



U K WEIGHING FEDERATION

CALIBRATION CODE OF PRACTICE

FOR BATCH WEIGHING MACHINES USED IN

**BATCHING PLANTS FOR CEMENTITIOUS AND CEMENT BOUND
MATERIALS**

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The UK Weighing Federation (UKWF) is the national trade organisation for manufacturers, dealers, repairers, installers and service organisations in the weighing machine industry. On behalf of its members it takes part in the development of new national, European and international legislation and Standards relating to all aspects of weighing. The UKWF believes the principles of fair competition; equitable trading and value for money are the basis for good business between its members and their customers. The UKWF has been established for over 50 years.

This Code of Practice has been produced (and first published in October 1999) by the UKWF as a means of demonstrating to all parties that UKWF Members operate to the highest standards of integrity and professional practice. As with all such Codes it will, from time to time need to be amended in the light of experience, changing customer needs and technological progress. To this end the Code will be reviewed by the UKWF every 2 years and will be amended as necessary.

The Code is not intended to provide an alternative for those users of weighing equipment whose Quality System requires that their machines are calibrated by a UKAS (NAMAS) Accredited organisation. It will provide a calibration traceable to national/international standards, which will adequately provide the level of accuracy and traceability required by customers whose Quality System is in accordance with the ISO 9000 series of standards.

The Code recognises that many weighing machines are only used for weighings that are less than the maximum capacity of the machine, and the customer may then request that the calibration should be carried out over the normal “working” range of the machine. In such cases the recommendation is that the calibration is carried out over the normal working range plus 5% (e.g. a 1500kg capacity machine, used only for weighings up to 1000kg may be calibrated up to 1050kg - working range of 1000kg +5%).

The UKWF will be pleased to receive comments and constructive criticism from users (calibrating organisations and their customers) of the Code and interested third parties such as Certification Bodies. Customers and members attention is drawn to Section 8 of the Code in cases where dispute or disagreement arises. The UKWF's intention is to promote the highest standard of integrity amongst its Members and to provide their customers with the ratification which comes from using the services of a member of the nationally recognised trade association for the weighing industry.

Where known the UKWF have included in the Code italicised notes of specific interpretations that particular Certification Bodies have defined. Readers should be aware that Certification Bodies are continually assessing and revising their interpretations and therefore such notes are included for reference only. For a full and complete understanding of such interpretations reference should always be made to documents issued by the Certification Body.

Section 1. Introduction

- 1.1 The UK Weighing Federation (UKWF) provides this Code of Practice for the benefit of its members and their customers. It sets out the procedures for the calibration of weighing equipment used in batching plants for cementitious and cement bound materials, the selection of the personnel and test equipment which should be used and the methods of recording the results of the calibration.
- 1.2 Calibrations performed in accordance with this Code of Practice will normally satisfy the requirements both of customers and third party assessment bodies, enabling users of the weighing equipment to show compliance with the appropriate requirements of the ISO9000 series of standards, or established industry standards where these exist.
- 1.3 Because the relationship between the customer and the calibrating organisation is a commercial one, this Code recognises that the customer may instruct that methods other than those specified in this Code be used. In those cases the Calibration Certificate shall be endorsed with a statement that such instructions were issued and who issued them.
Customers are responsible for notifying the calibrating organisation of any specific requirements of their Certification Body.
- 1.4 Where the weighing machine is used for a legally controlled purpose then the provisions of the Weights and Measures Act 1985, and its subordinate legislation, is the primary control and nothing in this Code shall be taken as overriding that legislation. UKWF members are expected to act in accordance with that legislation at all times and when weighing equipment is outside the tolerances specified in that legislation or does not comply with the legislation in some other way they shall draw that fact to the attention of their customers. **Customers are reminded that they have an obligation to comply with the Weights and Measures legislation that cannot contractually be passed on to the calibrating organisation.**
- 1.5 UKWF members shall comply with all relevant UK health and safety legislation and customers' local rules, systems of work and permits to work. Both contractors and customers are required to co-operate to minimise the risks to both customers and UKWF member's staff.
- 1.6 This Code has been drawn up in consultation with the Quarry Products Association, Certification Bodies active in the industry, and other organisations that have an interest in this field. For a detailed technical explanation of the calibration process and the theory of calibration control readers are recommended to refer to the Institute of Measurement and Control publication "A Code of Practice for the Calibration of Industrial Process Weighing Systems, WGC0496, published in 1996. (Copies can be obtained from: The Institute of Measurement and Control, 87 Gower Street, London WC1E 6AA).

