McCROMETER

Standards and Protocols for use of DP Flowmeters in Natural Gas

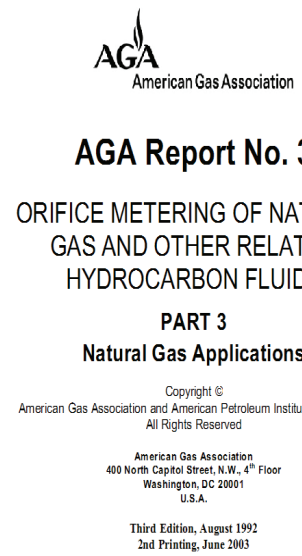
1955	American Gas Association (AGA)	AGA Report #3 "Orifice Metering of Natural Gas"
1975	American Petroleum Institute (API)	adopted AGA 3 as a standard
1977	American National Standards Institutue (ANSI)	adopted AGA 3 as a standard
2003	American Petroleum Institute (API)	5.7 "Differential Pressure Flow Measurement Devices"
2005	American Petroleum Institute (API)	22.2 (revision of 5.7) "Testing Protocol-Differential Pressure Flow Measurement Devices"

In 1955, AGA published Report #3 which is a standard for manufacturing and installing orifice meters for the measurement of natural gas. This standard only applies to Orifice meters and does not address all other dP meter technologies. In 2003, API published Chapter 5.7 to standardize testing and reporting methods to fairly compare the performance of any DP flowmeters to the manufacturers published specifications.

The protocol outlines rigorous test requirements including testing under various conditions ranging from fully developed velocity profile to a disturbed swirling flow stipulating the test must be performed by a certified NIST traceable test lab. In January 2005, API 5.7 was revised and moved to Chapter 22.2.

In 2006, McCrometer V-Cone® and Wafer Cone® flowmeters were tested by a certified test lab (CEESI) in accordance with API 5.7 and then further tested to meet the additional requirements of API 22.2.

The test results proved the V-Cone® and Wafer Cone® flowmeters accuracy and repeatability claims as published by McCrometer.


AGA
American Gas Association

AGA Report No. 3

ORIFICE METERING OF NATURAL GAS AND OTHER RELATED HYDROCARBON FLUIDS

PART 3
Natural Gas Applications

American Gas Association
400 North Capitol Street, N.W., 4th Floor
Washington, DC 20001
U.S.A.

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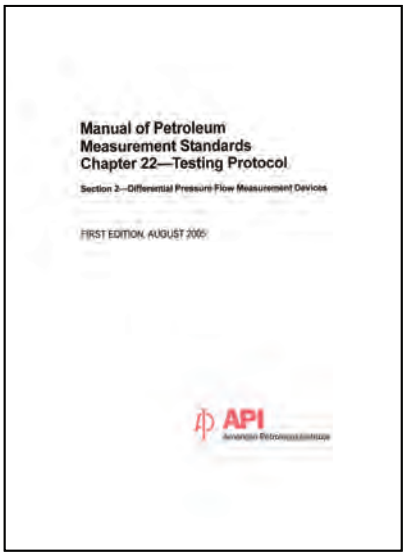
Manual of Petroleum Measurement Standards
Chapter 22—Testing Protocol

Section 2—Differential Pressure Flow Measurement Devices

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API

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McCROMETER

Straight Run Requirement Comparison

Orifice Plate (based on AGA 3) V-Cone® (proven results from API 22.2)

		Orifice AGA 3 Recommendations Accuracy +/-0.5%		V-Cone® API 22.2 Proven Results Accuracy +/-0.5%		% Pipe Savings	
		0.45 Beta	0.75 Beta	0.45 Beta	0.75 Beta	0.45 Beta	0.75 Beta
Close Coupled Double Elbow Out of Plane	Upstream	50	95	3	5	94.00%	94.74%
	Downstream	3.2	4.5	0	0	100.00%	100.00%
	Total	53.2	99.5	3	5	94.36%	94.97%
Half Open Gate Valve	Upstream	21	44	3	5	85.71%	88.64%
	Downstream	3.2	4.5	0	0	100.00%	100.00%
	Total	24.2	48.5	3	5	87.60%	89.69%

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