

Nederlands Meetinstituut

# Certificate

Certificate number : 39310225  
Project number : 205894  
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**Applicant** Emerson Process Management  
Groeneveldseleen 6-8  
3903 AZ VEENENDAAL  
The Netherlands

**Submitted** A test installation for the calibration of flowmeters.

Installation name : Stand 2  
Tool number : 32226-01  
Test liquid : water

The test installation mainly consist of:

- a storage tank with 46 m<sup>3</sup> water,
- a frequency controlled centrifugal pump,
- a section for meters under test,
- two Mettler Toledo weighing scales namely:

No.	Maximum load	Type	Serial number	Tool number
1	4 kg	PM 4000	G82258	10052-01
2	11 kg	PM 11	G64400	10121-01

- a set of counters,
- a temperature- and pressure transmitter,
- a computer data acquisition system,

The test installation is in use for the calibration of flowmeters by means of weighing directly according to the static gravimetric method.

**Test method** The Calibration Measurement Capabilities (CMC) were determined in accordance with the Guide to the expression of uncertainty in measurement. The method is reported in the addendum to this certificate, called "CMC of stand 2", version 2; 26 November 2002, edited by Mr. A. R. Pruysen from Emerson Process Management in Veenendaal. This addendum was verified and hallmarked by NMI Van Swinden Laboratorium B.V..

**Period of Investigation** November 2002.

**Results** The results are presented on page 2 of 2.

Dordrecht, 29 November 2002  
NMI Van Swinden Laboratorium B.V.

F.M. Smits  
Metrologist

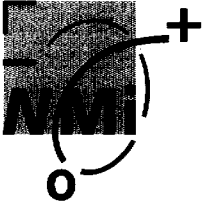
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**Results**

The Calibration Measurement Capability of Stand 2 for mass, is less than or equal to as listed below.

Weighing scale	Batch size	CMC
PM 4000	5 gram	0,26%
	10 gram	0,14%
	100 gram	0,03%
PM 11	800 gram	0,03%

The Calibration Measurement Capability of Stand 2 for density, is less than or equal to 0,13 kg/m<sup>3</sup>.

The reported uncertainties are based on 95% confidence intervals. The coverage factor is  $k = 2$

**Usages of CMC**

The Calibration Measurement Capability is only valid if the following criteria are fulfilled:

- the testing time is at least 30 seconds,
- the minimum amount of generated pulses by the flowmeter during the test is 10000,

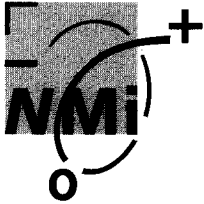
**Traceability**

All instrument used in the test installation were verified to be traceable to primary and/or (inter)nationally accepted measurement standards. Netherlands Meetinstituut (NMI - Netherlands Measurements Institute) is the National institute of metrology in the Netherlands. NMI Van Swinden Laboratorium B.V. (NMI VSL) is part of NMI and appointed by Dutch Law and Royal Decision as the National Standards institute.

The calibration services of NMI Van Swinden Laboratorium B.V. provide a direct link to international accepted physical standards to achieve comparability and reliability of measurement data by proven traceability.

NMI Van Swinden Laboratorium B.V. has an accreditation certificate from The Dutch Accreditation Council RvA as being in compliance with ISO/IEC 17025:1999. NMI VSL accreditation number is K999.





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Remarks

- The Calibration Measurement Capability is defined according ISO 5168 as the uncertainty that is achieved when calibrating an ideal flowmeter under normal conditions; the uncertainty contribution from variations of the meter under test (type A contributions) and the uncertainty coming from start stop effects are not included in the CMC. The contribution in the uncertainty for standing start stop method for Micro Motion mass flowmeters is quantified in the mentioned addendum, clause D.8.
- When an initial verification of a custody transfer flowmeter is performed on this test installation, the applied legal regulations require that the testing time is increased to at least 60 seconds.
- To avoid droplets before and after tests, the pipes to and from the container are continuously immersed so that these pipes are automatically completely filled with liquid. Container and pipes are made of transparent plastic so that a visual verification can take place on air-bubbles
- This certificate is not valid anymore if the weighing scales are modified or replaced. The temperature and pressure measurements may be replaced as long as the uncertainties as mentioned in the addendum are granted.