Section 2 Scope and General Principles

- 2.1** This Code of Practice covers weighing and measuring equipment used in the batching and manufacture of cementitious and cement bound materials. It does not apply to equipment used for sample testing or specification conformity testing; such equipment is predominantly required to be calibrated in accordance with UKAS (NAMAS) procedures and is therefore outside the scope of this document.
- 2.2** **Continuous weighers are not covered by this Code** as they are by their very nature unique, application specific devices and they require unique on-site specific calibration procedures. The calibration procedure used for such machines shall be documented either as a site procedure or as a specific procedure by the calibrating organisation. The general principles of accuracy, integrity and recording of results contained in this Code shall apply.
- 2.3** Customers are advised that the accuracy of Calibration is a function of the integrity, training and competence of the person/organisation carrying out the calibration. Calibration also requires the co-operation of the customer to make the weighing equipment available for sufficient time for the work to be carried out and ensure that adequate facilities, assistance and materials are available.
- 2.4** As a general principle the UKWF recommends that a full calibration should be carried out at least every three months, and that interim checks are carried out as agreed with the customer. It is recommended that equipment that has a high output be calibrated more frequently. In a number of cases the Certification Body responsible for the assessment of the customers quality management system will specify maximum intervals between full calibrations and interim checks. The frequency of calibrations and interim checks shall be agreed in the contractual arrangements between the customer and the calibrating organisation.
- 2.5** The signature of the person carrying out the calibration is the customers safeguard for the integrity and validity of the calibration. It is essential that the person signing the calibration record is the person who has noted the readings/indications of the equipment during the testing phase. The signature of the customer representative receiving the calibration certificate is regarded as an indication that the calibration has been carried out to the customer's satisfaction. If it should arise that the customer or his representative is not so satisfied they should still sign the certificate but should endorse it, commenting on their dissatisfaction, and the reason.
- In cases where the customer does not provide the necessary assistance and facilities to carry out the testing efficiently it must be recognised that the calibration time will be increased.**

- 2.6** Many customers are implementing sealing arrangements or other methods of securing the integrity of the calibration parameters between calibrations. The calibrating organisation shall co-operate with the customer in the use of such systems, and in instances where calibration seals are found to be broken at the time of calibration this shall be recorded on the calibration certificate.

QSRMC requirements are that calibration seals incorporate an identification mark and that the calibrating organisation has a document control system for traceability of such seals. Paper seals should destruct when removed. Potentiometer pots controlling coarse tare or span shall be protected by a seal. When primary or secondary calibration of the system can be adjusted via the keyboard of the computer system there shall be a non-resettable event number (event logger) displayed within the calibration screen. Calibrating organisations shall record previous and existing event numbers on the Calibration Certificate.

Section 3 Personnel

- 3.1** All personnel carrying out work covered by this Code of Practice shall be trained in the requirements of this Code, and a training record kept. Training records shall be made available to customers on request
- 3.2** Personnel shall be trained in the calibration techniques used and a training record kept. Where personnel are regarded as trained by experience, the calibrating organisation shall record details of such experience in place of training records.
- 3.3** On going training in new techniques or requirements shall be recorded for all personnel.
- 3.4** The calibrating organisation shall monitor the adequacy and effectiveness of training and shall establish methods of assessing its effectiveness.

