



National
Metrology
Institute



Training

Calibration of liquid flow meters

At first glance the calibration of a liquid flow meter appears to be simple, but the details can be quite complicated. For the determination of e.g. the measurement error, k-factor or mA output of a flow meter as a function of the flow rate, different calibration methods can be used depending on the measurement principle of the flow meter, the liquid or the required accuracy. During the VSL training you will learn about the theoretical background of the methods and how to perform calibrations.

After following the training Calibration of liquid flow meters, participants are familiar with:

- Calibration methods and models;
- Fluid dynamics;
- Specific requirements of the calibration of different flow meter types;
- Interpretation of BIPM, OIML, API and ISO documents;

During this training an experienced metrologist from VSL will discuss practical examples. In order to let the students apply their acquired knowledge, their own practical examples and questions are discussed as well. After the training, the theory will be included in the form of a digital reference work.

Target audience:

The training is suitable for people working for calibration laboratories, manufacturers, service companies, or end-user that performs testing, proving and calibration of liquid flow meters.

Registration:

Please go to our website <https://www.vsl.nl/en/services/training/> to fill in the registration form.

Fee:

The price is calculated to fit your individual preferences.

Terms of payment:

Payment in advance. Invoice will be sent 1 month before the start of the training. Payment is due within 30 days after invoice date.

About VSL

VSL is the National Metrology Institute and recognized worldwide. VSL manages and develops primary measurement standards and primary reference materials on the instruction of the Minister of Economic Affairs and Climate Policy. These measurement standards are the foundation for reliable measurements in science, industry and fair trade and other areas. VSL makes measurement results from companies, laboratories and institutions directly traceable to international standards. VSL also participates in research projects to develop newer and better measurement methods.

For more information on VSL and our offerings, please visit our website at <https://www.vsl.nl/en/services/training/>. Should you have any questions or wish to join our PTs, feel free to contact us.



Estimated number of participants:

Minimum 5 participants, maximum 10 participants.

If the number of participants remains smaller than the minimum number of participants, VSL reserves the right to cancel this training and will contact the registered participants to offer an alternative.

Duration:

4 Consecutive days

Training location:

Information will follow

Language:

This training will be given in English.

Training content:

The topics that will be discussed are:

- Gravimetric, volumetric (proving tank), master meter, pipe prover and tower calibration methods
- Calibration models (calculation of measurement error etc.)
- Important fluid dynamics properties like Bernoulli's law, the Reynolds number, etc.
- Viscosity, density, temperature and pressure effects during calibration
- Specific requirements for the calibration of different flow meter types like turbine, PD, Mass, Ultrasonic, EMF, Delta P, and others using each calibration method
- Interpretation of BIPM, OIML, API and ISO documents about flow measurement
- ISO/IEC 17025 requirements for flow laboratories,
- Laboratory vs field calibration
- Witness a calibration using different methods in a Liquid Flow Calibration facility with the possibility to ask questions

VSL

Thijssseweg 11
2629 JA Delft
The Netherlands
T +31 (0)15 269 15 00
E vs1@vsl.nl
W www.vsl.nl

CoC: 27.228.703
TAX: NL800189620B01
IBAN: NL24ABNA0620273321