

# Calibration



## Calibration of measurement equipment

The demands placed by modern society for accuracy and the satisfactory documentation of measurements are constantly increasing. For companies this means increased demands for the precision of measuring equipment used. Time is yet another important factor: costly production hold-ups must be avoided and companies must ensure that calibration is carried out at established time intervals.

## Total solution

To satisfy the needs and wishes of our customers FORCE Technology offers a total measurement equipment calibration solution. Besides actual calibration this provides our customers a number of other benefits:

- In situ calibration
- Automatic call-in of equipment for calibration
- Collection and delivery of equipment
- Rapid delivery
- Accredited certificates.

To avoid production hold-ups at your company, or to reduce delivery times, FORCE Technology carries out most types of calibration, wherever you may require it, e.g. in the production hall.

FORCE Technology provides a free subscription service through which your measuring instruments are automatically called in for calibration, thus ensuring that your equipment is always calibrated by the current calibration date.

FORCE Technology provides a range of collection and delivery services for your measuring equipment, among other things to ensure the correct handling of equipment.

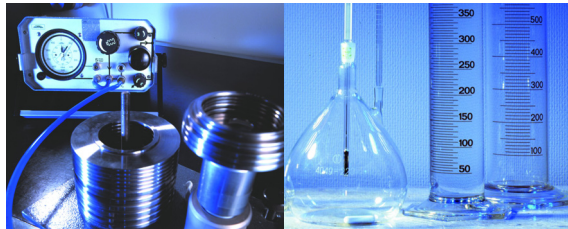
In many cases short delivery times are crucial to a company. FORCE Technology customers themselves decide when they wish their measuring instruments to be returned. By prior agreement FORCE Technology can deliver from one day to the next.

FORCE Technology generally issues accredited certificates for all calibrations. The certificates are stored in fireproof rooms for 5 years at FORCE Technology.

## Calibration services

The following are among the calibration activities performed by FORCE Technology:

- Calibration of equipment for temperature, pressure, force, torque, materials testing machinery including hardness devices, and impact resistance devices
- Calibration and verification of volume, flow meters and density
- Verification, calibration and sales of weights
- Calibration and verification of weighing machines and mobile weighing systems
- Calibration of cup anemometers for measurement of air velocity
- Type testing of flow meters and weighing systems
- e-labelling.



FORCE Technology commands a large number of calibration skills, of which the commonest are described below:

### Temperature

Temperature sensors, digital thermometers, glass thermometers, dial thermometers, capillary thermometers, temperature recorders, thermographs, calibrators, transmitters, data loggers, pyrometers.

### Pressure

Manometers, barometers, transducers, transmitters, calibrators, vacuum meters, micro-manometers, differential pressure gauges, deadweight testers.

### Force

Transducers, load cells, dynamometers, lifting jacks, control rings, tyre pressure gauges.

### Torque

Wrenches, screwdrivers, transducers, testers.

### Materials testing machinery

Push/pull/bending test machines, hardness devices, Shore A/D meters, impact resistance devices.

### Volume

Volumetric flasks, pipettes, burettes, dispensers, graduated cylinders, and standards and containers up to 40 m<sup>3</sup>.

### Density

Gas density meters, determination of fluid density in largely all fluids.

## Gas flow

Measurement orifice plates, bellows gas meters, nozzles, rotation meters, turbine meters, swirl meters, V/A meters, ultrasound meters, Venturi meters, vortex meters, wet gas meters, Coriolis meters, thermal mass flow meters, mass flow controllers and v-cone meters.



*High pressure calibration of volume gas meters and flow meters with natural gas as test medium*

## Fluid flow

Volume, mass or energy flow meters of the following types: magnetic inductive, turbine meters, ultrasound meters, impeller meters, orifice meters, PD meters, V/A meters, Coriolis mass meters, etc, consumption meters for the payment of hot/cold water and distance heating. Furthermore FORCE Technology perform calibration of mass and flow meters (incl. weight tanks) to other liquids than water, - e.g. petrol, gasoil, diesel, medical liquids etc., also verification of petrol and diesel dispensers, milk meters etc.

### *Sale of:*

Meters and spare parts to measuring systems.

## Weights

### *Verification of:*

M1 weights and weights in the intermediate tolerance class, special weights.

### *Calibration of:*

Weights in all classes, solid substance mass, special weights.



### *Sale of:*

All classes of weights.

## Weighing machines

### *Calibration and verification of:*

Non-automatic scales, mechanical and electronic weighing machines of the following types: Shop scales, analytical balances, weighbridges, floor scales, pallet scales, laboratory balances, counting scales, decimal scales, postage scales, plus/minus scales, self-service scales, combined scales, mobile weighing systems with trestles or tanks.

*Automatic scales, mechanical and electronic weighing machines of the following types:*

Check scales, belt scales, dosing scales, checking and sorting scales, throughput scales, price markers, marketing scales, multi-head scales, franking machines, weighing-in scales.

### **Wind velocity**

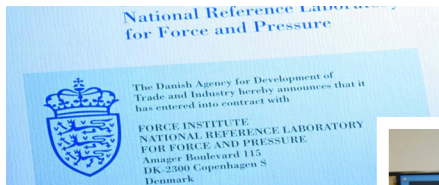
Accredited calibration of cup anemometers.

