

CALIBRATION OF WEIGHING INSTRUMENTS.

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INTRODUCTION

A weighing instrument, like most sophisticated measuring equipment, operates best when it is suitable for its purpose, used properly, regularly maintained, and correctly calibrated. If just one of those steps is omitted or ignored then the results obtained will be less reliable than they should be and may even be completely erroneous.

Do you recognise those requirements? They are defined quite clearly in Clause 7.6 of ISO 9001:2008. Without wishing to repeat the whole clause here, in summary it requires:

- *the organisation to determine the equipment needed to provide evidence of conformity;*
- *the organisation shall establish processes to ensure that measurement can be carried out in a consistent manner*
- *measuring equipment shall be calibrated at specific intervals*
- *measuring equipment shall be adjusted as necessary*
- *measuring equipment shall be safeguarded from adjustments that would invalidate measurement results*
- *measuring equipment shall be protected from damage and deterioration*

For the purposes of this discussion we are assuming that the user has purchased the correct equipment and has properly trained his staff in the use of the equipment. This article concerns the testing, calibration and maintenance of the equipment and the organisation that carries out the work. In general, such organisations can be identified as one of four broad categories:

- internal, i.e. work is carried out by the company using the equipment
- an external organisation without certification
- an external organisation certified by or a member of a recognised body
- a UKAS accredited service organisation

Calibration of a weighing instrument is a complex business, requiring consistency of approach, traceability of standards, training of personnel, knowledge of the equipment and keeping of clear and relevant records. Yes a weighing instrument can be "calibrated" by placing one or two weights on the instrument and recording the result, but just how valid is that calibration? What about the accuracy and

traceability of the weights? Was the instrument set up correctly before the weights were applied? Were the weights applied correctly? Did the person doing the calibration understand what they were doing, why they were doing it, and what the results meant?

CALIBRATION BY DIFFERENT TYPES OF ORGANISATIONS

CALIBRATION BY THE EQUIPMENT USER

In many situations, a quality system, or even just principles of good practice require the weighing equipment to be checked for calibration by the equipment user on a regular basis. However, it is unlikely that this on its own would be sufficient to completely satisfy the requirements of a quality system as commercial pressures, potential conflicts of interest, and lack of expertise may compromise the results. The equipment should be tested and, if necessary, adjusted by an independent and competent third party organisation.

CALIBRATION BY AN EXTERNAL ORGANISATION WITHOUT CERTIFICATION

An external service organisation may have the capabilities to perform testing, calibration and maintenance. But they may not. With no accreditation, additional checks would need to be performed to assess the organisation's suitability to perform the work; but without knowing what to check and how to make that assessment it would be very difficult for a typical weighing equipment user to make that judgement.

CALIBRATION BY AN ORGANISATION CERTIFIED BY OR BELONGING TO A RECOGNISED BODY

The UK Weighing Federation (UKWF) is the only trade association for the weighing industry in the UK and its members are bound to a code of practice. Calibration by a UK Weighing Federation Member will ensure the appropriate level of integrity of the calibration. The calibration certificate issued will provide all the information needed to satisfy ISO 9001:2008 or other comparable Standards, the calibrating organisation will be independent and bias free and there will be no danger of influence or coercion being used to influence the results or skew the outcomes.

The UKWF is committed to maintaining high standards within the weighing industry. It provides training and technical advice to its members. The majority of UKWF Members are ISO 9001 Certified and those that are not are regularly audited by the Federation to ensure competence and continuing compliance with the calibration code of practice is maintained.

There are some service organizations that are not members of the UK Weighing Federation but are certified to ISO 9001. Whilst the calibration carried out by such organizations will be subject to audit by the certification body and will no doubt be performed in accordance with the organizations stated procedures, the calibration will not have the benefit of being carried out in accordance with the UK Weighing

Federation's Code of Practice or being supported by a calibration certificate that is confirmed as meeting the UK Weighing Federations stringent requirements.

For the majority of general purpose industrial and retail applications calibration and service performed by a UKWF member would be both sufficient and necessary to comply with the requirements of ISO 9001:2008 or other similar audited quality systems.

CALIBRATION BY A UKAS ACCREDITED ORGANISATION

There is one other question that often arises regarding calibration, and that is "do I need a UKAS Calibration Certificate?"

UKAS is the United Kingdom Accreditation Service and operates from the National Physical Laboratory site in Teddington. UKAS carry out accreditation of both calibration and testing laboratories, principally but not exclusively to International Standard ISO 17025. In the main these laboratories provide calibration and testing for scientific metrology purposes (research laboratories, analytical laboratories etc) rather than for general metrology and legal metrology uses. This is not to say that UKAS calibration is not valid for these other purposes, it is, and in some industries a mixture of calibrations is required. In the concrete industry, for example, the weighing instruments that dispense the concrete into the delivery lorries have a general metrology calibration, while the balances used for testing the strength of a batch of concrete are required to have UKAS accredited calibration. However for most general purposes such as weighing in industrial or retail applications calibration to the UK Weighing Federation standards would be more than sufficient to meet an ISO auditors requirements.

SUMMARY

To meet the requirements of a good quality system, weighing equipment users should have calibrations performed by a recognised, external service organisation. For the majority of general purpose industrial and retail applications, membership of the UKWF should be a good indication of the suitability of such a service organisation. Only in more demanding applications should additional requirements such as UKAS accreditation be necessary. Without any form of accreditation at all it is doubtful that a service organisation would be able to demonstrate their suitability that would satisfy the needs of any quality system without further assessment.