

Acoustical instruments – specification standards update

By Susan Dowson

When performing any acoustical measurement, or specifying a device to use, it is important to ensure the instrument you select is suitable for the task so that reliable and traceable measurements can be performed. In many cases the instrumentation requirements will already be specified, for example if performing a particular measurement to a given standard e.g. an ISO standard, these requirements are normally included in that standard. This is usually achieved by referring to a specific specification standard and, where applicable, to a particular class of device as defined in that standard e.g. “use a class 1 sound level meter conforming to the requirements of IEC 61672-1” etc. So where do these specification standards come from?

For most acoustical instruments the specifications are given in international standard documents produced by the IEC (International Electrotechnical Commission). The relevant committee for acoustical instruments is IEC/TC29 “Electroacoustics”. This is paralleled by a UK National Committee within the British Standards Institution, BSI EPL/29. It is now many years since a specific British Standard was issued by BSI for an acoustical instrument, with BSI now adopting new/revised IEC standards unchanged as BS EN documents with the same standard number as the IEC version. There are many benefits with this approach – IEC/TC29 in common with other IEC committees, has global membership, currently having 24 participating countries and 12 observer countries, and it is clearly beneficial for manufacturers, suppliers and users for discussion on the content

of the documents to take place internationally. The aim is to obtain sufficient consensus such that a document can advance successfully through the various comment and voting stages and become approved as an international standard that is widely adopted.

IEC TC/29 has a broad remit and covers a wide range of instrumentation – see below. Working Groups (WGs) are set up to write new documents and these become Maintenance Teams (MTs) when they are just dealing with revisions to documents. EPL/29 provides the UK expert members for these WGs and MTs, and the national committees of other countries do likewise.

There are various well-prescribed stages in production of any IEC standard: *Preliminary Work Item (PWI)*, *New Work Item Proposal (NWIP)*, *Working Draft(s) (WD)*, *Committee Draft(s) (CD)*, *Committee Draft for Vote (CDV)*, *Final Draft International Standard (FDIS)*, *Publication stage (IS)*. There are specific rules on format, circulation, translation, voting times, voting majorities etc. required at the various stages, and the total maximum time permitted for production of a standard or revision is ≤ 36 months. Further information about the various stages can be found in the ISO/IEC Directives, Part 1 ‘Procedures for the technical work’ available at <http://goo.gl/FjDHDO>

Where appropriate, dependent on the instrument being specified, several standards written by IEC/TC29 are now split to cover three key areas, usually in separate Parts or Annexes of the standard. These are:

- full specifications of the instrument, which will also describe maximum permitted uncertainties of measurement for

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those testing the instrument

- detailed pattern evaluation tests (previously known as type testing) - a wide range of full tests against all the specifications of the standard for a *model* of instrument. This is mandatory in some countries, although not the UK, but nonetheless it is important for manufacturers who are exporting and in general to provide a high level of confidence in the performance of the instrument. These tests are usually performed by National Metrology Institutes, with one of the main centres being at PTB, Germany.
- detailed periodic tests, often known as periodic verification tests - a limited range of tests performed on an *individual specimen* of sound level meter on a *regular* basis, to assure the user that the performance of an instrument still conforms to the applicable specifications for a limited set of key tests, for the environmental conditions under which the tests were performed. Periodic testing is normally performed by accredited laboratories - in the UK the accreditation body is the United Kingdom Accreditation Service (UKAS).

Throughout the standards documents the aim is to ensure that testing is performed in a consistent manner at all testing laboratories wherever they may be, and to ensure that all specifications and tests can be readily understood.

Areas of work for each WG/MT

There is not space to discuss in detail here all the work of the WGs and MTs, but the following table explains the *main* areas of activity, as well as mentioning examples from the *current* (at the time of writing) or recent work programme. See table below.

Have your say

New input into standardisation activities is always welcome, and

ensures that more people have their say on draft documents. The main route is to apply to join the relevant BSI committee, EPL/29 in this case - if you are interested please contact the author or BSI directly. Documents are circulated electronically to Members and within EPL/29 most of the work is performed by email with typically only one meeting a year of about half a day, so membership is not too onerous. The IEC TC/29 Plenary meetings take place nominally every 18 months, meeting for a week at a host venue with two half-day plenary sessions and with the active WGs and MTs meeting on the other days during the week. The next plenary meeting takes place in Paris in November 2015. Some WGs and MTs also schedule additional meetings between the 18 month plenary sessions.

