

SCOTT™ BTU Calibration Standards

Eliminate Error in Natural Gas Measurements



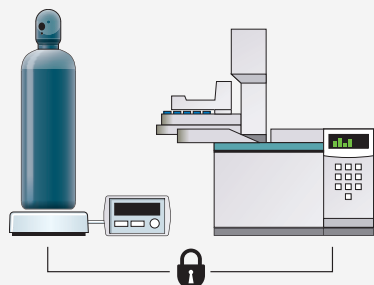
SCOTT Certified Class BTU mixtures from Air Liquide are the calibration gas of choice for all natural gas applications. Use them when measurements are compared and the need to establish an undisputed, common anchor point is essential. Dual-certification and guaranteed ± 2 BTU accuracy* combine to make these mixtures deliver unsurpassed performance when even a small error in measurement could have serious legal or commercial ramifications.

SCOTT Certified Class BTU mixtures are the most accurate and traceable gas and liquid mixtures available. They are gravimetrically prepared, dual-certified and guaranteed to be traceable to a national or international metrology organization (usually NIST or VSL). Air Liquide can also prepare these mixtures to ASTM, GPA, ALRS (Air Liquide Reference Standard), or other standard industry methods. BTU gas mixtures are specifically engineered for uses involving primary instrument calibration or for applications where metrological traceability is critical.

Benefits and Features

- $\pm 1\%$ accuracy of components delivers guaranteed ± 2 BTU accuracy* for consistently accurate measurements.
- Traceability to recognized standards provides unbiased third-party substantiation for absolute confidence in your measurements.
- Dual-certification, independent blending and laboratory analytical values guarantee the accuracy of your mixture.
- Exclusive interlocking concentration values provide an added measure of confidence in mixture accuracy.
- Assured availability from Air Liquide regional manufacturing facilities provides just-in-time delivery to minimize the need for on-site inventory.

* ± 1 BTU accuracy is available on some products: call for more information.



Interlocked
Concentrations with agreement
as low as 1%

Certified Class™, BTU

Air Liquide's Certificate of Accuracy for Certified Class BTU mixtures shows the following information:

- 1 Cylinder identification number and other product information
- 2 Certified concentration (ppm or % mole basis; weight basis is optional)
- 3 Certified accuracy by component
- 4 List of minor components and balance gas/liquid
- 5 BTU calculated values
- 6 Physical property information
- 7 Method used to calculate BTU value (either GPA 2145-03 or 2172-97)

The reverse side of our Certificate of Accuracy shows detailed component information:

- 8 Detailed information by component
- 9 Requested concentration
- 10 Blended (gravimetric) concentration
- 11 Blend tolerance result
- 12 Certified accuracy result
- 13 Traceability of laboratory analysis (traceability to gas reference standard from NIST (SRM) or VSL (PRM), or other institute or NIST weight)
- 14 Special handling instructions
- 15 Comments

Note: For illustrative purposes the Certificate of Accuracy is shown as being one-sided. Your actual document will be two-sided.

Air Liquide is also able to provide multiple units of measure, chromatograms and fidelity plots with your certification.

Exclusive Interlocking Concentration Values™

Certified Class BTU products receive two rigorous, independent methods of certification: one during GRAVSTAT™ blending and the other using proprietary laboratory analytical procedures. Air Liquide then further ensures the accuracy of your mixture by employing our exclusive interlocking feature: the concentrations determined from both certification processes must interlock with agreement as low as 1%.

Certificate of Accuracy

Every cylinder containing a SCOTT™ Certified Class BTU mixture is shipped with a Certificate of Accuracy (below). This Certificate of Accuracy can be affixed to the cylinder itself, mailed, faxed or electronically transmitted to you. Certificates are also available online at SHOP@airliquide.com.




