TRIDONIC

## Module LLE 24x1120 / 24x1400mm CRI90 HV ADV6

Modules LLE advanced



LLE 24x1120mm 2600lm HV ADV6



LLE 24x1400mm 3250lm HV ADV6



LLE 24x1120mm 4800lm HV ADV6

**Product description**
_ Ideal for linear and panel lights
_ 2 terminals for serial wiring
_ Perfectly uniform light, even if several LED modules are used together in a line
_ Push terminals for quick and simple wiring of LED module to LED module
_ Option backside terminal
_ Broad portfolio from extruded lenses and covers available
_ HE ... High Efficiency, NM ... Nominal Mode, HO ... High Output
_ Long lifetime up to 102,000 hours
_ 5 years guarantee (conditions at https://www.tridonic.com/en/int/services/manufacturer-guarantee-conditions)

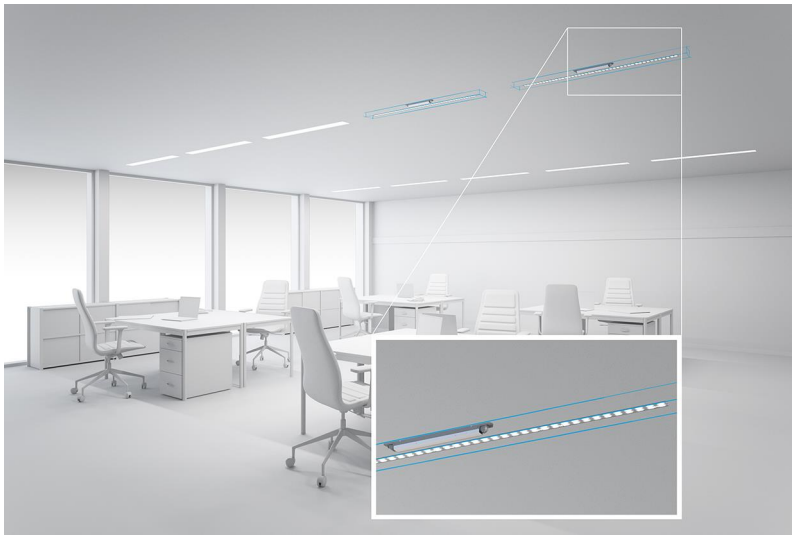
**Optical properties**
_ Colour temperatures 3,000 and 4,000 K
_ Efficacy of the LED module 172 lm/W at Irated and tp = 25 °C
_ High colour rendering index CRI > 90
_ High colour consistency (MacAdam 3) ①
_ Small luminous flux tolerances

**Mechanical properties**
_ Module dimension 24 x 1,120 mm and 24 x 1,400 mm (ZHAGA compliant)
_ Simple installation via clips or screws

**System solution**
_ Combine Tridonic's LED modules and dimmable drivers to achieve an outstanding system efficacy (configuration possible via https://setbuilder.tridonic.com/)

① Integral measurement over the complete module.

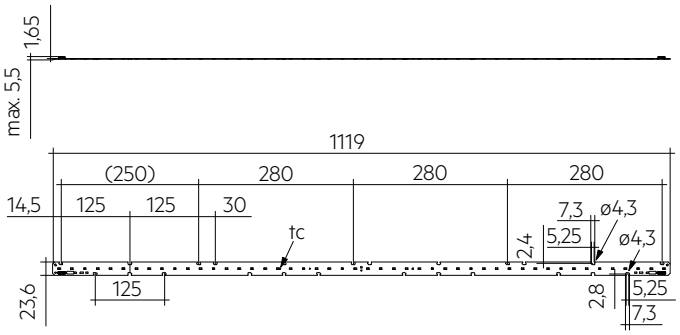
**Website**
http://www.tridonic.com/28004842



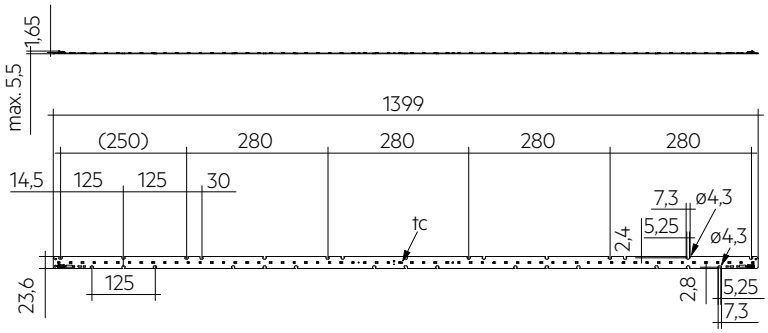
Linear | High bay | Decorative | Downlights | Spotlights | Free-standing | Area | Floor | Wall | Street

## Module LLE 24x1120 / 24x1400mm CRI90 HV ADV6

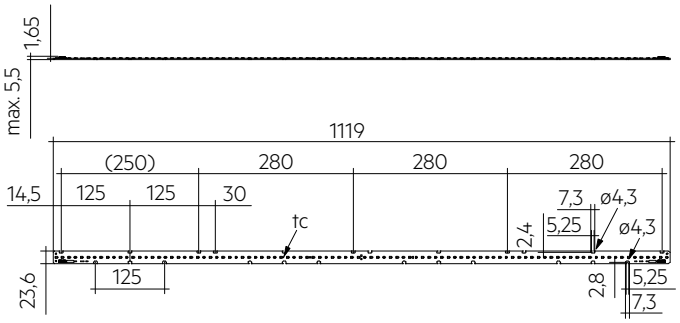
Modules LLE advanced



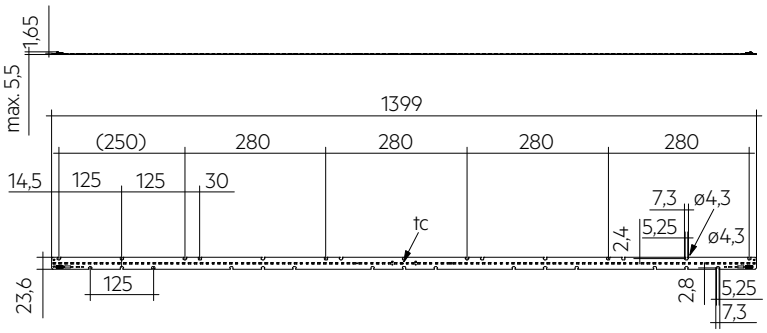

LLE 24x1120mm 2600lm HV ADV6




LLE 24x1400mm 3250lm HV ADV6




LLE 24x1120mm 4800lm HV ADV6




LLE 24x1400mm 6000lm HV ADV6

## Ordering data

| Type | Article number | Article status | Colour temperature | Packaging, carton | Weight per pc. |
|---|---|---|---|---|---|
| **LLE 24x1120mm 2600lm 930 HV ADV6** | **28004842** | Standard | 3,000 K | 20 pc(s). | 0.091 kg |
| **LLE 24x1120mm 2600lm 940 HV ADV6** | **28004843** | Standard | 4,000 K | 20 pc(s). | 0.091 kg |
| **LLE 24x1400mm 3250lm 930 HV ADV6** | **28004854** | Standard | 3,000 K | 20 pc(s). | 0.116 kg |
| **LLE 24x1400mm 3250lm 940 HV ADV6** | **28004855** | Standard | 4,000 K | 20 pc(s). | 0.116 kg |
| **LLE 24x1120mm 4800lm 930 HV ADV6** | **28004887** | Standard | 3,000 K | 20 pc(s). | 0.091 kg |
| **LLE 24x1120mm 4800lm 940 HV ADV6** | **28004888** | Standard | 4,000 K | 20 pc(s). | 0.091 kg |
| **LLE 24x1400mm 6000lm 930 HV ADV6** | **28004892** | Standard | 3,000 K | 20 pc(s). | 0.116 kg |
| **LLE 24x1400mm 6000lm 940 HV ADV6** | **28004893** | Standard | 4,000 K | 20 pc(s). | 0.116 kg |

