



Module LLE FLEX 8mm SNC2

Modules LLE FLEX essence

Product description

- Dimmable 24 V constant voltage LED flextape (SELV)
- Ideal for various decorative lighting applications: facade accent lighting, ceiling integration, cove lighting and for aluminium extrusions

Features and benefits

- Luminous flux range of 600, 1,200, 1,800 and 2,500 lm/m
- Colour temperature 2,700, 3,000, 4,000 and 6,500 K with SDCM 3[®]
- Efficacy of the module up to 133 lm/W
- High design freedom due to 5 cm cut-options
- Pitch distance of 8.3 mm enables high light homogeneity
- Self-adhesive 3M tape at the backside for simple mounting on different surfaces
- PCB to PCB and wire to PCB connectors for toolless handling and connection
- Long lifetime: 60,000 hours
- 5 years guarantee (conditions at www.tridonic.com)
- System solution in combination with Tridonic constant voltage LED Driver (fixed output and dimmable)



Standards, page 6

Colour temperatures and tolerances, page 8



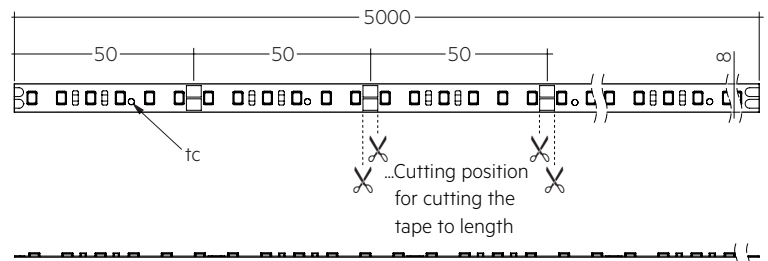


Module LLE FLEX 8mm SNC2

Modules LLE FLEX essence

Technical data

Beam characteristic	120°
Ambient temperature range	-25 ... +45 °C
tp rated	65 °C
tc	75 °C
DC supply voltage	24 V
DC supply voltage range®	21.5 – 26.4 V
Insulation test voltage	0.5 kV
ESD classification	severity level 1
Risk group (IEC 62471)	RG1
Type of protection	IP00
Lifetime	up to 60,000 h
Guarantee (conditions at www.tridonic.com)	5 years



Ordering data

Type	Article number	Colour temperature	Packaging carton	Weight per roll
LLE FLEX 8x5000 5W-600lm/m 827 SNC2	28003323	2,700 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 5W-600lm/m 830 SNC2	28003324	3,000 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 5W-600lm/m 840 SNC2	28003325	4,000 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 5W-600lm/m 865 SNC2	28003351	6,500 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 10W-1200lm/m 827 SNC2	28003326	2,700 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 10W-1200lm/m 830 SNC2	28003327	3,000 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 10W-1200lm/m 840 SNC2	28003328	4,000 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 10W-1200lm/m 865 SNC2	28003352	6,500 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 15W-1800lm/m 827 SNC2	28003329	2,700 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 15W-1800lm/m 830 SNC2	28003330	3,000 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 15W-1800lm/m 840 SNC2	28003331	4,000 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 15W-1800lm/m 865 SNC2	28003353	6,500 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 21W-2500lm/m 827 SNC2	28003332	2,700 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 21W-2500lm/m 830 SNC2	28003333	3,000 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 21W-2500lm/m 840 SNC2	28003334	4,000 K	30 pc(s).	0.072 kg
LLE FLEX 8x5000 21W-2500lm/m 865 SNC2	28003354	6,500 K	30 pc(s).	0.072 kg

