• Present regulations in the European Union
• Omnibus revision of the regulations
• SEAD Lighting Awards
• Global Lighting Challenge
Transforming the market by ecodesign and labelling... and more!

Ecodesign, incl. Info & benchmark

Energy labelling

Manufacturer, importer, retailer, installer

Market

Green Public Procurement

TopTen

Consumer
Transforming the *lighting* market

1. Ecodesign (MEPS)
2. Energy labelling
3. Fore runners & Top notch

Energy efficiency
Lighting Product Regulations


3. Ecodesign regulation 1194/2012 for LED and directional lamps

4. Energy labelling 874/2012 of lamps and luminaires

5. Online energy labelling 518/2014 A++

6. Harmonisation and sharpening of definition of special lamps 1428/2015 – phase out industrial incandescent and vintage lamps
Sharper definition of exemption from ecodesign as special lamp (1428/2015) from Feb 27, 2016

• Vintage (Edison style) lamps phased out due to existing energy efficient alternatives

• LED-filament lamp 40 x more efficient!

• Industrial (shock absorbing) incandescent lamps phased out due to existing energy efficient alternatives
Energy labels of light sources and luminaires

Lamps: A++ to E

Luminaires: Info on the lamp

This luminaire contains built-in LED lamps and has sockets for bulbs of the energy classes: A++, A+, A, B, C, D, E.

The LED lamps cannot be changed in the luminaire.
Sales within EU: measured and prognoses
European policy work revising current Lighting Regulations

- Initiated a review of all lighting regulations in Europe 2014
- Ecodesign
  - EC 244/2009 – household, non-directional
  - EC 245/2009 – professional lighting, tertiary sector
  - EU 1194/2012 – directional lamps and all types of LED
  - And amendments
- Energy labelling
  - EC 874/2012 – energy label for lighting
  - And amendments
- Had a draft measure published in November 2015 with public consultation meeting in December 2015
- Re-worked the proposal: Consultation in December 2017, possible vote early 2018
- For information, visit: https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficient-products/lighting
1.1. Light sources

The declared power consumption of a light source at full-load $P_{on}$ shall not exceed the maximum allowed power $P_{onmax}$ (in W), defined in function of the declared useful luminous flux $\Phi_{use}$ (in lm) and the declared colour rendering index $CRI$ (in $Ra$) as follows:

$$P_{onmax} = C \times (L + \Phi_{use} / (F \times \eta)) \times R$$

Where:

- The values for threshold efficacy ($\eta$ in $lm/W$) and end loss factor ($L$ in $W$) are specified in Table 1, depending on the light source type.
- Basic values for correction factor ($C$) depending on light source type, and additions to $C$ for special light source features are specified in Table 2.
- Efficacy factor ($F$) is:
  - 1.00 for non-directional light sources (NDLS, using total flux)
  - 0.85 for directional light sources (DLS, using flux in a cone)
- $CRI$ factor ($R$) is:
  - 0.65 for $CRI \leq 25$
  - $((CRI + 80)/160)$ for $CRI > 25$

- Efficacy requirements
- Performance requirements (not shown here)
- Market surveillance instructions (not shown here)
### New draft on the omnibus *ecodesign* regulation - the “one equation” regulation (2)

<table>
<thead>
<tr>
<th>Light source description</th>
<th>$\eta$</th>
<th>$L$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[lm/W]</td>
<td>[W]</td>
</tr>
<tr>
<td>LFL T5-HE</td>
<td>98,8</td>
<td>1,9</td>
</tr>
<tr>
<td>LFL T5-HO, 4000≤$\Phi$≤5000 lm</td>
<td>83</td>
<td>1,9</td>
</tr>
<tr>
<td>LFL T5-HO, other lm output</td>
<td>79</td>
<td>1,9</td>
</tr>
<tr>
<td>FL T5 circular</td>
<td>79</td>
<td>1,9</td>
</tr>
<tr>
<td>FL T8 other than LFL 2-, 4- and 5-foot (incl. FL T8 U-shaped)</td>
<td>89,7</td>
<td>4,5</td>
</tr>
<tr>
<td>FL using magnetic induction, any length/flux</td>
<td>70,2</td>
<td>2,3</td>
</tr>
<tr>
<td>CFLni</td>
<td>70,2</td>
<td>2,3</td>
</tr>
<tr>
<td>FL T9 circular</td>
<td>71,5</td>
<td>6,2</td>
</tr>
<tr>
<td>HPS single-ended</td>
<td>88</td>
<td>50</td>
</tr>
<tr>
<td>HPS double-ended</td>
<td>78</td>
<td>47,7</td>
</tr>
<tr>
<td>MH $\leq$ 405 W single-ended</td>
<td>84,5</td>
<td>7,7</td>
</tr>
<tr>
<td>MH $&gt; 405$ W single-ended</td>
<td>79,3</td>
<td>12,3</td>
</tr>
<tr>
<td>MH ceramic double-ended</td>
<td>84,5</td>
<td>7,7</td>
</tr>
<tr>
<td>MH quartz double-ended</td>
<td>79,3</td>
<td>12,3</td>
</tr>
<tr>
<td>Organic light-emitting diode (OLED)</td>
<td>65</td>
<td>1,5</td>
</tr>
<tr>
<td>HL R7s $\leq$ 2700 lm</td>
<td>26</td>
<td>13</td>
</tr>
<tr>
<td>Other light sources in scope not mentioned above</td>
<td>120</td>
<td>1,5*</td>
</tr>
</tbody>
</table>

- OLED included for the first time
- “Other”: basically = LED
New draft on the energy labelling