Section 4 Test Equipment

- 4.1** Test equipment covered by this section includes test weights, force application systems and load cells.
- 4.2** Recommended tolerances for test weights are given in Annex A to this Code.
- 4.3** All test weights shall be kept in a clean dry condition and when not in use shall be stored in conditions that are not likely to affect their accuracy.
- 4.4** Factors to be taken into account when determining the calibration frequency for test equipment shall include the amount and type of use, whether the equipment has been subject to damage which may have affected the validity of the calibration, and the variation in value between calibrations.
- 4.5** Calibration certificates for test equipment shall be kept for sufficient time to demonstrate that the values are stable; records shall be kept for at least three previous calibrations. In the case of new equipment the date it is brought into service shall be noted.
- 4.6** Calibration frequency shall be dependent upon the calibration history of the test equipment. The maximum interval between calibration shall be 12 months.
- 4.7** All test equipment shall have a current certificate of calibration or certificate of accuracy traceable to national or international standards.

Section 5 Test Procedures

NOTE. In this section the word “test” is used to denote each aspect of the calibration. “Tests”, “tested” and “testing” should be read accordingly.

5.0 General

- 5.0.1** When necessary two sets of readings should be taken. The first set of readings with the machine in the “As found” condition, i.e. no adjustments or repairs carried out with the exception of any normal preparation for a weighing. Any abnormal circumstance found prior to testing shall be noted on the calibration certificate. Where no adjustment is necessary only the “as found” results are required. If discrepancies are found, the "as found" calibration may be concluded after at least two consecutive readings are outside the specified tolerances.
- 5.0.2** The second set of readings - “Definitive” - will be carried out following any routine maintenance, adjustment or repair which may have influenced the ‘As found’ results. (Such maintenance, adjustment or repair is outside the scope of this Code of Practice and will be covered by a maintenance agreement or repair contract.)
- 5.0.3** If the “as found” results indicate that the weighing equipment is out of calibration and cannot be quickly or easily rectified, the responsible site representative shall be notified and this shall be recorded on the calibration certificate. If there is no maintenance agreement in force, or if the customer does not want any maintenance or adjustment carried out then only “as found” results will be recorded.
- 5.0.4** Machines which are in need of repair and not capable of being used before any testing can be carried out, will only be tested following such repairs, and the results shall be recorded as ‘Definitive’. Newly installed machines shall be tested after installation and adjustment is complete and the results recorded as ‘Definitive’.
- 5.0.5** When the machine is used for legally controlled purposes and the Definitive test shows results which are outside the permitted tolerances this shall be indicated on the Calibration Certificate and brought to the attention of the customer.
- 5.0.6** A list of the recommended tolerances, based on the recognised industry requirements is given in Annex B. Customers may specify their own tolerances if they wish to do so, these must be made known in writing to the calibrating organisation, and this may form part of the contract between the customer and the calibrating organisation.
- 5.0.7** The appropriate tests shall be carried out as described below.

Section 5.1 Preliminary

- 5.1.1** Ensure that personal protective equipment (hard hat, safety boots, high visibility clothing etc.) and other safety equipment is available and being used.
- 5.1.2** Identify the company representative by name, (usually the batcher) present at the calibration.
- 5.1.3** Liase with company representative to ensure that adequate materials and assistance will be available for the calibration and that the weighing equipment will be available for use for the time necessary for the calibration to be completed. (“Adequate materials” means sufficient material to reach maximum capacity or maximum batch weight +5%.)
- 5.1.4** Obtain any necessary work permits and authorities.
- 5.1.5** Visually inspect the site to confirm safe working conditions including, but not limited to, safe and satisfactory access to the equipment, safe and secure methods of loading the equipment and “locking off” where necessary. Calibration shall not proceed if lock-out devices are not operating safely and the Calibration Certificate shall be endorsed to that effect.
- 5.1.6** Check plant records for any work carried out on the measuring equipment or its associated equipment that may have affected its accuracy or operation and confirm that recommendations made during the previous calibration have been carried out.
- 5.1.7** Ensure that adequate test equipment, including weights and loading systems, are available for the work to be completed and that any calibration certificates for this equipment are in force and valid.
- 5.1.8** Calibration points shall be identified on the equipment. The calibrating organisation may advise the customer of the location of suitable points.
- 5.1.9** Check customers Test Procedures for any deviations from those contained in this Code, and become familiar with all relevant site procedures.

