



Module CLE Quadrant G2 ADV

Module CLE

Product description

- Ideal for round shaped and flat ceiling and pendant luminaires
- THE solution to realise XXL luminaires
- For uniform illumination of prestige areas or rooms designed to impress
- High Output and High Efficiency Mode enables more flexibility on luminaire design
- Narrow diffuser distances possible
- Self cooling (no additional heat sink required)
- Small colour tolerance MacAdam 3rd
- Colour temperatures 3,000 and 4,000 K
- Long life-time: 50,000 hours
- 5-year guarantee
- Perfect system solution with PREMIUM Ip drivers



Standards, page 3

Colour temperatures and tolerances, page 8



Specific technical data

Type [®]	Photo-metric code	Typ. luminous flux at tp = 25 °C ^①	Typ. luminous flux at tp = 45 °C ^②	Typ. forward current	Min. forward voltage at tp = 45 °C	Max. forward voltage at tp = 25 °C	Typ. power consumption at tp = 45 °C ^③	Efficacy of the module at tp = 25 °C	Efficacy of the module at tp = 45 °C	Efficacy of the system at tp = 45 °C	Colour rendering index CRI
Operating mode HE											
CLE Quadrant G2 261mm 1200lm 830 ADV	830/359	1,230 lm	1,200 lm	225 mA	28.3 V	31.8 V	6.7 W	180 lm/W	178 lm/W	160 lm/W	> 80
CLE Quadrant G2 261mm 1200lm 840 ADV	840/359	1,290 lm	1,260 lm	225 mA	28.3 V	31.8 V	6.7 W	189 lm/W	187 lm/W	168 lm/W	> 80
CLE Quadrant G2 401mm 2500lm 830 ADV	830/359	2,480 lm	2,420 lm	450 mA	27.8 V	31.3 V	13.2 W	185 lm/W	183 lm/W	165 lm/W	> 80
CLE Quadrant G2 401mm 2500lm 840 ADV	840/359	2,590 lm	2,530 lm	450 mA	27.8 V	31.3 V	13.2 W	193 lm/W	191 lm/W	172 lm/W	> 80
CLE Quadrant G2 541mm 1000lm 830 ADV	830/359	1,000 lm	970 lm	250 mA	20.5 V	23.1 V	5.4 W	182 lm/W	178 lm/W	160 lm/W	> 80
CLE Quadrant G2 541mm 1000lm 840 ADV	840/359	1,040 lm	1,020 lm	250 mA	20.5 V	23.1 V	5.4 W	189 lm/W	188 lm/W	169 lm/W	> 80
Operating mode HO											
CLE Quadrant G2 261mm 1200lm 830 ADV	830/359	1,890 lm	1,840 lm	350 mA	28.8 V	32.4 V	10.6 W	175 lm/W	172 lm/W	155 lm/W	> 80
CLE Quadrant G2 261mm 1200lm 840 ADV	840/359	1,980 lm	1,930 lm	350 mA	28.8 V	32.4 V	10.6 W	183 lm/W	181 lm/W	163 lm/W	> 80
CLE Quadrant G2 401mm 2500lm 830 ADV	830/359	3,920 lm	3,820 lm	725 mA	28.6 V	32.2 V	21.9 W	176 lm/W	174 lm/W	157 lm/W	> 80
CLE Quadrant G2 401mm 2500lm 840 ADV	840/359	4,100 lm	4,000 lm	725 mA	28.6 V	32.2 V	21.9 W	184 lm/W	182 lm/W	164 lm/W	> 80
CLE Quadrant G2 541mm 1000lm 830 ADV	830/359	1,470 lm	1,430 lm	375 mA	20.9 V	23.5 V	8.3 W	175 lm/W	173 lm/W	156 lm/W	> 80
CLE Quadrant G2 541mm 1000lm 840 ADV	840/359	1,540 lm	1,500 lm	375 mA	20.9 V	23.5 V	8.3 W	184 lm/W	181 lm/W	163 lm/W	> 80

^① Integral measurement over the complete module.

^② If mounted with M4 screws.

^③ Measured at operating mode HO.

^④ Tolerance range for optical and electrical data: ±10 %.

[®] HE ... high efficiency, HO ... high output.