### **Type testing**

Devices and measuring equipment for function, accuracy and sensitivity to electronic and climatic affects.

### **e-labelling**

Approval and packaging lines for the production of: e-labelled ready packaged goods, epsilon labelled graduated flasks.



FORCE Technology has many years expertise in these areas since we:

- Are accredited by DANAK
- Appointed as national reference laboratory
- Dispose of well equipped laboratory facilities in Brøndby, Vejen, Fredericia and Lyngby.

This assures our customers of the high quality of products supplied.

### **Accreditation**

FORCE Technology is accredited by DANAK under Reg. No. 9 within the following areas:

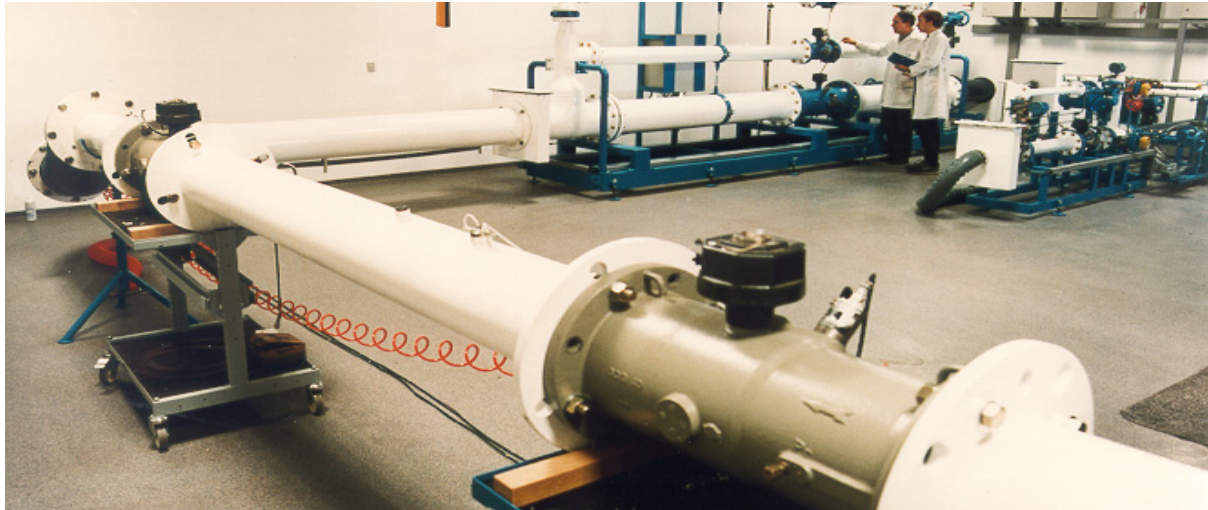
- Calibration and testing of temperature, pressure, force, torque, materials testing machinery including hardness devices and impact resistance devices, volume, density, flow and energy, mass and air velocity
- Checking of net contents of ready packaged goods including e-labelled goods, and volume checks of graduated flasks including epsilon labelled graduated flasks.



### **National reference laboratory**

The Danish Accreditation and Metrology Fund has appointed FORCE Technology as National Reference Laboratory within several fields in the measurement area. Among other things this implies an obligation to ensure the traceability of all of our reference standards back to international standards. In addition, it means that FORCE Technology represents Danish interests in international cooperation. FORCE Technology participates on the relevant committees and boards both at home and abroad in order to constantly keep pace of developments and ensure compliance with customer needs for accredited services.





### Laboratory facilities

FORCE Technology disposes of well equipped laboratories in Brøndby, Vejen, Fredericia and Lyngby, where we can provide the measurement environments required in specific branches of knowledge. We record temperature, humidity and air pressure and measure the local acceleration due to gravity. Where deemed necessary, instruments are protected against seismic effects and electrical interference.

### Validation/qualification

In combination with our measurement expertise our consultants with experience within the medicinal and food sectors can provide qualified assistance relative to the validation of processes, equipment, methods, resources, etc against national and international standards and requirements.

Services may consist of:

- Preparation of system documents in the form of a validation master plan (VMP), protocols, test plans and validation reports
- Performance of validation tasks as independent assignments or as part of validation teams
- Validation/qualification of specific equipment such as for example thermal equipment (autoclaves, incubators, etc) and utilities (ventilation, water, air, etc).

### Consultancy services

Through its many years of experience in the area of measuring technology FORCE Technology has accumulated a great deal of experience and expertise in the area, with the result that each company will enjoy the services of a worthy and reputable sparring partner relative to consultancy services for:

- The establishment of calibration intervals or calibration procedures
- The construction of production facilities or calibration laboratories
- Plant validation
- Acquisition of new equipment.

### Courses

FORCE Technology holds regular courses in the following areas among others:

- Statistics, validation/qualification and measurement techniques, including accuracy calculations
- Quality and environmental management.

The courses are held partly as open courses and partly as company customized courses, the contents of which are designed to suit the precise needs of the company involved. Course times are arranged so as to best fit in with company planning.

Should some areas fall outside FORCE Technology's own areas of expertise we use approved subcontractors.



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