ORLab Technical Note

Ophthalmic Product Series

Issue 4

A series of technical notes to aid understanding of standards, reasons for failure to comply and hints on avoiding the problem.

Accreditation number 1923

Accredited since 1985

Differences between AS/NZS1337:1992 AND AS/NZS1337.1:2010

General

AS/NZS1337:1992 was written before AS/NZS1337.4, 5 and 6. The new version has been renumbered to reflect the, now, multipart nature of the standard. Parts 2 and 3 had been earmarked for other applications and will eventually be populated. Earlier in 2010 AS/NZS1337.0:2010 was published. This contains most of the definitions and is a copy of the draft ISO standard at the time. Some definitions from AS/NZS1337:1992 were not covered by ISO and are included in AS/NZS1337.1 for the time being. They have all been submitted to ISO for inclusion in the ISO draft.

AS/NZS1337.1 has been drafted to be technically equivalent with the European standards where the committee thought appropriate. The standard takes into account possible outcomes from the ISO committee in the preparation of the standards on both occupational eye and face protection and sunglasses (in particular, the test methods).

Highlighting the changes

There are many clauses which are unchanged and many in which the changes have no significant practical consequence. These will not be addressed. The remainder have been separated into significant and minimal changes, which require some action on your part (highlighted in bold) or no action other than noting respectively. The section on test methods is listed separately. This necessitates changes in ORLAB procedures rather than by manufacturers except where the manufacturer carries out their own testing.

Significant changes requiring some action

Old Clause 1.4.9 New Clause 1.4.6 Headform

Two headforms are now defined. The first is a 50%ile European head and this is consistent with the EN head. In 1992 the AS/NZS1337 definition was of the 50%ile European head in use at that time around Australia but with tolerances that included the head in use in Europe. The current specification reverses that relationship. That is, the dimensions are the European (and, for the time being, intended to be the ISO) but are termed "typical" so that the "Australian European" head is not precluded. This headform is now referred to as "Medium".

The second head is a "Small " headform. Manufacturers may choose the headform that testing will be carried out on. It does not preclude testing (and compliance) on both.

It is accepted that these headforms do not cover the range of head sizes in a diverse population such as Australia and the ISO committee is working on this issue but progress is slow. Eventually there should be a set of headforms.

Action: None essential. The European heads are available neoprene covered for impact testing and in glass-reinforced plastic with the area of coverage dimensions inscribed on it, which are very convenient.

As a separate issue, we now note that there are at least 3 suppliers of these heads worldwide and at least one appears to have incorrect markings. Since we source our heads from INSPEC in the UK, we can confirm that INSPEC heads are accurately marked. We have only seen photographs of one of the other types.

Section 2 (in both standards)

The title reflects the adoption of European terminology, which will be reflected throughout the document. AS/NZS1337.0:2010 explains the new (to us) terminology.

6.1.12 Ocular: generic term for the light transmitting part of an eye-protector (made of mesh, mineral or organic material) permitting vision, e.g. lens, visor, screen.

10.1.1 Filter, optical filter: regularly transmitting device used to modify the radiant or luminous flux, the relative spectral distribution, or both, of the radiation passing through it.

"Lens" is not defined but used with a number of other words that imply that a lens has intentional refractive power.

Thus
9.1.4 correcting lenses ; corrective lenses ; prescription lenses: subset of oculars having optical properties (focal power and or prismatic power) intended to correct the wearer's refractive error.

Would appear to be tautological!

In summary, a filter has radiation protective effects and a lens has intentional refractive power while an ocular has neither and this is the generic term now adopted.

Action: Change our terminology to suit.

Old clause 2.4.3 Refractive power of lenses New Clause 2.4.7 Refractive power of oculars

The 1992 requirement is specified in meridional powers and sets ±0.12 as the limit. The 2010 requirement is set as mean sphere and sets ±0.09 as the limit. In practice these are very similar in their effect although it needs re-examination of the data to be entirely sure. Prismatic power requirements remain the same. There is now a specified test for local aberrations that were previously covered by a qualitative clause.

Action: Probably none needed, the actual consequence are small.

Old Table 2.1 New Table 1 Transmittance requirements

The new table reflects the European practice that has already been incorporated into AS/NZS1067:2003. Instead of the Red Signal Visibility Factor and Violet Factor devised by Barry Clark in the 1960s we have the Q factors for red, yellow, green and blue signals devised by Ernst Sutter. The relationship between them has been demonstrated (Dain SJ (1993). Comparison of the transmittance and coloration requirements of the four national sunglass standards. Optom Vis Sci 70: 66-74.) and a copy of this paper is available upon request. The differences are not great but re-measurement and examination of the existing data would be necessary. For any filters tested since 2003 ORLAB already has the calculations, since the spectrophotometer program now covers AS/NZS1067:2003, AS/NZS1337:1992 and AS/NZS1337.1:2010.

The signal data for the calculation of Q values has been changed from the European practice (and, therefore, AS/NZS1067:2003). The original data came from Dr Ernst Sutter of PTB in Germany before the DIN standard (on which the European standard is based). Traffic signalling practices have changed over the years plus the blue signal specified did not meet the international standard requirement. The new signals represent modern practice in incandescent lit traffic signals. The effects of the change are more in principle than in practice. However, present practice is to change to light emitting diode signals for their much greater energy efficiency and much longer life. Data to calculate Q values for LED signals are included in the standard as an information exercise with the intention that the next revision of the standard will adopt the LED values (either instead of or as well as the incandescent). The Q values do change significantly with LED signals, most notably with the blue and, to a lesser extent, the green.

