# National Voluntary Laboratory Accreditation Program

**CALIBRATION LABORATORIES** **NVLAP LAB CODE 200939-0**

## SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

| **FMC Technologies Flow Research and Test Center** | **Fields of Calibration** |
|---|---|
| 1602 Wagner Avenue<br>Erie, PA 16510-1444<br>Mr. Mark Martin<br>Phone: 814-898-5440 Fax 814-899-3414<br>E-mail: mark.martin@fmcti.com<br>URL: http://www.fmctechnologies.com | Mechanical<br><br>This laboratory is compliant to ANSI/NCSL Z540-1-1994; Part 1. (NVLAP Code: 20/A01) |

**CALIBRATION AND MEASUREMENT CAPABILITIES (CMC)[Notes 1,2]**

| **Measured Parameter or Device Calibrated** [Note 8] | **Range** [Note 7] | **Expanded Uncertainty** [Notes 3,5] | **Remarks** |
|---|---|---|---|
| **MECHANICAL** | | | |
| **FLOW RATE (20/M05)** | | | |
| Flow Meter Factor<br>High Flow Test System | | | |
| Viscosity - 7 cSt to 20 cSt | 26.24 $m^3/h$ to 317.98 $m^3/h$ | 0.025 % | Small Volume Prover (SVP) |
| | 318 $m^3/h$ to 2782.5 $m^3/h$ | 0.026 % | |
| | 26.24 $m^3/h$ to 47.68 $m^3/h$ | 0.072 % | 1 Master Meter |
| | 47.7 $m^3/h$ to 2226 $m^3/h$ | 0.071 % | |
| | 2226 $m^3/h$ to 4452 $m^3/h$ | 0.061 % | 2 Master Meters |
| | 2385 $m^3/h$ to 6678 $m^3/h$ | 0.058 % | 3 Master Meters |
| Multi-viscosity Test System | | | |
| Viscosity - 1 cSt to 7 cSt | 26.24 $m^3/h$ to 47.7 $m^3/h$ | 0.030 % | SVP |
| | 47.7 $m^3/h$ to 1287.9 $m^3/h$ | 0.029 % | |
| | 26.24 $m^3/h$ to 1287.9 $m^3/h$ | 0.073 % | 1 Master Meter |

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**CALIBRATION AND MEASUREMENT CAPABILITIES (CMC)[Notes 1,2]**

| Measured Parameter or Device Calibrated [Note 8] | Range [Note 7] | Expanded Uncertainty [Notes 3,5] | Remarks |
|---|---|---|---|
| 7 cSt to 20 cSt | 26.24 $m^3/h$ to 1287.9 $m^3/h$ | 0.027 % | SVP |
| | 26.24 $m^3/h$ to 1287.9 $m^3/h$ | 0.071 % | 1 Master Meter |
| 20 cSt to 70 cSt | 26.24 $m^3/h$ to 47.7 $m^3/h$ | 0.027 % | SVP |
| | 47.7 $m^3/h$ to 1287.9 $m^3/h$ | 0.026 % | |
| | 26.24 $m^3/h$ to 1287.9 $m^3/h$ | 0.071 % | 1 Master Meter |
| 70 cSt to 370 cSt | 26.24 $m^3/h$ to 1287.9 $m^3/h$ | 0.026 % | SVP |
| | 26.24 $m^3/h$ to 1287.9 $m^3/h$ | 0.070 % | 1 Master Meter |
| Low Flow Multi-viscosity Test System | | | |
| Viscosity - 1 cSt to 7 cSt | 0.64 $m^3/h$ to 0.94 $m^3/h$ | 0.055 % | SVP |
| | 0.95 m3/h to 1.57 m3/h | 0.045 % | |
| | 1.59 $m^3/h$ to 2.37 $m^3/h$ | 0.037 % | |
| | 2.39 $m^3/h$ to 3.96 $m^3/h$ | 0.034 % | |
| | 3.98 $m^3/h$ to 7.93 $m^3/h$ | 0.032 % | |
| | 7.95 $m^3/h$ to 15.88 $m^3/h$ | 0.030 % | |
| | 15.9 $m^3/h$ to 39.73 $m^3/h$ | 0.030 % | |
| | 39.75 $m^3/h$ to 283.82 $m^3/h$ | 0.029 % | |

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**CALIBRATION AND MEASUREMENT CAPABILITIES (CMC)[Notes 1,2]**

