



State of Wisconsin
Governor Tony Evers

Department of Agriculture, Trade and Consumer Protection
Secretary Randy Romanski

GUIDANCE DOCUMENT

Date: June 30, 2025

Re: Coriolis Mass Flow Meter use as a Field Standard - Approval Requirements

Service companies and meter manufacturers have approached the Department requesting approvals to use Coriolis mass flow “Master Meters” in place of traditional field standards for testing commercial measuring devices. Coriolis mass flow meters are very accurate measuring devices that can display measurements in terms of mass or volume or both. If testing and documentation show the ability of a testing apparatus to meet the requirements described in NIST Handbook 44, Appendix A. Fundamental Considerations, 3. Testing Apparatus, then the Handbook allows transfer standards and that testing apparatus to be used in place of field standards covered by the NIST 105 Series Handbooks.

When requesting approval for a Coriolis mass flow meter to be used as a field standard meter, the submitter must provide documentation of the ability of the device to meet the NIST Handbook 44, Appendix A. Fundamental Considerations criteria for determining commercial measuring device compliance with the performance requirements stated in NIST Handbook 44.

The following requirements must be met.

- NIST Handbook 44, Appendix A. Fundamental Considerations will be consulted first.
- The field standard meter must be suitable for the application (product family, flow rate, temperature, etc.).
- A minimum of 10 different flow rates shall be documented on the calibration certificate for a Coriolis mass flow meter to be used as a field standard. Test points of approximately 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100 percent of maximum flow rate is required.
 - NIST recognized Calibration Laboratory (or IILAC MRA laboratory) calibration certificate must show that the value of the combined expanded uncertainty plus the meter error at individual flow rates are less than 1/3 the minimum applicable acceptance tolerance that could be applied to the meter under test for the field standard to be used in the field without corrections.
 - If manual corrections at each flow rate will be applied in the field, then the expanded uncertainty from the calibration report must meet the 1/3 minimum applicable acceptance tolerance requirement.
 - Repeatability range of errors for three consecutive drafts run at the same flow rate and conditions must be less than the lab expanded uncertainty and must be recorded on the calibration report.
 - Repeatability tests will be conducted at 30% and 70% of maximum flow rate.
 - The calibration laboratory report must show the ‘as found’ and ‘as left’ errors for the field standard meter to document any measurement drift over time.

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- An addendum sheet must be supplied with the calibration report that summarizes the specific approval requirements noted in this document.

The Bureau of Weights and Measures Laboratory Director, Field Operations Section Manager, and Internal Operations Section Manager must reach a consensus on approval of the use of the mass flow meter as a Field Standard and the meter must be re-evaluated by the department after each new laboratory calibration.

- Laboratory Director – Traceability
- Field Operations Section Manager – Accuracy and documentation
- Internal Operations Manager – Awareness for service company licensing and annual calibration

Annual field standard meter calibration will be required, and laboratory calibration certificate must be submitted with the annual weights and measures service company license renewal for annual approval.

Field standard cannot be placed into service for testing commercial devices until written approval has been received from the Department.