## Technical data

| | |
|---|---|
| Beam characteristic | 120° |
| Ambient temperature ta | -40 … +65 °C |
| tp rated | 50 °C |
| tc | 95 °C |
| Irated for 2,600 - 6,000 lm | 275 mA |
| Imax for 2,600 - 6,000 lm | 800 mA |
| Max. permissible LF current ripple for 2,600 - 6,000 lm | 900 mA |
| Max. permissible peak current | 1,350 mA / max. 10 ms |
| Max. working voltage for insulation for 2,600 - 6,000 lm ② | 440 V |
| Insulation test voltage for 2,600 - 6,000 lm | 1.88 kV |
| Colour tolerance | 3 SDCM |
| ESD classification | Severity level 2 |
| Risk group (IEC 62471) for 2,600 - 3,250 lm | RG1 (> 562 – 800 mA (Imax)), RGO (≤ 562 mA) |
| Risk group (IEC 62471) for 4,800 - 6,000 lm | RG1 (> 280 – 800 mA (Imax)), RGO (≤ 280 mA) |
| Classification acc. to IEC 62031 | Built-in |
| Type of protection | IP00 |
| Lumen maintenance L70B50 | 102,000 h |
| Guarantee (conditions at www.tridonic.com) | 5 Year(s) |

## Approval marks

RoHS

## Standards

IEC 62031, IEC 62471, IEC 61000-4-2, IEC 62778, IEC 61547

**Specific technical data**

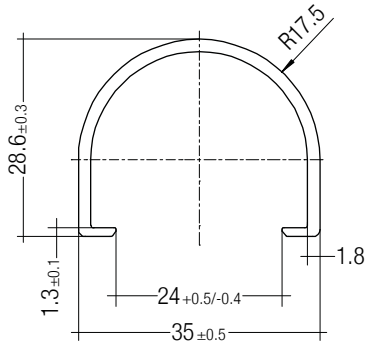
| Type | Article number | Photometric code[3] | Useful luminous flux at tp = 25 °C[4] | Expected luminous flux at tp rated[5] | Typ. forward current | Min. forward voltage at tp rated | Max. forward voltage at tp = 25 °C | Power consumption Pon at tp = 25 °C[6] | Efficacy of the module at tp = 25 °C | Expected efficacy of the module at tp rated | Colour rendering index CRI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Operating mode HE** | | | | | | | | | | | |
| **LLE 24x1120mm 2600lm 930 HV ADV6** | **28004842** | 930/359 | – | 712 lm | 100 mA | 40.3 V | 43.9 V | – | – | 169 lm/W | >90 |
| **LLE 24x1120mm 2600lm 940 HV ADV6** | **28004843** | 940/359 | – | 740 lm | 100 mA | 40.3 V | 43.9 V | – | – | 175 lm/W | >90 |
| **LLE 24x1400mm 3250lm 930 HV ADV6** | **28004854** | 930/359 | – | 890 lm | 100 mA | 50.4 V | 54.9 V | – | – | 169 lm/W | >90 |
| **LLE 24x1400mm 3250lm 940 HV ADV6** | **28004855** | 940/359 | – | 925 lm | 100 mA | 50.4 V | 54.9 V | – | – | 175 lm/W | >90 |
| **LLE 24x1120mm 4800lm 930 HV ADV6** | **28004887** | 930/359 | – | 1,424 lm | 100 mA | 80.7 V | 87.8 V | – | – | 169 lm/W | >90 |
| **LLE 24x1120mm 4800lm 940 HV ADV6** | **28004888** | 940/359 | – | 1,480 lm | 100 mA | 80.7 V | 87.8 V | – | – | 175 lm/W | >90 |
| **LLE 24x1400mm 6000lm 930 HV ADV6** | **28004892** | 930/359 | – | 1,780 lm | 100 mA | 100.8 V | 109.8 V | – | – | 169 lm/W | >90 |
| **LLE 24x1400mm 6000lm 940 HV ADV6** | **28004893** | 940/359 | – | 1,780 lm | 100 mA | 100.8 V | 109.8 V | – | – | 175 lm/W | >90 |
| **Operating mode NM** | | | | | | | | | | | |
| **LLE 24x1120mm 2600lm 930 HV ADV6** | **28004842** | 930/359 | 2,001 lm | 1,921 lm | 275 mA | 41.8 V | 45.4 V | 12.1 W | 165 lm/W | 160 lm/W | >90 |
| **LLE 24x1120mm 2600lm 940 HV ADV6** | **28004843** | 940/359 | 2,081 lm | 1,997 lm | 275 mA | 41.8 V | 45.4 V | 12.1 W | 172 lm/W | 166 lm/W | >90 |
| **LLE 24x1400mm 3250lm 930 HV ADV6** | **28004854** | 930/359 | 2,502 lm | 2,401 lm | 275 mA | 52.3 V | 56.8 V | 15.2 W | 165 lm/W | 160 lm/W | >90 |
| **LLE 24x1400mm 3250lm 940 HV ADV6** | **28004855** | 940/359 | 2,601 lm | 2,497 lm | 275 mA | 52.3 V | 56.8 V | 15.2 W | 172 lm/W | 166 lm/W | >90 |
| **LLE 24x1120mm 4800lm 930 HV ADV6** | **28004887** | 930/359 | 4,003 lm | 3,842 lm | 275 mA | 83.6 V | 90.8 V | 24.3 W | 165 lm/W | 160 lm/W | >90 |
| **LLE 24x1120mm 4800lm 940 HV ADV6** | **28004888** | 940/359 | 4,162 lm | 3,995 lm | 275 mA | 83.6 V | 90.8 V | 24.3 W | 172 lm/W | 166 lm/W | >90 |
| **LLE 24x1400mm 6000lm 930 HV ADV6** | **28004892** | 930/359 | 5,004 lm | 4,803 lm | 275 mA | 104.5 V | 113.5 V | 30.3 W | 165 lm/W | 160 lm/W | >90 |
| **LLE 24x1400mm 6000lm 940 HV ADV6** | **28004893** | 940/359 | 5,004 lm | 4,803 lm | 275 mA | 104.5 V | 113.5 V | 30.3 W | 172 lm/W | 166 lm/W | >90 |
| **Operating mode HO** | | | | | | | | | | | |
| **LLE 24x1120mm 2600lm 930 HV ADV6** | **28004842** | 930/359 | – | 4,562 lm | 700 mA | 44.4 V | 48.1 V | – | – | 141 lm/W | >90 |
| **LLE 24x1120mm 2600lm 940 HV ADV6** | **28004843** | 940/359 | – | 4,743 lm | 700 mA | 44.4 V | 48.1 V | – | – | 146 lm/W | >90 |
| **LLE 24x1400mm 3250lm 930 HV ADV6** | **28004854** | 930/359 | – | 5,207 lm | 700 mA | 55.5 V | 60.1 V | – | – | 141 lm/W | >90 |
| **LLE 24x1400mm 3250lm 940 HV ADV6** | **28004855** | 940/359 | – | 5,929 lm | 700 mA | 55.5 V | 60.1 V | – | – | 146 lm/W | >90 |
| **LLE 24x1120mm 4800lm 930 HV ADV6** | **28004887** | 930/359 | – | 9,123 lm | 700 mA | 88.9 V | 96.1 V | – | – | 141 lm/W | >90 |
| **LLE 24x1120mm 4800lm 940 HV ADV6** | **28004888** | 940/359 | – | 9,486 lm | 700 mA | 88.9 V | 96.1 V | – | – | 146 lm/W | >90 |
| **LLE 24x1400mm 6000lm 930 HV ADV6** | **28004892** | 940/359 | – | 11,857 lm | 700 mA | 111.1 V | 120.1 V | – | – | 141 lm/W | >90 |
| **LLE 24x1400mm 6000lm 940 HV ADV6** | **28004893** | 940/359 | – | 11,857 lm | 700 mA | 111.1 V | 120.1 V | – | – | 146 lm/W | >90 |