SECTION 5.2 CONVENTIONAL HOPPER SYSTEMS .

5.2.1. Testing with weights

5.2.1.1 Ensure that the weigh-hopper is empty. Attach test equipment (weight supports, shackles, slings etc.) to the hopper and zero the system if necessary. The effort should be applied as close as practicable through the geometric centre of the load supporting structure. The customer should have ensured that the calibration points are clearly identified.

5.2.1.2 For new installations, following repair /replacement of load cells, or in those instances where the loading method may not reveal an incorrect or malfunctioning load cell, individual load cell checks shall be carried out. A load of 100kg or more shall be applied to each cell to confirm that the load cell output is acceptable.

QSRMC requirements are that the load cell output is checked on each quarterly calibration.

5.2.1.3 Test to capacity or maximum batch weight plus 5% using weights and material.
(Recommendation: The maximum batch weight as determined by the customer should be marked on the indicator and recorded in the calibration record book kept by the customer.)

5.2.1.4 Apply test weights, note reading/indication and error.

5.2.1.5 When applicable remove the test weights and apply material to as close to the same reading/indication as is practicable. (Note: errors from the weight readings are to be carried forward to the next stage of the test).

5.2.1.6 Apply test weights, note reading/indication and any error.

5.2.1.7 Continue as in 5.2.1.4 to 5.2.1.6 until maximum capacity or maximum batch weight +5% is reached.

5.2.1.8 Any leakage of material, lack of venting or other circumstances that may affect the accuracy of the weighing equipment or its proper operation shall be noted on the calibration record.

5.2.2 Testing with load application (push /pull) systems.

5.2.2.1 For new installations, following repair /replacement of load cells, or in those instances where the loading method may not reveal an incorrect or malfunctioning load cell, individual load cell checks shall be carried out. A load of 100kg or more shall be applied to each cell to confirm that the load cell output is acceptable.

QSRMC requirements are that the load cell output is checked on each quarterly calibration.

5.2.2.2 Ensure that the fixing system and fixtures are secure and safe, and apply the effort as close as practicable through the geometric centre of the load supporting structure. The customer should have ensured that the calibration points are clearly identified.

5.2.2.3 Ensure that the “push” or “ pull” generated by the system can be applied vertically, and will be stable for sufficient time for reliable readings to be taken.

5.2.2.4 Connect the load application system and zero the equipment if necessary.

5.2.2.5 Apply load, and note reading/indication and any error.

5.2.2.6 When applicable remove load and apply material to the same reading/indication or as near thereto as is practicable. (Note: errors from the weight readings are to be carried forward to the next stage of the test).

5.2.2.7 Apply load and note reading/indication and any error.

5.2.2.8 Continue as in 5.2.2.4 to 5.2.2.6 until maximum capacity or maximum batch weight +5% is reached.

In some instances where only one material is available it may not be possible to reach maximum capacity; when sufficient material is not available the calibration record shall be endorsed as appropriate.

5.2.2.9 Any leakage of material, lack of venting or other circumstances that may affect the accuracy of the weighing equipment or its proper operation shall be noted on the calibration record.

5.3 Backweigh systems

{NOTE: Experience has shown that a large number of these systems including those using quarter-bridge load cells are less stable and accurate than conventional weighing systems.

The UKWF recommends that quarter-bridge load cells be replaced with full bridge load cells, and this Code of Practice specifically excludes weighing systems using quarter-bridge load cells.

For full-bridge load cell systems, two methods of calibration are given below. Attention is drawn to the note at the end of section 5.3.1}

5.3.1 Direct weighing method

5.3.1.1 For new installations, following repair /replacement of load cells, or in those instances where the loading method may not reveal an incorrect or malfunctioning load cell, individual load cell checks shall be carried out. A load of 100kg or more shall be applied to each cell to confirm that the load cell output is acceptable.

QSRMC requirements are that the load cell output is checked on each quarterly calibration.

