Module CLE Shallow G2 EXC

Modules CLE excite

Product description

- Ideal for extra-flat luminaires, minimum backlight distance 30 mm
- For round shaped luminaires with a diameter of 160 – 1,082 mm
- Compatible with Tridonic ADV, EXC and PRE Driver in different modes (HE, NM, HO), enables more flexibility on luminaire design
- Self cooling (no additional heat sink required)
- Long lifetime: 72,000 hours
- 5 years guarantee

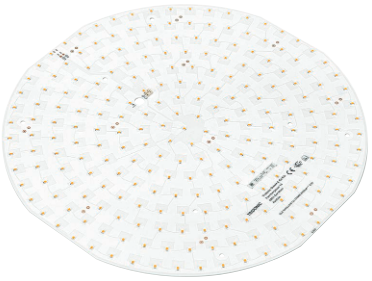
Optical properties

- Colour temperatures 3,000 K and 4,000 K
- Useful luminous flux 3,891 lm at Irated and tp = 25 °C
- Efficacy of the LED module 175 lm/W at Irated and tp = 25 °C
- High color rendering index CRI > 90
- Small colour tolerance MacAdam 3①

Mechanical properties

- Module dimension ø160.5 mm, ø360 mm, ø522 mm, ø802 mm and ø1,082 mm, from ø522 mm with several module segments
- Simple installation (e. g. screws)

Standards, page 3
Colour temperatures and tolerances, page 8



CLE SHALLOW G2 370mm 2900lm EXC

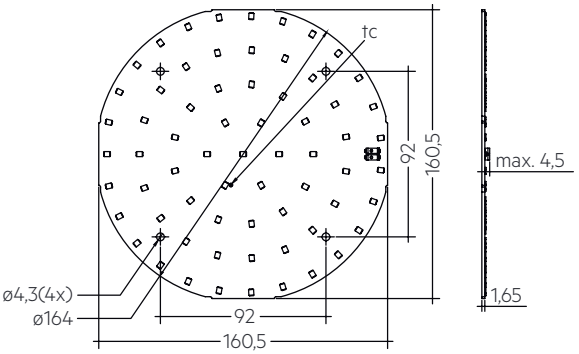
CLE SHALLOW G2 802mm 3800lm EXC

Module CLE Shallow G2 EXC

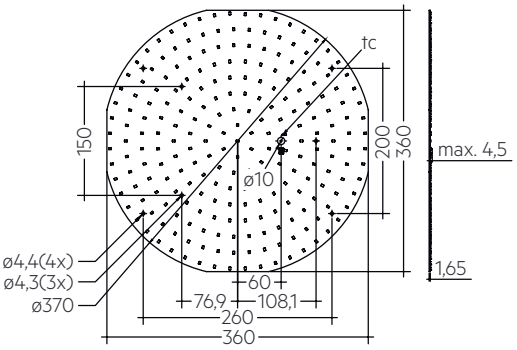
Modules CLE excite

Technical data

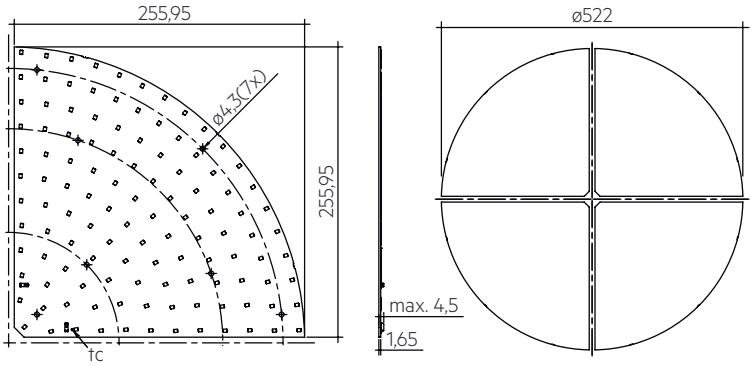
Beam characteristic	120°
Ambient temperature range	-25 … +65 °C
tp rated	65 °C
tc	85 °C
Irated for CLE Shallow G2 160mm	150 mA
Irated for CLE Shallow G2 370mm	500 mA
Irated for CLE Shallow G2 522mm	300 mA
Irated for CLE Shallow G2 802mm	650 mA
Irated for CLE Shallow G2 1082mm	450 mA
Imax for CLE Shallow G2 160mm	600 mA
Imax for CLE Shallow G2 370mm	1,900 mA
Imax for CLE Shallow G2 522mm	950 mA
Imax for CLE Shallow G2 802mm	2,150 mA
Imax for CLE Shallow G2 1082mm	1,500 mA
Max. permissible LF current ripple for CLE Shallow G2 160mm	1,200 mA
Max. permissible LF current ripple for CLE Shallow G2 370mm	3,600 mA
Max. permissible LF current ripple for CLE Shallow G2 522mm	1,800 mA
Max. permissible LF current ripple for CLE Shallow G2 802mm	4,200 mA
Max. permissible LF current ripple for CLE Shallow G2 1082mm	2,600 mA
Max. permissible peak current for CLE Shallow G2 160mm	1,800 mA / max. 10 ms
Max. permissible peak current for CLE Shallow G2 370mm	5,400 mA / max. 10 ms
Max. permissible peak current for CLE Shallow G2 522mm	2,700 mA / max. 10 ms
Max. permissible peak current for CLE Shallow G2 802mm	6,300 mA / max. 10 ms
Max. permissible peak current for CLE Shallow G2 1082mm	3,900 mA / max. 10 ms
Max. working voltage for insulation[2]	250 V
Insulation test voltage	1.5 kV
CTI of the printed circuit board	≥ 600
ESD classification	severity level 4
Risk group (IEC 62471)[3]	RG0
Classification acc. to IEC 62031	Built-in
Type of protection	IP00
Lumen maintenance L70B50	72,000 h
Guarantee	5 years