② If mounted with M4 screws with 7 mm head diameter.
③ The detailed explanation, see data sheet section 1.1.
④ Tolerance of useful light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %.
⑤ Measurement uncertainty ± 10 %. Based on calculation.
⑥ Tolerance of power consumption Pon ± 10 %. Measurement uncertainty ± 5 %.

## LINEAR COVER LLE

Accessory






**Product description**

_ LINEAR COVER for LLE
_ Protection against direct touch for non-SELV applications (recommendation LLE 20: use all fixing points and screwed Endcap, recommendation LLE 24: use all fixing points)
_ Fast snap on mounting on to LLE 20: with M4 screws and plastic washers, to LLE 24: with clips or plastic washers
_ High transmission: transparent, semi-transparent and diffuse
_ Material: PMMA
_ Tolerances: ± 1 mm for 597 mm length (ends finished), + 10 mm from length 1,150 mm (ends raw)

**Website**
http://www.tridonic.com/28000338

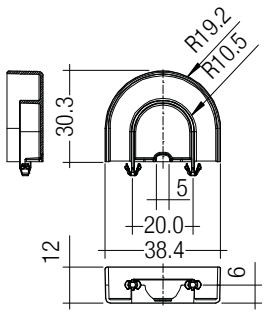
**Ordering data**

| Type | Article number | Colour | Length L | Efficiency | Packaging, carton | Weight per pc. |
|---|---|---|---|---|---|---|
| **LINEAR COVER SY Transparent 1600mm** | **28000338** | Transparent | 1,600 mm | 94 % | 12 pc(s). | 0.272 kg |
| **LINEAR COVER SY Frosted 1800mm** | **28000437** | Semi-transparent | 1,800 mm | 87 % | 12 pc(s). | 0.308 kg |
| **LINEAR COVER SY Frosted 1600mm** | **28000339** | Semi-transparent | 1,600 mm | 87 % | 12 pc(s). | 0.272 kg |
| **LINEAR COVER SY Frosted 1500mm** | **28000435** | Semi-transparent | 1,500 mm | 87 % | 12 pc(s). | 0.244 kg |
| **LINEAR COVER SY Frosted 1200mm** | **28000422** | Semi-transparent | 1,200 mm | 87 % | 12 pc(s). | 0.205 kg |
| **LINEAR COVER SY Frosted 597mm** | **28000340** | Semi-transparent | 597 mm | 87 % | 12 pc(s). | 0.102 kg |
| **LINEAR COVER SY Diffuse 1800mm** | **28000438** | Diffuse | 1,800 mm | 76 % | 12 pc(s). | 0.308 kg |
| **LINEAR COVER SY Diffuse 1600mm** | **28000341** | Diffuse | 1,600 mm | 76 % | 12 pc(s). | 0.272 kg |
| **LINEAR COVER SY Diffuse 1500mm** | **28000436** | Diffuse | 1,500 mm | 76 % | 12 pc(s). | 0.257 kg |
| **LINEAR COVER SY Diffuse 1200mm** | **28000434** | Diffuse | 1,200 mm | 76 % | 12 pc(s). | 0.205 kg |
| **LINEAR COVER SY Diffuse 597mm** | **28000342** | Diffuse | 597 mm | 76 % | 12 pc(s). | 0.102 kg |

## ACL ENDCAP LLE

Accessory






**Product description**

_ ENDCAP for LLE
_ PUSH-FIX: Fast snap on mounting (sheet thickness 0.5 – 1.0 mm), for drilling hole 4 mm
_ SCREW-FIX: Screw mounting with EJOT Delta PT WN 5451 30x8 (not included), tightening torque 0.7 Nm
_ Clip made of polycarbonate

**Website**

http://www.tridonic.com/28001037

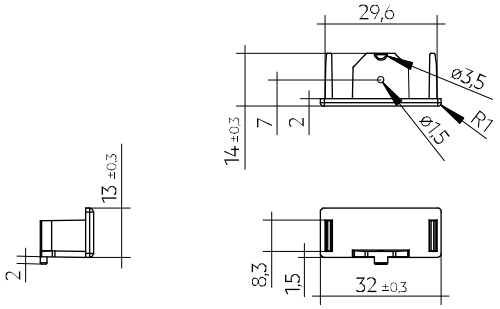
**Ordering data**

| Type | Article number | Colour | Packaging, carton | Weight per pc. |
|---|---|---|---|---|
| **ACL ENDCAP LLE24 PUSH-FIX** | **28001037** | White | 480 pc(s). | 0.003 kg |
| **ACL ENDCAP LLE24 SCREW-FIX** | **28002315** | White | 480 pc(s). | 0.003 kg |

## ACL LINEAR LENS 24mm

Accessory






**Product description LINEAR LENS**

_ Linear lens for LLE 20 / 24
_ Available with different beam characteristics
_ Protection against direct touch for non-SELV applications (recommendation: use all fixing points)
_ Fast snap on mounting on to LLE 20: with M4 screws and plastic washers, to LLE 24: with clips or plastic washers
_ Recommendation: Fastening with screws and plastic washers, see 2.3 Heat sink specifications in data sheet
_ Material: PMMA
_ Available lengths: 1,200, 1,500 and 1,800 mm, Tolerance: + 10 mm (ends raw)
_ Max. permissible temperature 80 °C
_ Photometric data available on website

**Product description Endcap**

_ ENDCAP for LINEAR LENS 24mm INTENSE, ASY and DASY
_ Mounting by clipping in and screwing from below using screw EJOT Delta PT WN 5451 20x4, tightening torque 0.7 Nm
_ Made of Polyamide UL94 V0