5.3.1.2 Identify a local weighbridge for use during the calibration. The weighbridge must either bear a valid indication (stamp or sticker from a Trading Standards Officer or accredited verification organisation) that it is suitable for use for trade or must have a valid calibration certificate..

5.3.1.3 If the weighbridge is a “public” weighbridge, (within the meaning of Part III of the Weights and Measures Act 1985) and the keeper/operator holds a valid certificate of competence from a Chief Inspector of Weights and Measures then the ticket issued for each weighing can be accepted as the correct indication of the weighbridge. It will not be necessary for the person signing the calibration certificate to witness the individual weighings.

5.3.1.4 Identify a suitable vehicle for use during the testing and ascertain the tare weight. (Note; during the testing allowance must be made for the loss of weight due to fuel usage, this will vary on distance travelled between weighings and local traffic conditions. Significant changes to the vehicle during the testing phase (e.g. refuelling, wheel changing) will invalidate the testing and require the complete process to be restarted).A check weighing of the vehicle tare weight shall be taken at the completion of the test to determine what allowances need to be made for fuel usage per journey etc during testing)

5.3.1.5 With the hopper, discharge material into the vehicle, note the readings/indications and compare with the material weight determined by the weighbridge. Note any error.

5.3.1.6 Repeat 5.3.1.5. at least 4 more times until the maximum capacity or maximum batch weight +5% has been reached.

QSRMC does not recognise the above method as having sufficient accuracy to be acceptable to them)

5.3.2. Load application method

5.3.2.1 For new installations, following repair /replacement of load cells, or in those instances where the loading method may not reveal an incorrect or malfunctioning load cell, individual load cell checks shall be carried out. A load of 100kg or more shall be applied to each cell to confirm that the load cell output is acceptable.

QSRMC requirements are that the load cell output is checked on each quarterly calibration.

5.3.2.2 Ensure that the hopper is empty. Affix load application equipment (cradle or push/pull kit). The customer should have ensured that the calibration points are clearly identified. Tare machine and note reading.

5.3.2.3 Apply load and note reading/indication and error.

5.3.2.4 Add material until the noted reading, or as close below thereto as is practical is achieved, then reapply load.

5.3.2.5 Repeat 5.3.2.3 and 5.3.2.4 until the maximum capacity or maximum batch weight +5% is achieved.

5.4 Other Equipment

5.4.1 The scope of this Code of Practice is restricted to the weighing equipment used for directly batching the concrete. Water meters and Volumetric measuring equipment are outside the scope of this Code.

5.4.2 Where the customer asks, or the contractual arrangements require this type of equipment to be calibrated by the organisation calibrating the weighing equipment, the calibration shall be carried out in accordance with the documented local site procedures. If no specific procedures are available calibration shall be carried out in a way that appears suitable to the calibrator, and the calibration record shall include a statement to the effect that the calibration has not been performed according to any documented procedure.

Section 6 Records

- 6.1** The format of the calibration certificate should meet the business needs of the user and customer, but shall as a minimum contain the following:-
- Name and address of the organisation carrying out the calibration.
 - The UKWF logo, and statement of compliance with this Code, and any exceptions from it.
 - Name and site address of the customer.
 - A unique identification to allow the calibration to be traced.
 - The name and signature of the authorised signatory. (Where the signatory is not the person who carried out the calibration means of tracing the certificate back to the calibrator must be available).
 - The date of the calibration.
 - Means of identifying the calibration records for the test equipment used for the calibration.
 - A description of the machine being calibrated, e.g. serial number, or plant number, or model.
 - Location of machine (where applicable).
 - The results of the tests (as required by section 5.0.1 above).
 - Maximum weighing capacity and scale interval (division size)
 - Maximum batch size if less than the maximum weighing capacity.
 - Statement of compliance with specified tolerances
 - Any observations or comments considered relevant to the future use or accuracy of the equipment.
 - Calibration sealing/securing method employed.
 - Date of last calibration of test equipment
 - Authority carrying out calibration of test equipment
 - Time of commencement and completion of calibration
 - Any errors or corrective actions
 - Results of loading checks on individual load cells
 - Indications (previous and existing) of event logger(s)/security seals.
- 6.2** The results recorded must show the loads applied for each test, together with the actual reading and/or the deviation of the indication from the true value. (The deviation may be shown either in terms of scale divisions or weight.)
- 6.3** Customers may ask for copies of calibration certificates for test equipment. These must be supplied if requested.