1. Standards

IEC 62031
IEC 62471
IEC 61547
IEC 55015
IEC 61000-4-2

1.1 Photometric code

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

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

1.2 Energy classification

Type	Energy classification
CLE Quadrant G2 ADV	A++

2. Thermal details

2.1 tc point, ambient temperature and life-time

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

For CLE a tp temperature of 45 °C has to be complied in order to achieve an optimum between heat sink requirements, light output and life-time.

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
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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.

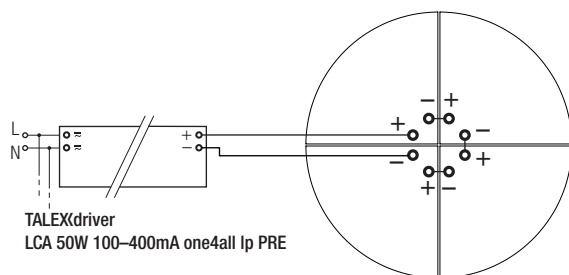
CLE can be operated either from SELV LED Drivers or from LED Drivers with LV output voltage.



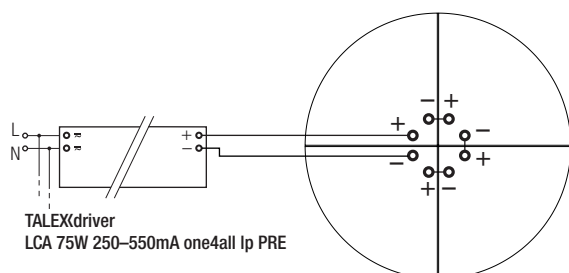
CLE are basic isolated up to 300 V against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the led Driver (also against earth) is above 300 V, an additional isolation between LED module and heat sink is required (for example by isolated thermal 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

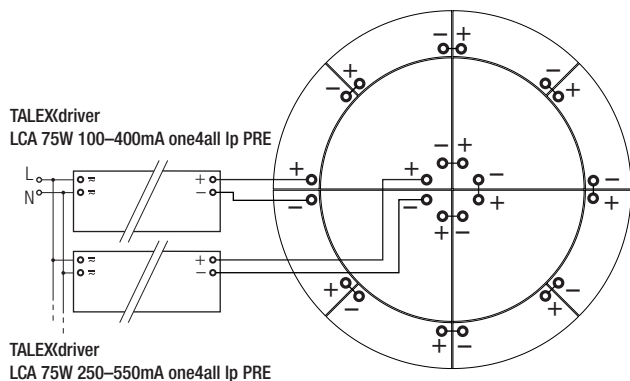
CLE Quadrant G2 261mm 1200 lm ADV



CLE Quadrant G2 401mm 2500lm ADV

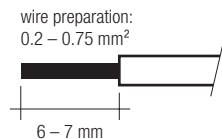


CLE Quadrant G2 401mm 2500lm ADV +
CLE Quadrant G2 541mm 1000lm ADV



3.3 Wiring type and cross section

The wiring can be solid cable with a cross section of 0.2 to 0.75 mm². For the push-wire connection you have to strip the insulation (6-7 mm).



Inserting stranded wires / removing wires by lightly pressing on the push button.

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 per module. In order not to damage the modules only rounded head screws and an additional plastic flat washer should be used.

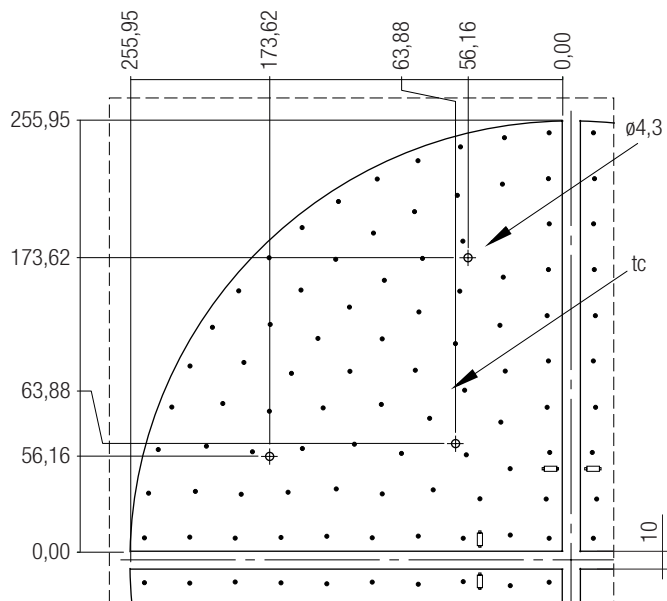


Chemical substance may harm the LED module. Chemical reactions could lead to colour shift, reduced luminous flux or a total failure of the module caused by corrosion of electrical connections.