**Website**

http://www.tridonic.com/28001428

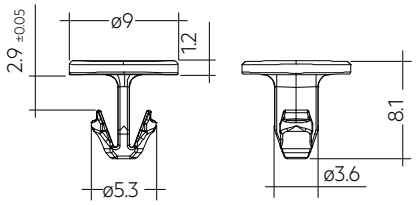
**Ordering data**

| Type | Article number | Length L | Beam characteristic | Efficiency | Packaging, carton | Weight per pc. |
|---|---|---|---|---|---|---|
| **ACL LINEAR LENS 24x1200mm 60°** | **28001428** | 1,200 mm | 60° | 97 % | 21 pc(s). | 0.196 kg |
| **ACL LINEAR LENS 24x1200mm 90°** | **28001429** | 1,200 mm | 90° | 97 % | 21 pc(s). | 0.165 kg |
| **ACL LINEAR LENS 24x1500mm 60°** | **28000953** | 1,500 mm | 60° | 97 % | 21 pc(s). | 0.261 kg |
| **ACL LINEAR LENS 24x1500mm 90°** | **28000955** | 1,500 mm | 90° | 97 % | 21 pc(s). | 0.221 kg |
| **ACL LINEAR LENS 24x1200mm INTENSE** | **28002024** | 1,200 mm | 40° | 95 % | 18 pc(s). | 0.261 kg |
| **ACL LINEAR LENS 24x1500mm INTENSE** | **28002025** | 1,500 mm | 40° | 95 % | 18 pc(s). | 0.326 kg |
| **ACL LINEAR LENS 24x1800mm INTENSE** | **28002026** | 1,800 mm | 40° | 95 % | 18 pc(s). | 0.392 kg |
| **ACL LINEAR LENS 24x1200mm BATWING** | **28002027** | 1,200 mm | batwing | 95 % | 18 pc(s). | 0.275 kg |
| **ACL LINEAR LENS 24x1500mm BATWING** | **28002028** | 1,500 mm | batwing | 95 % | 18 pc(s). | 0.344 kg |
| **ACL LINEAR LENS 24x1800mm BATWING** | **28002029** | 1,800 mm | batwing | 95 % | 18 pc(s). | 0.412 kg |
| **ACL LINEAR LENS 24x1200mm ASY** | **28002030** | 1,200 mm | asymmetric | 95 % | 18 pc(s). | 0.250 kg |
| **ACL LINEAR LENS 24x1500mm ASY** | **28002031** | 1,500 mm | asymmetric | 95 % | 18 pc(s). | 0.312 kg |
| **ACL LINEAR LENS 24x1800mm ASY** | **28002032** | 1,800 mm | asymmetric | 95 % | 18 pc(s). | 0.375 kg |
| **ACL LINEAR LENS 24x1200mm DASY** | **28002033** | 1,200 mm | double asymmetric | 92 % | 18 pc(s). | 0.249 kg |
| **ACL LINEAR LENS 24x1500mm DASY** | **28002034** | 1,500 mm | double asymmetric | 92 % | 18 pc(s). | 0.311 kg |
| **ACL LINEAR LENS 24x1800mm DASY** | **28002035** | 1,800 mm | double asymmetric | 92 % | 18 pc(s). | 0.373 kg |
| **ACL Endcap LENS 24mm PSF** | **28002669** | – | – | – | 3,600 pc(s). | 0.003 kg |

## ACL CLIP 4.3mm

Accessory






**Product description**

_ Clip for fixation of LED modules with 4.3 mm holes
_ Fast snap on mounting (sheet thickness 0.5 – 1.0 mm for PUSH-FIX and 1 – 2 mm for PUSH-FIX Long)
_ For drilling hole 4 mm
_ Clip made of polycarbonate
_ Minimum sales quantity 500 pcs.

**Website**

http://www.tridonic.com/28001036

### Ordering data

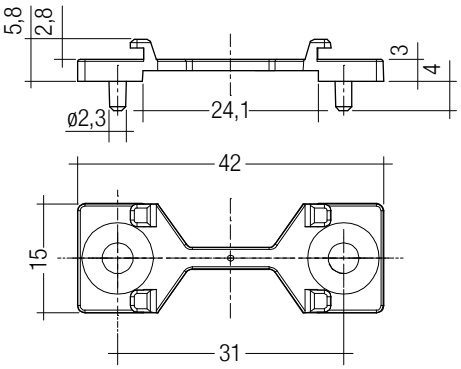
| Type | Article number | Colour | Packaging, bag ① | Weight per pc. |
|---|---|---|---|---|
| **ACL CLIP 4.3mm PUSH-FIX** | **28001036** | White | 500 pc(s). | 0.001 kg |
| **ACL CLIP 4,3mm PUSH-FIX Long** | **28002314** | Transparent | 500 pc(s). | 0.001 kg |

① Minimum sales quantity 500 pcs.

## ACL BRIDGE LLE24/40

Accessory






**Product description**

_ Enables the fixation of 24 mm wide Tridonic LED modules to fixtures made for 40 mm wide modules
_ Ideal for extruded aluminium gear trays made for 40 mm modules with pre-alignment knobs
_ Clip-on for LINEAR COVER and LINEAR LENS ①
_ For LLE 24 with 280 mm module minimum 2 bridges required
_ For LLE 24 with 560 mm module minimum 3 bridges required
_ Fixation via M3 or M4 countersunk screw, max. tightening torque 0.5 Nm
_ Material: white polycarbonate
_ Minimum sales quantity 600 pcs.

① Beam characteristics will change due to the elevated fixation (see photometric files for details).

**Website**

http://www.tridonic.com/28001205

**Ordering data**

| Type | Article number | Colour | Packaging, carton | Weight per pc. |
|---|---|---|---|---|
| **ACL BRIDGE LLE24/40 SCREW-FIX** | **28001205** | White | 600 pc(s). | 0.001 kg |

## 1. Standards

IEC 62031
IEC 62471
IEC 61000-4-2
IEC 62778
IEC 61547

### 1.1 Photometric code

Key for photometric code, e. g. 830 / 349

| 1st digit | | 2nd + 3rd digit | 4th digit | 5th digit | 6th digit | |
|---|---|---|---|---|---|---|
| Code | CRI | Colour temperature in Kelvin x 100 | MacAdam initial | MacAdam after 25% of the lifetime (max.6000h) | Luminous flux after 25% of the lifetime (max.6000h) | |
| | | | | | Code | Luminous flux |
| 7 | 70 – 79 | | | | 7 | ≥ 70 % |
| 8 | 80 – 89 | | | | 8 | ≥ 80 % |
| 9 | ≥90 | | | | 9 | ≥ 90 % |

### 1.2 Risk group

**LLE 24x1120mm 2600lm ADV6 + LLE 24x1400mm 3250lm ADV6**

| Forward current | Risk group (IEC 62471) |
|---|---|
| ≤ 562 mA | RG0 |
| > 562 – 800 mA (Imax) | RG1 |

**LLE 24x1120mm 4800lm ADV6 + LLE 24x1400mm 6000lm ADV6**

| Forward current | Risk group (IEC 62471) |
|---|---|
| ≤ 280 mA | RG0 |
| > 280 – 800 mA (Imax) | RG1 |

### 1.3 Energy classification

| Type | Colour tempera-ture | Forward current | Energy classifi-cation | Energy consumption |
|---|---|---|---|---|
| LLE 24x1120mm 2600lm 930 HV ADV6 | 2,001 lm | 275 mA | D | 13 kWh / 1,000 h |
| LLE 24x1120mm 2600lm 940 HV ADV6 | 2,081 lm | 275 mA | D | 13 kWh / 1,000 h |
| LLE 24x1400mm 3250lm 930 HV ADV6 | 2,502 lm | 275 mA | D | 16 kWh / 1,000 h |
| LLE 24x1400mm 3250lm 940 HV ADV6 | 2,601 lm | 275 mA | D | 16 kWh / 1,000 h |
| LLE 24x1120mm 4800lm 930 HV ADV6 | 4,003 lm | 275 mA | D | 25 kWh / 1,000 h |
| LLE 24x1120mm 4800lm 940 HV ADV6 | 4,162 lm | 275 mA | D | 25 kWh / 1,000 h |
| LLE 24x1400mm 6000lm 930 HV ADV6 | 5,004 lm | 275 mA | D | 31 kWh / 1,000 h |
| LLE 24x1400mm 6000lm 940 HV ADV6 | 5,004 lm | 275 mA | D | 31 kWh / 1,000 h |

Energy label and further information at www.tridonic.com in the certificates tab of the corresponding product page and at the EPREL data base https://eprel.ec.europa.eu/

## 2. Thermal details

### 2.1 tc point, ambient temperature and lifetime

The temperature at tp reference point is crucial for the light output and lifetime of a LED product.

