

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200668-0

Cox Flow Measurement, a div. of Badger Meter, Inc.
Scottsdale, AZ

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

CALIBRATION LABORATORIES

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2011-10-01 through 2012-09-30

Effective dates



Sally S. Bruce
For the National Institute of Standards and Technology



**National Voluntary
Laboratory Accreditation Program**



CALIBRATION LABORATORIES

NVLAP LAB CODE 200668-0

Scope Revised: 2011-10-05

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

<p align="center">Cox Flow Measurement, Inc., a division of Badger Meter, Inc. 15555 N. 79th Place Scottsdale, AZ 85260-1681 Mr. Jerry Timmerman Phone: 480-948-3789 Fax: 480-948-3610 E-mail: jtimmerman@badgermeter.com URL: http://www.coxflow.com</p>	<p align="center">Parameter(s) of Accreditation Mechanical</p> <p>This laboratory is compliant to ANSI/NCSL Z540-1-1994; Part 1. (NVLAP Code: 20/A01)</p>
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CALIBRATION AND MEASUREMENT CAPABILITY (CMC) Notes 1,2

Measured Parameter Or Device Calibrated	Range	Uncertainty (<i>k</i> =2) <small>Note 3</small>	Remarks
MECHANICAL			
<p>NVLAP Code: 20/M05 FLOW RATE Flow of Liquid Hydrocarbons Piston Prover</p>	<p>0.003 gpm to 3 gpm 0.019 lpm to 37.9 lpm</p>	<p align="center">0.033 %</p>	<p>Determination of flow meter calibration factor</p> <p>gpm: US Gallons per minute.</p>
<p>Flow of Water Piston Prover</p>	<p>0.25 gpm to 1500 gpm 0.95 lpm to 5678 lpm</p>	<p align="center">0.034 %</p>	<p>lpm: Liters per minute; may also be expressed as cubic decimeters per minute.</p>
<p>Flow of Water Piston Prover</p>	<p>0.03 gpm to 30 gpm 0.11 lpm to 114 lpm</p>	<p align="center">0.033 %</p>	
<p>Flow of Water Piston Prover</p>	<p>0.3 gpm to 300 gpm 1.1 lpm to 1136 lpm</p>	<p align="center">0.033 %</p>	
<p>Flow of Air Bell/Piston Prover</p>	<p>0.00035 scfm to 1000 scfm 0.01 slpm to 28 317 slpm</p>	<p align="center">0.20 %</p>	<p>scfm: Standard cubic feet per minute at standard conditions of 14.7 psia (101 353 pascals) and 70°F (21.1 °C).</p>
<p>Sonic Nozzle Transfer Standard</p>	<p>0.0015 scfm to 1000 scfm 0.042 slpm to 28 317 slpm</p>	<p align="center">0.35 %</p>	<p>or slpm: Standard liters per minute at standard conditions of 14.7 psia (101 353 pascals) and 70°F (21.1 °C).</p>

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CALIBRATION AND MEASUREMENT CAPABILITY (CMC) ^{Notes 1,2}

Measured Parameter Or Device Calibrated	Range	Uncertainty (k=2) ^{Note 3}	Remarks
Flow of Inert Gasses Bell/Piston Provers	0.00035 scfm to 200 scfm 0.01 slpm to 5663 slpm	0.20 %	Uncertainties shown are for operation with fluid at or near room temperature (70° F.). At elevated temperatures, the uncertainty increases by 0.000693% per degree F above 70° F. The maximum operating temperature is 140 ° F.
Sonic Nozzle Transfer Standard	0.1 scfm to 400 scfm 2.83 slpm to 11 327 slpm	0.35 %	
Calibration of Flow Calibrators		Max uncertainty for Volumetric Flow Rate	
Liquid Flow Calibrator	0.003 GPM to 3 GPM	0.033 %	
Liquid Flow Calibrator	0.03 GPM to 30 GPM	0.033 %	
Liquid Flow Calibrator	0.06 GPM to 65 GPM	0.033 %	
Liquid Flow Calibrator	0.10 GPM to 100 GPM	0.033 %	
Liquid Flow Calibrator	0.15 GPM to 150 GPM	0.033 %	
Liquid Flow Calibrator	0.30 GPM to 300 GPM	0.033 %	
Liquid Flow Calibrator	0.40 GPM to 400 GPM	0.033 %	
Liquid Flow Calibrator	0.50 GPM to 1500 GPM	0.034 %	
END			

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Notes

Note 1: A Calibration and Measurement Capability (CMC) is a description of the best result of a calibration or measurement (result with the smallest uncertainty of measurement) that is available to the laboratory's customers under normal conditions, when performing more or less routine calibrations of nearly ideal measurement standards or instruments. The CMC is described in the laboratory's scope of accreditation by: the measurement parameter/device being calibrated, the measurement range, the uncertainty associated with that range (see note 3), and remarks on additional parameters, if applicable.

Note 2: Calibration and Measurement Capabilities are traceable to the national measurement standards of the U.S. or to the national measurement standards of other countries and are thus traceable to the internationally accepted representation of the appropriate SI (Système International) unit.

Note 3: The uncertainty associated with a measurement in a CMC is an expanded uncertainty using a coverage factor, $k = 2$, with a level of confidence of approximately 95 %. Units for the measurand and its uncertainty are to match. Exceptions to this occur when marketplace practice employs mixed units, such as when the artifact to be measured is labeled in non-SI units and the uncertainty is given in SI units (Example: 5 lb weight with uncertainty given in mg).

Note 3a: The uncertainty of a specific calibration by the laboratory may be greater than the uncertainty in the CMC due to the condition and behavior of the customer's device and specific circumstances of the calibration. The uncertainties quoted do not include possible effects on the calibrated device of transportation, long term stability, or intended use.

Note 3b: As the CMC represents the best measurement results achievable under normal conditions, the accredited calibration laboratory shall not report smaller uncertainty of measurement than that given in a CMC for calibrations or measurements covered by that CMC.

Note 3c: As described in Note 1, CMCs cover calibrations and measurements that are available to the laboratory's customers under *normal conditions*. However, the laboratory may have the capability to offer special tests, employing special conditions, which yield calibration or measurement results with lower uncertainties. Such special tests are not covered by the CMCs and are outside the laboratory's scope of accreditation. In this case, NVLAP requirements for the labeling, on calibration reports, of results outside the laboratory's scope of accreditation apply. These requirements are set out in Annex A.1.h. of NIST Handbook 150, Procedures and General Requirements.

Note 4: Uncertainties associated with field service calibration may be greater as they incorporate on-site environmental contributions, transportation effects, or other factors that affect the measurements. (This note applies only if marked in the body of the scope.)

Note 5: Uncertainty values listed with percent (%) are percent of reading or generated value unless otherwise noted.

Note 6: NVLAP accreditation is the formal recognition of specific calibration capabilities. Neither NVLAP nor NIST guarantee the accuracy of individual calibrations made by accredited laboratories.

Note 7: See [NIST Handbook 150](#) for further explanation of these notes.

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