Specific technical data

Type	Photometric code	Typ. luminous flux at tp = 25 °C ^①	Typ. luminous flux at tp = 65 °C ^①	Typ. current consumption at tp = 65 °C ^②	Typ. power consumption at tp = 65 °C ^②	Efficacy of the module at tp = 25 °C	Efficacy of the module at tp = 65 °C	Colour rendering index CRI
LLE FLEX 8x5000 5W-600lm/m 827 SNC2	827/359	625 lm/m	590 lm/m	210 mA/m	5.0 W/m	126 lm/W	118 lm/W	> 80
LLE FLEX 8x5000 5W-600lm/m 830 SNC2	830/359	655 lm/m	620 lm/m	210 mA/m	5.0 W/m	133 lm/W	124 lm/W	> 80
LLE FLEX 8x5000 5W-600lm/m 840 SNC2	840/359	650 lm/m	615 lm/m	197 mA/m	4.7 W/m	141 lm/W	133 lm/W	> 80
LLE FLEX 8x5000 5W-600lm/m 865 SNC2	865/359	645 lm/m	610 lm/m	197 mA/m	4.7 W/m	140 lm/W	131 lm/W	> 80
LLE FLEX 8x5000 10W-1200lm/m 827 SNC2	827/359	1,250 lm/m	1,180 lm/m	420 mA/m	10.1 W/m	126 lm/W	118 lm/W	> 80
LLE FLEX 8x5000 10W-1200lm/m 830 SNC2	830/359	1,310 lm/m	1,240 lm/m	420 mA/m	10.1 W/m	133 lm/W	124 lm/W	> 80
LLE FLEX 8x5000 10W-1200lm/m 840 SNC2	840/359	1,330 lm/m	1,260 lm/m	402 mA/m	9.7 W/m	141 lm/W	133 lm/W	> 80
LLE FLEX 8x5000 10W-1200lm/m 865 SNC2	865/359	1,320 lm/m	1,250 lm/m	402 mA/m	9.7 W/m	140 lm/W	131 lm/W	> 80
LLE FLEX 8x5000 15W-1800lm/m 827 SNC2	827/359	1,900 lm/m	1,800 lm/m	642 mA/m	15.4 W/m	125 lm/W	117 lm/W	> 80
LLE FLEX 8x5000 15W-1800lm/m 830 SNC2	830/359	1,990 lm/m	1,880 lm/m	642 mA/m	15.4 W/m	131 lm/W	122 lm/W	> 80
LLE FLEX 8x5000 15W-1800lm/m 840 SNC2	840/359	2,000 lm/m	1,890 lm/m	612 mA/m	14.7 W/m	139 lm/W	131 lm/W	> 80
LLE FLEX 8x5000 15W-1800lm/m 865 SNC2	865/359	1,980 lm/m	1,870 lm/m	612 mA/m	14.7 W/m	137 lm/W	129 lm/W	> 80
LLE FLEX 8x5000 21W-2500lm/m 827 SNC2	827/359	2,640 lm/m	2,500 lm/m	894 mA/m	21.5 W/m	125 lm/W	117 lm/W	> 80
LLE FLEX 8x5000 21W-2500lm/m 830 SNC2	830/359	2,760 lm/m	2,610 lm/m	894 mA/m	21.5 W/m	131 lm/W	122 lm/W	> 80
LLE FLEX 8x5000 21W-2500lm/m 840 SNC2	840/359	2,790 lm/m	2,640 lm/m	844 mA/m	20.3 W/m	139 lm/W	130 lm/W	> 80
LLE FLEX 8x5000 21W-2500lm/m 865 SNC2	865/359	2,760 lm/m	2,610 lm/m	844 mA/m	20.3 W/m	137 lm/W	128 lm/W	> 80

^① Tolerance range for optical data ±15 %, measurement uncertainty ±7.5 %. Values given for 1 m LLE FLEX.

^② Tolerance range for electrical data ±15 %, measurement uncertainty ±5 %. Values given for 1 m LLE FLEX.

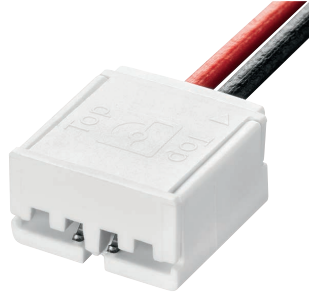
^③ Exceeding the max. operating voltage leads to an overload on the LLE FLEX. This may in turn result in a reduction in lifetime or even in destruction.

^④ Integral measurement over the complete module.

Connector for LLE FLEX

Product description

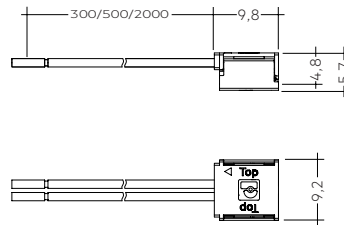
- For connection of LLE FLEX modules
- For internal wiring only (no strain relief functionality)
- Easy assembly: For assembly instructions see application note available at www.tridonic.com
- Glow wire test according to IEC 60695-2-11: 650 °C
- Max. 4 A in connection with LLE FLEX
- Urated = 299 V
- Wire cross section AWG 22