CLE Shallow G2 160mm 750lm EXC



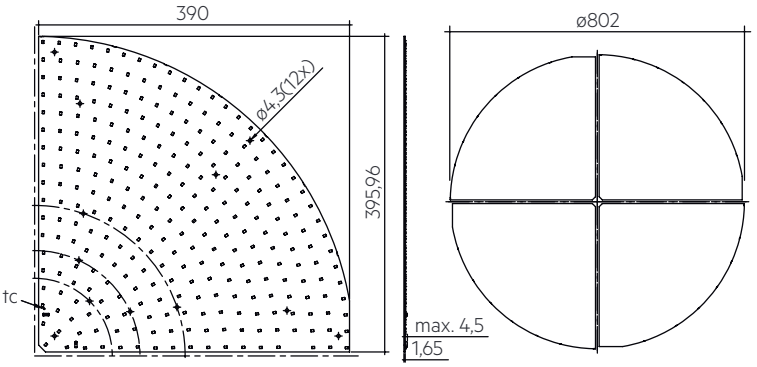
CLE Shallow G2 370mm 2900lm EXC



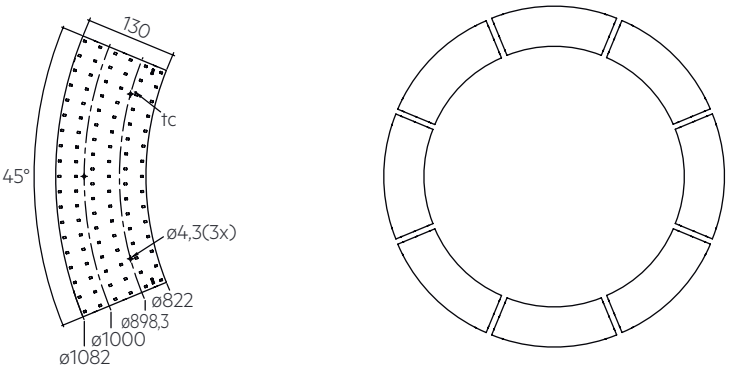
CLE Shallow G2 522mm 1750lm EXC (details see 3.4 Mounting instructions)

Module CLE Shallow G2 EXC

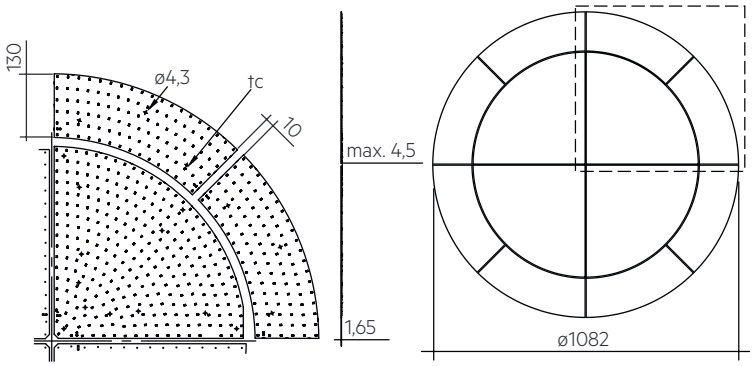
Modules CLE excite



CLE Shallow G2 802mm 3800lm EXC (details see 3.4 Mounting instructions)



CLE Shallow G2 1082mm 1500lm EXC (details see 3.4 Mounting instructions)



CLE Shallow G2 802mm 3800lm EXC + CLE Shallow G2 1082mm 1500lm EXC (details see 3.4 Mounting instructions)

Ordering data

Type	Article number	Colour temperature	Packaging carton	Weight per pc.
CLE SHALLOW G2 160MM 750LM 930 EXC	**89603353**	3.000 K	288 pc(s).	0.053 kg
CLE SHALLOW G2 160MM 750LM 940 EXC	**89603354**	4.000 K	288 pc(s).	0.053 kg
CLE SHALLOW G2 370MM 2900LM 930 EXC	**89603355**	3.000 K	10 pc(s).	0.290 kg
CLE SHALLOW G2 370MM 2900LM 940 EXC	**89603356**	4.000 K	10 pc(s).	0.290 kg
CLE SHALLOW G2 522MM 1750LM 930 EXC	**89603357**	3.000 K	20 pc(s).	0.140 kg
CLE SHALLOW G2 522MM 1750LM 940 EXC	**89603358**	4.000 K	20 pc(s).	0.140 kg
CLE SHALLOW G2 802MM 3800LM 930 EXC	**89603359**	3.000 K	20 pc(s).	0.336 kg
CLE SHALLOW G2 802MM 3800LM 940 EXC	**89603360**	4.000 K	20 pc(s).	0.336 kg
CLE SHALLOW G2 1082MM 1500LM 930 EXC	**89603361**	3.000 K	40 pc(s).	0.146 kg
CLE SHALLOW G2 1082MM 1500LM 940 EXC	**89603362**	4.000 K	40 pc(s).	0.146 kg

