



# LAB5

EDITION 2 | NOVEMBER 2012

## Reporting Calibration Results

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## 1 INTRODUCTION

- 1.1 The general requirements that testing and calibration laboratories have to meet if they wish to demonstrate that they operate to a quality system, are technically competent and are able to generate technically valid results are contained within ISO/IEC 17025:2005 <sup>[B1]</sup>. This international standard forms the basis for international laboratory accreditation and in cases of differences in interpretation remains the authoritative document at all times. LAB5 is not intended as a prescriptive document, and does not set out to introduce additional requirements to those in ISO/IEC 17025:2005 but to provide amplification and guidance on the current requirements within the international standard.
- 1.2 This publication provides guidance for the format, presentation and wording of calibration certificates and calibration labels covered by the scope of a laboratory's UKAS accreditation to ISO/IEC 17025:2005. Laboratories following this guidance will be able to produce documentation that is easily identified as produced by a UKAS accredited calibration laboratory and that minimizes the risk of customers and readers being misled.
- 1.3 This document replaces LAB5 (Edition 1, March 2000). It also incorporates details from P11, *Reference standards on UKAS accredited calibration certificates* (Edition 3, June 2000), with minor amendments. P11 will continue as a separate document.
- 1.4 Edition 2 of LAB5 is a complete revision of the previous issue and it is impractical to list or identify all the changes in detail. Some of the more notable changes or additions are as follows:
- 1.4.1 Details regarding the use of the ILAC MRA Mark have been included.
- 1.4.2 The recommended traceability statement at the foot of the first page of the example calibration certificate has been updated to include reference to SI units.
- 1.4.3 The list of references to other publications has been updated.
- 1.4.4 Further detail has been added to paragraph 3.2 regarding reporting of uncertainty and compliance statements.
- 1.4.5 Further detail has been added to paragraph 4.2 regarding the use of "limited calibration" statements on calibration labels.
- 1.4.6 The overall presentation, including minor text clarifications, has been updated.

## 2 UKAS CALIBRATION ACCREDITATION SYMBOL

- 2.1 The conditions for reference to UKAS accreditation on certificates and reports, including the need for clarifying statements and disclaimers when the results of non-accredited calibrations and/or opinions are reported with accredited calibrations, are given in UKAS Publication LAB1<sup>[B2]</sup>, *Reference to accreditation for laboratories*. Conditions specifically for use of the national accreditation symbols, including the UKAS calibration symbol, are given in BIS Publication URN 11/673<sup>[B3]</sup>.
- 2.2 A calibration certificate bearing the UKAS calibration accreditation symbol is sufficient evidence of the traceability of the calibration results reported.
- 2.3 The ILAC MRA Mark may also be used on calibration certificates. This Mark has been registered for use with the UK Intellectual Property Office which means that UKAS can sublicense the Mark to accredited laboratories. All UKAS accredited laboratories are entitled to use the ILAC MRA Mark provided they have signed the ILAC MRA License Agreement and use the Mark as prescribed. The ILAC MRA Mark can only be used in conjunction with the relevant laboratory accreditation symbol. Further details are available on the UKAS web site.

### 3 GENERAL GUIDANCE FOR THE PRESENTATION OF CALIBRATION CERTIFICATES

3.1 It is recommended that:

- (a) The first page of a UKAS calibration certificate is in the format shown in Figure 1 and that any continuation pages have the format shown in Figure 2.
- (b) Calibration certificates are issued on A4 sized paper with the accreditation symbol at the top of the page on the left or right hand side.
- (c) The date of issue appears on the certificate and that all dates are in the format *day/month/year*.

3.2 It is generally necessary for the interpretation of calibration results for calibration certificates to include the uncertainty of measurement and/or a statement of compliance with an identified metrological specification or clauses thereof.

3.3 In the normal case, where calibration certificates contain measurement results, there should be a statement regarding the basis on which the reported uncertainty has been evaluated. In order to meet the rules for international acceptance of certificates under the mutual recognition agreements of ILAC and EA this evaluation should be carried out according to UKAS publication M3003<sup>[B4]</sup> or EA publication EA-4/02<sup>[B5]</sup> and the statement should be in the form given therein, e.g.,

*The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a coverage probability of approximately 95 %. The uncertainty evaluation has been carried out in accordance with UKAS requirements.*

NOTE: There may be circumstances under which a coverage factor other than 2 is required and therefore this statement will have to be modified accordingly. There are also circumstances under which the effective degrees of freedom should be reported. Examples are presented in UKAS document M3003.

3.4 In the case where compliance with specification statements are made the uncertainty of measurement should be taken into account in accordance with the methods described in UKAS publication M3003<sup>[B4]</sup>. If compliance statements are made but results and uncertainties are omitted then there should be a written statement that describes the calibration points at which compliance is claimed.

NOTE: References to compliance statements apply equally to statements of non-compliance.

3.5 A laboratory may include in its calibration certificates the following statement:

UKAS is one of the signatories to the Multilateral Agreement of the European co-operation for Accreditation (EA) for the mutual recognition of calibration certificates issued by accredited laboratories.

