Self-ballasted compact fluorescent lamps for general lighting services - performance limits

At the request of members, *lites.asia* have developed the following draft performance limits for CFLs. We are planning to submit these proposed draft performance limits for CFLs for consideration as a technical specification at the next meeting of the IEC in September 2012.

If you have any comments on these proposals, please send these comments to us at info@lites.asia **before the end of July 2012**. Also, please advise your National IEC representative that these proposals are being made at the next IEC meeting and encourage them to support the consideration of the proposals for review by an IEC working group.

TS XXXXXX - Self-ballasted compact fluorescent lamps for general lighting services - performance limits

DRAFT

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Self-ballasted compact fluorescent lamps for general lighting services - performance limits

1 Scope

This technical specification specifies a number of performance limits that can be applied to self-ballasted compact fluorescent lamps intended for general lighting services.

This Standard applies to self-ballasted compact fluorescent lamps of voltages > 50V and all power ratings with lamp caps complying with IEC 60061-1.

NOTE: Some features of this standard may be applicable to self-ballasted compact fluorescent lamps of voltages ≤ 50V and to other types of self-ballasted gas discharge lamps.

The methods of test to determine compliance with the performance limits in this technical specification are described in IEC 60969.

1 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050(845), International Electrotechnical Vocabulary—Lighting

IEC 60969, Self-ballasted compact fluorescent lamps for general lighting services - performance requirements

2 Terms and definitions

For terms and definitions refer to IEC 60969.

3 Performance Criteria: assessment and compliance

3.1 General

A lamp, on which compliance with this standard is claimed, shall comply with the requirements of IEC 60968 and IEC 60969.

3.2 Performance requirements

A lamp claiming to comply with a tier listed in Table 1 shall comply with all of the corresponding parameters listed in Table 1.

Table 1 - Compliance criteria

<table>
<tr><th>Parameter</th><th colspan="3">Tier 1
(basic)</th><th colspan="3">Tier 2
(standard)</th><th>Tier 3
(high)</th><th>Tier 4
(aspirational)</th><th>Compliance</th></tr>
<tr><td rowspan="6">Min efficacy (lm/W) (bare lamps) [1]</td><td>Wattage</td><td>≤ 4500K</td><td>> 4500K</td><td>Wattage</td><td>≤ 4500K</td><td>> 4500K</td><td rowspan="6">$\frac{1}{\frac{0.24}{\sqrt{F}}+0.0103}$
Where F = initial luminous flux in lumens</td><td rowspan="6">TBA</td><td rowspan="6">Mean measured value shall be ≥ tier value, and all samples shall measure ≥ 90% of tier value.</td></tr>
<tr><td>< 5W</td><td>40</td><td>36</td><td>< 5W</td><td>45</td><td>42</td></tr>
<tr><td>5W to < 9W</td><td>44</td><td>40</td><td>5W to < 9W</td><td>50</td><td>46</td></tr>
<tr><td>9W to < 16W</td><td>48</td><td>44</td><td>9W to < 16W</td><td>55</td><td>52</td></tr>
<tr><td>16W to < 25W</td><td>55</td><td>51</td><td>16W to < 25W</td><td>60</td><td>57</td></tr>
<tr><td>≥ 25W</td><td>60</td><td>57</td><td>≥ 25W</td><td>65</td><td>62</td></tr>
<tr><td>Min efficacy (lm/W) (covered lamps)</td><td colspan="3">80% of bare lamp value</td><td colspan="3">80% of bare lamp value</td><td>85% of bare lamp value</td><td>85% of bare lamp value</td><td></td></tr>
<tr><td>Min efficacy (lm/W) (reflector lamps)</td><td colspan="3">60% of bare lamp value</td><td colspan="3">60% of bare lamp value</td><td>60% of bare lamp value</td><td>60% of bare lamp value</td><td></td></tr>
<tr><td>Min lumen maintenance @ 2000hrs</td><td colspan="3">≥80%</td><td colspan="3">≥80%</td><td>≥88%</td><td>TBA</td><td rowspan="3">Mean measured value shall be ≥ tier values, and all samples shall measure ≥ 90% of tier values.</td></tr>
<tr><td>Min lumen maintenance @ 6000hrs</td><td colspan="3">≥70%</td><td colspan="3">≥70%</td><td>≥78%</td><td>TBA</td></tr>
<tr><td>Min lumen maintenance @ 10000hrs</td><td colspan="3">-</td><td colspan="3">-</td><td>≥75%</td><td>TBA</td></tr>
<tr><td>Chromaticity coordinates (max SDCM)</td><td colspan="3">7</td><td colspan="3">5</td><td>5</td><td>3</td><td>Chromaticity coordinates of all samples shall measure ≤ tier value.</td></tr>
<tr><td>Min colour rendering index (CRI)</td><td colspan="3">80</td><td colspan="3">80</td><td>80</td><td>90</td><td>CRI of all samples shall measure ≥ tier value.</td></tr>
<tr><td>Max starting time (seconds)</td><td colspan="3">2.0</td><td colspan="3">1.5</td><td>1.0</td><td>0.5</td><td>Mean measured value shall be ≤ tier value, and all samples shall start within tier value + 0.25 seconds.</td></tr>
<tr><td>Max run-up time (seconds to 60% flux)</td><td colspan="3">180</td><td colspan="3">180</td><td>60</td><td>30</td><td>The mean measured time, to reach the specified percentage of initial luminous flux, shall be ≤ the tier value.
All samples shall reach the specified percentage of initial luminous flux within 125% of the tier value.</td></tr>
</table>

Parameter	Tier 1 (basic)	Tier 2 (standard)	Tier 3 (high)	Tier 4 (aspirational)	Compliance
Min median lifetime (hours)	6000	8000	10000	12000	≥ 50% of samples shall survive to the tier value.
Min switching withstand (cycles)	3000	4000	10000	12000	≥ 50% of samples shall survive to the tier value.
Power Quality – Displacement Factor	All samples shall measure within limits listed in Annex J (IEC606969), and all samples shall measure within rated limits	All samples shall measure within limits listed in Annex J (IEC606969), and all samples shall measure within rated limits.	All samples shall measure within limits listed in Annex J (IEC606969), and all samples shall measure within rated limits	All samples shall measure within limits listed in Annex J (IEC606969), and all samples shall measure within rated limits	
Power Quality – Distortion Factor	All samples shall be within limits for harmonic distortion as per IEC 61000-3-2, and all samples shall measure within rated limits.	All samples shall be within limits for harmonic distortion as per IEC 61000-3-2, and all samples shall measure within rated limits.	All samples shall be within limits for harmonic distortion as per IEC 61000-3-2, and all samples shall measure within rated limits.	All samples shall be within limits for harmonic distortion as per IEC 61000-3-2, and all samples shall measure within rated limits.	
Maximum mercury content (mg)	5	3	2.5	2.5	
Claimed extended conditions –% Light output – condition tested: extreme temperature	?	?	?		
Claimed extended conditions – Premature failure. Conditions tested: extreme temperature, extreme humidity, extreme voltage	?	?	?		
Max premature failure rate	?	?	Maximum 10% at 30% rated life		

[1] Note The efficacy binning in tier 1 & 2 is based on current standards available at this level but it is proposed this be replaced with efficacy curves for greater consistency with tier 3.