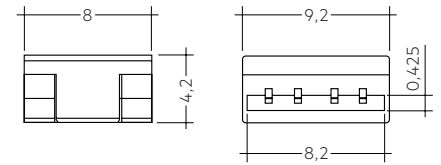
ACL connector Wire-PCB



ACL connector PCB-PCB



ACL connector Wire-PCB



ACL connector PCB-PCB

Ordering data

Type	Article number	Cable length	Packaging carton	Weight per pc.
ACL connector Wire-PCB 300mm	28003846	300 mm	20 pc(s).	0.002 kg
ACL connector Wire-PCB 500mm	28003847	500 mm	20 pc(s).	0.002 kg
ACL connector Wire-PCB 2000mm	28003848	2,000 mm	10 pc(s).	0.002 kg
ACL connector PCB-PCB	28003849	–	25 pc(s).	0.001 kg

LED Driver matrix – Dimmable – LLE FLEX 8mm SNC2

Type	PRE 35W	PRE 60W	PRE 100W	PRE 150W
Article number	28002415 28001662	28002416 28001663	28002417 28001253	28002418 28001437

Type

Assignable LED Driver

LLE FLEX 8x5000 5W-600lm/m 827 SNC2	75–650 cm	130–1,115 cm	215–1,860 cm	320–2,795 cm
LLE FLEX 8x5000 5W-600lm/m 830 SNC2	75–650 cm	130–1,115 cm	215–1,860 cm	320–2,795 cm
LLE FLEX 8x5000 5W-600lm/m 840 SNC2	80–695 cm	135–1,195 cm	230–1,990 cm	340–2,990 cm
LLE FLEX 8x5000 5W-600lm/m 865 SNC2	80–695 cm	135–1,195 cm	230–1,990 cm	340–2,990 cm
LLE FLEX 8x5000 10W-1200lm/m 827 SNC2	40–320 cm	65–555 cm	110–925 cm	160–1,390 cm
LLE FLEX 8x5000 10W-1200lm/m 830 SNC2	40–320 cm	65–555 cm	110–925 cm	160–1,390 cm
LLE FLEX 8x5000 10W-1200lm/m 840 SNC2	40–335 cm	70–580 cm	110–970 cm	165–1,455 cm
LLE FLEX 8x5000 10W-1200lm/m 865 SNC2	40–335 cm	70–580 cm	110–970 cm	165–1,455 cm
LLE FLEX 8x5000 15W-1800lm/m 827 SNC2	25–210 cm	45–360 cm	70–600 cm	105–905 cm
LLE FLEX 8x5000 15W-1800lm/m 830 SNC2	25–210 cm	45–360 cm	70–600 cm	105–905 cm
LLE FLEX 8x5000 15W-1800lm/m 840 SNC2	30–220 cm	45–380 cm	75–630 cm	110–950 cm
LLE FLEX 8x5000 15W-1800lm/m 865 SNC2	30–220 cm	45–380 cm	75–630 cm	110–950 cm
LLE FLEX 8x5000 21W-2500lm/m 827 SNC2	20–150 cm	30–255 cm	50–430 cm	75–645 cm
LLE FLEX 8x5000 21W-2500lm/m 830 SNC2	20–150 cm	30–255 cm	50–430 cm	75–645 cm
LLE FLEX 8x5000 21W-2500lm/m 840 SNC2	20–155 cm	35–270 cm	55–455 cm	80–685 cm
LLE FLEX 8x5000 21W-2500lm/m 865 SNC2	20–155 cm	35–270 cm	55–455 cm	80–685 cm

LED Driver matrix – Fixed output SNC – LLE FLEX 8mm SNC2

Type	SNC 35W	SNC 60W	SNC 100W	SNC 200W
Article number	87500852 87500854	87500665 87500669	87500666 87500670	87500855