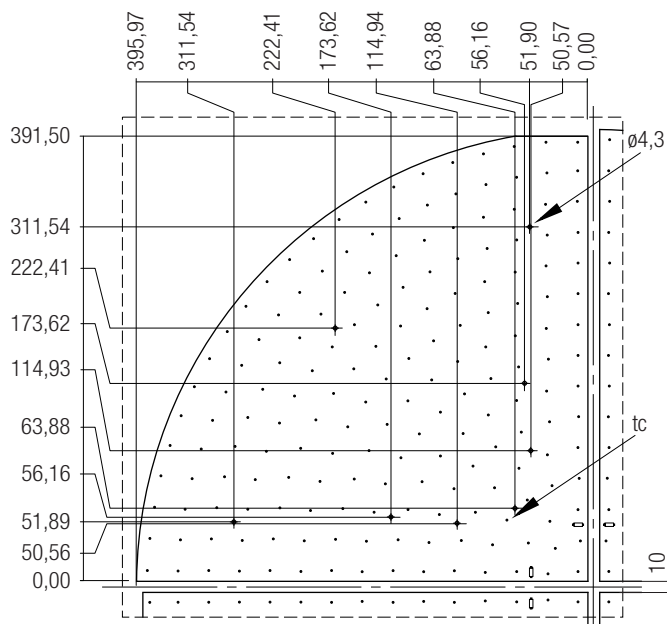
Materials which are used in LED applications (e.g. sealings, adhesives) must not produce dissolver gas. They must not be condensation curing based, acetate curing based or contain sulfur, chlorine or phthalate.

Avoid corrosive atmosphere during usage and storage.

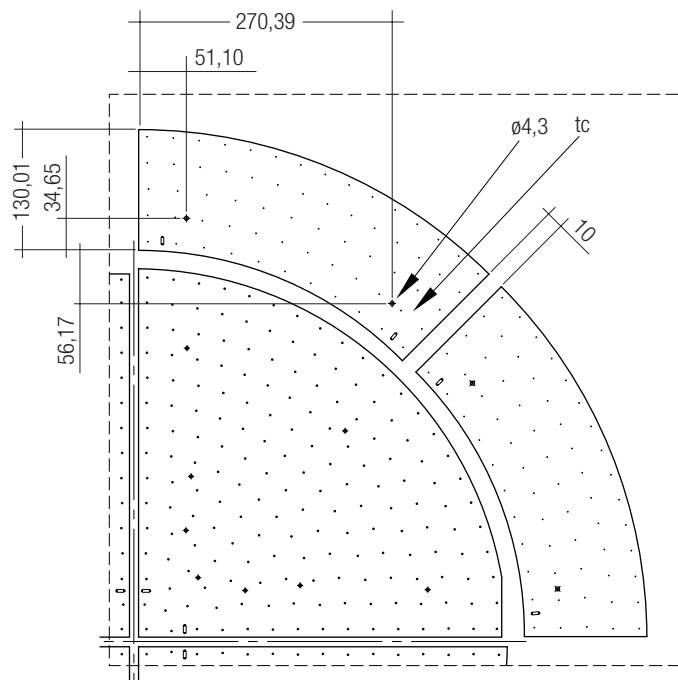
CLE Quadrant G2 261mm 1200 lm ADV



CLE Quadrant G2 401mm 2500lm ADV



CLE Quadrant G2 541mm 1000lm ADV



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. Life-time

4.1 Life-time, lumen maintenance and failure rate

The light output of an LED Module decreases over the life-time, 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 life-time 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 Quadrant G2 261mm 1200lm 8x0 ADV

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
225 mA	45 °C	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
	55 °C	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
	65 °C	24,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
350 mA	45 °C	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
	55 °C	36,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
	65 °C	19,000 h	45,000 h	37,000 h	>50,000 h	>50,000 h	>50,000 h

