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Draft Minimum Energy Performance Standards for LED Lighting Response from Lighting Council New Zealand

Lighting Council New Zealand (LCNZ) is the New Zealand industry association of lighting equipment manufacturers and importers, representing 28 New Zealand member companies. www.lightingcouncil.org.nz

This submission contains LCNZ suggestions and recommendations on the preliminary E3 Program draft MEPS addressing LED lighting efficiency and performance in Australia and New Zealand.

Overview Comment and Recommendations

- a) We suggest that there is a decreasing need for regulatory intervention in LED market activities. The development of LED technology has been advancing very appreciably in recent years so interventions of a mandatory nature to ensure more efficient alternatives to sunset technologies are needed to a lesser extent.
- b) We recommend that the number of product attributes to be monitored should be limited as far as practical in order to simplify implementation, performance verification and enforcement. The monitored parameters should be focused on a range of essential attributes that will assist with market delivery of a positive user experience.

- c) We recommend that MEPS for luminaires be confined to luminaires used in residential application only and remove all luminaire related requirements for commercial and industrial building applications. (See Scope below).
- d) We recommend the removal of 3000 Hr and 6000 Hr attributes for maintained values for lumen depreciation, colour performance and abrupt failure. These parameters are costly and time consuming for compliance and also for measurement, verification and enforcement tasks.
- e) We recommend the removal of monitored attributes that do not yet have a readily implementable international standard test methods available.
- f) We recommend the removal of attributes for commercial and industrial luminaires that are application dependent and are otherwise subject to AS/NZS lighting design standards for lighting scheme design and/or NZS or NZ Building Code requirements for systemic energy performance.
- g) We recommend that referenced product standards be aligned with international IEC/ISO/CIE standards to the maximum extent possible
- h) We recommend that the standards and building codes for lighting design and energy performance (NZS, AS/NZS, ABC and NZBC) for commercial and industrial lighting scheme design and application (noted in item e) above) be augmented by energy performance requirements similar to those in EN standards.
- i) We suggest that the enforcement of any MEPS regulatory measures that are implemented be a high priority for the relevant government agencies and that enforcement tasks are adequately resourced.

Scope – Commercial and Industrial Luminaires

Our recommendation is that MEPS for luminaires be confined to luminaires used in residential application only and energy performance requirements for commercial and industrial building applications be lighting systems based is explained below.

Applying product efficacy requirements for “designed applications” such as commercial and industrial buildings is no longer international best practice. An efficacy limit (lm/W) for commercial and industrial luminaires may not be effective as high efficacy luminaires can be used in inappropriate ways and in such cases may deliver an overall result with poor energy performance.

It is more appropriate from both a practical and regulatory standpoint (via design standards and building codes) to introduce application specific energy requirements for lighting systems using the metric of **kWh/m²/year** with calculated outcomes for specific projects. This is the European (commercial and industrial) interior lighting metric the Lighting Energy

Numeric Indicator (LENI). This is defined in the European standard *EN 15193: 2007 Energy performance of buildings — Energy requirements for lighting* and specifies the calculation methodology for lighting system energy performance. This approach will help to incentivise the use of smart lighting controls, including constant light output (CLO) technology, as it will provide the descriptors, the metrics, the calculation methods and the reporting methods to quantify and communicate the resultant energy performance from the application of smart switching and variable light levels available with modern LED luminaires and control systems.

We recommend consideration of the principles of *EN 15193: 2007 Energy performance of buildings — Energy requirements for lighting*. Such an approach is consistent with forthcoming European Commission Ecodesign regulations. EPBD (Energy Performance of Buildings Directive)

Lamp Product Type Organisation

IEC Standards

This MEPS document is organised by:

- a) Non-directional lamps
- b) Directional lamps
- c) Linear lamps

The IEC performance standards for lamps are organised by technology:

- a) LED lamps >50V (230V)
- b) LED lamps <50V (12V)
- c) Linear LED lamps

Recommendation: harmonise structure of lamp requirements with IEC approach.

Table 1 - Lamps - Performance requirements

Attribute - Life

Current IEC and IESNA standards only describe the life characteristics and do not define a measurement and calculation method.

