

Certificate of Analysis

Certificate: Think of it as your mixture's proof of pedigree. Read it carefully. A Certificate of Analysis should detail how your mixture was prepared. SCOTT™ brand mixtures are unique in that they ship with a Certificate of Accuracy, because the document exceeds EPA minimum requirements and details all preparation data necessary to validate the mixture's guaranteed accuracy. Don't lose the certificate for each cylinder on site. You must show them in the event of an audit.

SCOTT certs are available online. In addition, our SHOP@airliquide™ online cylinder management system will automatically send you an email to alert you when the certification period is about to expire.

AIR LIQUIDE		Scott		RATA CLASS	
Dual-Analyzed Calibration Standard					
6141 Easton Road, P.O. Box 310, Plumsteadville, PA 18949-0310 215.766.4860 800.217.2688 FAX: 215.766.0320					
CERTIFICATE OF ACCURACY: Interference-Free™ Multi-Component EPA Protocol Gas			Customer		
Assay Laboratory		P.O. No.: STCCK		XYZ Corporation	
Air Liquide America Specialty Gases 6141 Easton Road Bldg 1 Plumsteadville PA 18949		Project No.: 01-0300-000 Item No.: 55867503900AL		2244 Highland Road Knoxville TN 12345	
Cylinder Number: ALM057617 Cylinder Pressure: 1343 psig Cylinder Size: 30AL		Certification Date: 13.Jan.2009 Previous Certification Dates: None Exp Date: 13.Jan.2011			
This certification was performed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards, Procedure G-1, September 1997.					
CERTIFIED CONCENTRATION					
Component Name	Concentration (Mole)	Accuracy* (±%)	Traceability		
Carbon Dioxide	17.85%	±1.0	Direct NIST		
Nitric Oxide	44.7ppm	±1.0	Direct NIST		
Sulfur Dioxide	1.111%	±1.0	Direct NIST		
Nitrogen-Oxygen Free	balance	±1.0	Direct NIST		
Total Oxides of Nitrogen	44.7ppm		Reference Value Only		
*Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997. **Do not use when cylinder pressure is below 150 psig.					
REFERENCE STANDARD					
Type/SRM No.	Expiration Date	Cylinder Number	Concentration	Component	
NTRM 1800	01Mar2009	K004320	17.87%	Carbon Dioxide	
NTRM 1886	15Sep2012	KAL004346	490.8 ppm	Nitric Oxide	
NTRM 2690	19May2010	KAL003173	975.0 ppm	Sulfur Dioxide	
INSTRUMENTATION					
Instrument Model/Serial#	Date Last Calibrated	Analytical Procedure			
FTIR/000328781	20Dec2008	FTIR			
FTIR/000328781	24Dec2008	FTIR			
FTIR/000328781	08Jan2009	FTIR			
ANALYZER READINGS					
FIRST TRIAD ANALYSIS		SECOND TRIAD ANALYSIS		CALIBRATION CURVE	
Carbon Dioxide		Carbon Dioxide		Carbon Dioxide	
Date: 06Jan2009 Response Unit: %		Date: 06Jan2009 Response Unit: %		Concentration = A + Bx + Cx² + Dx³ + Ex⁴	
Z1 = 0.0202	R1 = 17.85468 T1 = 17.60488	Z1 = 0.0000	R1 = 0.00000 T1 = 0.00000	f = 9.9999E-1	
R2 = 17.8556	Z2 = 0.00681 T2 = 17.52086	Z2 = 0.0000	R2 = 0.00000 T2 = 0.00000	Constant: A = 0.00000E+0	
Z3 = 0.01921	T3 = 17.85238 R3 = 17.85238	Z3 = 0.00000	T3 = 0.00000 R3 = 0.00000	B = 0.52796E-1 C = 1.26270E-2	
Avg. Concentration: 17.85%		Avg. Concentration: 17.85%		D = 0.00000E+0 E = 0.00000E+0	
Nitric Oxide		Nitric Oxide		Nitric Oxide	
Date: 06Jan2009 Response Unit: ppm		Date: 13Jan2009 Response Unit: ppm		Concentration = A + Bx + Cx² + Dx³ + Ex⁴	
Z1 = 0.01192	R1 = 440.3973 T1 = 447.9637	Z1 = 0.08203	R1 = 440.8729 T1 = 448.9677	f = 9.9999E-1	
R2 = 441.4473	Z2 = 0.00742 T2 = 447.7400	Z2 = 491.0300	Z2 = 0.24861 T2 = 447.0860	Constant: A = 0.00000E+0	
Z3 = 0.25628	T3 = 445.1907 R3 = 431.8114	Z3 = 0.52415	T3 = 447.1983 R3 = 431.2220	B = 8.80030E-1 C = 8.80000E-2	
Avg. Concentration: 445.4 ppm		Avg. Concentration: 446.8 ppm		D = 0.00000E+0 E = 0.00000E+0	
Sulfur Dioxide		Sulfur Dioxide		Sulfur Dioxide	
Date: 06Jan2009 Response Unit: ppm		Date: 13Jan2009 Response Unit: ppm		Concentration = A + Bx + Cx² + Dx³ + Ex⁴	
Z1 = 0.04602	R1 = 976.8443 T1 = 1114.934	Z1 = 0.02726	R1 = 976.8625 T1 = 1112.257	f = 9.9999E-1	
R2 = 978.2311	Z2 = 0.07890 T2 = 1115.115	R2 = 977.2268	T2 = 0.25581 T2 = 1113.726	Constant: A = 0.00000E+0	
Z3 = 0.04652	T3 = 1115.4738 R3 = 976.4587	Z3 = 0.61656	T3 = 1115.81	B = 9.96002E-1 C = 0.00000E+0	
Avg. Concentration: 1111 ppm		Avg. Concentration: 1111 ppm		D = 0.00000E+0 E = 0.00000E+0	
(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)					
Approved By: <i>Luci Masters</i> Date: <i>1-13-09</i>					

