

## AQR: Balance Calibration Checks and Maintenance

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**Introduction** The balances in the laboratory must be periodically checked to ensure that they are operating satisfactorily. Satisfactory operation of the balances is achieved through

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- maintenance
  - calibration
  - calibration checks
  - repair
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**Definitions** The following are terms are related to balance calibration checks and operation.

- *accuracy* – The degree of agreement of the measurement with the true value of the quantity measured.
  - *capacity* – The maximum weight load of the balance as specified by the manufacturer.
  - *NIST traceable weight* – Any weight traceable to SI units.
  - *readability* – The value of the smallest unit of weight that can be read without estimation.
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**Records** Each balance in the laboratory must have log books recording calibration checks and maintenance. These logs should include the following information:

- manufacturer
- model number
- serial number
- date of calibration checks
- analyst performing the check
- weights used
- observed mass of weights

Logs may be discarded after 5 years.

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### Routine maintenance

Routine maintenance of balances will consist of analysts cleaning and leveling the equipment as needed.

Routine maintenance need not be recorded in the log book.

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### Calibration

Annual calibration and maintenance will be performed by an approved vendor. An approved vendor consists of a service supplier accredited to ISO/IEC 17025 by an accrediting body that is signatory to the IAAC or ILAC.

Records of maintenance and calibration will be kept in the appropriate log books for a minimum of five years.

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### Calibration check

The calibration of each balance must be checked using weights traceable to SI units.

Refer to the individual procedure manuals for specific information.

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### Allowable error

The allowable error for a NIST traceable weight is +/- 5 in the smallest unit that can be read on the balance (for example, +/- 0.005 g for a milligram balance).

EXCEPTION: If a balance does not read to +/- one unit, then the allowable error is +/- 5 times the smallest division (for example, +/- 2.5 grams for a balance with a readability of 0.5 g/division).

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### Outside range

If the observed mass of the NIST traceable weight is outside of the allowable range, the balance must be **immediately** removed from use. The balance will be recalibrated by an approved vendor.

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### Repair

Repair of balances will be performed by an approved vendor.

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### Relocating balances

Any balance which is relocated must be leveled and have the calibration checked prior to use at the new location.

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### References

The following references were used in this document.

- *Instruction Manual for Precision Advanced Electronic Balances, GT Series.* Ohaus.
  - *1998 Annual Book of ASTM Standards, General Methods and Instrumentation.* ASTM. Section E 898-88. pp. 541-544.
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