Specific technical data

Type[4]	Photo-metric code	Useful luminous flux at tp = 25 °C[5]	Expected luminous flux at tp rated[6]	Typ. forward current	Min. forward voltage at tp = 65 °C	Max. forward voltage at tp = 25 °C	Power con-sumption Pon at tp = 25 °C[7]	Efficacy of the module at tp = 25 °C	Expected efficacy of the module at tp rated	Colour rendering index CRI
CLE Shallow G2 160mm – Operating mode NM at 150 mA										
CLE SHALLOW G2 160MM 750LM 930 EXC	930/359	710 lm	681 lm	150 mA	27.4 V	29.9 V	4.4 W	161 lm/W	156 lm/W	> 90
CLE SHALLOW G2 160MM 750LM 940 EXC	940/359	757 lm	728 lm	150 mA	27.4 V	29.9 V	4.4 W	172 lm/W	166 lm/W	> 90
CLE Shallow G2 160mm – Operating mode HO at 350 mA										
CLE SHALLOW G2 160MM 750LM 930 EXC	930/359	–	1,564 lm	350 mA	28.2 V	30.7 V	–	–	150 lm/W	> 90
CLE SHALLOW G2 160MM 750LM 940 EXC	940/359	–	1,671 lm	350 mA	28.2 V	30.7 V	–	–	160 lm/W	> 90
CLE Shallow G2 160mm – Operating mode HO at 500 mA										
CLE SHALLOW G2 160MM 750LM 930 EXC	930/359	–	2,188 lm	500 mA	28.6 V	31.1 V	–	–	145 lm/W	> 90
CLE SHALLOW G2 160MM 750LM 940 EXC	940/359	–	2,340 lm	500 mA	28.6 V	31.1 V	–	–	155 lm/W	> 90
CLE Shallow G2 160mm – Operating mode HO at 600 mA										
CLE SHALLOW G2 160MM 750LM 930 EXC	930/359	–	2,562 lm	600 mA	28.9 V	31.4 V	–	–	140 lm/W	> 90
CLE SHALLOW G2 160MM 750LM 940 EXC	940/359	–	2,733 lm	600 mA	28.9 V	31.4 V	–	–	150 lm/W	> 90
CLE Shallow G2 370mm – Operating mode NM at 500 mA										
CLE SHALLOW G2 370MM 2900LM 930 EXC	930/359	2,819 lm	2,693 lm	500 mA	32.5 V	35.5 V	17.2 W	164 lm/W	159 lm/W	> 90
CLE SHALLOW G2 370MM 2900LM 940 EXC	940/359	2,992 lm	2,864 lm	500 mA	32.5 V	35.5 V	17.2 W	174 lm/W	168 lm/W	> 90
CLE Shallow G2 370mm – Operating mode HO at 700 mA										
CLE SHALLOW G2 370MM 2900LM 930 EXC	930/359	–	3,759 lm	700 mA	32.8 V	35.8 V	–	–	156 lm/W	> 90
CLE SHALLOW G2 370MM 2900LM 940 EXC	940/359	–	3,986 lm	700 mA	32.8 V	35.8 V	–	–	165 lm/W	> 90
CLE Shallow G2 370mm – Operating mode HO at 900 mA										
CLE SHALLOW G2 370MM 2900LM 930 EXC	930/359	–	4,805 lm	900 mA	33.1 V	36.1 V	–	–	154 lm/W	> 90
CLE SHALLOW G2 370MM 2900LM 940 EXC	940/359	–	5,098 lm	900 mA	33.1 V	36.1 V	–	–	163 lm/W	> 90
CLE Shallow G2 370mm – Operating mode HO at 1,050 mA										
CLE SHALLOW G2 370MM 2900LM 930 EXC	930/359	–	5,609 lm	1,050 mA	33.3 V	36.3 V	–	–	153 lm/W	> 90
CLE SHALLOW G2 370MM 2900LM 940 EXC	940/359	–	5,945 lm	1,050 mA	33.3 V	36.3 V	–	–	162 lm/W	> 90
CLE Shallow G2 370mm – Operating mode HO at 1,400 mA										
CLE SHALLOW G2 370MM 2900LM 930 EXC	930/359	–	7,353 lm	1,400 mA	33.7 V	36.7 V	–	–	149 lm/W	> 90
CLE SHALLOW G2 370MM 2900LM 940 EXC	940/359	–	7,795 lm	1,400 mA	33.7 V	36.7 V	–	–	158 lm/W	> 90
CLE Shallow G2 370mm – Operating mode HO at 1,900 mA										
CLE SHALLOW G2 370MM 2900LM 930 EXC	930/359	–	9,639 lm	1,900 mA	34.2 V	37.2 V	–	–	142 lm/W	> 90
CLE SHALLOW G2 370MM 2900LM 940 EXC	940/359	–	10,216 lm	1,900 mA	34.2 V	37.2 V	–	–	150 lm/W	> 90
CLE Shallow G2 522mm – Operating mode NM at 300 mA										
CLE SHALLOW G2 522MM 1750LM 930 EXC	930/359	1,696 lm	1,628 lm	300 mA	32.7 V	35.6 V	10.4 W	163 lm/W	157 lm/W	> 90
CLE SHALLOW G2 522MM 1750LM 940 EXC	940/359	1,815 lm	1,735 lm	300 mA	32.7 V	35.6 V	10.4 W	175 lm/W	170 lm/W	> 90
CLE Shallow G2 522mm – Operating mode HO at 400 mA										
CLE SHALLOW G2 522MM 1750LM 930 EXC	930/359	–	2,154 lm	400 mA	33.0 V	35.9 V	–	–	155 lm/W	> 90
CLE SHALLOW G2 522MM 1750LM 940 EXC	940/359	–	2,304 lm	400 mA	33.0 V	35.9 V	–	–	167 lm/W	> 90
CLE Shallow G2 522mm – Operating mode HO at 500 mA										
CLE SHALLOW G2 522MM 1750LM 930 EXC	930/359	–	2,690 lm	500 mA	33.2 V	36.2 V	–	–	154 lm/W	> 90
CLE SHALLOW G2 522MM 1750LM 940 EXC	940/359	–	2,872 lm	500 mA	33.2 V	36.2 V	–	–	166 lm/W	> 90
CLE Shallow G2 522mm – Operating mode HO at 700 mA										
CLE SHALLOW G2 522MM 1750LM 930 EXC	930/359	–	3,694 lm	700 mA	33.7 V	36.7 V	–	–	149 lm/W	> 90
CLE SHALLOW G2 522MM 1750LM 940 EXC	940/359	–	3,949 lm	700 mA	33.7 V	36.7 V	–	–	161 lm/W	> 90
CLE Shallow G2 522mm – Operating mode HO at 950 mA										
CLE SHALLOW G2 522MM 1750LM 930 EXC	930/359	–	4,844 lm	950 mA	34.2 V	37.2 V	–	–	142 lm/W	> 90
CLE SHALLOW G2 522MM 1750LM 940 EXC	940/359	–	5,176 lm	950 mA	34.2 V	37.2 V	–	–	153 lm/W	> 90

[1] Integral measurement over the complete module.

[2] If mounted with M4 screws.

[3] Measured at operating mode HO.

[4] HE ... high efficiency, NM ... nominal mode, HO ... high output.

[5] Tolerance of useful light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %.

[6] Tolerance of expected light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %. Based on calculation.

[7] Tolerance of power consumption Pon ± 10 %. Measurement uncertainty ± 5 %.