| Measured Parameter or Device Calibrated [Note 8] | Range [Note 7] | Expanded Uncertainty [Notes 3,5] | Remarks |
|---|---|---|---|
| 7 cSt to 20 cSt | 0.64 $m^3/h$ to 0.94 $m^3/h$ | 0.049 % | SVP |
| | 0.95 $m^3/h$ to 1.57 $m^3/h$ | 0.040 % | |
| | 1.59 $m^3/h$ to 2.37 $m^3/h$ | 0.033 % | |
| | 2.39 $m^3/h$ to 3.96 $m^3/h$ | 0.031 % | |
| | 3.98 $m^3/h$ to 7.93 $m^3/h$ | 0.030 % | |
| | 7.95 $m^3/h$ to 39.73 $m^3/h$ | 0.028 % | |
| | 39.75 $m^3/h$ to 79.48 $m^3/h$ | 0.027 % | |
| | 79.5 $m^3/h$ to 283.82 $m^3/h$ | 0.026 % | |
| 20 cSt to 70 cSt | 0.64 $m^3/h$ to 0.94 $m^3/h$ | 0.047 % | |
| | 0.95 $m^3/h$ to 1.57 $m^3/h$ | 0.038 % | |
| | 1.59 $m^3/h$ to 2.37 $m^3/h$ | 0.032 % | |
| | 2.39 $m^3/h$ to 3.96 $m^3/h$ | 0.030 % | |
| | 3.98 $m^3/h$ to 7.93 $m^3/h$ | 0.029 % | |
| | 7.95 $m^3/h$ to 39.73 $m^3/h$ | 0.027 % | |
| | 39.75 $m^3/h$ to 283.82 $m^3/h$ | 0.026 % | |
| 70 cSt to 220 cSt | 0.64 $m^3/h$ to 0.94 $m^3/h$ | 0.045 % | |
| | 0.95 $m^3/h$ to 1.57 $m^3/h$ | 0.037 % | |

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**CALIBRATION AND MEASUREMENT CAPABILITIES (CMC)[Notes 1,2]**

| Measured Parameter or Device Calibrated [Note 8] | Range [Note 7] | Expanded Uncertainty [Notes 3,5] | Remarks |
|---|---|---|---|
| | 1.59 $m^3/h$ to 2.37 $m^3/h$ | 0.031 % | SVP |
| | 2.39 $m^3/h$ to 3.96 $m^3/h$ | 0.030 % | |
| | 3.98 $m^3/h$ to 7.93 $m^3/h$ | 0.028 % | |
| | 7.95 $m^3/h$ to 39.73 $m^3/h$ | 0.027 % | |
| | 39.75 $m^3/h$ to 283.82 $m^3/h$ | 0.026 % | |
| 1 cSt to 7 cSt | 3.98 $m^3/h$ to 6.34 $m^3/h$ | 0.073 % | 1 Master Meter |
| | 6.36 $m^3/h$ to 12.7 $m^3/h$ | 0.072 % | |
| | 12.72 $m^3/h$ to 39.73 $m^3/h$ | 0.071 % | |
| | 39.75 $m^3/h$ to 283.82 $m^3/h$ | 0.070 % | |
| 7 cSt to 20 cSt | 3.18 $m^3/h$ to 3.96 $m^3/h$ | 0.072 % | |
| | 3.98 $m^3/h$ to 6.34 $m^3/h$ | 0.071 % | |
| | 6.36 $m^3/h$ to 12.7 $m^3/h$ | 0.070 % | |
| | 12.72 $m^3/h$ to 55.63 $m^3/h$ | 0.069 % | |
| | 55.65 $m^3/h$ to 283.82 $m^3/h$ | 0.068 % | |
| 20 cSt to 70 cSt | 2.39 $m^3/h$ to 3.16 $m^3/h$ | 0.072 % | |
| | 3.18 $m^3/h$ to 3.96 $m^3/h$ | 0.071 % | |

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**CALIBRATION AND MEASUREMENT CAPABILITIES (CMC)[Notes 1,2]**

| Measured Parameter or Device Calibrated [Note 8] | Range [Note 7] | Expanded Uncertainty [Notes 3,5] | Remarks |
|---|---|---|---|
| 70 cSt to 225 cSt | 3.98 $m^3/h$ to 9.52 $m^3/h$ | 0.070 % | 1 Master Meter |
| | 9.54 $m^3/h$ to 23.83 $m^3/h$ | 0.069 % | |
| | 23.85 $m^3/h$ to 283.82 $m^3/h$ | 0.068 % | |
| | 1.59 $m^3/h$ to 2.37 $m^3/h$ | 0.073 % | |
| | 2.39 $m^3/h$ to 3.16 $m^3/h$ | 0.071 % | |
| | 3.18 $m^3/h$ to 4.75 $m^3/h$ | 0.070 % | |
| | 4.77 $m^3/h$ to 15.88 $m^3/h$ | 0.069 % | |
| | 15.9 $m^3/h$ to 79.48 $m^3/h$ | 0.068 % | |
| | 79.5 $m^3/h$ to 283.82 $m^3/h$ | 0.067 % | |
| **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 with a level of confidence of approximately 95 %, typically using a coverage factor of $k = 2$. However, laboratories may report a coverage factor different than $k = 2$ to achieve the 95 % level of confidence. 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.5 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:** 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:** Laboratory able to perform calibrations in units of measure other than $m^3/h$, such as bph, gpm, and lpm. Meter Types: MV Turbine, Positive Displacement, Sentry Turbine, Ultra-Sonic, and Coriolis.

**Note 8:** Viscosities listed are achieved between 21.1 °C and 43.3 °C. Contact laboratory for fluid availability

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