Type

Assignable LED Driver

LLE FLEX 8x5000 5W-600lm/m 827 SNC2	225–650 cm	385–1,115 cm	635–1,860 cm	1,270–3,725 cm
LLE FLEX 8x5000 5W-600lm/m 830 SNC2	225–650 cm	385–1,115 cm	635–1,860 cm	1,270–3,725 cm
LLE FLEX 8x5000 5W-600lm/m 840 SNC2	240–695 cm	405–1,195 cm	675–1,990 cm	1,350–3,985 cm
LLE FLEX 8x5000 5W-600lm/m 865 SNC2	240–695 cm	405–1,195 cm	675–1,990 cm	1,350–3,985 cm
LLE FLEX 8x5000 10W-1200lm/m 827 SNC2	115–320 cm	190–555 cm	320–925 cm	635–1,855 cm
LLE FLEX 8x5000 10W-1200lm/m 830 SNC2	115–320 cm	190–555 cm	320–925 cm	635–1,855 cm
LLE FLEX 8x5000 10W-1200lm/m 840 SNC2	120–335 cm	200–580 cm	330–970 cm	660–1,940 cm
LLE FLEX 8x5000 10W-1200lm/m 865 SNC2	120–335 cm	200–580 cm	330–970 cm	660–1,940 cm
LLE FLEX 8x5000 15W-1800lm/m 827 SNC2	75–210 cm	125–360 cm	205–600 cm	410–1,205 cm
LLE FLEX 8x5000 15W-1800lm/m 830 SNC2	75–210 cm	125–360 cm	205–600 cm	410–1,205 cm
LLE FLEX 8x5000 15W-1800lm/m 840 SNC2	80–220 cm	130–380 cm	220–630 cm	435–1,265 cm
LLE FLEX 8x5000 15W-1800lm/m 865 SNC2	80–220 cm	130–380 cm	220–630 cm	435–1,265 cm
LLE FLEX 8x5000 21W-2500lm/m 827 SNC2	55–150 cm	90–255 cm	150–430 cm	295–860 cm
LLE FLEX 8x5000 21W-2500lm/m 830 SNC2	55–150 cm	90–255 cm	150–430 cm	295–860 cm
LLE FLEX 8x5000 21W-2500lm/m 840 SNC2	55–160 cm	95–270 cm	160–455 cm	315–915 cm
LLE FLEX 8x5000 21W-2500lm/m 865 SNC2	55–160 cm	95–270 cm	160–455 cm	315–915 cm

1. Standards

IEC 62031
IEC 62471
IEC 61000-4-2

1.1 Photometric code

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

1 st digit	2 nd + 3 rd digit	4 th digit	5 th digit	6 th digit
Code	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)
7	70 – 79			Code
8	80 – 89			Luminous flux
9	≥90			7
				8
				9

1.2 Energy classification

Type	Energy classification
LLE FLEX 8x5000 5W-600lm/m 827 SNC2	A+
LLE FLEX 8x5000 5W-600lm/m 830 SNC2	A+
LLE FLEX 8x5000 5W-600lm/m 840 SNC2	A++
LLE FLEX 8x5000 5W-600lm/m 865 SNC2	A++
LLE FLEX 8x5000 10W-1200lm/m 827 SNC2	A+
LLE FLEX 8x5000 10W-1200lm/m 830 SNC2	A+
LLE FLEX 8x5000 10W-1200lm/m 840 SNC2	A+
LLE FLEX 8x5000 10W-1200lm/m 865 SNC2	A+
LLE FLEX 8x5000 15W-1800lm/m 827 SNC2	A+
LLE FLEX 8x5000 15W-1800lm/m 830 SNC2	A+
LLE FLEX 8x5000 15W-1800lm/m 840 SNC2	A+
LLE FLEX 8x5000 15W-1800lm/m 865 SNC2	A+
LLE FLEX 8x5000 21W-2500lm/m 827 SNC2	A+
LLE FLEX 8x5000 21W-2500lm/m 830 SNC2	A+
LLE FLEX 8x5000 21W-2500lm/m 840 SNC2	A+
LLE FLEX 8x5000 21W-2500lm/m 865 SNC2	A+

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 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
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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 LLE will be greatly reduced or the LLE may be destroyed.

2.4 Heat sink values

LLE FLEX 600lm/m

ta	tp	R _{th, hs-a} ^①	Cooling area ^①
25 °C	< 75 °C		self-cooling
35 °C	< 75 °C		self-cooling
45 °C	< 75 °C		self-cooling

LLE FLEX 1200lm/m

ta	tp	R _{th, hs-a} ^①	Cooling area ^①
25 °C	< 75 °C		self-cooling
35 °C	< 75 °C		self-cooling
45 °C	< 75 °C		self-cooling

LLE FLEX 1800lm/m

ta	tp	R _{th, hs-a} ^①	Cooling area ^①
25 °C	< 75 °C		self-cooling
35 °C	< 75 °C		self-cooling
45 °C	65 °C	29.5 K/W	24 cm²

LLE FLEX 2500lm/m

ta	tp	R _{th, hs-a} ^①	Cooling area ^①
25 °C	< 75 °C		self-cooling
35 °C	65 °C	31.4 K/W	21 cm²
45 °C	65 °C	19.8 K/W	34 cm²

^① Values for a single segment of the LLE FLEX (50 mm).

Notes

The actual cooling surface can differ because of the material, the structural shape, outside influences and the installation situation.