<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center; font-weight: bold; font-size: 1.2em;">CERTIFICATE OF CALIBRATION</p> <p>ISSUED BY _____</p> <p>DATE OF ISSUE _____      CERTIFICATE NUMBER _____</p> </div> <p>Laboratory name and address (and company logo if desired)</p>	 <p>0000</p>												
<p>Laboratory name and address (and company logo if desired)</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Page</td> <td style="padding: 2px;">of</td> <td style="padding: 2px;">pages</td> </tr> <tr> <td colspan="3" style="padding: 2px;">Approved Signatory</td> </tr> <tr> <td colspan="3" style="padding: 2px;"><i>Name</i></td> </tr> <tr> <td colspan="3" style="padding: 2px;"><i>Signature</i></td> </tr> </table>	Page	of	pages	Approved Signatory			<i>Name</i>			<i>Signature</i>		
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<hr/> <p style="font-size: 0.8em;">This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.</p> <hr/>													

**Figure 1**  
Recommended format for the first page of a calibration certificate.

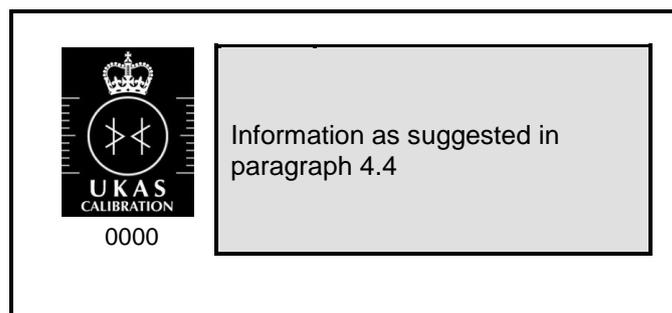
<b>CERTIFICATE OF CALIBRATION</b>  UKAS Accredited Calibration Laboratory No. 0000	Certificate Number
	Page    of    pages

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**Figure 2**  
Recommended format for continuation pages of calibration certificates.

## 4 CALIBRATION LABELS

- 4.1 Laboratories should apply calibration labels to measuring instruments (or, if not practicable, to the container) that they have calibrated under their accredited scope.
- 4.2 It is important that the label is not misleading. Therefore, if the coverage of the calibration is such that not all major parts of a metrological specification are covered with sufficient detail to give confidence in the equipment performance, the words *Limited Calibration* should be used.
- 4.3 Superseded UKAS calibration labels should be removed or cancelled.



**Figure 3**

Example design for calibration labels

- 4.4 The following information should be indelibly inscribed on the label by the laboratory that has performed the calibration:
- (a) UKAS accreditation symbol, including the accreditation number of the calibration laboratory;
  - (b) Instrument identification;
  - (c) Date of calibration (with the month stated as a word);
  - (d) Certificate number;
  - (e) Space for the date when calibration is again due, e.g. *Recalibration due ...* (date to be inserted by the customer unless the calibration laboratory has been instructed to insert this by the customer or if required by legal regulations);
  - (f) If desired, the name of the calibration laboratory.
- 4.5 A suggested format and design for calibration labels is shown Figure 3.

## APPENDIX A REFERENCE STANDARDS ON UKAS ACCREDITED CALIBRATION CERTIFICATES

- A1 The purpose of this Appendix is to assist accredited laboratories, or their customers, with the discussions they may have with assessors from certification bodies and others about the content of calibration certificates.
- A2 Difficulties may occur because assessors sometimes wish to see details of the reference standards used for calibration included on UKAS accredited calibration certificates (i.e. those bearing the UKAS calibration symbol).
- A3 Any calibration laboratory that holds UKAS accreditation has to operate in accordance with ISO/IEC 17025:2005 and UKAS requirements. These requirements apply not only to the calibrations for which the laboratory offers a service, but also to all subsidiary measurements (for example, of environmental conditions) whose accuracy may significantly affect the accuracy or validity of such calibrations.
- A4 The laboratory is required to have procedures for carrying out the calibrations and for the management and calibration of its reference standards of measurement and other measuring equipment. To satisfy these requirements, laboratories must hold all of the appropriate reference standards of measurement that they need, and maintain them in an appropriate state of calibration to ensure traceability of measurement results.
- A5 Furthermore, accredited laboratories are required to comply with other technical requirements, such as the effective training of staff, the need for a suitable environment, the adherence to technically valid procedures, the requirements for quality control, record keeping, interlaboratory comparisons and the like. A list of equipment in a calibration certificate does not demonstrate that such requirements are sufficiently addressed.
- A6 UKAS assessment visits do confirm that the above requirements are being satisfied. There is therefore no need for accredited calibration certificates to provide details of the equipment used, since UKAS calibration laboratory accreditation provides all the assurances that the user needs.
- A7 There may, however, be technical reasons when it might be necessary to include information about the equipment used within a calibration certificate. These may include:
- (a) Circumstances when the calibration data are entered directly into the certificates, either manually or automatically, and the certificate becomes the only record of the calibration;
  - (b) Situations when the nature of the equipment used has direct relevance to the results and a description is needed to properly interpret those results.

## APPENDIX B REFERENCES

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- B1 CEN/CENELEC, ISO/IEC 17025:2005, *General requirements for the competence of testing and calibration laboratories*, May 2005.
- B2 United Kingdom Accreditation Service, LAB1, *Reference to Accreditation for Laboratories*, Edition 5, August 2009.
- B3 Department for Business Innovation & Skills, URN 11/673, *Conditions for Use of the National Accreditation Logo and Symbols by UKAS and UKAS Accredited Organisations*, July 2009.
- B4 United Kingdom Accreditation Service, M3003, *The Expression of Uncertainty and Confidence in Measurement*, Edition 3, November 2012.
- B5 European cooperation for Accreditation, EA-4/02 *Expression of the Uncertainty of Measurement in Calibration*, December 1999.