CERTIFIED CLASS
Certified BTU Calibration Standard

6141 Easton Road, P.O. Box 310, Plumsteadville, PA 18949-0310 (215) 766-8860 (800) 217-2688 FAX: (215) 766-0320

CERTIFICATE OF ACCURACY: Certified Class BTU Calibration Standard

<p>Product Information</p> <p>Project No.: 08-46153-001 Item No.: 0802NOOD235PBL P.O. No.: 170452 REL#120 Folio#: FOLIO #99999999 Cylinder Number: BAL251 Cylinder Size: BL Certification Date: 05Jan2009 Expiration Date: 05Jan2011</p>	<p>Customer</p> <p>Acme Chemical, Inc. John Kitner 4600 Wakefield Drive Box 217 Somerville, PA 19090-9999</p>
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1		
4	2	3
4	Concentration (Mole)	Accuracy (±%)
Component Name		
Nitrogen	1.000%	1.0
Methane	95.187%	1.0
Carbon Dioxide	0.701%	1.0
Ethane	2.510%	1.0
Propane	0.340%	1.0
IsoButane	0.060%	1.0
N-Butane	0.059%	1.0
IsoPentane	0.020%	1.0
N-Pentane	0.020%	1.0
N-Hexane	0.101%	1.0

5		
BTU		
Gross/Real/Dry 1029.4	Gross/Ideal/Dry 1027.6	
Net/Real/Dry 927.6	Net/Ideal/Dry 926.0	
Specific Gravity 0.5867		
All reported value calculated at 14.730 psia and 60 degrees Fahrenheit		

6		
PHYSICAL PROPERTIES		
Cylinder Size: BL	Pressure: 765 PSIG	Valve Connection: 350
Dew Point: 32°F	Expiration Date: 05Jan2011	

TRACEABILITY

7	
Traceable To	
GPA 2145-03	Physical Constants for the Paraffin Hydrocarbons and Other Components of Natural Gas

8				
SPECIFICATIONS	9	10	11	12
Component Name	Requested Concentration (Mole)	Gravimetric Concentration (Mole)	Blend Tolerance Result (±%)	Certified Accuracy Result (±%)
Nitrogen	1.000	1.000%	0.0	1.0
Methane	95.200%	95.187%	0.0	1.0
Carbon Dioxide	0.700	0.701%	0.1	1.0
Ethane	2.500	2.510%	0.4	1.0
Propane	0.340	0.340%	0.0	1.0
IsoButane	0.060	0.060%	0.0	1.0
N-Butane	0.060	0.059%	0.2	1.0
IsoPentane	0.020	0.020%	2.0	1.0
N-Pentane	0.020	0.020%	2.0	1.0
N-Hexane	0.100	0.101%	1.0	1.0

13	
Traceable To	
NIST	

14	
SPECIAL HANDLING INSTRUCTIONS	
Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.	
Use of calibration standards at or below dew point temperature may result in calibration error.	

15	
COMMENTS	
Z Factor = .9978	
Key BTU 1 C6+ Split 47/36/17	
BTU value based on a calculated split using the following respective ratios for C6/C7/C8: 47%/36%/17%	

Approved By: Luci Martens Date: 2-8-09



Use Air Liquide Calibration Standards for these Natural Gas Applications

Pipeline

Online/Lab Analyzers and Propane/Air Injection Systems

- Natural gas/BTU calibration standards
- Sulfur calibration standards
- ALPHAGAZ™ high-purity GC carrier and zero gases
- Gas handling equipment

Compression Stations

- Low NOx, CO, VOC calibration standards
- Formaldehyde calibration standards

Quality Assurance

- Natural Gas Cross Reference™ Service

Petrochemical

Raw Material Analysis for Quality Assurance

- Natural gas/BTU calibration standards
- Ethane, propane, butane and NGL calibration standards
- Sulfur calibration standards
- ALPHAGAZ high-purity GC carrier and zero gases
- Gas handling equipment
- Natural Gas Cross Reference Service

Power Plant/Utility

Online/Lab Analyzers for BTU Verification

- Natural gas/BTU calibration standards
- ALPHAGAZ high-purity GC carrier and zero gases
- Gas handling equipment
- Natural Gas Cross Reference Service

Processing Plant

Process Control

- Natural gas/BTU calibration standards
- Ethane, propane, butane and NGL calibration standards
- Sulfur calibration standards
- ALPHAGAZ high-purity GC carrier and zero gases
- Gas handling equipment

Acid Gas Treating/Sulfur Recovery

- Sulfur calibration standards
- CO₂ calibration standards

Dehydrator Emissions Monitoring

- BTEX, VOC calibration standards

Environmental Compliance

- Low NOx, CO, H₂S, SO₂, BTEX, VOC calibration standards

Health and Safety

- SCOTTY™ Transportables

Quality Assurance

- Natural Gas Cross Reference Service

Wellhead/Logging

Quality Assurance

- Natural gas/BTU calibration standards
- Sulfur calibration standards

Environmental Compliance

- Low NOx, CO, H₂S, SO₂, BTEX, VOC calibration standards

Sample Cylinder/Line Cleaning

- Supercritical Fluid Extraction (ALPHAGAZ SFE) CO₂

Health & Safety

- SCOTTY Transportables

SCOTT™ Calibration Gases and Liquids Available from Air Liquide

We can create custom C6+ fractions specific to the end use including the Phillips Lot #4 Hexanes+.