Recommendation: Remove attributes that do not yet have readily implementable international standard test methods available.

Section 11 - Premature lamp failure rate

3000Hr and 6000Hr requirements. These attributes are expensive and time consuming for measurement, verification and enforcement in the field.

Recommendation: Remove attributes that are not practical to implement and enforce.

Section 13 - Lumen maintenance

How will these 3000Hr and 6000Hr requirements be measured, verified and enforced in the field? These attributes are expensive and time consuming for measurement, verification and enforcement.

Recommendation: Remove attributes that are not practical to implement and enforce.

Section 14 - Rated Life Declaration

There is no standard available that explains how to measure and calculate to allow for fair comparison.

Recommendation: Remove attributes that do not yet have readily implementable international standard test methods available

Section 16 - Warranty duration

Warranty provisions are a commercial consideration. Is this applicable in a MEPS technical intervention?

Warranty commercial and legal terms and conditions need to be defined to harmonise in the market as “warranty quality” may be a market problem.

If warranties become mandatory the technical requirements for maintained values and lifetime declarations are not relevant (double coverage).

Recommendations: Remove attributes that may not be necessary. Define warranty attributes. Do not double up on attributes.

Section 17 - Power Factor

Recommendation: Use IEC 62612 LED lamps > 50V performance requirements Annex D.

LED lamps < 50V.

There is no performance standard to measure Power Factor.

Recommendation: Remove attributes that do not yet have readily implementable international standard test methods available

Linear LED lamps.

There is no performance standard to measure Power Factor.

Recommendation: Remove attributes that do not yet have readily implementable international standard test methods available

Linear LED lamps.

Recommendation: Only require power factor for lamps directly mains connected.

Section 19 - Dimmer compatibility

Test method to be developed.

Recommendation: Remove attributes that do not yet have readily implementable international standard test methods available.

Section 20 - ELV converter compatibility

Test method to be developed.

Recommendation: Remove attributes that do not yet have a readily implementable international standard test methods available.

Section 22 – Flicker

Recommendation: Refer to *IEC TR 61547 Equipment for general lighting purposes – EMC immunity requirements – Part 1: An objective voltage fluctuation immunity test method*

Section 23 - Glare

Glare Limits are application dependent and are embedded where relevant, in particular lighting design standards and regional implementation specifications.
There is no need to define glare at the luminaire level.
Recommendation: Remove attributes that are addressed elsewhere.

Table 2 – Integrated LED luminaires

Section 1 - Efficacy

MEPS for luminaire efficacy (lm/W) should be confined to luminaires used in residential application only and energy performance requirements for commercial and industrial building applications be lighting systems based.
Recommendation: Remove luminaire efficacy attributes for commercial and industrial luminaires.

Section 2 - Replacement Lamp Equivalence

One for One replacement is only relevant for residential building application. Commercial and industrial application will be lighting design standards based. There is no need to specify this at the luminaire level.
Recommendation: Remove replacement lamp equivalence for commercial and industrial luminaires.

Section 3 - Centre beam luminous intensity

Centre beam luminous intensity is only relevant for residential building application. Commercial and industrial application will be lighting design standards based. There is no need to specify this at the luminaire level.
Recommendation: Remove centre beam luminous intensity for commercial and industrial luminaires.

Section 4 - Light distribution tolerancing

Light distribution tolerancing is only relevant for residential building application. Commercial and industrial application will be lighting design standards based. There is no need to specify this at the luminaire level.
Recommendation: Remove light distribution tolerancing for commercial and industrial luminaires.

Section 7 - Smart Lighting – controlled variations in power consumption

Energy Star test method is for lamps only, not luminaires.
Recommendation: Remove attributes that do not yet have readily implementable international standard test methods available.

Smart 8 - Colour Rendering

Colour rendering attributes are only relevant for residential building application. Commercial and industrial application will be lighting design standards based. There is no need to specify this at the luminaire level.
Recommendation: Remove colour rendering attributes for commercial and industrial luminaires.

Section 9 - Colour Appearance

This section is for integrated luminaires. If luminaires have interchangeable LED lamps then there is no need to specify at luminaire level.

