

Chromatograph Equipment and Industry Standards for Gas Sampling

Industry Standards:

American Petroleum Institute (API)

American Petroleum Institute (API) *Manual of Petroleum Measurement Standards* (MPMS), Chapter 14.1, "Collecting and Handling of Natural Gas Samples for Custody Transfer"

American Standards Testing & Materials (ASTM)

- D 1142-95 *Standard Test Method for Water Vapor Content of Gaseous Fuels by Measurement of Dew-Point Temperature*
- D 1945-03 *Standard Test Method for Analysis of Natural Gas by Gas Chromatography*
- D 5454-93 *Standard Test Method for Water Vapor Content of Gaseous Fuels Using Electronic Moisture Analyzers*
- D 5504-01 *Standard Test Method for Determination of Sulfur Compounds in Natural Gas and Gaseous Fuels by Gas Chromatography and Chemiluminescence*

Gas Processors Association (GPA)

- 2166- Obtaining Natural Gas Samples for Analysis by Gas Chromatography
- 2172- 2008 Calculation of Gross Heating Value, Relative Density, and Compressibility of Natural Gas Mixtures from Compositional Analysis
- 2199-99 Determination of Specific Sulfur Compounds by Capillary Gas Chromatography and Sulfur Chemiluminescence Detection
- 2261-00 Analysis for Natural Gas & Similar Gaseous Mixtures by Gas Chromatography
- 2145 *Table of Physical Constants of Paraffin Hydrocarbons and Other Components of Natural Gas.*
- 2265-68 Determination of Hydrogen Sulfide and Mercaptan in Natural Gas

Chemical & Composition-Dependent Properties	Typical Units (SI)	Measurement Instruments	Standard Methods/References
Hydrocarbons & Inerts Content	Mole %	Gas Chromatography	ASTM D1945, GPA 2261
Carbon Dioxide	Mole %	Gas Chromatography (Lab & On-line)	ASTM D1945, GPA 2261 Tunable laser diode absorption spectroscopy
Moisture Content	Lbs/MMSCF	Electronic Moisture	ASTM D1142, ASTM D5454 Tunable laser diode absorption spectroscopy

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Chemical & Composition-Dependent Properties	Typical Units (SI)	Measurement Instruments	Standard Methods/References
H2S Content	ppm _v , or grains per 100 scf ⁵	On-line Analyzer, Gas Chromatography,	ASTM D5504, GPA 2261 Tunable laser diode absorption spectroscopy
Total Sulfur	ppm _v , or grains per 100 scf ⁵	Gas Chromatography	ASTM D5504, GPA 2199
Relative Density		Calculated via Gas Chromatography Results	GPA 2172, GPA 2261
Compressibility		Calculated via Gas Chromatography Results	GPA 2172, GPA 2261, AGA 8

EQUIPMENT

HEATING CONTENT RELATIVE DENSITY COMMON INERTS	MOISTURE	SULFUR HYDROGEN SULFIDE	OXYGEN
Instromet Encal 2000	Spectra Sensor	Galvanic 903	Illinois Instruments EC91,910,911
ABB 8206/8209	GE Panametrics MIS1	Ametek 933 H2S & Total Sulfur	GE Panametrics O2X1
Chandler 2920	COSA XTR-100	Galvanic 842 DI	
Cosa HGC-303	MEECO Accupoint	Galvanic 842	
Daniel 512/570/572/590	Kahn Transmet IS	Del Mar Smart Sulfur 1100	
	Moisture Chek 2000		
	Spectrasensor SS3000 (& CO2)		