



PRODUCT CALCULATION SHEET

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|----------------------------|---------------------------------------|
| Brandname | LSC |
| Product description | LSC Smart Ceiling Light |
| EAN Code | 8712879162643 |
| Product code | 3206306 (factory model number: TBD14) |

| | |
|-----------------------|------------------|
| Lamp type | - |
| Main/non-mains | Mains |
| Φ_{use} | 2300 |
| P_{on} | 22.0 |
| P_{ftm} | 1.000 |
| CTLS (for Smart) | Yes |
| CCT (colour tuneable) | RGB + 2200-6500K |
| CRI | 80 |

Within directives (EU) 2019/2015 and (EU) 2019/2020 several calculations are required. This document provides the below mentioned calculations are provided:

1. Energy efficiency class calculation
2. Energy consumption calculation
3. Claimed equivalent incandescent lamp power calculation

1. Energy efficiency class calculations

The Energy efficiency class calculations of light sources as set out in Table 1, annex II from Regulation (EU) 2019/2015 on basis of the total mains efficiency η_{TM} , which is calculated by dividing the declared useful luminous flux Φ_{use} (expressed in *lm*) by the declared on-mode power consumption P_{on} (expressed in *W*) and multiplying by the applicable factor F_{TM} of tables 2, annex II from Regulation (EU) 2019/2015.

$$\eta_{TM} = (\Phi_{use}/P_{on}) \times F_{TM} \text{ (lm/W)}$$

$$\eta_{TM} = (2300/22,00) \times 1,000 = 104$$

The Energy efficiency class = F

Table 1
Energy efficiency classes of light sources

| Energy efficiency class | Total mains efficacy η_{TM} (lm/W) |
|-------------------------|---|
| A | $210 \leq \eta_{TM}$ |
| B | $185 \leq \eta_{TM} < 210$ |
| C | $160 \leq \eta_{TM} < 185$ |
| D | $135 \leq \eta_{TM} < 160$ |
| E | $110 \leq \eta_{TM} < 135$ |
| F | $85 \leq \eta_{TM} < 110$ |
| G | $\eta_{TM} < 85$ |

Table 2
Factors F_{TM} by light source type

| Light source type | Factor F_{TM} |
|--|-----------------|
| Non-directional (NDLS) operating on mains (MLS) | 1,000 |
| Non-directional (NDLS) not operating on mains (NMLS) | 0,926 |
| Directional (DLS) operating on mains (MLS) | 1,176 |
| Directional (DLS) not operating on mains (NMLS) | 1,089 |

2. Calculation of the energy consumption

The weighted energy consumption (E_c) is calculated in kWh/1000h as follows and is rounded up to two decimal places:

$$E_c = (P_{on} \times 1000h) \div 1000$$

Where P_{on} is the power corrected for any control gear losses in accordance with above.

The weighted energy consumption (E_c) as printed on the energy label:

$$22 = (22,00 \times 1000) \div 1000$$

3. Claimed equivalent incandescent lamp power

For the non-directional light source, the equivalent wattage with an incandescent lamp is calculated and rounded up to 1W, based on Table 7, annex V from Commission Delegated Regulation (EU) 2019/2015. The intermediate values of both the luminous flux and the claimed incandescent lamp shall be calculated by linear interpolation between the two adjacent values.

The equivalent wattage for this non-directional light source is calculated as follows:

$$100 + (2300 - 1521) \times ((150 - 100) \div (2452 - 1521))$$

The equivalent wattage $\approx 142W$

Table 7

Equivalence claims for non-directional light sources

| Rated light source luminous flux Φ (lm) | Claimed equivalent incandescent light source power (W) |
|--|---|
| 136 | 15 |
| 249 | 25 |
| 470 | 40 |
| 806 | 60 |
| 1 055 | 75 |
| 1 521 | 100 |
| 2 452 | 150 |
| 3 452 | 200 |