Recommendation: Remove lamp criteria from luminaire section.

Section 11 - Premature luminaire failure rate

3000Hr and 6000Hr requirements. These attributes are expensive and time consuming for measurement, verification and enforcement in the field.

Recommendation: Remove attributes that are not practical to implement and enforce.

Section 13 - Lumen maintenance

3000Hr and 6000Hr requirements. These attributes are expensive and time consuming for measurement, verification and enforcement in the field.

Recommendation: Consider removal of attributes that are difficult to enforce.

If implemented, base requirements on:

IEC 62722-2-1 Performance requirements for LED based luminaires

IEC 62717 Performance requirements for LED modules

Section 14 - Rated Life Declaration

There is no standard available to measure or calculate to undertake fair comparison.

Recommendation: Remove attributes that do not yet have readily implementable international standard test methods available.

Section 15 - Minimum Rated Life, F50

For commercial and industrial luminaires two separate lifetime values LB (depreciation) and LC (catastrophic failure) are normally used.

Recommendation: Use LB and LC attributes for commercial and industrial luminaires.

Section 16 - Warranty duration

Warranty is a commercial consideration, is this applicable in a MEPS technical intervention?

Warranty commercial and legal terms and conditions need to be defined to harmonise in the market as "warranty quality" may be a market problem.

If warranties become mandatory the technical requirements for maintained values and lifetime declarations are not relevant (double coverage).

Recommendations: Remove attributes that may not be necessary. Define warranty attributes. Do not double up on attributes.

Section 19 - Dimmer compatibility

Test method to be developed.

Recommendation: Remove attributes that do not yet have a readily implementable international standard test methods available.

Section 21 – Flicker

Recommendation: Refer to *IEC TR 61547 Equipment for general lighting purposes – EMC immunity requirements – Part 1: An objective voltage fluctuation immunity test method.*

Section 22 - Glare

Glare Limits are application dependent and are embedded where relevant, in particular lighting design standards and regional implementation specifications.

There is no need to define glare at the luminaire level.

Recommendation: Remove attributes that are addressed elsewhere.

Table 3: Proposed product package marking requirements

Section 11 - Ballast compatibility information

This will usually comprise a list of a range of products and the lack of physical space on the ballast will limit product labelling opportunity.

Recommendation: Remove attribute for product based labelling.

Table 4: Proposed test conditions

Section 2 - Replacement Lamp Equivalence

Not relevant for luminaires

Recommendation: Remove requirement.

Section 3 - Standby Power (smart lamps only)

For commercial and industrial luminaires there is no standard for measurement of stand-by power.

Recommendation: Remove attributes that do not yet have readily implementable international standard test methods available

Section 6 - Colour Rendering

Colour rendering attributes are only relevant for residential building application.

Commercial and industrial application will be lighting design standards based. There is no need to specify this at the luminaire level.

Recommendation: Remove colour rendering attributes for commercial and industrial luminaires.

Section 7 - Lumen maintenance

Recommendation:

For LED based luminaires:

IEC 62722-2-1 Performance requirements for LED based luminaires

IEC 62717 Performance requirements for LED modules

For LED lamps >50V:

IEC 62612 performance retrofit LED Lamps >50V

Section 8 - Premature lamp failure rate

Recommendation:

For LED based luminaires:

IEC 62722-2-1 Performance requirements for LED based luminaires
IEC 62717 Performance requirements for LED modules

For LED lamps >50V:

IEC 62612 performance retrofit LED Lamps >50V

Section 11 - Dimmer compatibility

Recommendation: Remove attributes that do not yet have readily implementable international standard test methods available

Section 12 - ELV converter compatibility

Recommendation: Remove attributes that do not yet have a readily implementable international standard test methods available

Section 18 - Colour maintenance

Recommendation:

For LED based luminaires:

IEC 62722-2-1 Performance requirements for LED based luminaires

IEC 62717 Performance requirements for LED modules

For LED lamps >50V:

IEC 62612 performance retrofit LED Lamps >50V

We hope this information is useful and are available to discuss details at any point.

Yours faithfully



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