Specific technical data

Type[4]	Photo-metric code	Useful luminous flux at tp = 25 °C[5]	Expected luminous flux at tp rated[6]	Typ. forward current	Min. forward voltage at tp = 65 °C	Max. forward voltage at tp = 25 °C	Power con-sumption Pon at tp = 25 °C[7]	Efficacy of the module at tp = 25 °C	Expected efficacy of the module at tp rated	Colour rendering index CRI
CLE Shallow G2 802mm – Operating mode NM at 650 mA										
CLE SHALLOW G2 802MM 3800LM 930 EXC	930/359	3,654 lm	3,490 lm	650 mA	32.6 V	35.6 V	22.4 W	163 lm/W	158 lm/W	> 90
CLE SHALLOW G2 802MM 3800LM 940 EXC	940/359	3,891 lm	3,714 lm	650 mA	32.6 V	35.6 V	22.4 W	174 lm/W	168 lm/W	> 90
CLE Shallow G2 802mm – Operating mode HO at 950 mA										
CLE SHALLOW G2 802MM 3800LM 930 EXC	930/359	–	4,814 lm	950 mA	32.9 V	35.9 V	–	–	156 lm/W	> 90
CLE SHALLOW G2 802MM 3800LM 940 EXC	940/359	–	5,122 lm	950 mA	32.9 V	35.9 V	–	–	166 lm/W	> 90
CLE Shallow G2 802mm – Operating mode HO at 1,050 mA										
CLE SHALLOW G2 802MM 3800LM 930 EXC	930/359	–	5,597 lm	1,050 mA	33.1 V	36.1 V	–	–	155 lm/W	> 90
CLE SHALLOW G2 802MM 3800LM 940 EXC	940/359	–	5,950 lm	1,050 mA	33.1 V	36.1 V	–	–	164 lm/W	> 90
CLE Shallow G2 802mm – Operating mode HO at 1,750 mA										
CLE SHALLOW G2 802MM 3800LM 930 EXC	930/359	–	9,116 lm	1,750 mA	33.8 V	36.8 V	–	–	149 lm/W	> 90
CLE SHALLOW G2 802MM 3800LM 940 EXC	940/359	–	9,693 lm	1,750 mA	33.8 V	36.8 V	–	–	157 lm/W	> 90
CLE Shallow G2 802mm – Operating mode HO at 2,150 mA										
CLE SHALLOW G2 802MM 3800LM 930 EXC	930/359	–	10,904 lm	2,150 mA	34.2 V	37.1 V	–	–	143 lm/W	> 90
CLE SHALLOW G2 802MM 3800LM 940 EXC	940/359	–	11,594 lm	2,150 mA	34.2 V	37.1 V	–	–	151 lm/W	> 90
CLE Shallow G2 1082mm – Operating mode NM at 450 mA										
CLE SHALLOW G2 1082MM 1500LM 930 EXC	930/359	1,574 lm	1,506 lm	450 mA	20.1 V	22.0 V	9.6 W	164 lm/W	158 lm/W	> 90
CLE SHALLOW G2 1082MM 1500LM 940 EXC	940/359	1,675 lm	1,605 lm	450 mA	20.1 V	22.0 V	9.6 W	174 lm/W	169 lm/W	> 90
CLE Shallow G2 1082mm – Operating mode HO at 625 mA										
CLE SHALLOW G2 1082MM 1500LM 930 EXC	930/359	–	2,073 lm	625 mA	20.3 V	22.2 V	–	–	156 lm/W	> 90
CLE SHALLOW G2 1082MM 1500LM 940 EXC	940/359	–	2,203 lm	625 mA	20.3 V	22.2 V	–	–	167 lm/W	> 90
CLE Shallow G2 1082mm – Operating mode HO at 725 mA										
CLE SHALLOW G2 1082MM 1500LM 930 EXC	930/359	–	2,405 lm	725 mA	20.4 V	22.3 V	–	–	155 lm/W	> 90
CLE SHALLOW G2 1082MM 1500LM 940 EXC	940/359	–	2,562 lm	725 mA	20.4 V	22.3 V	–	–	166 lm/W	> 90
CLE Shallow G2 1082mm – Operating mode HO at 1,200 mA										
CLE SHALLOW G2 1082MM 1500LM 930 EXC	930/359	–	3,823 lm	1,200 mA	20.9 V	22.7 V	–	–	145 lm/W	> 90
CLE SHALLOW G2 1082MM 1500LM 940 EXC	940/359	–	4,068 lm	1,200 mA	20.9 V	22.7 V	–	–	156 lm/W	> 90
CLE Shallow G2 1082mm – Operating mode HO at 1,500 mA										
CLE SHALLOW G2 1082MM 1500LM 930 EXC	930/359	–	4,702 lm	1,500 mA	21.2 V	23.0 V	–	–	142 lm/W	> 90
CLE SHALLOW G2 1082MM 1500LM 940 EXC	940/359	–	5,005 lm	1,500 mA	21.2 V	23.0 V	–	–	152 lm/W	> 90

[1] Integral measurement over the complete module.

[2] If mounted with M4 screws.

[3] Measured at operating mode HO.

[4] HE ... high efficiency, NM ... nominal mode, HO ... high output.

[5] Tolerance of useful light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %.

[6] Tolerance of expected light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %. Based on calculation.

[7] Tolerance of power consumption Pon ± 10 %. Measurement uncertainty ± 5 %.

1. Standards

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

1.1 Photometric code

Key for photometric code, e. g. 830 / 449

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 Energy classification

Type	Colour temperature	Forward current	Energy classification	Energy consumption
CLE SHALLOW G2 160MM 750LM				
CLE SHALLOW G2 160MM 750LM 930 EXC	3,000 K	150 mA	D	5 kWh / 1,000 h
CLE SHALLOW G2 160MM 750LM 940 EXC	4,000 K	150 mA	D	5 kWh / 1,000 h
CLE SHALLOW G2 370MM 2900LM				
CLE SHALLOW G2 370MM 2900LM 930 EXC	3,000 K	500 mA	D	18 kWh / 1,000 h
CLE SHALLOW G2 370MM 2900LM 940 EXC	4,000 K	500 mA	C	18 kWh / 1,000 h
CLE SHALLOW G2 522MM 1750LM				
CLE SHALLOW G2 522MM 1750LM 930 EXC	3,000 K	300 mA	D	11 kWh / 1,000 h
CLE SHALLOW G2 522MM 1750LM 940 EXC	4,000 K	300 mA	C	11 kWh / 1,000 h
CLE SHALLOW G2 802MM 3800LM				
CLE SHALLOW G2 802MM 3800LM 930 EXC	3,000 K	650 mA	D	23 kWh / 1,000 h
CLE SHALLOW G2 802MM 3800LM 940 EXC	4,000 K	650 mA	C	23 kWh / 1,000 h
CLE SHALLOW G2 1082MM 1500LM				
CLE SHALLOW G2 1082MM 1500LM 930 EXC	3,000 K	450 mA	D	10 kWh / 1,000 h
CLE SHALLOW G2 1082MM 1500LM 940 EXC	4,000 K	450 mA	C	10 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 CLE a tp temperature of 65 °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	-30 … +80 °C

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

2.3 Thermal design and heat sink

The rated life of LED products depends to a large extent on the temperature. If the permissible temperature limits are exceeded, the life of the CLE will be greatly reduced or the CLE may be destroyed.

3. Installation / wiring

3.1 Electrical supply/choice of LED Driver

CLE 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 CLE 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

CLE 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 CLE.

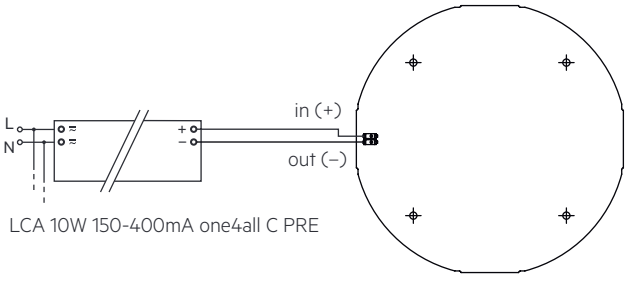
With parallel wiring tolerance-related differences in output are possible (thermal stress of the module) and can cause differences in brightness. If one module fails, the remaining modules may be overloaded.

CLE can be operated either from SELV LED Drivers or from LED Drivers with LV output voltage.

CLE are basic insulated up to 250 V 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 250 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.