CLE Quadrant G2 401mm 2500lm 8x0 ADV

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
450 mA	45 °C	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
	55 °C	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
	65 °C	25,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
725 mA	45 °C	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
	55 °C	27,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
	65 °C	15,000 h	34,000 h	28,000 h	>50,000 h	44,000 h	>50,000 h

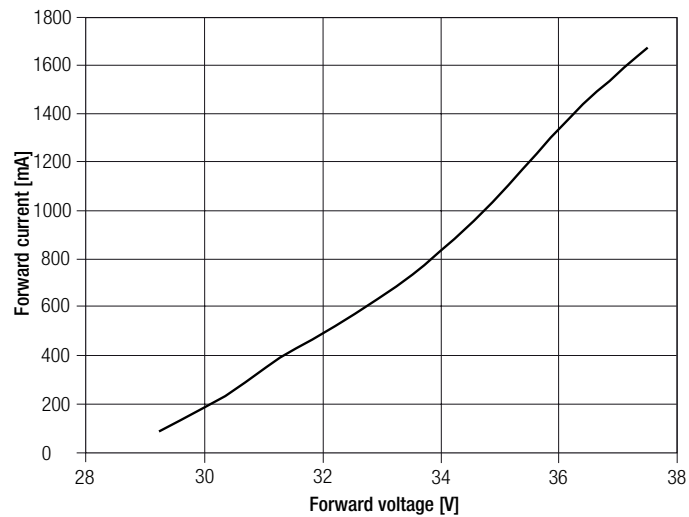
CLE Quadrant G2 541mm 1000lm 8x0 ADV

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
250 mA	45 °C	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
	55 °C	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
	65 °C	24,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
375 mA	45 °C	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
	55 °C	35,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h	>50,000 h
	65 °C	18,000 h	44,000 h	36,000 h	>50,000 h	>50,000 h	>50,000 h

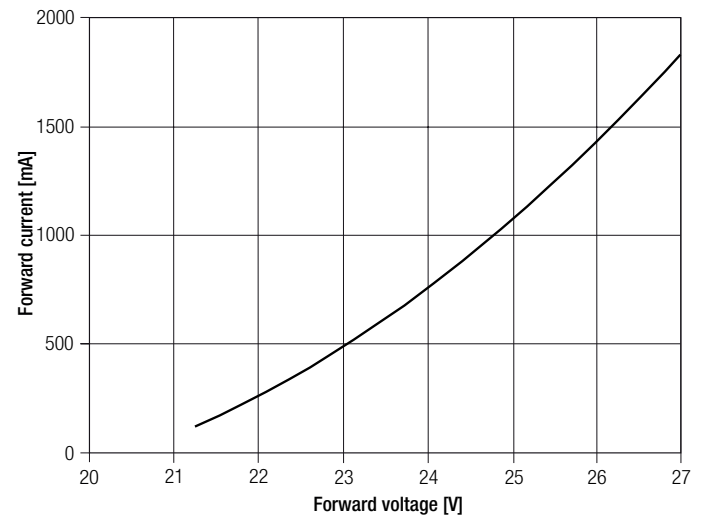
5. Electrical values

5.1 Typ. forward voltage vs. forward current

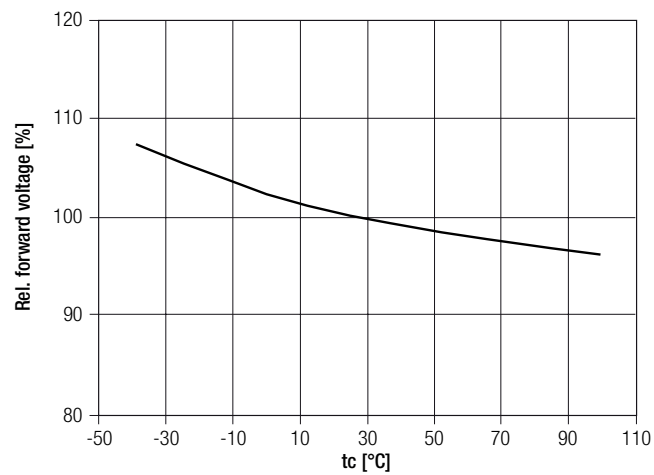
CLE Quadrant G2 261mm 1200lm + CLE Quadrant G2 401mm 2500lm