For LLE a tp temperature of 50 °C has to be complied in order to achieve an optimum between heat sink requirements, light output and lifetime.

Compliance with the maximum permissible reference temperature at the tc point must be checked under operating conditions in a thermally stable state. The maximum value must be determined under worst-case conditions for the relevant application.

The tc and tp temperature of LED modules from Tridonic are measured at the same reference point.

### 2.2 Storage and humidity

| | |
|---|---|
| Storage temperature | -40 … +80 °C |

Operation only in non condensing environment.
Humidity during processing of the module should be between 30 to 70 %.

### 2.3 Heat sink values

**LLE 24x1120mm 2600lm ADV6**

| ta | tp | Forward current | $R_{th, hs-a}$ | Cooling area |
|---|---|---|---|---|
| 25 °C | 50 °C | 275 mA | self cooling | |
| 25 °C | 50 °C | 700 mA | 1.24 K/W | 539 cm² |
| 35 °C | 50 °C | 275 mA | self cooling | |
| 35 °C | 50 °C | 700 mA | 0.67 K/W | 994 cm² |
| 40 °C | 50 °C | 275 mA | 1.66 K/W | 401 cm² |
| 40 °C | 50 °C | 700 mA | 0.39 K/W | 1721 cm² |
| 45 °C | 50 °C | 275 mA | 0.74 K/W | 898 cm² |
| 45 °C | 50 °C | 700 mA | 0.10 K/W | 6,385 cm² |

**LLE 24x1120mm 4800lm ADV6**

| ta | tp | Forward current | $R_{th, hs-a}$ | Cooling area |
|---|---|---|---|---|
| 25 °C | 50 °C | 275 mA | 2.12 K/W | 314 cm² |
| 25 °C | 50 °C | 700 mA | 0.53 K/W | 1261 cm² |
| 35 °C | 50 °C | 275 mA | 1.20 K/W | 554 cm² |
| 35 °C | 50 °C | 700 mA | 0.25 K/W | 2711 cm² |
| 40 °C | 50 °C | 275 mA | 0.74 K/W | 898 cm² |
| 40 °C | 50 °C | 700 mA | 0.10 K/W | 6,385 cm² |
| 45 °C | 50 °C | 275 mA | 0.28 K/W | 2,366 cm² |
| 45 °C | 50 °C | 700 mA | 3.43 K/W | 194 cm² |

**LLE 24x1400mm 3250lm ADV6**

| ta | tp | Forward current | $R_{th, hs-a}$ | Cooling area |
|---|---|---|---|---|
| 25 °C | 50 °C | 275 mA | self cooling | |
| 25 °C | 50 °C | 700 mA | 0.99 K/W | 674 cm² |
| 35 °C | 50 °C | 275 mA | self cooling | |
| 35 °C | 50 °C | 700 mA | 0.54 K/W | 1,243 cm² |
| 40 °C | 50 °C | 275 mA | 1.33 K/W | 501 cm² |
| 40 °C | 50 °C | 700 mA | 0.31 K/W | 2,151 cm² |
| 45 °C | 50 °C | 275 mA | 0.59 K/W | 1,123 cm² |
| 45 °C | 50 °C | 700 mA | 0.08 K/W | 7,981 cm² |

**LLE 24x1400mm 6000lm ADV6**

| ta | tp | Forward current | $R_{th, hs-a}$ | Cooling area |
|---|---|---|---|---|
| 25 °C | 50 °C | 275 mA | 1.70 K/W | 393 cm² |
| 25 °C | 50 °C | 700 mA | 0.42 K/W | 1,576 cm² |
| 35 °C | 50 °C | 275 mA | 0.96 K/W | 693 cm² |
| 35 °C | 50 °C | 700 mA | 0.20 K/W | 3,389 cm² |
| 40 °C | 50 °C | 275 mA | 0.59 K/W | 1,123 cm² |
| 40 °C | 50 °C | 700 mA | 0.08 K/W | 7,981 cm² |
| 45 °C | 50 °C | 275 mA | 0.23 K/W | 2,958 cm² |

**Notes**
The actual cooling surface can differ because of the material, the structural shape, outside influences and the installation situation. Depending on the heat sink a heat conducting paste or heat conducting film might be necessary to keep the specified tp temperature.

For applications with a small distance between LED module and lens, screw mounting is recommended to ensure a reliable thermal connection between LED module and cooling surface.

## 3. Installation / wiring

### 3.1 Electrical supply/choice of LED driver

LLE modules from Tridonic are not protected against overvoltages, overcurrents, overloads or short-circuit currents. Safe and reliable operation can only be guaranteed in conjunction with a LED driver which complies with the relevant standards. The use of LED driver from Tridonic in combination with LLE modules guarantees the necessary protection for safe and reliable operation.

If a LED driver other than Tridonic is used, it must provide the following protection:
- Short-circuit protection
- Overload protection
- Overtemperature protection

LLE modules must be supplied by a constant current LED driver. Operation with a constant voltage LED driver will lead to an irreversible damage of the module.

Wrong polarity can damage the LLE.

The LLE module is designed for serial wiring.

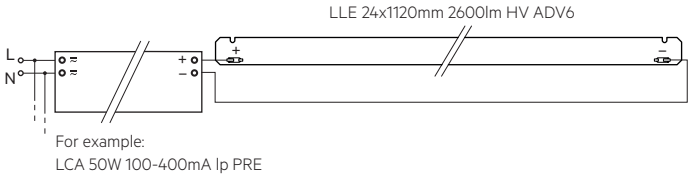
LLE can be operated either from SELV LED drivers or from LED drivers with LV output voltage.

LLE are basic insulated up to 440 V (if mounted with M4 screws with head diameter 7 mm) against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the LED driver (also against earth) is above 440 V, an additional insulation between LED module and heat sink is required (for example by insulated thermal pads) or by a suitable luminaire construction.
At voltages > 60 V an additional protection against direct touch (test finger) to the light emitting side of the module has to be guaranteed. This is typically achieved by means of a non removable light distributor over the module.

### 3.2 Wiring



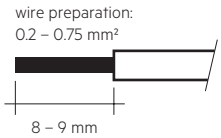

**Wiring example**




For example:
LCA 50W 100-400mA lp PRE

### 3.3 Wiring type and cross section

For wiring use stranded wire with ferrules or solid wire from 0.2 to 0.75 mm². For the push-wire connection you have to strip the insulation (8–9 mm).




To remove the wires use a suitabel tool (e.g. Microcon release pin) or through twist and pull .

### 3.4 Mounting instruction

None of the components of the LLE (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.

Max. torque for fixing: 0.5 Nm.

The LED modules are mounted onto a heat sink with min. 12 screws per module or ACL CLIP 4.3mm.

Chemical substance may harm the LED module. Chemical reactions could lead to colour shift, reduced luminous flux or a total failure of the module caused by corrosion of electrical connections.