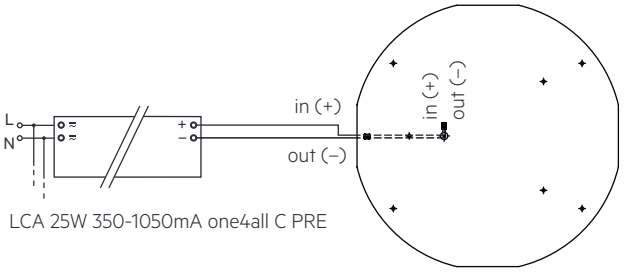
3.2 Wiring

CLE Shallow G2 160mm 750lm EXC



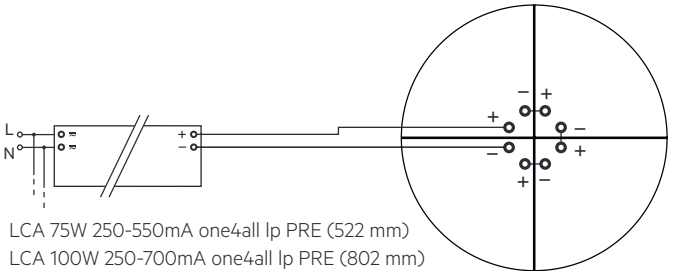
LCA 10W 150-400mA one4all C PRE

CLE Shallow G2 370mm 2900lm EXC



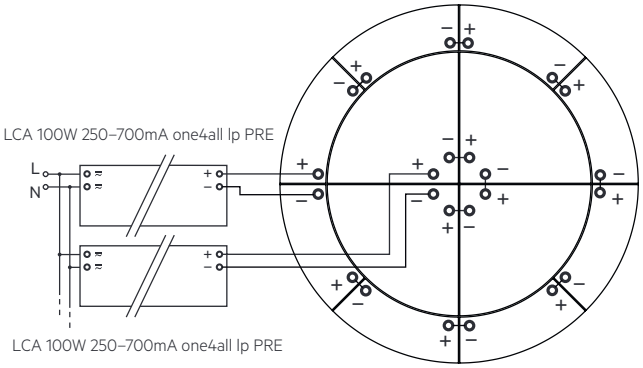
LCA 25W 350-1050mA one4all C PRE

CLE Shallow G2 522/802mm 1750/3800lm EXC



LCA 75W 250-550mA one4all lp PRE (522 mm)
LCA 100W 250-700mA one4all lp PRE (802 mm)

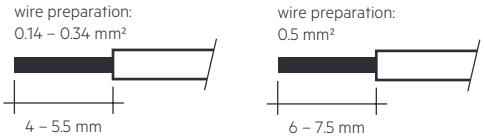
CLE Shallow G2 1082mm 1500lm EXC



LCA 100W 250–700mA one4all lp PRE
LCA 100W 250–700mA one4all lp PRE

3.3 Wiring type and cross section

The wiring can be in solid with a cross section of 0.14 to 0.5 mm².
No reconnection with smaller diameters possible if used with >0.34 mm².



To remove the wires use a suitabel tool (Wago 206-859) or through twist and pull.

3.4 Mounting instruction

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

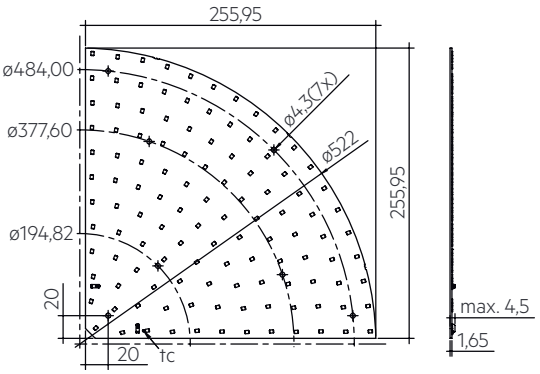
Max. torque for fixing: 0.5 Nm.

The LED modules are mounted with 4 screws or with ACL clips.
In order not to damage the modules only rounded head screws and an additional plastic flat washer should be used.

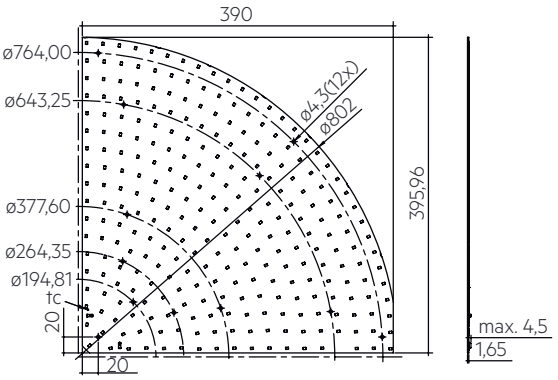
Chemical substance may harm the LED module. Chemical reactions could lead to colour shift, reduced luminous flux or a total failure of the module caused by corrosion of electrical connections.

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.

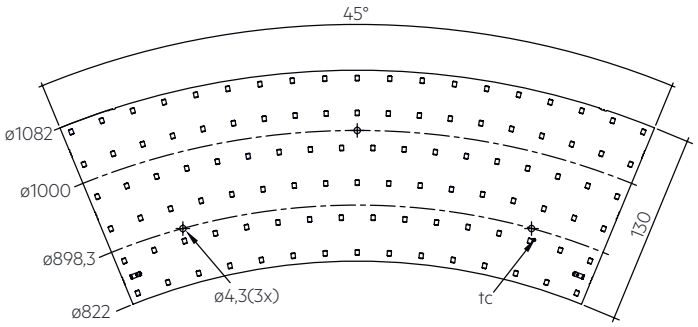
CLE Shallow G2 522mm 1750lm EXC



CLE Shallow G2 802mm 3800lm EXC



CLE Shallow G2 1082mm 1500lm EXC



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.

The F value is the combination of the B and C value. That means for F degradation and complete failures are considered, e.g. L70F10 means 10 % of the LED modules may fail or be below 70 % of the initial luminous flux.

4.2 Lumen maintenance for CLE

CLE Shallow G2 160mm 750lm 9x0 EXC

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
150 mA	45 °C	42,000 h	58,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	50 °C	41,000 h	56,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	55 °C	40,000 h	54,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	60 °C	40,000 h	52,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	65 °C	39,000 h	51,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	70 °C	38,000 h	49,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	75 °C	37,000 h	48,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	80 °C	36,000 h	46,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	85 °C	35,000 h	45,000 h	72,000 h	72,000 h	72,000 h	72,000 h

CLE Shallow G2 370mm 2900lm 9x0 EXC

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
500 mA	45 °C	42,000 h	58,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	50 °C	41,000 h	56,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	55 °C	40,000 h	54,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	60 °C	40,000 h	52,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	65 °C	39,000 h	51,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	70 °C	38,000 h	49,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	75 °C	37,000 h	48,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	80 °C	36,000 h	46,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	85 °C	35,000 h	45,000 h	72,000 h	72,000 h	72,000 h	72,000 h