CLE Quadrant G2 541mm 1000lm



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

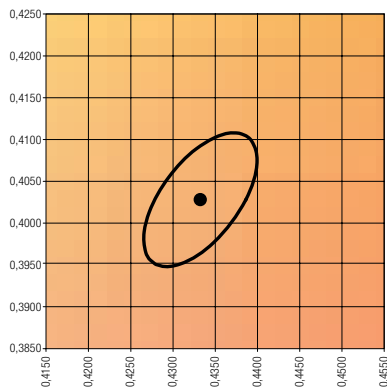
The specified colour coordinates are measured by a current impulse of 250 mA and a duration of 100 ms.

The ambient temperature of the measurement is $t_a = 25^\circ\text{C}$.

The measurement tolerance of the colour coordinates are ± 0.01 .

3,000 K

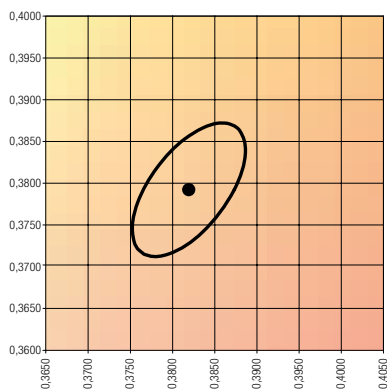
	x0	y0
Centre	0.4338	0.4030



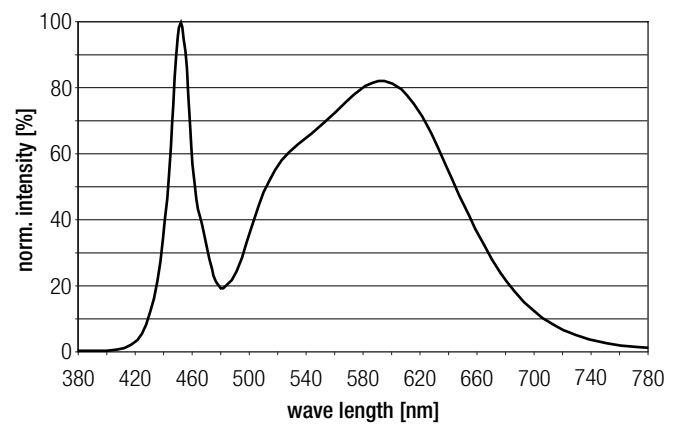
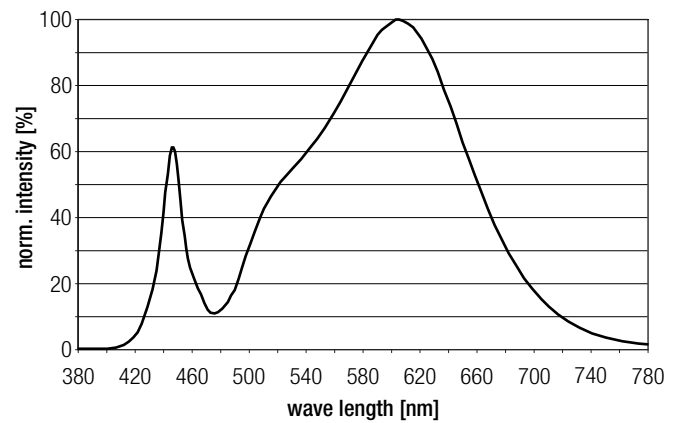
— MacAdam Ellipse: 3SDCM