Materials which are used in LED applications (e.g. sealings, adhesives) must not produce dissolver gas. They must not be condensation curing based, acetate curing based or contain sulfur, chlorine or phthalate.
Avoid corrosive atmosphere during usage and storage.

### 3.5 EOS/ESD safety guidelines

The device / module contains components that are sensitive to electrostatic discharge and may only be installed in the factory and on site if appropriate EOS/ESD protection measures have been taken. No special measures need be taken for devices/modules with enclosed casings (contact with the pc board not possible), just normal installation practice. Please note the requirements set out in the document EOS / ESD guidelines (Guideline_EOS_ESD.pdf) at:
http://www.tridonic.com/esd-protection

## 4. Lifetime

### 4.1 Lifetime, lumen maintenance and failure rate

The light output of an LED module decreases over the lifetime, this is characterized with the L value.
L70 means that the LED module will give 70 % of its initial luminous flux.
This value is always related to the number of operation hours and therefore defines the lifetime of an LED module.

As the L value is a statistical value and the lumen maintenance may vary over the delivered LED modules.
The B value defines the amount of modules which are below the specific L value, e.g. L70B10 means 10 % of the LED modules are below 70 % of the initial luminous flux, respectively 90 % will be above 70 % of the initial value.
In addition the percentage of failed modules (fatal failure) is characterized by the C value.

### 4.2 Lumen maintenance for LLE 24mm HV ADV6

| Forward current | tp temperature | L90 / B10 | L90 / B50 | L80 / B10 | L80 / B50 | L70 / B10 | L70 / B50 |
|---|---|---|---|---|---|---|---|
| 700 mA | 55 °C | 52k h | 52k h | > 102k h | > 102k h | > 102k h | > 102k h |
| | 85 °C | 52k h | 52k h | > 102k h | > 102k h | > 102k h | > 102k h |

L00C03 > 102k h. At tp rated and I rated, based on 10 swichting cycles per day.

### 4.3 Switching capability

100,000 cycles

Tridonic test according to IEC 62717 Cl 10.3.3
30 s on / 30 s off at Imax

## 5. Electrical values

### 5.1 Declaration of electrical parameters

Irated … Nominal operating current the module is designed for.

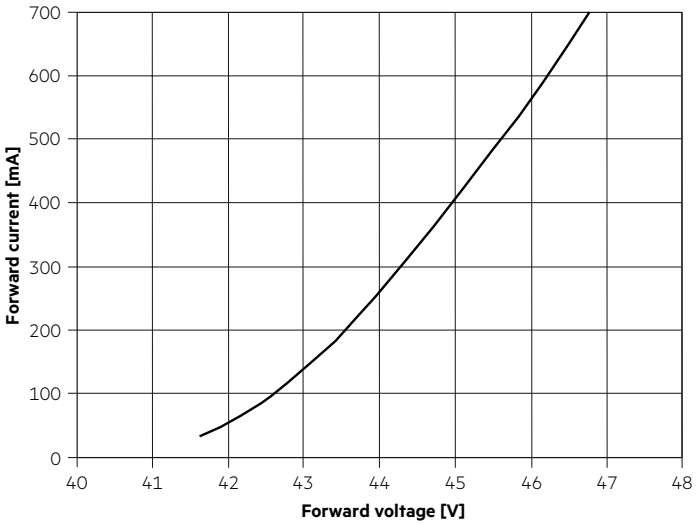
Imax … Max. permissible continuous operating current incl. The tolerances of the LED driver.

Max. permissible LF current ripple … Max. output current of the LED driver incl. Tolerances and LF current ripple must not exceed this value.

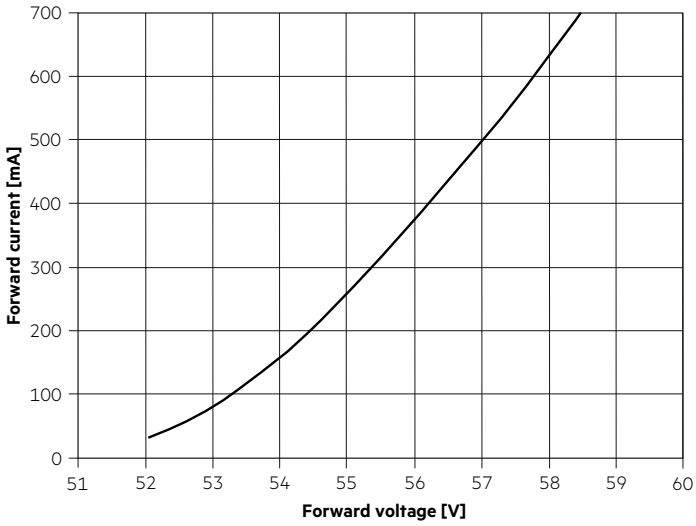
Max. permissible peak current … The max. output peak current of the LED driver must not exceed this value.

