

UK Weighing Federation: Notes for Management Systems Auditors on the calibration of non-automatic weighing instruments

The UK Weighing Federation (UKWF) has compiled the following notes to assist Management Systems Auditors when considering the calibration of weighing instruments. These notes have been updated to reflect the requirements of ISO 9001:2008.

There is confusion and often misunderstanding about whether calibration should be carried out by UKAS Accredited Laboratories. Whilst there are odd occasions where this is necessary, in the vast majority of cases, particularly for weighing instruments that fall within the category of Class III or Class IIII instruments as defined in OIML (Organisation Internationale de Metrologie Legale) Recommendation R76, calibration to UKAS accreditation level is far more than necessary and the additional cost would not add any value to the veracity of the calibration certificate..

Non-automatic Weighing Instruments are those that require the intervention of an operator at some stage during the weighing process.

| The appropriate Clause of ISO 9001:2008 is 7.6 which, for ease of reference is reproduced here:

7.6 Control of monitoring and measuring equipment

The organization shall determine the monitoring and measurement to be undertaken and the monitoring and measuring equipment needed to provide evidence of conformity of product to determined requirements.

The organization shall establish processes to ensure that monitoring and measurement can be carried out and are carried out in a manner that is consistent with the monitoring and measurement requirements.

Where necessary to ensure valid results, measuring equipment shall

a) be calibrated or verified, or both, at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards; where no such standards exist, the basis used for calibration or verification shall be recorded (see 4.2.4);

b) be adjusted or re-adjusted as necessary;

c) have identification in order to determine its calibration status;

d) be safeguarded from adjustments that would invalidate the measurement result;

e) be protected from damage and deterioration during handling, maintenance and storage.

In addition, the organization shall assess and record the validity of the previous measuring results when the equipment is found not to conform to requirements. The organization shall take appropriate action on the equipment and any product affected. Records of the results of calibration and verification shall be maintained (see 4.2.4).

In 1999 recognising the need for a consistent approach to the calibration of non-automatic weighing equipment, the UKWF in consultation with the Trading Standards Institute, LACORS (Local Authorities Co-ordinating body on Regulatory Services) and the Institute of Measurement and Control drafted a practical guide to calibration of weighing instruments. The guide was issued in the form of a Code of Practice and UKWF members providing calibration services to their customers are required to adopt and follow the

Code. Those members who are themselves ISO 9001:2008 certified are required to reference the Code in their QMS documentation so that compliance will be covered by both the internal audit system, and by the Certification Body; those UKWF members who are not ISO 9001:2008 certified are audited by the Federation itself for compliance. In the following table we compare ISO 9001:2008 requirements against the UKWF Code of Practice.

ISO 9001:2008; Clause 7.6 Requirement	UKWF Calibration Code of Practice Summary of Requirement
<i>The organization shall establish processes to ensure that monitoring and measurement can be carried out and are carried out in a manner that is consistent with the monitoring and measurement requirements.</i>	The UKWF Code requires that specific tests designed to reliably and consistently measure the weighing instruments performance are carried out and recorded during the calibration exercise. The tests are designed around those laid down by the OIML in Recommendation R76
<i>Where necessary to ensure valid results, measuring equipment shall a) be calibrated or verified, or both, at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards; where no such standards exist, the basis used for calibration or verification shall be recorded</i>	UKWF Members are required to carry out calibration using test weights that have been calibrated in a manner traceable to national standards. Members may either use the services of UKAS accredited Laboratories for the calibration of their weights, or have them calibrated by a Local Authority Trading Standards Department operating under section 74 of the Weights and Measures Act. In either case the calibration is directly traceable to the UK Primary Standards. Members are required to identify the calibration status of their test weights on the calibration certificate that they issue
<i>Where necessary to ensure valid results, measuring equipment shall.... b) be adjusted or re-adjusted as necessary;</i>	UKWF Members are required to carry out both "As Found" and - if adjustment or repair has been necessary - "Definitive" tests on the weighing instruments that they calibrate.
<i>Where necessary to ensure valid results, measuring equipment shall c) have identification in order to determine its calibration status;</i>	The Code requires UKWF members to record serial numbers or other identification on the test records and on the calibration certificate that they issue
<i>Where necessary to ensure valid results, measuring equipment shall d) be safeguarded from adjustments that would invalidate the measurement result;</i>	UKWF Members are required to affix a calibration label to the weighing instrument, identifying the calibration date. The label should be impossible to remove without destruction, and should, whenever possible be placed so that access to any adjustment facility is not possible without the label being broken.
<i>Where necessary to ensure valid results, measuring equipment shall e) be protected from damage and deterioration during handling, maintenance and storage.</i>	UKWF Members are trained in the handling and maintenance of weighing instruments and will provide advice and guidance to customers who may wish to store equipment during periods when it is not in use

<p><i>In addition, the organization shall assess and record the validity of the previous measuring results when the equipment is found not to conform to requirements. The organization shall take appropriate action on the equipment and any product affected.</i></p>	<p>The Code requires UKWF members to provide details of any errors found during the calibration. In normal circumstances weighing instruments are deemed to be satisfactory if they are performing within the tolerances laid down in Weights and Measures legislation, but where a customer wishes he may specify his own tolerances if the equipment is not legally controlled by the Weights and Measures legislation. In either instance the tolerances applicable are required to be recorded on the calibration certificate</p>
<p><i>Records of the results of calibration and verification shall be maintained (see 4.2.4).</i></p>	<p>UKWF Members are required to provide their customers with a calibration certificate which must include details of the instrument calibrated, the date and place of calibration, the tests carried out and the results of those tests, as well as the information detailed above. In addition the Certificate is required to identify the calibrating organization, membership of the UKWF and the fact that the calibration has been carried out in accordance with the Code</p>

In addition to the above the UKWF also requires Members to ensure that the personnel they use to carry out calibrations are adequately trained and that the training is recorded in their files. Compliance with the code is mandatory on Members offering calibration service

Some users of weighing instruments have endeavoured to carry out calibration themselves, In such instances it is unlikely that they are aware of the need to maintain traceability between the weights they use and national standards; they are unlikely to have been trained in correct calibration procedures; they are often unaware of what tolerances are acceptable; they are unlikely to be able to distinguish between those errors caused by malfunction and those caused by incorrect usage, and in the event of a problem they will still need to use a specialist to carry out any necessary corrective actions.

Copies of the UKWF Calibration Code of Practice for non-automatic weighing instruments can be obtained from the UK Weighing Federation; please contact the Federation Secretariat via our web-site www.ukwf.org.uk

If you have any queries or questions relating to the Code or this note please contact the Federation's Technical Officer at technical@ukwf.org.uk

The Federation has also produced a Code of Practice for weighing instruments used for weighing cementitious products; the requirements are broadly similar to those for non-automatic weighing instruments and the same high standards of training, traceability, record keeping, certificate content and sealing are included. Copies are available from the UKWF Secretariat if required.