A heat transfer coefficient of 0,0015 is used for the calculation.

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:

- SELV
- Short-circuit protection
- Overload protection
- Overtemperature protection



LLE must be supplied by a constant voltage LED Driver.

Operation with a constant current LED Driver will lead to an irreversible damage of the module.

Wrong polarity can damage the LLE FLEX.

3.2 Mounting instruction



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

The LLE FLEX is separable each 50 mm with the full function of each segment.

The LLE FLEX is to be installed within 2 weeks after it has been removed from the ESD blister packaging (contacting by means of soldering or ACL connector).

Insulation must be ensured at the contact area of the segments (e.g. by using the connector ACL).

The fixing/cooling surface must be cleaned before installing the LLE FLEX modules to remove all dirt, dust and grease.

Prevent shear- or peel forces

Min. bending radius of the LLE FLEX is 2 cm.



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.

3.3 Soldering guidelines



The modules are suitable only for manual soldering (max. 275 °C, 2 seconds).

3.4 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 FLEX 8mm

Supply voltage	tp temperature	L90 / B10	L90 / B50	L80 / B10	L80 / B50	L70 / B10	L70 / B50
24 V	45 °C	25,000 h	28,000 h	47,000 h	54,000 h	>60,000 h	>60,000 h
24 V	55 °C	24,000 h	28,000 h	46,000 h	54,000 h	>60,000 h	>60,000 h
24 V	65 °C	24,000 h	28,000 h	45,000 h	53,000 h	>60,000 h	>60,000 h
24 V	75 °C	22,000 h	27,000 h	42,000 h	52,000 h	>60,000 h	>60,000 h

LOC10 >60 kh. At tp rated, based on 10 switching cycles per day.

4.3 Switching capability

30,000 cycles

Tridonic test according to IEC 62717 Cl 10.3.3

30 s on / 30 s off

6. Photometric characteristics

6.1 Coordinates and tolerances according to CIE 1931

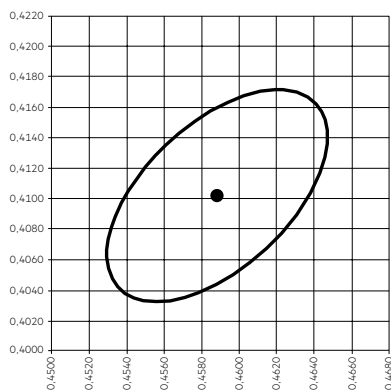
The specified colour coordinates are measured integral by a current impulse with typical values of module and a duration of 100 ms.

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

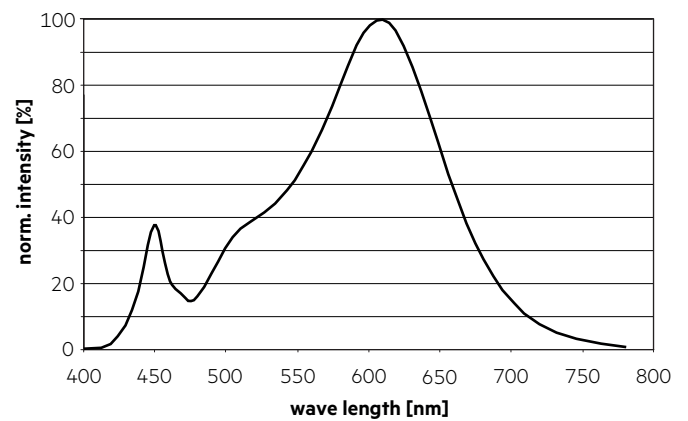
The measurement tolerance of the colour coordinates are ± 0.005 .

2,700 K

	x0	y0
Centre 600 lm/m	0.4588	0.4102
Centre 1,200 lm/m	0.4588	0.4102
Centre 1,800 lm/m	0.4587	0.4102
Centre 2,500 lm/m	0.4585	0.4102