### 5.2 Typ. forward voltage vs. forward current

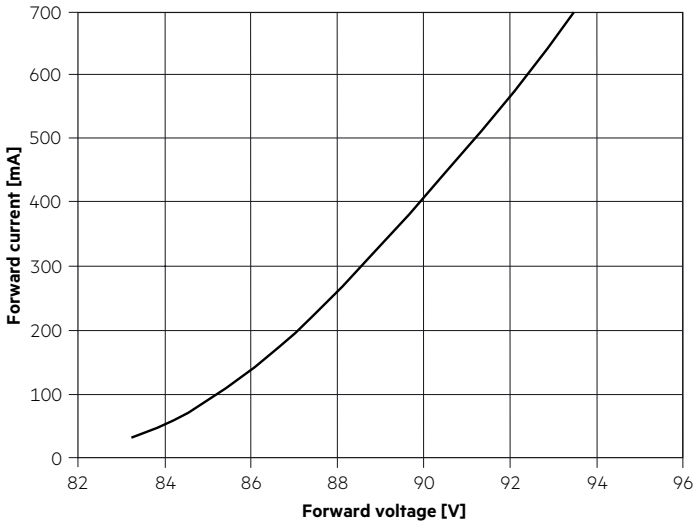
**LLE 24x1120mm 2600lm 9xx HV ADV6**



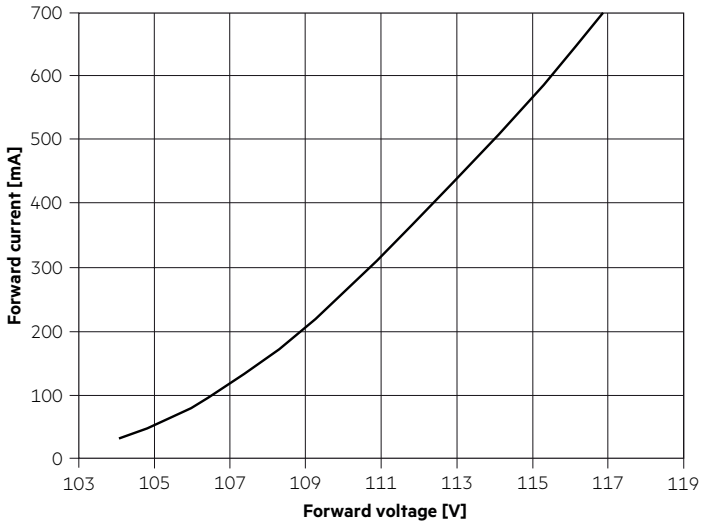

**LLE 24x1400mm 3250lm 9xx HV ADV6**




**LLE 24x1120mm 4800lm 9xx HV ADV6**

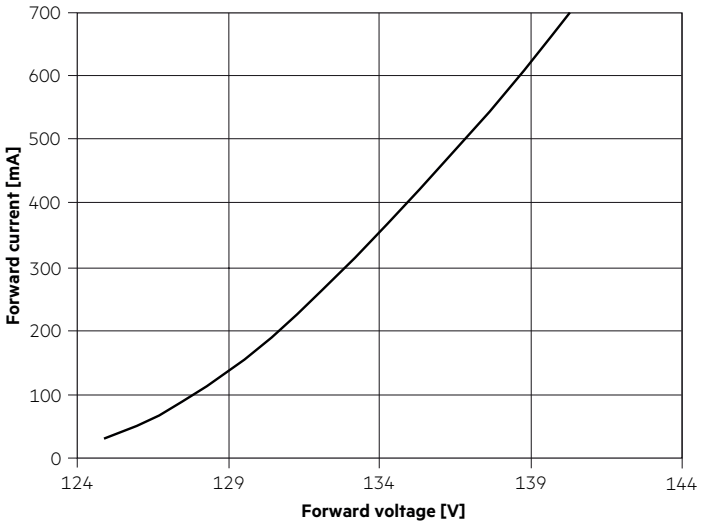



**LLE 24x1400mm 6000lm 9xx HV ADV6**

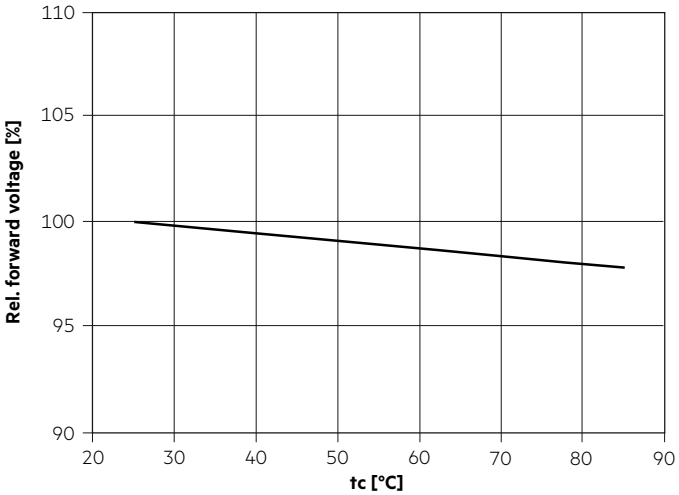



The diagrams are based on statistic values.
The real values can be different.

**LLE 24x1120mm 8000lm 9xx HV ADV6**




**5.3 Forward voltage vs. tc temperature**




The diagrams are based on statistic values.
The real values can be different.

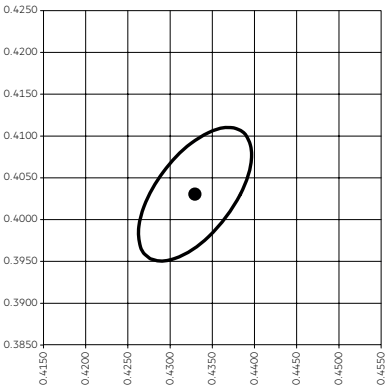
## 6. Photometric characteristics

### 6.1 Coordinates and tolerances according to CIE 1931

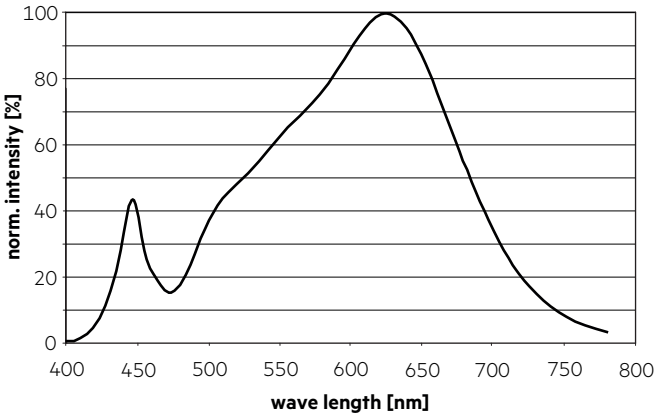
The specified colour coordinates are integral measured by current impulse of 195 mA and a duration of 100 ms.
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