Pipeline Natural Gas Calibration Standards*

Methane	92.490%
Ethane	3.000%
Propane	1.500%
n-Butane	0.250%
i-Butane	0.250%
n-Pentane	0.100%
i-Pentane	0.100%
neo-Pentane	0.010%
n-Hexane	0.050%
Carbon Dioxide	1.500%
Nitrogen	0.750%
Total	100%

Dew Point: 32°F (0°C), 1285 psia (89 bar)

Extended Analysis Natural Gas Calibration Standards*

Methane	89.180%
Ethane	4.000%
Propane	1.000%
n-Butane	0.300%
i-Butane	0.300%
n-Pentane	0.050%
neo-Pentane	0.050%
n-Hexane	0.100%
n-Heptane	0.010%
n-Octane	0.005%
n-Nonane	0.0025%
n-Decane	0.0025%
Carbon Dioxide	1.000%
Nitrogen	2.500%
Oxygen	1.500%
Total	100%

Dew Point: 32°F (0°C), 161 psia (11 bar)

* Typical blends (concentration, vol.%).



Certified Class™ SCOTT™ BTU Calibration Standards

Eliminate Error in Natural Gas Measurements

Typical Components

Butane, Ethane, Propane and NGL Calibration Standards

Acetylene	Carbon Dioxide	Dimethyl Sulfide	n-Hexane	n-Nonane	Propane
Benzene	Carbon Disulfide	Dodecane	Hydrogen	n-Octane	Propanol
Butanol	Carbon Monoxide	Ethane	Hydrogen Sulfide	Oxygen	n-Propyl Benzene
i-Butane	Carbonyl Sulfide	Ethanol	Methane	Pentadecane	Propylene
n-Butane	n-Decane	Ethyl Benzene	Methanol	i-Pentane	Tetradecane
1-Butene	2,2-Dimethyl Butane	Ethyl Mercaptan	Methyl Mercaptan	n-Pentane	Toluene
2-Butene (cis, trans)	2,3-Dimethyl Butane	Ethylene	2-Methyl Pentane	neo-Pentane	Tridecane
Butyl Mercaptan	Dimethyl Disulfide	Helium	3-Methyl Pentane	1-Pentene	Xylene (o, m, p)
Butylenes	2,2-Dimethyl Pentane	n-Heptane	Nitrogen	2-Pentene	

Custom blends are available—contact your Air Liquide representative for more information.

Other Air Liquide Products for Natural Gas Applications

ALPHAGAZ™ Pure Gases

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

Natural Gas Cross Reference™ Service

Participate in industry-wide assurance checks with our Natural Gas Cross Reference Service. This service can also be customized to meet your specific application requirements.

Moisture Standards

Air Liquide has developed these standards in cooperation with leading manufacturers of gas analyzers. Exceptional reliability and stability make our "green cylinders" the state-of-the-art benchmark for accurate analysis of moisture content.

Environmental Compliance Gases

Air Liquide is a leading producer of environmental compliance gases and EPA protocol gases for monitoring CO, Low NOx, H₂S, SO₂ and VOC emissions.

Transportables

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

Equipment

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

Click or Dial

These and other Air Liquide products are available to purchase online at scottgas.com.

To place an order or for fast technical service, call the Solutions Center at 800.217.2688 or contact your nearest Air Liquide location.



Cylinder Heating Jacket

A SCOTT™ cylinder heating jacket prevents condensation inside a cylinder. Maintains cylinders at 120°F (49°C) in ambient temperature down to 0°F (-18°C). Constructed of materials approved by Underwriters Laboratories Inc. for Class 1, Division 2, Group B, C and D hazardous locations.



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.

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