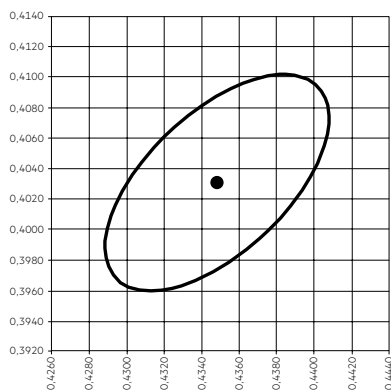


— MacAdam Ellipse: 3SDCM

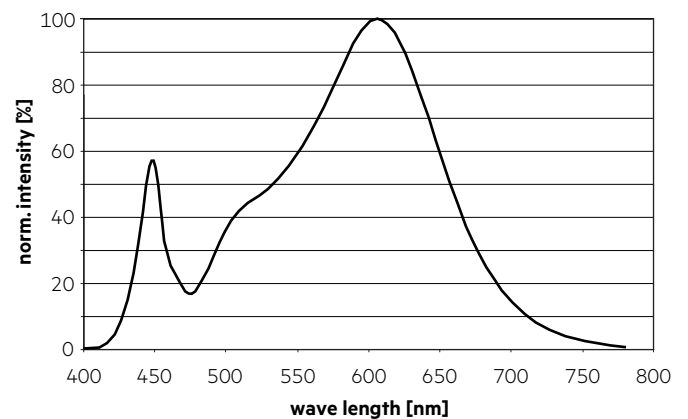


3,000 K

	x0	y0
Centre 600 lm/m	0.4348	0.4031
Centre 1,200 lm/m	0.4348	0.4031
Centre 1,800 lm/m	0.4347	0.4031
Centre 2,500 lm/m	0.4345	0.4031

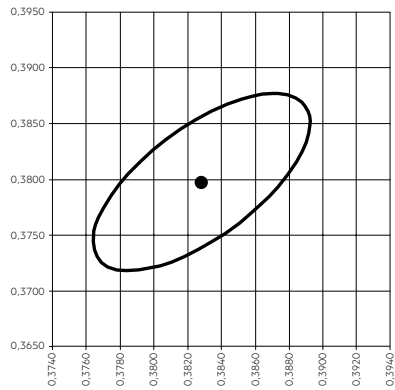


— MacAdam Ellipse: 3SDCM

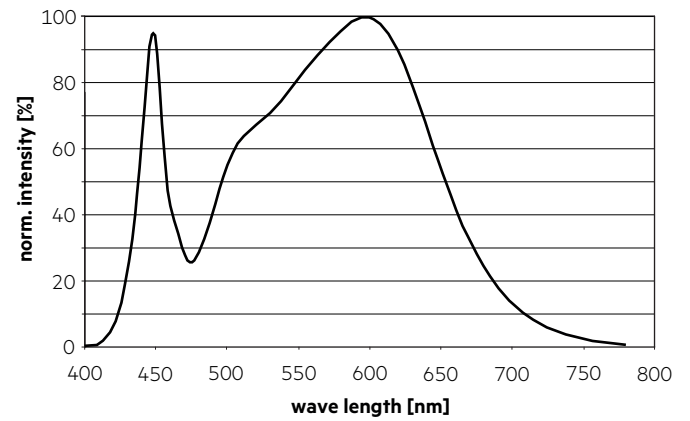


4,000 K

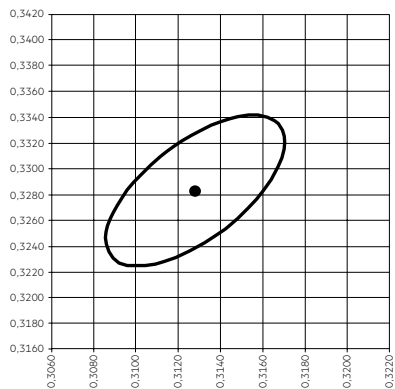
	x0	y0
Centre 600 lm/m	0.3828	0.3798
Centre 1,200 lm/m	0.3828	0.3798
Centre 1,800 lm/m	0.3827	0.3798
Centre 2,500 lm/m	0.3825	0.3798



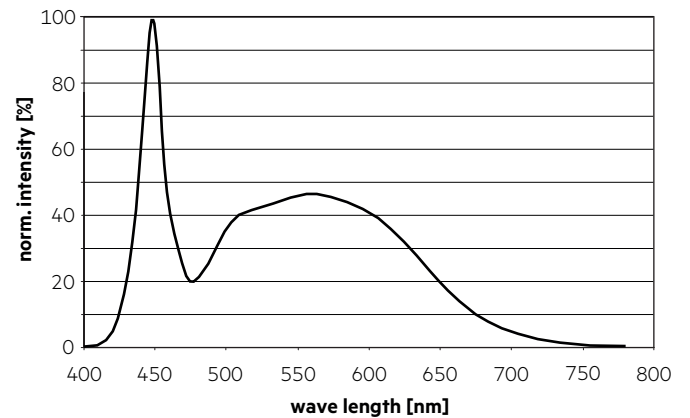
— MacAdam Ellipse: 3SDCM

**6,500 K**

	x0	y0
Centre 600 lm/m	0.3128	0.3283
Centre 1,200 lm/m	0.3128	0.3283
Centre 1,800 lm/m	0.3128	0.3283
Centre 2,500 lm/m	0.3128	0.3283