**3,000 K**

| | x0 | y0 |
|---|---|---|
| Centre | 0.4338 | 0.4030 |

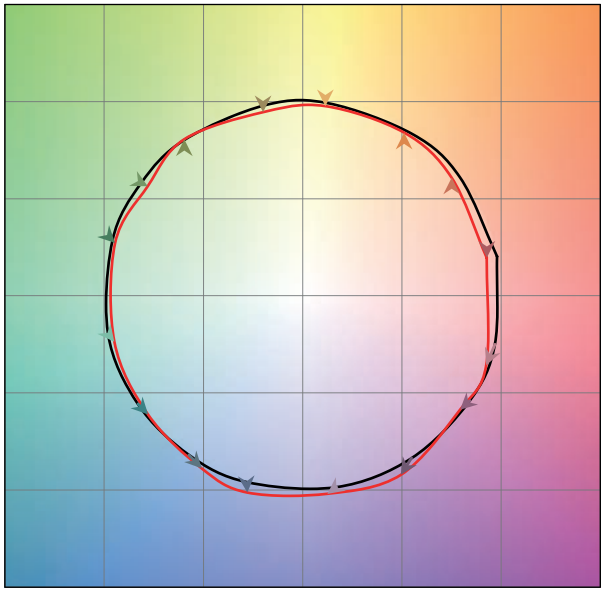



MacAdam Ellipse: 3SDCM

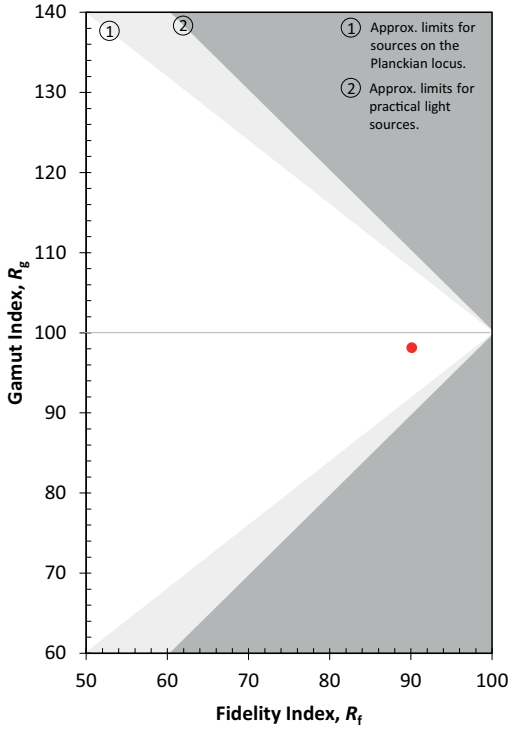



| TM30 | | CRI | |
|---|---|---|---|
| Rf | Rg | Ra | R9 |
| 90 | 98 | 92 | 57 |

Colour vector graphic



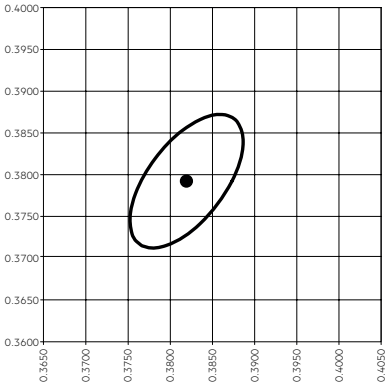
Reference source
Test source



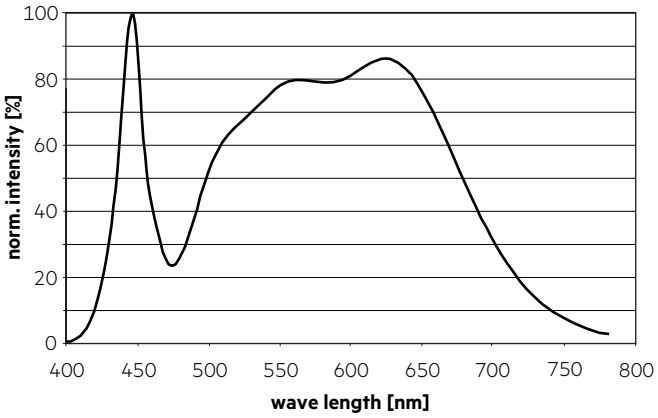

MacAdam Ellipse: 3SDCM

**4,000 K**

| | x0 | y0 |
|---|---|---|
| Center | 0.3818 | 0.3797 |

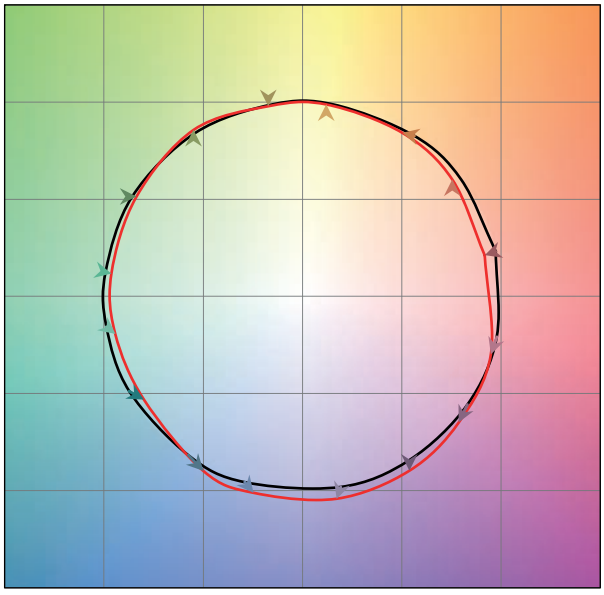



MacAdam Ellipse: 3SDCM

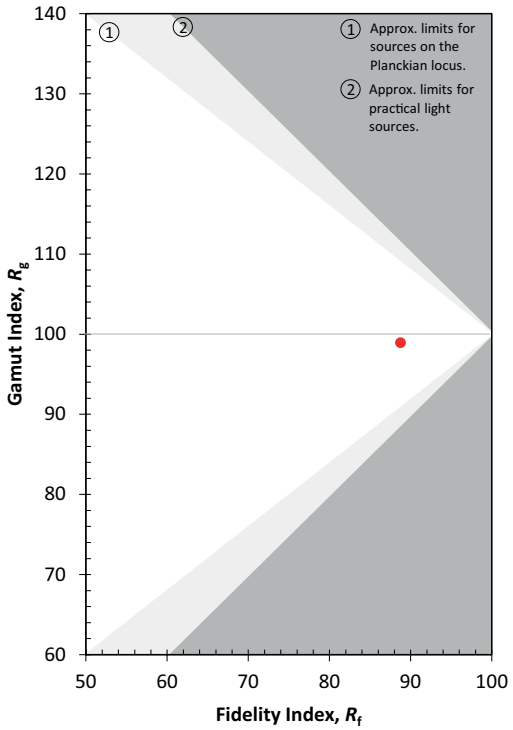



| TM30 | | CRI | |
|---|---|---|---|
| Rf | Rg | Ra | R9 |
| 89 | 99 | 91 | 54 |

Colour vector graphic

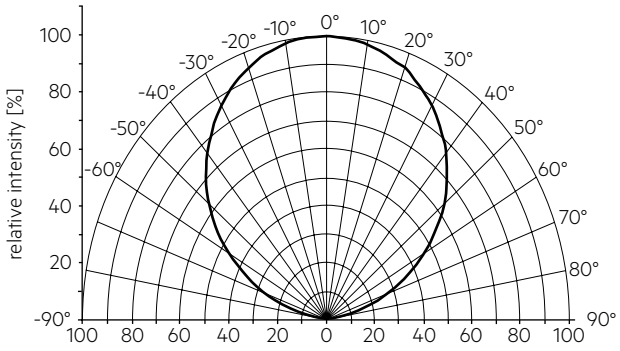


Reference source
Test source



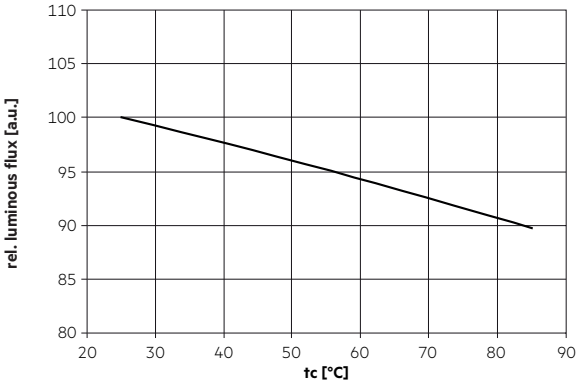
### 6.2 Light distribution

The optical design of the LLE product line ensures optimum homogeneity for the light distribution.

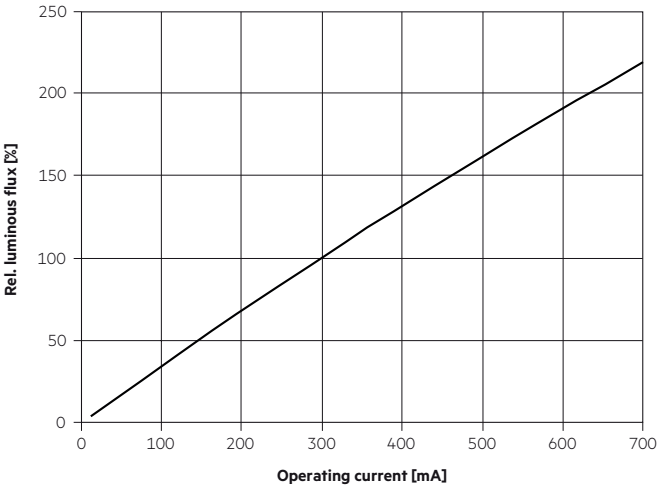



The colour temperature is measured integral over the complete module. The single LED light points can have deviations in the colour coordinates within MacAdam 5.
To ensure an ideal mixture of colours and a homogeneous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 4 cm) should be used.

### 6.3 Relative luminous flux vs. tc temperature




### 6.4 Relative luminous flux vs. operating current




The diagrams are based on statistic values.
The real values can be different.

## 7. Miscellaneous

### 7.1 Additional information

Additional technical information at www.tridonic.com → Technical Data

Energy label and further information at www.tridonic.com in the certificates tab of the corresponding product page and at the EPREL data base https://eprel.ec.europa.eu/

Guarantee conditions at www.tridonic.com → Services

Lifetime declarations are informative and represent no warranty claim.