CLE Shallow G2 522mm 1750lm 9x0 EXC

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
300 mA	45 °C	42,000 h	58,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	50 °C	41,000 h	56,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	55 °C	40,000 h	54,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	60 °C	40,000 h	52,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	65 °C	39,000 h	51,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	70 °C	38,000 h	49,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	75 °C	37,000 h	48,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	80 °C	36,000 h	46,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	85 °C	35,000 h	45,000 h	72,000 h	72,000 h	72,000 h	72,000 h

CLE Shallow G2 802mm 3800lm 9x0 EXC

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
650 mA	45 °C	42,000 h	58,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	50 °C	41,000 h	56,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	55 °C	40,000 h	54,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	60 °C	40,000 h	52,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	65 °C	39,000 h	51,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	70 °C	38,000 h	49,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	75 °C	37,000 h	48,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	80 °C	36,000 h	46,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	85 °C	35,000 h	45,000 h	72,000 h	72,000 h	72,000 h	72,000 h

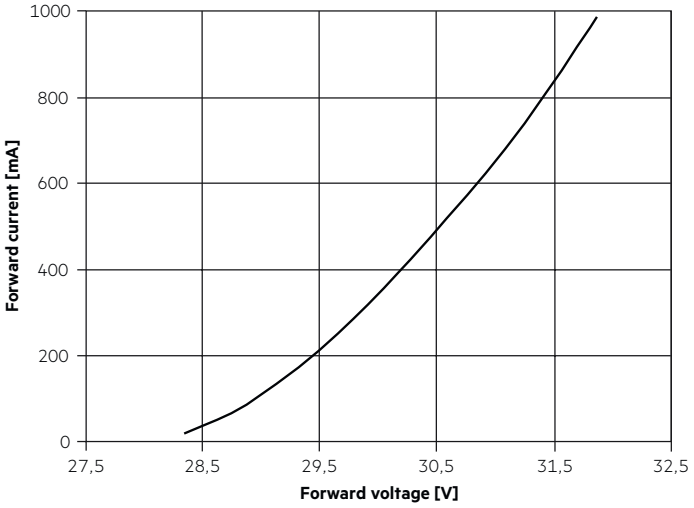
CLE Shallow G2 1082mm 1500lm 9x0 EXC

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
450 mA	45 °C	42,000 h	58,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	50 °C	41,000 h	56,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	55 °C	40,000 h	54,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	60 °C	40,000 h	52,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	65 °C	39,000 h	51,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	70 °C	38,000 h	49,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	75 °C	37,000 h	48,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	80 °C	36,000 h	46,000 h	72,000 h	72,000 h	72,000 h	72,000 h
	85 °C	35,000 h	45,000 h	72,000 h	72,000 h	72,000 h	72,000 h