Customers are reminded that when the calibration certificate/record is, or may be, required for audit purposes it is their responsibility to maintain the certificate/record issued by the calibrating organisation.

Section 7. Audit and Review

7.1 Calibration Organisations registered to BS EN ISO 9000

7.1.1 UKWF members who are involved in the calibration of weighing equipment at batching plants for cementitious materials and who are registered to one of the BS EN ISO 9000 series of standards shall incorporate this Code into their documented Quality System, either by direct transposition or by specific reference. Compliance with this Code will then be subject to the internal audit and Management Review procedures of the Quality System and continuing assessment by the Certification Body granting the registration to the Standard.

7.2 Calibration Organisations not registered to BS EN ISO 9000

7.2.1 UKWF members who are not so registered shall carry out regular audits of their compliance with this Code including, but not restricted to:

- Calibration of test equipment,
- training, and competence of personnel,
- completeness of test /calibration reports
- adequacy and condition of test equipment.

7.2.2 The organisation shall conduct an annual review of the systems and procedures employed to ensure continuing compliance with the requirements of this Code and any revisions to it.

7.2.3 The audits and review shall be recorded. Copies shall be made available to customers if they so request them. The calibrating organisation may sub-contract the audits and review to suitably qualified/experienced people or organisations if they so wish.

Section 8 Enforcement and Complaints

- 8.1** Sufficient information must be recorded to allow customers queries to be answered.
- 8.2** Calibrations carried out to this Code of Practice satisfy the requirements of ISO9000 assessment bodies. Any comments about the validity of the procedures described in this Code should be brought to the attention of the UKWF without delay.
- 8.3** Complaints (by customers or relevant third parties) arising from any aspect of this Code of Practice or the calibration service provided under it should initially be discussed and resolved between the customer and the UKWF member concerned.
All complaints shall be recorded together with details of subsequent actions and resolution. Records of complaints, together with any corrective actions and the outcome of any investigation shall be retained for at least two years, and shall be considered during the Management Review.
- 8.4** If the complaint cannot be resolved details of the complaint may be sent in writing to the General Secretary of the UKWF, Brooke House, 4.The Lakes, Bedford Road, Northampton, NN4 7YD. The complaint will be acknowledged on receipt.
- 8.5** The complaint will be referred to the Board of Directors of the UKWF for investigation and action. The decision of the Board of Directors will be made known in writing to both parties. In the event of a prolonged enquiry both parties will be advised at regular intervals of progress.
- 8.6** The decision of the Board of Directors will be binding on the UKWF member.

Section 9 Sanctions

- 9.1** UKWF members are required to trade equitably and fairly. The UKWF will ensure that these high standards of integrity are maintained.
- 9.2** For that reason, justified complaints against a member about work undertaken in accordance with this Code may result in the UKWF's approval to provide a calibration service under this Code being withdrawn. In such cases the UKWF logo and any references in the members documents, contracts or calibration certificates to compliance with this Code will be withdrawn immediately.
- 9.3** Failure to implement the Code, or to observe its requirements may result in sanctions being applied to the UKWF Member concerned: serious or persistent breaches of the Code may result in the expulsion of the Member from the UKWF.
- 9.4** UKWF Members are reminded that to comply with the Code they are required to include the UKWF logo and a statement of compliance with the Code in their Calibration Certificates. The logo and statement are "Trade Descriptions" within the meaning of the Trade Descriptions Act 1968, and any person who is not a UKWF Member, or any Member who does not follow the Code is liable to prosecution. A conviction resulting from such a prosecution will be regarded as a serious breach of the Code

Annex A. Tolerances for test equipment

- A.1** Weights used for the calibration of equipment covered by this code shall be adjusted to the tolerances specified for Class M3 weights as defined in OIML Recommendation R111. This is equivalent to weights known as “traders weights” under the current UK Weights and Measures legislation. The use of such weights will ensure that the maximum error on the weights used for the calibration does not exceed 0.25% of the applied load.
- A.2** Test equipment used for calibration purposes (e.g. hydraulic loading devices) shall be calibrated and adjusted such that the maximum error on the equipment does not exceed 1 scale division or 0.25% of the applied load, whichever is the greater.