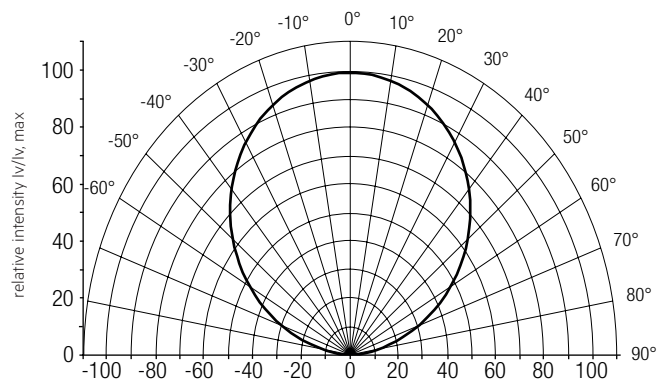


— MacAdam Ellipse: 3SDCM



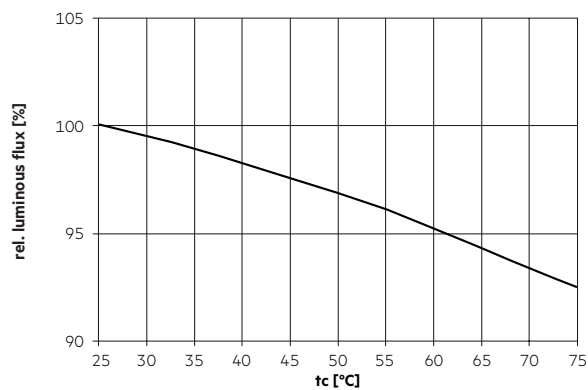
6.2 Light distribution

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



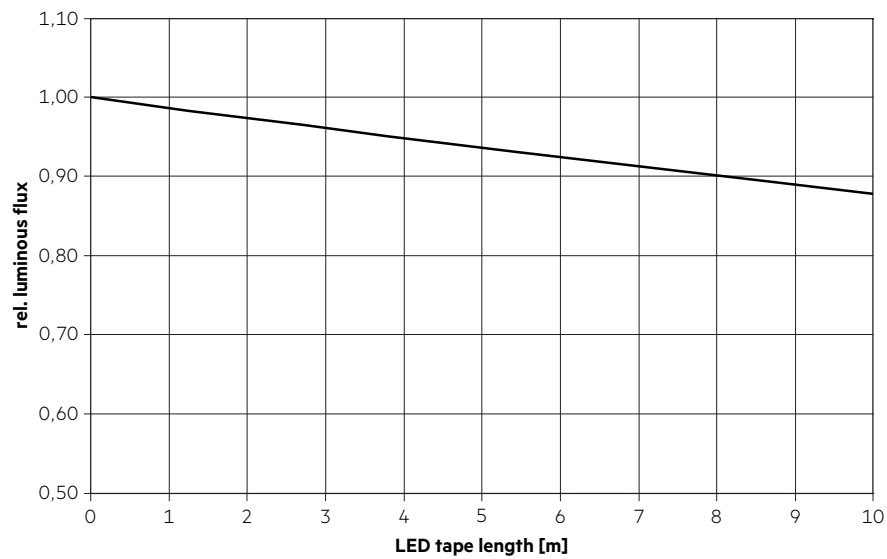
The colour temperature is measured over the complete module.
The single LED light points are inside of 5SDCM.
To ensure an ideal mixture of colours and a homogeneous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 1 cm) should be used.

