

Nederlands Meetinstituut

Certificate

Certificate number : 39310226

Project number : 205894

Page 1 of 3

Applicant Emerson Process Management
Groeneveldselaan 6-8
3903 AZ VEENENDAAL
The Netherlands

Submitted A test installation for the calibration of flowmeters.

Installation name : Stand 3
Tool number : 32224-01
Test liquid : water

The test installation mainly consist of:

- a storage tank with 46 m³ 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	6 kg	PM 6000	G47506	10123-01
2	60 kg	EB 60	1113569	32228-01

- 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 3", 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

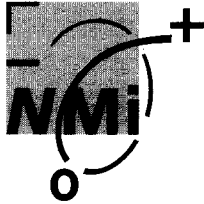
Nederlands Meetinstituut
Hugo de Grootplein 1, Dordrecht (NL)
P.O. Box 394, 3300 AJ Dordrecht (NL)
phone +31 78 6332332
fax +31 78 6332309
website www.nmi.nl
e-mail flow@nmi.nl

NMI B.V.
(Chamber of Commerce no. 27.228.701)

Subsidiary Companies:
NMI Van Swinden Laboratorium B.V. (27.228.703)
NMI Certin B.V. (27.233.418)
Verispect B.V. (27.228.700)

This certificate is issued under the provision that no liability is accepted and that the applicant gives warranty for each responsibility against third parties.

Reproduction of the complete certificate is permitted. Parts of this certificate may only be reproduced after written permission.



Results

The Calibration Measurement Capability of Stand 3 for mass, is less than or equal to 0,03%.
The Calibration Measurement Capability of Stand 3 for density, is less than or equal to 0,13 kg/m³.

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:

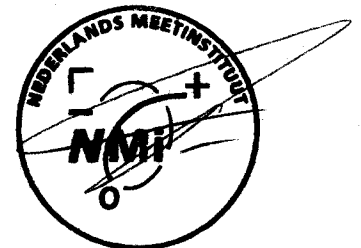
- the testing time is at least 30 seconds,
- the minimum amount of generated pulses by the flowmeter during the test is 10000,
- the minimum batch for weighing scale 1 is 0,8 kg,
- the minimum batch for weighing scale 2 is 8,0 kg,

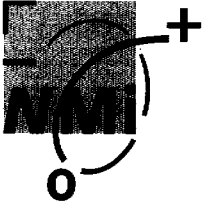
Traceability

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.





Nederlands Meetinstituut

Certificate number : 39310226

Project number : 205894

Page 3 of 3

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.