Annex B. Recommended Tolerances for Weighing Equipment

B.1 New Equipment

New weighing machines shall be adjusted and calibrated such that the error of indication, if any, does not exceed 0.25% of the applied load, or 1 scale interval, whichever is the greater.

B.2 Repaired Equipment

Weighing equipment that has been the subject of repair by the replacement, adjustment or modification of any metrologically significant component shall be adjusted and calibrated as if it were new equipment.

B.3 Equipment in Service

Equipment which is in service shall be calibrated to 0.5% of the applied load or 1 scale interval, whichever is the greater.

Annex C Definitions

- As found - The initial calibration recorded on the certificate prior to any routine maintenance or adjustments being carried out to the weighing machine.
- Calibration - The set of operations that establish under specified conditions the relationship between the loads applied and the corresponding value of the weighing system output, (the indications).
- Note. The term does not include adjustment, repair or preventative maintenance work carried out on a machine, even if this work is carried out during a calibration exercise.**
- Definitive - The final calibration recorded on the certificate following any routine maintenance and/or adjustments made to the weighing machine.
- EN45501 - The European Standard for non-automatic weighing instruments. (Published in the UK by BSI, as BS EN 45501).
- Linearity - The degree of accuracy of a machine as the load applied increases in size.
- Load Receptor - The part of a weighing machine which the load being weighed is placed in or on.
- Test - In this document, particularly section 5 the word “test” is used to denote each aspect of the calibration. “Tests”, “tested” and “testing” should be read accordingly.
- Test weights - Weights that are subject to a controlled calibration procedure and which are in calibration at the time that the testing is carried out.
- The calibration procedure for the test weights may require that the weights are calibrated by a Weights and Measures (Trading Standards) Department, by a UKAS accredited laboratory, or in accordance with an in-house documented procedure. Weights and Measures Departments will carry out testing, adjustment and re-testing of the weights in accordance with current legislative requirements for Working Standards and Testing Equipment; in UKAS accredited laboratories testing, adjustment and re-testing will be carried out in accordance with the documented calibration procedures of the laboratory concerned. In house calibration procedures shall be documented and shall ensure traceability to national standards.***

When calibration is carried out by a Weights and Measures Department the certificate issued by that Department may or may not contain all the information normally included in a certificate issued by a UKAS accredited laboratory, nevertheless it will satisfy the requirements of this Code.

- | | | |
|-------------------|---|--|
| Tolerance | - | The allowable error of indication of the weighing machine. |
| Verified Machine | - | Refers to a machine which has been tested by a Weights and Measures Inspector or an accredited manufacturer repairer or service organisation as appropriate and has been assessed as meeting all the requirements for use for legally controlled purposes. The machine will usually carry a stamp on a lead plug, or a set of stickers indicating that it has been tested and has passed the tests |
| Primary displays | - | The display(s) driven directly from the measuring system.

<i>In normal circumstances the calibration records will be based on the indications given by the Primary Display. Any disparity between the Primary display and a secondary display shall be noted on the Calibration Certificate.</i> |
| Secondary Display | - | Any additional display driven subsequently from the Primary display.

<i>In many computer-linked systems the display provide on the computer is used by the operator to monitor and control the system. Nevertheless it is regarded as a secondary display unless it is driven directly from the measuring system.</i> |

Amendment Record**AMENDMENT RECORD**

Amendment No	Reference	Inserted	Date

From time to time it will be necessary to amend this document. In order to ensure your copy is up-to-date you should register your interest with the UKWF.

Amendments will normally be issued as single sheets, allowing holders to annotate their copy with the details of the amendments. However should it become necessary to reissue the document in its complete form holders will be advised that a new version is available.