Another possible route for involvement is starting to emerge through the BSI Draft Review System. This involves registration on a BSI website, and within EPL/29 we have requested that IEC CD documents will be posted there as Drafts for Public Comment (DPC), as well as the ISO documents which are automatically uploaded to the site. There is then a means whereby you can make comments on the drafts, and these comments are sent to the relevant BSI committee (EPL/29 in this case), who will review and decide which of the comments will be included in the UK national comments on the document that are sent on to IEC by BSI. This Draft Review System can be accessed at <http://drafts.bsigroup.com/>

It would also be useful if there was some way the IOA could flag up to its members when relevant DPCs appear on this website, and some initial discussions have taken place on this. ◻

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| WG/MT no. | Title | Areas of activity |
|-----------|--|--|
| MT4 | Sound level meters | Edition 2 of IEC 61672 was published in 2013, and currently there is no ongoing work on sound level meters. MT4 is in the very early stages of considering revision to IEC 61252 'Specifications for personal sound exposure meters' |
| WG5 | Measurement microphones | Responsible for the IEC 61094 series of standards, including revisions. IEC 61094-3 on 'Primary method for free-field calibration of laboratory standard microphones by the reciprocity technique' is undergoing circulation to National Committees at the CDV stage, and IEC 61094-5 'Methods for pressure calibration of working standard microphones by comparison', has just been approved at CDV stage |
| WG10 | Audiometric equipment | Responsible for the IEC 60645 series of standards, including revisions. Edition 4 'Audiometric equipment - Part 1: Equipment for pure-tone and speech audiometry (amalgamated revision of IEC 60645-1 Ed.3.0 and IEC 60645-2 Ed.1.0)' is under circulation to National Committees as a CDV |
| WG13 | Hearing aids | Responsible for most of the IEC 60118 series of standards, including revisions. IEC 60118-0 Ed.4 - 'Hearing aids: Measurement of the performance characteristics of hearing aids' was published recently. Currently IEC 60118-13 Ed. 4.0 - 'Hearing aids: Electromagnetic compatibility (EMC)' has been approved for circulation as an FDIS. Also IEC 61669 Ed. 2.0 'Measurement of real-ear acoustical performance characteristics of hearing aids' is under circulation to National Committees as an FDIS, and IEC/TS 62886 Ed. 1.0 'Hearing aids: Method for measuring the electroacoustic performance up to 16 kHz' has been circulated and comments received at 2CD stage |
| MT17 | Sound calibrators | Working on the revision of IEC 60942:2003 'Sound calibrators' to produce an Edition 4. Document has been circulated to National Committees as a CD and comments received |
| MT18 | EMC requirements and updates of relevant IEC/TC 29 standards | The remit of this MT is to provide advice to all the TC29 WGs/MTs on EMC requirements as requested |
| MT19 | Revision of IEC 61260, Filters | A full revision of IEC 61260:1995 'Octave-band and fractional-octave band filters' has taken place. Part 1 on 'Specifications' was published in 2014 and Part 2 'Pattern evaluation tests' and Part 3 'Periodic tests' have been approved for publication |
| MT20 | Revision of IEC 60118-4, Induction loop systems | Responsible for IEC 60118-4 'Hearing aids: Induction loop systems for hearing aid purposes - System performance requirements'. Edition 3 was published in 2014 |
| WG21 | Head and ear simulators | Responsible for the IEC 60318 series of standards. IEC/TS 60318-7 'Head and torso simulator for the measurement of air-conduction hearing aids' is currently at CD stage with comments received |
| WG22 | Audio-frequency induction-loop systems and equipment for assisted hearing | Responsible for the IEC 62489 series of standards, with the latest publication in 2014 being Edition 2 of IEC 62489-2: 'Audio-frequency induction loop systems for assisted hearing : Methods of calculating and measuring the low-frequency magnetic field emissions from the loop for assessing conformity with guidelines on limits for human exposure' |
| MT23 | Revision of IEC 61265, Instruments for the measurement of aircraft noise certification | This MT has just been revived and is working on a revision of IEC 61265:1995 'Instruments for measurement of aircraft noise - Performance requirements for systems to measure one-third-octave-band sound pressure levels in noise certification of transport-category aeroplanes', with a WD currently available within the MT |