



Accredited laboratories at FMI

- **Laboratory of Air Chemistry**
Testing laboratory
Accredited since 1997
- **Laboratory of Measurement Technology**
Calibration laboratory
Accredited since 2001



Some words about Calibration laboratory's

- **quality system**
- **documents and documentation**
- **assessments of the quality system**



Quality system (management system)

- **Described in the Quality manual** (could be named in other way, eg. QA/QC plan)
 - General ways of action
 - General quality principles
 - Quality policy statement
- **In addition other documents (eg. SOPs)**



Quality policy statement (requirement in accreditation)

- **Includes the following**

- Laboratory management's commitment to good professional practice
- Management's commitment to quality of its testing and calibration in servicing its customers
- Management's statement of the laboratory's standard of service
- Objectives of the quality (management) system
- Requirement that all personnel concerned with testing and calibration activities within the laboratory familiarize themselves with the quality documentation and procedures in their work
- Management's commitment to comply with the standard EN ISO/IEC 17025 ("accreditation standard")
- Management's commitment to continually improve the effectiveness of the quality (management) system



Documents

- **Quality manual**
- **Standard operation procedures (SOPs)**
- **Other documents, eg. Instrument manuals, Measuring standards, Laws/Acts/Directives**



Records (two types)

- **Quality records**
 - Reports from internal audits
 - Reports from management reviews
 - Records of corrective and preventive actions
 - Reports/records of intercomparisons
- **Technical records**
 - Original and derived data
 - Plans (eg. calibration, maintenance)
 - Contracts, notebooks, check sheets etc.
 - Registers (eg., instruments, reference standards)
 - Test and calibration reports
 - Staff and training records
 - Customer's complaints and feedback



Standard operation procedures (SOPs)

- **Total amount of SOPs: 38**
 - Calibration methods: 7
 - Use of Analysers: 8
 - Reference standards: 6
 - Software and data handling: 5
 - Miscellaneous: 12



SOPs Calibration methods

- **Dynamic dilution method: Sonimix 6000A1 s/n 1585**
- **Dynamic dilution method: Environnement MGC-101**
- **Ozone calibration by photometric method: TEI 49C**
- **Permeation method: Kin-Tek 491M**
- **Dynamic dilution method: Sonimix 6000A1 s/n 2385**
- **Ozone calibration by ultraviolet photometry: NIST SRP#37**



SOPs Use of analyzers

- **Thermo Environmental Instruments 43C SO₂-analyzer**
- **Thermo Environmental Instruments 42CTL NO-NO_x-analyzer**
- **Dasibi 1008AH ozone analyzer**
- **Uncertainty calculations for analyzers**
- **APMA-360 CO-analyzer**
- **Thermo Environmental Instruments 42C NO-NO_x-analyzer**
- **BTEX Syntec GC**



SOPs Reference standards

- **Producing dilution gas**
- **BIOS DryCal flow reference standard**
- **PTU 200 pressure and temperature reference standard**
- **Humicap MPH-35 humidity reference standard**
- **Maintenance of the reference standards of the laboratory**
- **DHI Molbox/Molbloc flow reference standard**



SOPs Software and data handling

- **Softwares: ILDAS, Ozone calibration (O3-ILDAS)**
- **Data collection and data processing**
- **Data recording and backup copies**
- **Data security instructions**
- **Sonimix GasCal**



SOPs Miscellaneous

- **Calibration instruction of gas analyzers and flow measurements**
- **Calculation of calibration results**
- **Guide to making contract with customer**
- **Guide to making calibration certificate**
- **Training a new worker**
- **Accepting of new suppliers of critical consumables, supplies and services**
- **Guide for packing instruments**
- **Guide for transporting and sending instruments**
- **Guide for ordering and reception of instruments**
- **Guide for daily checking of laboratory**
- **Internal auditing**
- **Guide for using gas cylinder regulator**



Assesment of quality system

- **Internal audits**

- Conducted periodically (once a year) to verify that all operations comply with the requirements of the quality system
- According to predetermined schedule and procedure
- Quality manager plans and organize audits as required by schedule and requested by management
- Carried out by trained and qualified personnel (independent of the activity to be audited)
- Audit findings and corrective actions that arise from them are recorded



Assesment of quality system

- **Management reviews**

- Laboratory's top management (not laboratory's technical leader) conducts periodically (usually once a year)
- Review of laboratory's quality (management) system and testing and/or calibration activities is conducted
 - to ensure their continuing suitability and effectiveness
 - to introduce necessary changes or improvements
- Review is conducted according to a predetermined schedule and procedure
- Findings from management reviews and the actions that arise from them are recorded
- Management ensures that those actions are carried out in an appropriate and agreed timescale



Assesment of quality system

- **Management reviews (cont'd)**
 - The review will take account of
 - the suitability of policies and procedures
 - reports from managerial personnel
 - the outcome of internal audits
 - assessments by external bodies (FINAS)
 - the results of interlaboratory comparisons
 - changes in volume and type of the work
 - customer feedback and complaints
 - recommendations for improvement
 - quality control activities
 - resources and staff training