

Natural Gas Standards

The calibration of the instrument used to measure the BTU content of your natural gas can have significant impact on your company's bottom line. The application of an inaccurate BTU value to millions of cubic feet of natural gas can add up to tens of thousands of dollars. Your instrument's calibration is only as good as the standard you use to calibrate it.

MATHESON's Family of BTU Calibration Standards provides you with the standard accuracy you need at a price with the best value possible. Available grades are outlined below.

MATHESON BTU Standard Grade Summary						
MATHESON Standard Grade	Certification	BTU Accuracy	Mixture Preparation	Blend Tolerance	Certification Accuracy	Cylinder Sizes (See Notes Below)
MaxiTherm™: C1 to C6 only (single cylinder)	NIST NTRM & Gravimetric	± 1.4 BTU Dual Certification Cylinder to Cylinder reproducible ≤1 BTU	High-resolution Gravimetric Preparation	C1 to C3 1% C4 to C5 2% C6, N2 ≤ 5%	1% ≤1% ≤2%	1R, 2R
Primary: Standard blends & Extended Analysis	NIST NTRM & Gravimetric	± 1-2 BTU Dual Certification C1 to C6 only Cylinder to Cylinder reproducible ≤ 1.5 BTU	High-resolution Gravimetric Preparation	C1 to C3 ≤ 1% C4 to C5 ≤ 2% C6, C7, N2 ≤ 5% C8 to C10 ≤ 10%	≤1% ≤1% ≤2% ≤5%	1R, 2R, 1A, 2, 1F
UniTherm™: identical cylinders in one batch (Hydrocarbons to C6)	NIST NTRM & Gravimetric	± 1-2 BTU Dual Certification Batch Homogeneity ≤ 0.7 BTU	Jumbo Tube & Scales	C1 to C3 ≤ 1% C4 to C5 ≤ 2% C6, N2 ≤ 5%	≤1% ≤1% ≤2%	1R->6R; 1A, 1F
10 1F/batch; ≥ 8 1R or 1A per batch filled to > 500psig Option 1: 100% cylinder certification. Each cylinder has its own analytical concentration; uniform batch gravimetric value Option 2: homogeneity test and certification of square root: certified concentration is average of sample analysis; uniform gravimetric concentrations Option 3: homogeneity test only; label with uniform gravimetric concentration						
Gravimetric Standard	Gravimetric & NTRM-Traceable Standard	± 2 BTU Typically Gravimetric Certification	Gravimetric Preparation	1-5%	1-2%	1R, 2R, 3R, 1A, 2, 3, 1F
Certified Standard (batch option)	Lab Standard Gravimetric only	No BTU accuracy provided: typically ± 2% Component batch homogeneity ≤ 1 BTU	Gravimetric or Volumetric Preparation Jumbo Tube & Scales	5% 5%	2% 2%	1A, 2, 3, 4, 6, 1F 1A, 2, 3, 4, 6, 1F
Notes: 1. Based upon desired hydrocarbon dewpoint, vapor pressure software will determine optimum mixture concentrations and cylinder pressure. 2. Cylinders with "R" designations are aluminum cylinders. 3. See the MATHESON Catalog for more detailed cylinder specifications.						

Extended Analysis Requirements

To meet extended analysis requirements, MATHESON will customize the C6 plus fraction to your components and concentrations on Primary Standard Grade and Gravimetric Standard Grade mixtures. Special preparations will assure continuity of the C6 plus fraction on repeat orders.

Accuracy ⇒ MaxiTherm™

MATHESON proudly introduces MaxiTherm™, the most advanced BTU calibration standard available today. If accuracy and consistency of BTU measurement is of utmost importance to you, you will appreciate the features of MaxiTherm:

- MaxiTherm offers BTU calibration to ± 1.4 BTU; you cannot get a more accurate calibration standard per uncertainty of 1 in 1000 in GPA 2145 physical constants.
- We certify MaxiTherm products against NIST NTRMs (NIST Traceable Reference Material). MATHESON is the first and only supplier that has natural gas NTRMs; offering you direct traceability to NIST measurements.

Consistency ⇒ UniTherm™

- Identical Cylinders: MATHESON can provide up to one hundred identical natural gas standards including components through n-hexane. Identical standards ensure consistency of instrument calibration.



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- MATHESON's standardized mixture production and certification procedures assure uniform mixtures from anywhere in the MATHESON production network. This is especially important for pipeline distributors with operations throughout North America. Mixtures are manufactured using a batch process. Blend analysis is based on customer requirement.

Components Common to Process Natural Gas

MATHESON's natural gas standards can include components from the following table:

2,2-Dimethylbutane	Hydrogen Sulfide	n-Heptane
2,3-Dimethylbutane	Iso-Butane	Nitrogen
Carbon Dioxide	Iso-Pentane	n-Nonane
Ethane	Methane	n-Octane
Helium	n-Butane	n-Pentane
Hexane	n-Decane	Oxygen
Hydrogen	Neopentane	Propane

MATHESON offers natural gas standards to meet most any application. With our understanding of the natural gas industry, MATHESON will consistently provide calibration standards that meet and exceed your requirements.

Sulfur Standards

MATHESON's low concentration sulfur standards in nitrogen or hydrocarbon balance gases are state-of-the-art. Several proprietary processes are used to enhance mixture stability and extend mixture shelf life:

- MATHESON's ULTRA-LINE® Microshield™ cylinder treatment process provides a stable foundation on which to manufacture the mixture.
- MATHESON uses a proprietary purification process to virtually eliminate oxygen and moisture contaminants from nitrogen and methane balance gases.

Support Equipment

MATHESON offers the broadest line of gas handling equipment in the specialty gas industry. We can work with you to design a complete gas distribution system effectively integrating your requirements with regulatory compliance and good engineering practices.

We also offer over 3,000 different gas handling equipment components to meet every possible need to control and monitor gas under pressure. This equipment is centrally stocked for fast delivery. For a personal copy of the MATHESON Catalog please call 800-416-2505.

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Printed in USA TB360 R04/10



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