6.3 Relative luminous flux vs. tc temperature

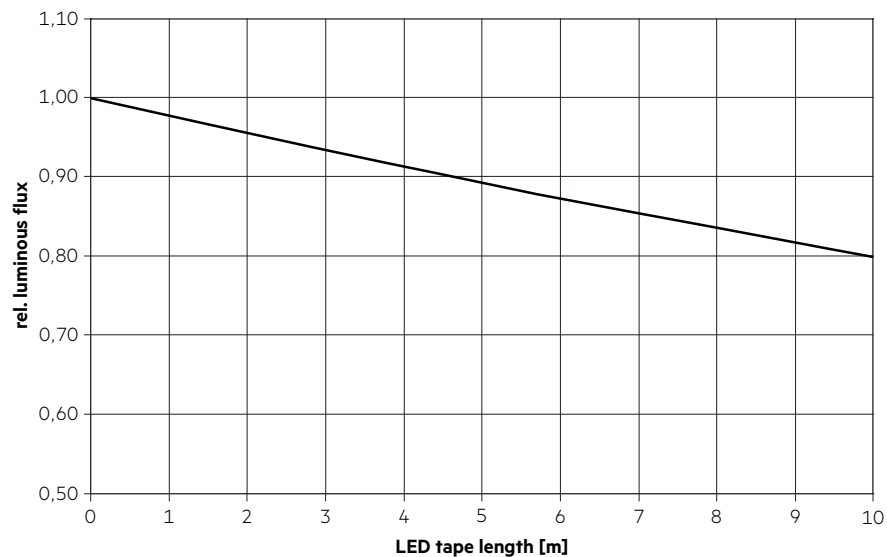


6.4 Relative luminous flux vs. LED tape length

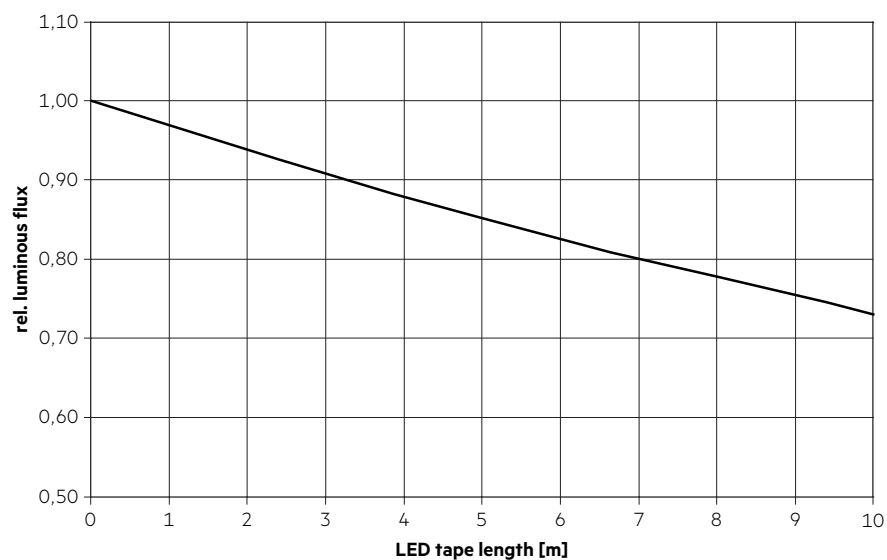
LLE FLEX 600lm:



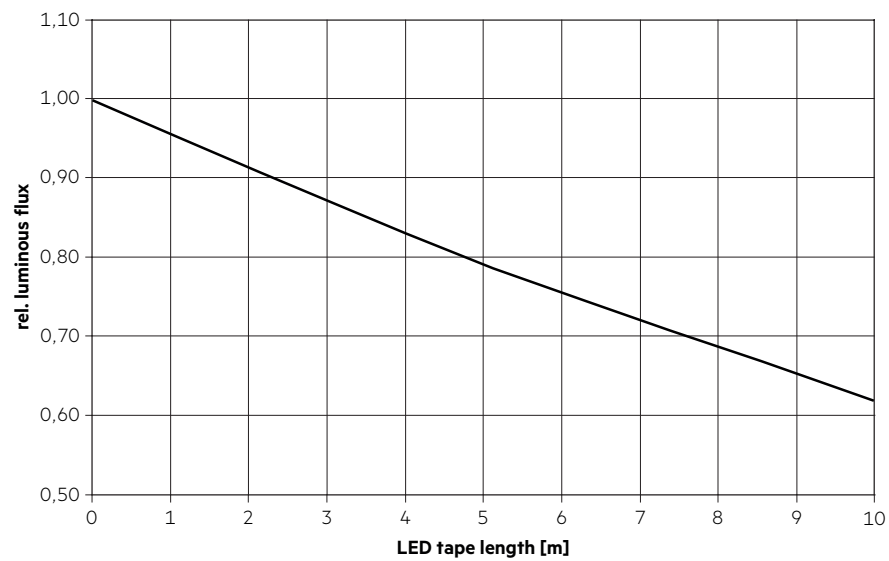
LLE FLEX 1200lm:



LLE FLEX 1800lm:



LLE FLEX 2500lm:



7. Miscellaneous

7.1 Additional information

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

Lifetime declarations are informative and represent no warranty claim.