- Luminaires are dropped
- The scale is back to A – G (as for all products eventually)
- Top two classes empty to begin with
• Based on \( lm/W \) instead of on Energy Efficiency Index (EEI)

\[
\eta_{TM} = \left( \frac{\Phi_{use}}{P_{on}} \right) \times F_{TM} \ (lm/W).
\]

### Table 1

<table>
<thead>
<tr>
<th>Energy efficiency class</th>
<th>Total mains efficacy ( \eta_{TM} ) (( lm/W ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>( 210 \leq \eta_{TM} )</td>
</tr>
<tr>
<td>B</td>
<td>( 185 \leq \eta_{TM} &lt; 210 )</td>
</tr>
<tr>
<td>C</td>
<td>( 160 \leq \eta_{TM} &lt; 185 )</td>
</tr>
<tr>
<td>D</td>
<td>( 135 \leq \eta_{TM} &lt; 160 )</td>
</tr>
<tr>
<td>E</td>
<td>( 110 \leq \eta_{TM} &lt; 135 )</td>
</tr>
<tr>
<td>F</td>
<td>( 85 \leq \eta_{TM} &lt; 110 )</td>
</tr>
<tr>
<td>G</td>
<td>( 85 \leq \eta_{TM} )</td>
</tr>
</tbody>
</table>

### Table 2

Factors \( F_{TM} \) to be used for determination of \( \eta_{TM} = \left( \frac{\Phi_{use}}{P_{on}} \right) \times F_{TM} \ (lm/W) \)

<table>
<thead>
<tr>
<th>Light source type</th>
<th>Factor ( F_{TM} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-directional mains light source (NDLS, MLS)</td>
<td>1.000</td>
</tr>
<tr>
<td>Non-directional non-mains light source (NDLS, NMLS)</td>
<td>0.926</td>
</tr>
<tr>
<td>Directional mains light source (DLS, MLS)</td>
<td>1.176</td>
</tr>
<tr>
<td>Directional non-mains light source (DLS, NMLS)</td>
<td>1.089</td>
</tr>
</tbody>
</table>
SEAD Global Efficiency Medal Award

- A global competition to find the most efficient models in the market
- Competition criteria are published with minimum quality spec, and manufacturers compete on the basis of highest efficiency
- Verification testing is conducted and awards made
- Most recent competition was (1) high and low-bay luminaires and (2) street lighting luminaires

<table>
<thead>
<tr>
<th>Category</th>
<th>Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-Bay and Low-Bay</td>
<td>2500 to &lt;15,000 lumens 2700 to &lt;3500K CCT</td>
</tr>
<tr>
<td>Luminaires</td>
<td>2500 to &lt;15,000 lumens 3500 to &lt;5000K CCT</td>
</tr>
<tr>
<td></td>
<td>2500 to &lt;15,000 lumens 5000 to 6500K CCT</td>
</tr>
<tr>
<td></td>
<td>≥15,000 lumens 2700 to &lt;3500K CCT</td>
</tr>
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<tr>
<td></td>
<td>≥15,000 lumens 5000 to 6500K CCT</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Lighting</td>
<td>2500 to &lt;10,000 lumens 2700 to &lt;3500K CCT</td>
</tr>
<tr>
<td>Luminaires</td>
<td>2500 to &lt;10,000 lumens 3500 to &lt;5000K CCT</td>
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For more information visit: [http://www.superefficient.org/Global-Efficiency-Medal/Lighting-Awards](http://www.superefficient.org/Global-Efficiency-Medal/Lighting-Awards)
SEAD Global Efficiency Medal Award (2)


- LumoLumen b.v. - 12K Polaris LB
- LumoLumen b.v. - 24K Polaris HB
- Bajaj Electricals Limited - BRTFG 60 W LED WH XE
SEAD Global Efficiency Medal Award (3)

- One of the five winners, an LED luminaire fixture efficacy of 146 lm/W

<table>
<thead>
<tr>
<th>SEAD Global Efficiency Medal Verification Testing Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Output (lm)</td>
</tr>
<tr>
<td>On-mode power (W)</td>
</tr>
<tr>
<td>Luminaire Efficacy (lm/W)</td>
</tr>
<tr>
<td>CRI (Ra)</td>
</tr>
<tr>
<td>Correlated Colour Temperature (CCT)</td>
</tr>
<tr>
<td>Chromaticity Duv</td>
</tr>
<tr>
<td>Power factor (&gt;0.9)</td>
</tr>
<tr>
<td>Website</td>
</tr>
</tbody>
</table>

For more information visit: [http://www.superefficient.org/Global-Efficiency-Medal/Lighting-Awards](http://www.superefficient.org/Global-Efficiency-Medal/Lighting-Awards)
The Global Lighting Challenge

• A campaign of the Clean Energy Ministerial (CEM)
• Launched 2015
• A global race to reach cumulative sales of 10 billion high-efficiency, high-quality and affordable advanced lighting products
• Public and private sector partners
• Can run national mirror campaigns – e.g. The Swedish Lighting Challenge

For more information visit: http://www.globallightingchallenge.org/
The Global Lighting Challenge (2)

- Over 13 billion LED lighting products pledged toward 10 billion goal!

- Endorsed by 16 countries and the European Commission, 2 subnational governments, and over 40 businesses and other stakeholders
Summary

Lighting Product Regulations
3. Ecodesign regulation 1194/2012 for LED and directional lamps
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For more information visit: http://www.sead-acl.org/energy-efficiency/medal/lighting-awards
For more information visit: http://www.globallightingchallenge.org/
Thank you for your attention!
Any questions?

- SSL Annex Website: [http://ssl.iea-4e.org/](http://ssl.iea-4e.org/)

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Philips “DubaiLamp”
200 lumens/Watt - 3W model
600 lumens (~ 60W incandescent)
4 x better than CFL
15 x better than halogen