TPS 49

EDITION 2 | JUNE 2009

Interim arrangements & guidance on the interpretation of IEC 61672 Sound Level Meters - Periodic Tests

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1 PURPOSE AND DURATION

1.1 The purpose of this Statement is to advise laboratories and assessors of the interim arrangements for periodic tests required on Sound Level Meters (SLMs) which are now being manufactured in accordance with IEC 61672-1:2002 *Electroacoustics - Sound level meters - Part 1:Specifications* (dual-numbered as BS EN 61672-1:2003).

1.2 IEC has published IEC 61672-3:2006 *Electroacoustics - Sound level meters - Part 3: Periodic tests*. However, until Part 3 of IEC 61672 is revised interim arrangements are still required for use in the UK to cover some aspects of the periodic verification of sound level meters originally manufactured to IEC 61672-1:2002 (BS EN 61672-1:2003).

1.3 This statement shall remain in force until further notice.

2 STATEMENT

2.1 A technical guide, “Technical Guide NPL Acoustics 2004/1”, based on the latest available draft of IEC 61672 Part 3 in December 2003, had been prepared by a sub-group of the UKAS Acoustical Industry Technical Committee as an interim measure until BS EN 61672-3:2006 was published. The guide can be downloaded from the National Physical Laboratory website: http://resource.npl.co.uk/docs/science_technology/acoustics/slm_tg_61672_2.pdf.

2.2 Periodic tests performed to the technical guide will be recognised by UKAS until the end of 2011. After Dec 09 UKAS will no longer accept new applications from laboratories to perform periodic tests to this technical guide, and laboratories applying prior to this should note the date when Certificates will no longer be recognised.

2.3 Existing UKAS accredited calibration laboratories wishing to be accredited for calibrations under Part 3 of BS EN 61672 should submit a request for extension to scope using the normal process.

2.4 For sound level meters originally manufactured in accordance with IEC 60651 (BS EN 60651:1994) and IEC 60804 (BS EN 60804:1994), UKAS accredited calibration laboratories shall continue to use BS 7580 - 1:1997 *Specification for the verification of sound level meters*.

2.5 Where a sound level meter is originally manufactured in accordance with IEC 60651 (BS EN 60651:1994), and/or IEC 60804 (BS EN 60804:1994) and IEC 61672 (BS EN 61672:1:2003) the meter may be verified accordingly to BS 7580-1 or BS EN 61672-3 amended by TPS 49, depending on the use of the sound level meter. Where a measurement standard specifically requires the use of a sound level meter manufactured to BS EN 61672, verification to BS EN 61672-3, amended by TPS49, shall apply.

3 SPECIFIC REQUIREMENTS

3.1 Interpretations and guidance are provided below for the following specific clauses within BS EN 61672-3:2006 together with two additional points listed below as 19u and 19v for practical application and consistency in the use of the standard for calibration laboratories seeking UKAS accreditation for these verification tests.

Para 3.5 Add to the existing paragraph: However, as this standard relates to recently-manufactured sound level meters, it is possible that some of this information may not yet be available. Until further notice, exceptions are made where the data are not published in the instruction manual or made available by the manufacturer or supplier. Details of these exceptions are given in the relevant sub-clause, and no further exceptions apply.

Para 3.9 Change the last sentence to read "Conformance shall be demonstrated for sound pressure level, frequency, and total distortion, preferably using the methods given in IEC 60942 for periodic testing".

Para 4.4 Add to end of para.:- Where the manufacturer's uncertainty data form significant elements of the uncertainty budget and contribute to the failure to meet the uncertainty requirements of this Standard, testing may be undertaken and the statement given in 19 v) shall be included on the certificate as appropriate.

Para 8.2 Last sentence changed to read "The frequency of the input signals shall be within ± 0.25% of the specified value"

Para 10.1 Subclause 10.1 shall be excluded from the periodic tests, unless specifically requested by the user. In this case the test shall be performed according to the method given in 10.1.

Para 10.2 Change the end of the main text to read
"…..10.1.3 shall be recorded for the most-sensitive level range on which a valid indication is available and for all frequency weightings available in the sound level meter"

Para 11.4 Add after existing text " "If data on the influence of effects due to the case of the sound level meter are not separately available, the corrections shall be assumed to be numerically zero, and the statement given below in 19u) added. Where a windscreen is in use, and data on the influence of the windscreen which excludes any effects due to the case of the sound level meter are not available, the windscreen corrections shall be assumed to be numerically zero, and a statement added to the certificate to that effect. Where an extension cable is in use, and data on the influence of effects due to the case of the sound level meter are not separately available, the corrections shall be assumed to be numerically zero, and a statement added to the certificate to that effect."