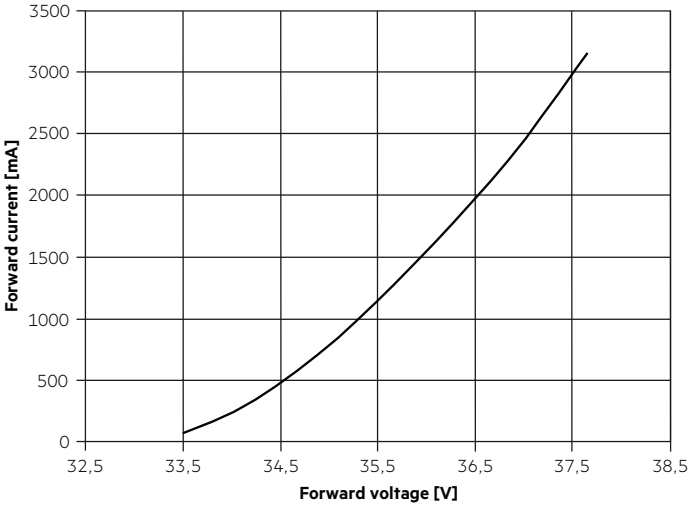
5. Electrical values

5.1 Typ. forward voltage vs. forward current

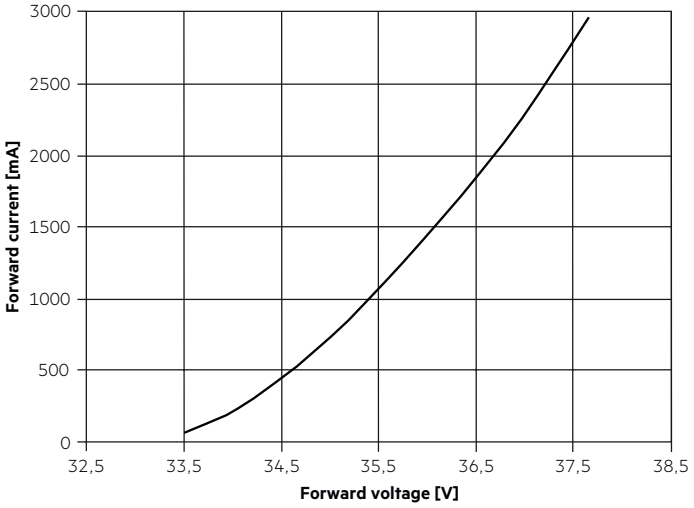
CLE Shallow G2 160mm 750lm



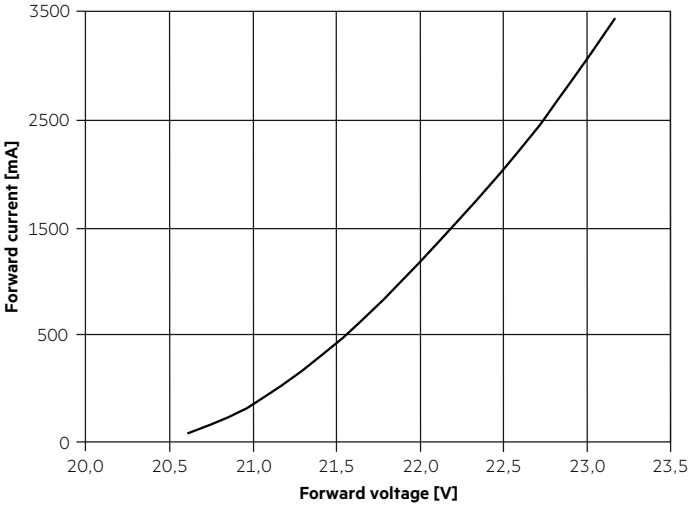
CLE Shallow G2 802mm 3800lm



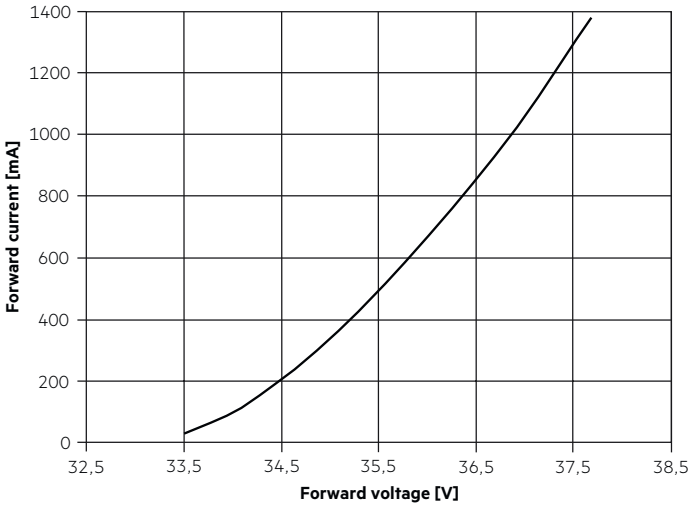
CLE Shallow G2 370mm 2900lm



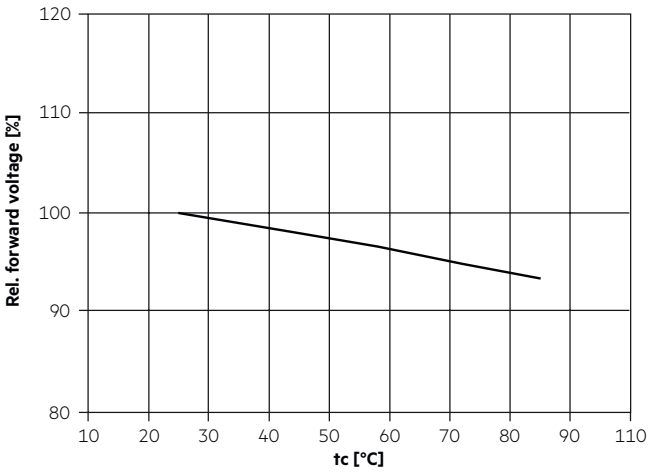
CLE Shallow G2 1082mm 1500lm



CLE Shallow G2 522mm 1750lm



5.2 Forward voltage vs. tp temperature



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

6. Photometric characteristics

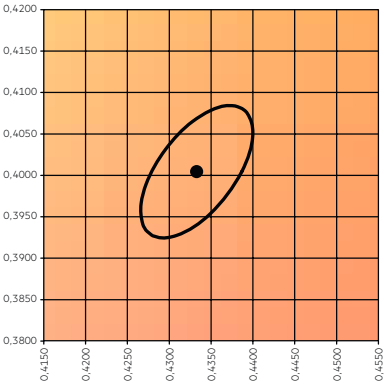
6.1 Coordinates and tolerances according to CIE 1931

The specified colour coordinates are measured integral after a settling time of 100 ms. The current impuls depends on the module type.
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

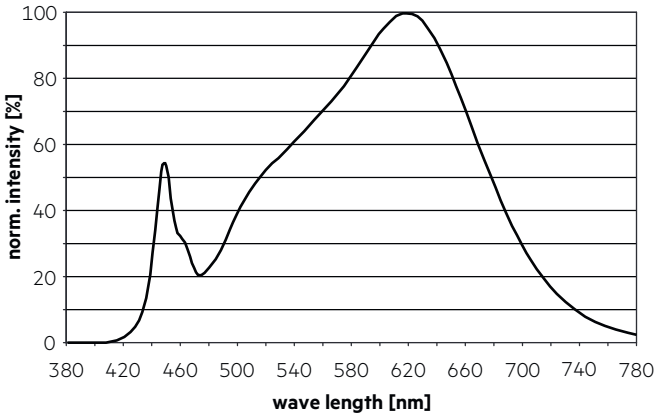
Module type	Current impulse
CLE SHALLOW G2 160MM 750LM 9x0 EXC	150 mA
CLE SHALLOW G2 370MM 2900LM 9x0 EXC	500 mA
CLE SHALLOW G2 522MM 1750LM 9x0 EXC	300 mA
CLE SHALLOW G2 802MM 3800LM 9x0 EXC	650 mA
CLE SHALLOW G2 1082MM 1500LM 9x0 EXC	450 mA