A SCOTT Certificate of Accuracy reports the official concentration for every component, as well as other important data demonstrating that the mixture meets our class specifications.



As the world's leading supplier of specialty and industrial gases, Air Liquide is all about "molecules that matter."

Our technologies are carefully engineered to provide customers with meticulously analyzed measures of certain molecules in the form of pure or mixed gases and liquids. These molecules are in turn used as raw materials or end products in themselves, as is often the case in healthcare or food and beverage processing. Other times the molecules we provide are used to measure or test for the presence of other molecules, as is the case in monitoring air pollution.

Our focus however, goes beyond the refining and selling of molecules. It includes providing value that can be measured at the bottom line. Air Liquide products and services help our many customers keep pace with a challenging global economy—by empowering them to improve efficiencies without sacrificing end product quality or analytical accuracy.

Our commitment to safety, technology and innovation has kept Air Liquide at the forefront of our industry for more than 100 years. Our presence of over 43,000 employees in nearly 80 countries enables us to leverage the resources of a global enterprise with personalized service from our localized, customer-focused teams. Combined with products such as SCOTT™ brand EPA Protocol Gases, this is a winning formula that transforms "molecules that matter" into greater customer satisfaction, efficiency and success—plus a safer and cleaner environment for us all.



Air Liquide America Specialty Gases LLC
6141 Easton Road, Box 310, Plumsteadville, PA 18949
Phone: 800.217.2688 Fax: 215.766.2476
www.ALspecialtygases.com

Founded in 1902, Air Liquide is the 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.

NOTE: This brochure is intended for general information purposes only and is not intended as a representation or warranty of any kind, or as a statement of any terms or condition of sale. The information herein is believed to be correct, but is not warranted for correctness or completeness or for applicability to any particular customer or situation.

ACUBLEND, Compliance Class, Molecules that Matter, RATA Class, SCOTT, SCOUT, and SHOP@airliquide are trademarks of Air Liquide Group.
©2010 Air Liquide America Specialty Gases LLC



How to Pick an EPA Protocol Gas



Air Liquide America Specialty Gases LLC

Change is in the air, quite literally. Today's industry cannot rely on old methods and expect to remain competitive, or in the case of acid rain regulations, even expect to remain within the law. When you pick your EPA protocol, choose a supplier with a history and reputation for producing high-quality products.