Para 11.7 Change last sentence of first paragraph to read:- "Where the associated uncertainties of measurement are supplied, they shall be from the same source as the adjustment data."
In the second paragraph add the word "numerically " before "zero" in line 2.

Para 12.6 Change the "typical microphone frequency response" in line 3 to "For each frequency weighting and at each test frequency, corrections shall be applied to the level differences determined in 12.5 to account for the deviation of the microphone response from a uniform frequency response, and for the typical effects of reflections from the case of the sound level meter and diffraction of sound around the microphone, and, if applicable, the influence of a windscreen. The microphone response shall preferably be the measured response of the actual microphone, but if this is not available a typical microphone response shall be used. The use of a typical microphone response shall be reported on the Certificate."
Add at end of para "If the actual microphone response is not available, then a typical

microphone response may be used. The use of the typical response shall be reported on the certificate."

Para 12.6 Add after existing text " If data on the influence of effects due to the case of the sound level meter are not separately available, the corrections shall be assumed to be numerically zero, and the statement given is 19u) added. Where a windscreen is in use, and data on the influence of the windscreen which excludes any effects due to the case of the sound level meter are not available, the windscreen corrections shall be assumed to be numerically zero, and a statement added to the certificate as given in 19u). Where an extension cable is in use, and data on the influence of effects due to the case of the sound level meter are not separately available, the corrections shall be assumed to be numerically zero, and the statement given in 19u) added "

Add to para 15.4:- On all ranges, the level of the input signal shall be adjusted to display an indication 2 dB above the lower limit of the range specified in the instruction manual, except where the lower limit of the range is less than 16 dB above the level of the self-generated noise as measured for frequency weighting A in 10.2, or less than 16 dB above the minimum indication of the sound level meter. In this case, measurements shall be performed for indications 16 dB above the level of the self-generated noise or above the minimum indication of the sound level meter, whichever is the higher. When the self-generated noise is measured on several ranges, where available the value measured for the range under test shall be used to determine the test point. For other ranges where the self-generated noise is not measured in 10.2, the highest measured level of A-weighted self-generated noise shall be used to determine the test point.

This additional test has been included as experience has shown that linearity at the bottom of ranges is a common cause of failure to meet the specifications.

Para 18.3 Add the following NOTE:-
For practical reasons laboratories may use any suitable method to determine the overload point to a resolution of 0.1 dB, not necessarily the method given in this subclause.

Para 19 Add 2 more sections:-

19 u) If no data on the influence of effects due to the case of the sound level meter are not separately available, the corrections shall be assumed to be numerically zero, and the statement given below is added. If either an extension lead or a windscreen or both are in use and no data is available either in the instruction manual or from the manufacturer or supplier of the sound level meter to adjust the indications, as required in 11.4 and/or 12.6, a statement as follows should be included in the certificate:-

"No adjustment data have been published in the instruction manual or made available by the manufacturer or supplier of the sound level meter to account for the average effects of reflections from the case of the sound level meter and diffraction of sound around the microphone and, if applicable, the influence of a windscreen (delete as appropriate), as required by sub-clause 11.4 and/or 12.6 (delete as appropriate) of IEC 61672-3:2006. The average effects of reflections from the case of the sound level meter and diffraction of sound around the microphone and, if applicable, for the influence of a windscreen (delete as appropriate) have therefore been assumed to be numerically zero for the purposes of this periodic test. If these adjustment data are not actually zero, there is a possibility that the frequency response of the sound level meter may not meet the requirements of IEC 61672-1:2002 (BS EN 61672-1:2003)."

19 v) Where the uncertainty in manufacturer supplied data is sufficiently large that a laboratory cannot add its own measurement uncertainty without exceeding the permitted uncertainties given in IEC 61672-1 Annex A, but where the permitted uncertainty is not exceeded if the contribution from manufacturer's data is excluded, the test may be carried out, and the following statement shall be added to the certificate:-

"The instrument failed to meet the requirements for the test of (insert test or tests as required) as the uncertainty of measurement exceed the maximum permitted value due to a significant contribution from data supplied by the manufacturer. If the manufacturer's uncertainty data were not included, the meter would meet the requirements of the Standard."

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