3,000 K

	x0	y0
Centre	0.4333	0.4006

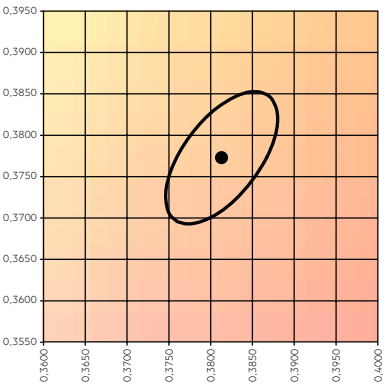


MacAdam Ellipse: 3SDCM

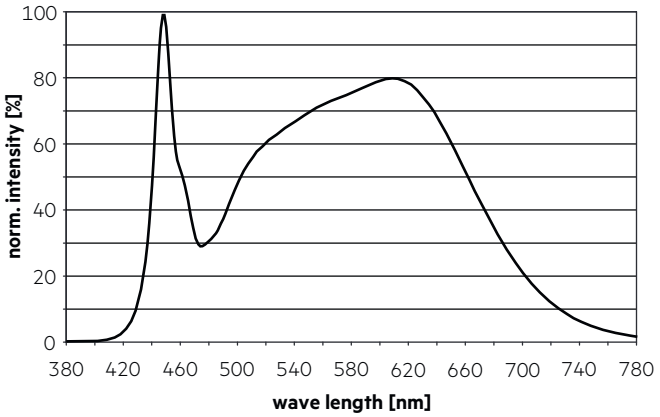


4,000 K

	x0	y0
Centre	0.3813	0.3773

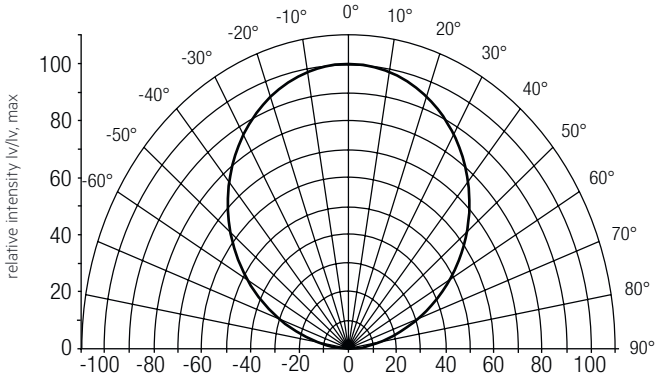


MacAdam Ellipse: 3SDCM



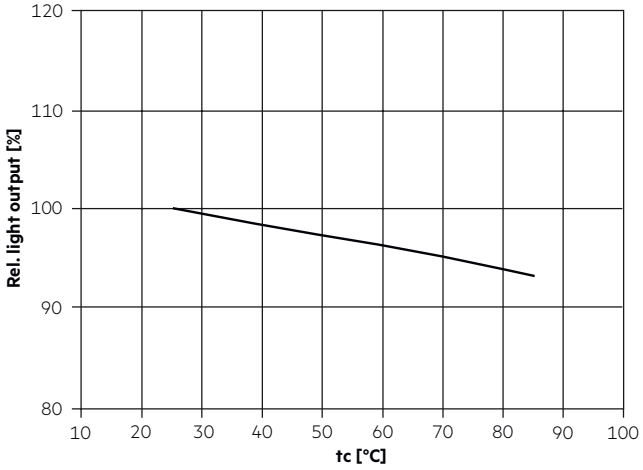
6.2 Light distribution

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



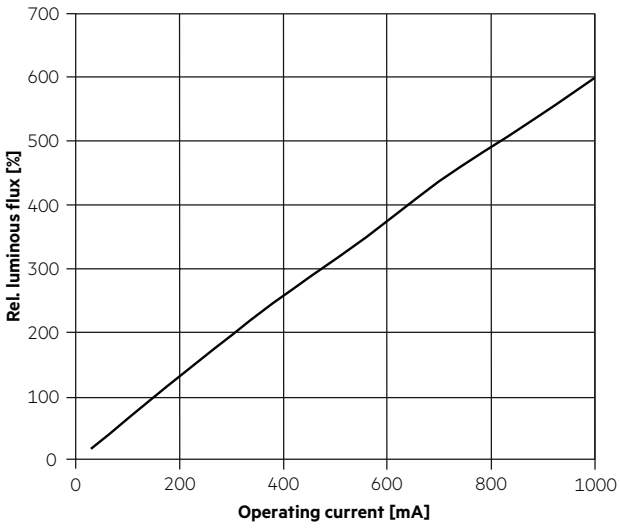
The colour temperature is measured over the complete module. The single LED light points can be outside of 3SDCM.
To ensure an ideal mixture of colours and a homogeneous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 7 cm) should be used.

6.3 Relative luminous flux vs. tc temperature

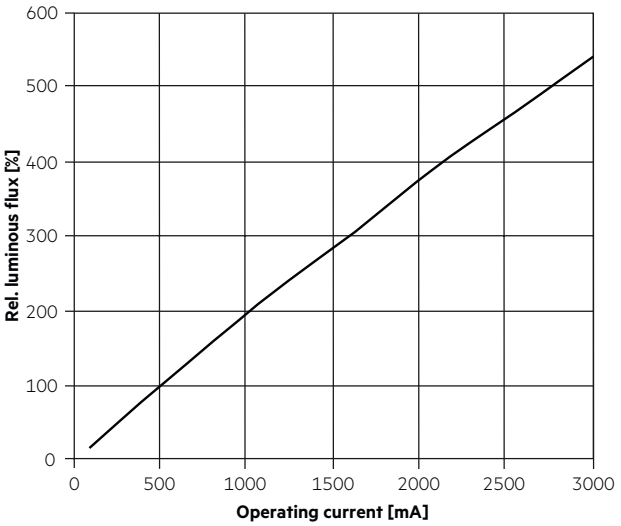


6.4 Relative luminous flux vs. operating current

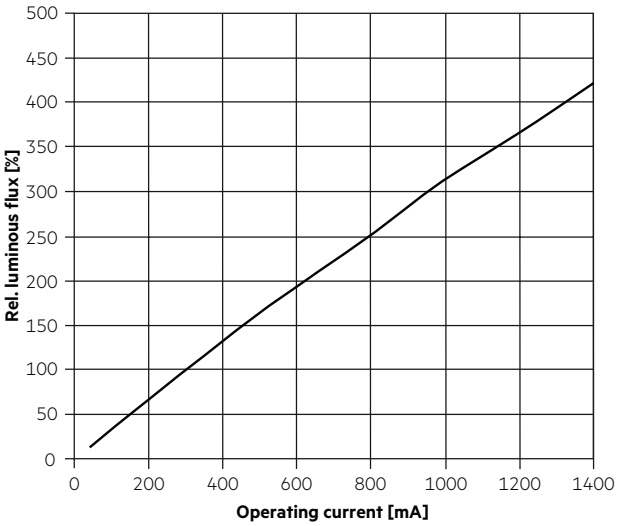
CLE Shallow G2 160mm 750lm



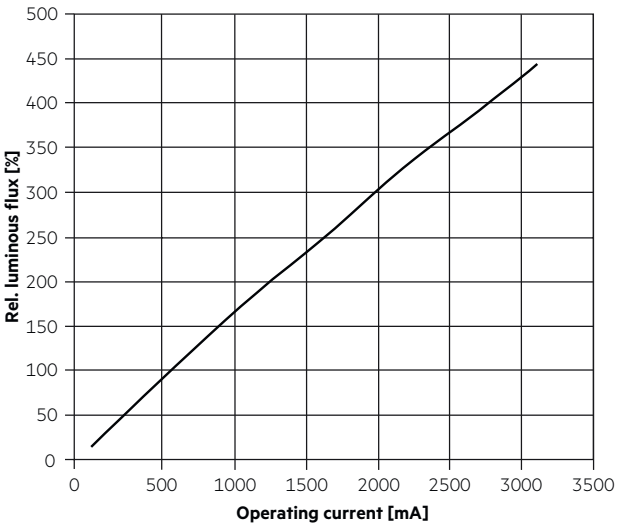
CLE Shallow G2 370mm 2900lm



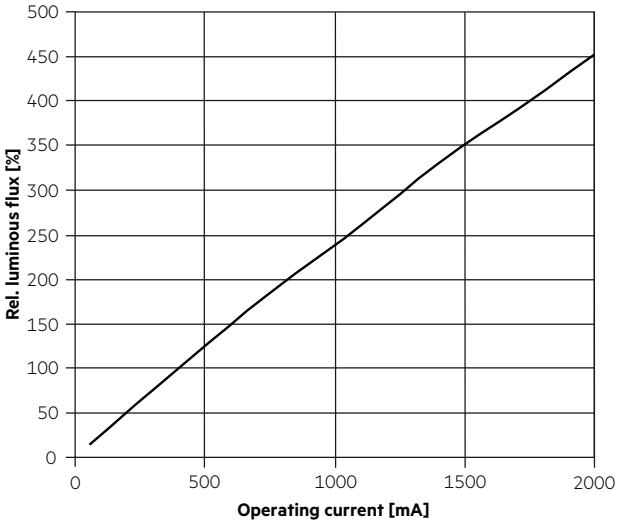
CLE Shallow G2 522mm 1750lm



CLE Shallow G2 802mm 3800lm



CLE Shallow G2 1082mm 1500lm



7. Miscellaneous

7.1 Additional information

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

Guarantee conditions at www.tridonic.com → Services

Lifetime declarations are informative and represent no warranty claim.