The new table also varies the ultraviolet requirements. Our experience over recent years is that eye protectors almost always easily pass both requirements. Existing transmittance data can be re-examined for compliance with the new requirements.

Action: Pay attention to any changes, they will be small. Pay attention to the Q values for LED signals, you will need to be prepared for the next revision of the standard.

Old Clause 2.9 Flame propagation New Clause 2.10 Resistance to ignition

New test. The accumulated experience of material properties that allowed us to determined the need for testing is lost. This test will need to be routinely added to the test programme.

Action: Testing necessary

New clause 3.2.6 Assessment of lateral protection

This is a new clause in AS/NZS1337.1:2010 that changes the way in which lateral protection (required when medium impact protection is claimed) is assessed. In borderline cases under AS/NZS1337:1992 we have been using this method to resolve doubt for some years. It is not consistently more or less stringent. Compliance is as much to do with changes in ear position and temple design as it is to do with the area of protection defined.

Action: Take care with designs that are close to the limit in AS/NZS1337:1992.

New Clause 3.3.8 Protection against high temperature

This is a new clause in AS/NZS1337.1:2010. The test method involves testing after exposure to 120C. The option to use the letter “H” to identify these eye and face protectors is introduced.

Action: Consider if this option is to be included in testing

New Section 4 Optional tests and claims

This is a new section in AS/NZS1337.1:2010. If you wish to make claims about ultraviolet (*eg* 100% UV protection), blue light protection or flame propagation (the last clause included with firefighters in mind), these clauses set out the criteria by which those claims may be justified. Clause 4.1 is consistent with AS/NZS1067:2003.

Minimal changes requiring noting but no action

Old clause 2.4.6 Fluorescence New Clause 2.4.8 Scattered light

The change is minimal in its practical consequences but removes the need to modify the haze meter. For dark samples (when the hazemeter doesn’t work) the option has been introduced to use the light diffusion method of EN167.

Old clauses 2.5 to 2.7 Low, medium and high impact New Clauses 3.2.6 3.2.7 Impact resistance

The specification of the balls has been made more specific and provision made for the 6mm ball and the ¼" (6.25mm) balls separately. The class of "Extra high impact" to match the European high impact requirement of a 6mm steel ball at 190m.s-1 has been introduced in clause 2.8. The impact grades above low impact remain optional.

3.2.5 (same clause in both) Dimensional requirements for eye shields and face shields

This has changed to the European method. It makes little practical difference except that a manufacturer may now specify which head is to be used.

3.5 same clause in both) Marking

Provision has been made to use either the AS/NZS1337:1992 marking or the European EN166 marking. This may save manufacturers from having to remark eye protection.

Test method Appendices

A The processes are much the same but include specific instructions for polarising, gradient and photochromic filters. These are consistent with AS/NZS1067:2003 and EN167. The formulae for calculation of Q values and transmittance values are refereed to AS/NZS1337.0(Int):2010.

C **NEW** Test method for polarizing axis comes from AS/NZS1067:2003 and EN167 and has been in use for many years in ORLAB. Testing of polarising lenses was not addressed previously.

D **NEW** This method for polarizing ratio is the same as that in the draft ISO sunglass standard. Testing of polarising lenses was not addressed previously.

E **NEW** This method for refractive power comes from AS/NZS1067:2003 and EN167 and has been in use for many years in ORLAB. AS/NZS1337:1992 had no test method specified.

F **NEW** This method for local variations in refractive power comes from AS/NZS1067:2003 and EN167 and has been in use for many years in ORLAB. AS/NZS1337:1992 had no test method specified.

G **NEW** This method for refractive power comes from AS/NZS1067:2003 and EN167 and has been in use for many years in ORLAB. AS/NZS1337:1992 had no test method specified.

H This is much the same as the previous Appendix B.

I **NEW** This method for light diffusion comes from AS/NZS1067:2003 and EN167 and has been in use for many years in ORLAB. It is an alternative to Appendix H when the filter is too dark for haze measurement.

J **NEW** This formalises methods that are widely used for the assessment of quality of material and surface.

K Same as previous C.

L Same as previous D.

M Same as previous E.

N Same as previous F.

O **NEW** This is the same as K to N but setting 190m.s^{-1} as the speed for the Extra High impact category.

P Same as previous G.

Q **NEW** Taken from EN168 and ISO drafts.

R Same as previous I.

S Same as previous J.

T Same as previous K.
U Same as previous L.
V Same as previous M.
W Same as previous N.
X Same as previous O.
Y **NEW** Optional method for claims of thermal stability.
Z Same as previous H

This advice is intended to be of a general nature and is not a substitute for your own evaluation of the situation. For specific information please refer to AS/NZS1337.0(Int):2010 and AS/NZS1337.1:2010.

Any specific questions, particularly on interpretation, should be addressed to www.standards.org.au

Questions on use of the Standards Mark and how the change of standards might affect your current licences to use the mark, contact www.saiglobal.com or www.benchmarkcertification.com.au.

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