

## EQP: Maintenance and Calibration of Technical Equipment

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### Introduction

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5.6.1

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All technical equipment that has an effect on the accuracy and precision of a test method or procedure will be properly maintained and appropriately calibrated before use.

To ensure proper functioning of instruments and equipment, the laboratory has maintenance agreements for the servicing of the following:

- major instruments including associated computer hardware and software
  - microscopes
  - balances
  - pipettes
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### Maintenance agreements for major instruments

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The laboratory has maintenance agreements for major instruments such as:

- gas chromatographs
- mass spectrometers
- inductively coupled plasma mass spectrometer
- laser ablation microscope
- spectrometers
  - FTIR spectrophotometers
  - UV-Visible spectrophotometers
  - FTIR spectrophotometers with microscope
  - UV-Visible spectrophotometer with microscope
  - Raman spectrometer with microscope
- liquid chromatographs
- capillary electrophoresis
- genetic analyzers
- scanning electron microscopes
- energy dispersive spectrometers

Maintenance agreements and serviced equipment lists are located in the Administrative Services Officer's files.

NOTE: For routine maintenance and calibration procedures, refer to the individual procedures manuals.

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### Microscopes

The laboratory contracts with a private vendor to clean and service the microscopes.

A list of serviced microscopes is located in the Administrative Services Officer's files. Additional logs may be kept in the laboratories in which the microscopes are used.

NOTE: The analysts in the Trace Evidence Section personally clean and service the microscopes in their section.

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### Malfunctioning equipment 5.5.7

Equipment that is not properly functioning or cannot be properly calibrated will be taken out-of-service and clearly marked as such, in order to prevent the equipment from being inadvertently used.

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### Calibration procedures 5.6.1.1 5.5.2 5.5.6 5.5.8

Calibration procedures, where applicable, will be included in each laboratory unit's technical procedures manuals and must contain at a minimum:

- list of equipment that requires calibration
- measuring criteria for deciding if a calibration is successful
- stated frequencies for calibrations.

The following equipment is calibrated by an approved vendor who is accredited to ISO/IEC 17025.

- balances
  - pipettes
  - weights
  - rulers used in firearms
  - Hott Rods used in firearms
  - titrator/dispenser in alcohol
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### Calibration procedures (continued)

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5.5.12

5.6.3.3

Refer to *10 Assuring Quality of Results, AQR: Balance Checks* in the *Quality Manual* for additional information on balances.

Laboratory equipment requiring calibration shall be labeled, coded, or otherwise identified to indicate the following:

- calibration status
- date of calibration
- date of recalibration (or expiration criteria)

A list of serviced equipment is kept by the Administrative Services Officer.

Each laboratory unit that performs intermediate calibration checks of equipment must follow the procedure described in the unit's technical procedures manual.

The laboratory staff shall ensure that test and calibration equipment, including both hardware and software, are safeguarded from adjustments which would invalidate test and/or calibration results.

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### Equipment in-service

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Any equipment that has been placed into or returned to service must demonstrate proper functioning either by calibration or verification (validation if appropriate).

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### Equipment outside of the laboratory

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When equipment goes outside the direct control of the laboratory, the laboratory will ensure that the function and calibration status are checked and satisfactory before equipment is returned to service.

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### Records 5.5.5

Each laboratory unit maintains records of all maintenance, calibrations, and validations of technical equipment. Such records must be easily accessible by unit analysts.

Maintenance records for each instrument must be kept in a maintenance log readily available to the instrument operator.

The following will be retained in the laboratory for five years, after which they may be destroyed:

- records of service agreements
  - lists of serviced microscopes, balances, and pipettes
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