comply with these EPA specified methods. See our catalog for more information about our environmental products.

EPA No.	Method Determination	EPA Protocol Mixtures	Zero Gas
3A	Oxygen and carbon dioxide concentrations in emissions from stationary sources (Instrumental Analyzer Procedure)	Oxygen in nitrogen; carbon dioxide in nitrogen or air; carbon dioxide/sulfur dioxide, oxygen/sulfur dioxide in nitrogen	CEM zero nitrogen/ CEM zero air
6C	Sulfur emissions from stationary sources (Instrumental Analyzer Procedure)	Sulfur dioxide in nitrogen or air; sulfur dioxide or carbon dioxide or carbon dioxide/oxygen in nitrogen multi-component	CEM zero air
7E	Nitrogen oxides from stationary sources (Instrumental Analyzer Procedure)	Nitric oxide in nitrogen	CEM zero air
10	Carbon monoxide emissions from stationary sources	Carbon monoxide in nitrogen	CEM zero nitrogen
10A	Carbon monoxide emissions in certifying Continuous Emission Monitoring Systems at petroleum refineries	Carbon monoxide in nitrogen; NIST-traceable mixture	
10B	Carbon monoxide emissions from stationary sources	Carbon monoxide in nitrogen	Zero air (helium zero, hydrogen zero)
15	Total Reduced Sulfur (TRS) emissions from sulfur recovery plants in petroleum refineries	Hydrogen sulfide in nitrogen	CEM zero air (zero oxygen/zero nitrogen)
15A	Total Reduced Sulfur (TRS) emissions from sulfur recovery plants in petroleum refineries	Carbonyl sulfide in nitrogen low TRS*	
16	Semi-continuous sulfur emissions from stationary sources	Hydrogen sulfide in nitrogen	Zero hydrogen/zero oxygen
16A	Total Reduced Sulfur (TRS) emissions from stationary sources (Impinger Technique)	Hydrogen sulfide in nitrogen	
16B	Total Reduced Sulfur (TRS) emissions from stationary sources	Sulfur dioxide in nitrogen	Zero hydrogen/zero oxygen
18	Measurement of gaseous organic compound emissions by gas chromatography	VOCs in nitrogen; NIST-traceable mixture	VOC free zero air/ VOC free nitrogen
20	Nitrogen oxides, sulfur dioxide and dilute emissions from stationary gas turbines	Nitric oxide in nitrogen; oxygen in nitrogen; carbon dioxide in air	CEM zero air/ VOC free nitrogen
21	Volatile Organic Compound (VOC) leaks	VOCs in nitrogen*; methane in air/hexane in air; VOC in air	Zero air/ VOC free air/ VOC free nitrogen
25	Total gaseous nonmethane organic emissions as carbon	Methane in air; propane in air/carbon monoxide, methane* (multi-component mix); hexane in air/toluene in air	Zero oxygen
25A	Total gaseous organic concentration using Flame Ionization Analyzer	Propane in air or nitrogen	Zero air
25B	Total gaseous organic concentration using a Nondispersive Infrared Analyzer	Propane in air or nitrogen	Zero air
25C	Nonmethane Organic Compounds (NMOC) in MSW landfill gases	See Method 25 above	
25D	Volatile organic concentration of waste samples	1,1 dichloroethylene*, propane in nitrogen	Zero nitrogen/zero hydrogen
25E	Vapor phase organic concentration in waste samples	Propane in nitrogen or air; NIST-traceable mixture	Zero air/zero oxygen

** Gas is Certified Master Class™*

Other Air Liquide Products

ALPHAGAZ™ Pure Gases

Air Liquide offers a complete line of high-purity GC carrier and zero gases.

Cross Reference Service™

Participate in our industry-wide assurance checks available for NO, NO_x or SO_2 monitoring. These services can also be customized to meet your specific application requirements.

Transportables

Use genuine SCOTTY™ Transportables for calibration of gas detectors and hand-held monitors for all of your health and safety applications.

DATAL™

Our exclusive DATAL wireless gas monitoring system is available for automatic reorder and supply of gas.

Equipment

Air Liquide offers an extensive line of SCOTT™ pressure regulators and other equipment to meet all of your gas handling and distribution requirements.

ARCAL™

High-performance industrial welding gases.

Molecules that Matter

As a leading world supplier of specialty and industrial gases, Air Liquide is essentially all about "molecules that matter." Our technologies are carefully engineered to provide customers with specific molecules—as raw materials, as end products and as carefully analyzed mixtures used to measure or test for the presence of other molecules.

But our focus goes beyond refining, measuring and selling molecules. Our presence of over 40,000 employees in 76 countries enables us to leverage our resources as a global enterprise to provide you with knowledgeable, personalized and local service. It's a winning formula that transforms molecules that matter into greater efficiency, growth and success for you— plus a safer, cleaner environment for us all.

AIR LIQUIDE™

MOLECULES that matter™

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Founded in 1902, Air Liquide is a world leader in industrial and medical specialty gases and related services, providing innovative solutions for the manufacture of everyday products and for the protection of life.