4,000 K

	x0	y0
Centre	0.3818	0.3797

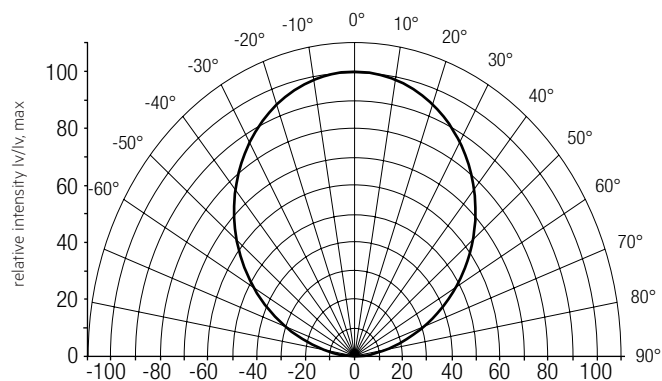


— MacAdam Ellipse: 3SDCM



6.2 Light distribution

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

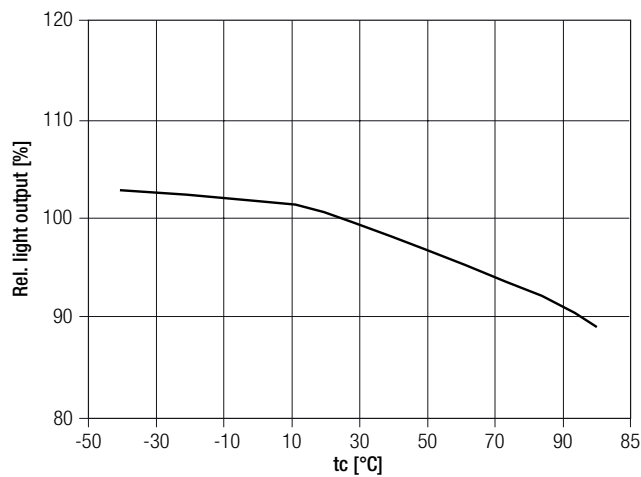


The colour temperature is measured over the complete module. The single LED light points can be outside of 3SDCM.

To ensure an ideal mixture of colours and a homogenous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 7 cm) should be used.

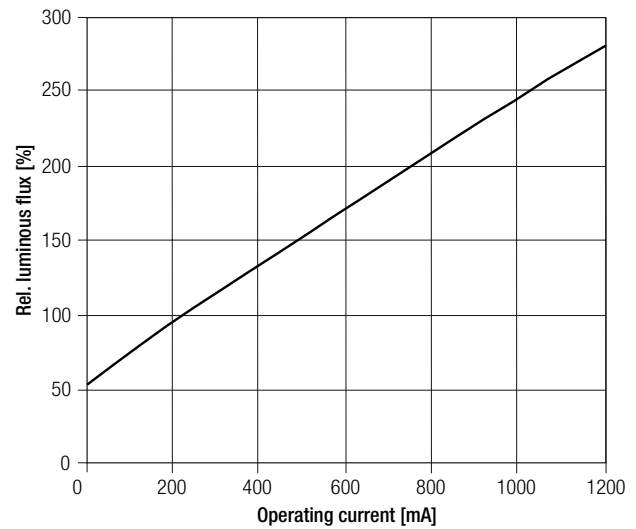
For further information see Design-in Guide, 3D data and photometric data on www.tridonic.com or on request.

6.3 Relative luminous flux vs. tc temperature

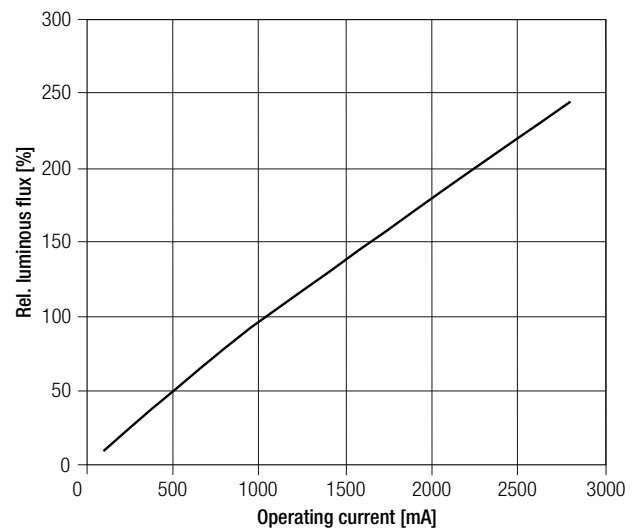


6.4 Relative luminous flux vs. operating current

CLE Quadrant G2 261mm 1200lm 8x0 ADV



CLE Quadrant G2 401mm 2500lm 8x0 ADV



CLE Quadrant G2 541mm 1000lm 8x0 ADV