Bargain Hunters Beware

EPA protocol gases seem to be growing on trees these days. But an EPA report disclosed they are not all the same. It revealed that among 87 cylinders of tri-blends from 14 suppliers, of the 261 components contained, 28 (11%) did not meet Acid Rain Program accuracy criterion*. Failed samples were off by as much as 6%. All were low-priced mixtures, lending validity to the adage, you get what you pay for. Bargain hunters beware! Here are more practical criterion for picking your protocol.



Accuracy: EPA mandates actual cylinder contents must be within 2% of what the cylinder's certificate indicates (tag value). Calibrating your CEM with an inaccurate mixture can result in either overstating or understating your emissions. If you overstate

them, you can lose out on valuable emission trade credits. If you understate them, well, suffice to say EPA takes a dim view of understating emissions.

SCOTT™ RATA Class™ Protocols provide guaranteed ±1% analytical accuracy while SCOTT Compliance Class™ provides guaranteed ±2% analytical accuracy.



Blending: Scott Specialty Gases invented precision blending over twenty years ago by achieving zero blend tolerance with ACUBLEND™. So despite recent promotion by Airgas of their "new" AcuGrav™ process (even the name they chose says: me too!),

precision blending is yesterday's news. Besides, the truth is, actual blending of EPA protocol gases isn't all that difficult.

SCOTT Blend Masters could almost whip up a protocol mix using a kitchen blender. It's subsequent accurate analysis of the mixture that separates the experts from the "me-too" gang—making SCOTT brand EPA Protocols the number one seller in the world.

*Source: Evaluation Report No. 09-P-0235, U.S. EPA Office of Inspector General, September 16, 2009
AcuGrav™ is a registered trademark of Airgas, Inc.



Analysis: It's the most important characteristic of any protocol blend, so you should understand precisely how your cylinder was analyzed. Analysis method and data should be clearly indicated on the cylinder's certificate. Also, know that some suppliers use chromatographs instead of FTIR. Those who do use FTIR typically use off-the-shelf models. More accurate analysis is possible using customized FTIR instruments.

SCOTT™ EPA Protocol Gases are analyzed using FTIR instrumentation that has been customized to deliver absolute precision accuracy that is not possible using chromatography or stock FTIR models.



Traceability: Your certificate should indicate that your mixture was prepared using standards directly traceable to either a Standard Reference Material (SRM) or a NIST-Traceable Reference Material (NTRM). There are no substitutes.

SCOTT RATA Class™ EPA Protocol Gases are analyzed exclusively with SRMs and NTRMs. In addition, Team SCOTT at Air Liquide maintains the world's largest inventory of NTRMs.



Cylinders: To save money, some suppliers buy reconditioned cylinders and valves that may have contained chemicals that affect mixture stability. Changing cylinder service from one type of mix to another can also contaminate a cylinder. Either

scenario can seriously degrade even the best-prepared mixture before its expiration date. You've heard of CARFAX®? Request a "CylinderFacts" history so you know where your cylinder has been before arriving at your facility.

Most SCOTT EPA Protocol Gases use only new or dedicated aluminum cylinders and do not switch service. In addition, we've been bar coding and tracking our cylinders for over 20 years using SCOUT™ Cylinder Tracking. Before we fill any cylinder, we know as much as is possible to know about gases that particular cylinder has contained.



Protocol Speak: Choose a supplier who speaks the language. When you have a question, or a problem, or need something out of the ordinary, it's people who will help you. Be sure you have a toll-free number you can call to speak to an expert who understands your application.

With over 50 years of experience, and a reputation as the world's foremost producer of air monitoring calibration standards, SCOTT Team members at Air Liquide have learned a thing or two—that's all we really need to say about our expertise.

CARFAX® is a registered trademark of CARFAX, Inc.

Consider how your supplier demonstrates a sustained commitment to innovation and world leadership in the supply of gases for industry, health and the environment. Air Liquide is the world leader.



Production Speed: Team SCOTT™ at Air Liquide frequently receives frantic calls from companies unable to get a mixture from their regular supplier. So consider choosing a supplier who can routinely blend and ship a nonreactive in 10 days, and a reactive in 17. (EPA requires seven calendar days between the first and second analysis for reactive mixtures.)

Air Liquide routinely prepares fresh SCOTT EPA Protocol Gases this quickly from eight facilities. It's the fastest delivery in the industry. We never stock them to ensure customers receive the full certification period allowed by EPA. Certification periods vary from six months up to three years, depending on the mix.