TRIDONIC

Module LLE FLEX 8mm 24V EXC4

Modules LLE FLEX excite

Product description

_ Dimmable 24 V constant voltage LED flextape (SELV)
_ Ideal for various lighting applications: indirect, accent and decorative lighting, ceiling integration, cove lighting and aluminium extrusions
_ 1 reel = 5 m (50 m on demand)
_ Made in Europe
_ Long lifetime: 60,000 hours
_ 5 years guarantee (conditions at https://www.tridonic.com/manufacturer-guarantee-conditions)

Optical properties

_ Colour temperature 2,700, 3,000, 4,000 K (6,500 K on demand)
_ Useful luminous flux up to 2,777 lm/m at tp = 25 °C
_ Efficacy of the LED module up to 148 lm/W at tp = 25 °C
_ High colour rendering index CRI > 80 and CRI > 90
_ Low colour temperature tolerances (MacAdam 3)
_ Outstanding homogeneity due to IC current control

Mechanical properties

_ High design freedom due to 5 cm cut-options and 140 LED light points per meter
_ Self-adhesive 3M tape at the backside for simple mounting on different surfaces
_ Available PCB to PCB and wire to PCB connectors for toolless handling and connection
_ reel2reel – No solder joints on the tape, easy to separate and low length tolerances ①

System solution

_ System solution in combination with Tridonic constant voltage LED driver (fixed output and dimmable)

① For 5 m reel max. 2 solder joints.

Website

http://www.tridonic.com/28005245

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

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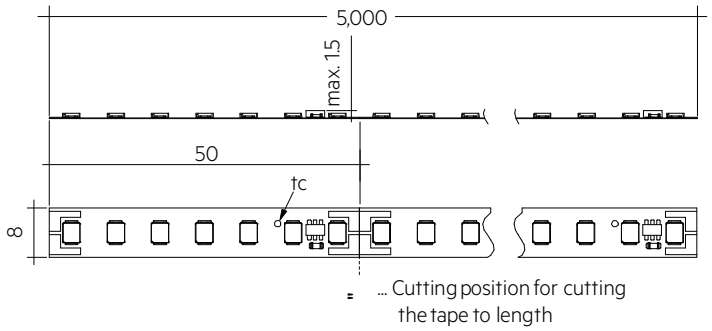


Ordering data

Type	Article number	Colour temperature	Packaging, carton	Weight per pc.
LLE FLEX 8mm 24V 10W 1200lm 830 EXC4 R05	**28005245**	3,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 10W 1200lm 840 EXC4 R05	**28005246**	4,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 14W 1800lm 830 EXC4 R05	**28005249**	3,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 14W 1800lm 840 EXC4 R05	**28005250**	4,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 20W 2500lm 830 EXC4 R05	**28005253**	3,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 20W 2500lm 840 EXC4 R05	**28005254**	4,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 6W 600lm 927 EXC4 R05	**28005256**	2,700 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 6W 600lm 930 EXC4 R05	**28005257**	3,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 6W 600lm 940 EXC4 R05	**28005258**	4,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 12W 1200lm 927 EXC4 R05	**28005260**	2,700 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 12W 1200lm 930 EXC4 R05	**28005261**	3,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 12W 1200lm 940 EXC4 R05	**28005262**	4,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 12W 1200lm 965 EXC4 R05	**28005263**	6,500 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 18W 1800lm 927 EXC4 R05	**28005264**	2,700 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 18W 1800lm 930 EXC4 R05	**28005265**	3,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 18W 1800lm 940 EXC4 R05	**28005266**	4,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 18W 1800lm 965 EXC4 R05	**28005267**	6,500 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 23W 2500lm 927 EXC4 R05	**28005268**	2,700 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 23W 2500lm 930 EXC4 R05	**28005269**	3,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 23W 2500lm 940 EXC4 R05	**28005270**	4,000 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 23W 2500lm 965 EXC4 R05	**28005271**	6,500 K	1 pc(s).	0.084 kg
LLE FLEX 8mm 24V 12W 1200lm 930 EXC4 R50	**28005352**	3,000 K	1 pc(s).	0.490 kg
LLE FLEX 8mm 24V 18W 1800lm 930 EXC4 R50	**28005353**	3,000 K	1 pc(s).	0.490 kg
LLE FLEX 8mm 24V 18W 1800lm 940 EXC4 R50	**28005354**	4,000 K	1 pc(s).	0.490 kg
LLE FLEX 8mm 24V 23W 2500lm 930 EXC4 R50	**28005355**	3,000 K	1 pc(s).	0.490 kg
LLE FLEX 8mm 24V 23W 2500lm 940 EXC4 R50	**28005356**	4,000 K	1 pc(s).	0.490 kg

Technical data

Beam characteristic	120°
Ambient temperature ta	-25 … +50 °C
tp rated	65 °C
tc	75 °C
Supply voltage DC	24 V
Supply voltage range DC ②	21.6 – 26.4 V
Insulation test voltage	0.5 kV
ESD classification	Severity level 1
Risk group (IEC 62471)	RG0
Classification acc. to IEC 62031	Built-in
Type of protection	IP00
Lumen maintenance L70B50	60,000 h
Guarantee (conditions at www.tridonic.com)	5 Year(s)

Approval marks

RoHS

Standards

IEC 62031, IEC 62471, IEC 62778, IEC 61000-4-2, UL 8750

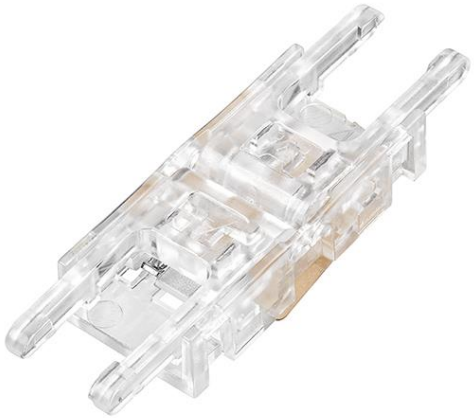
Specific technical data

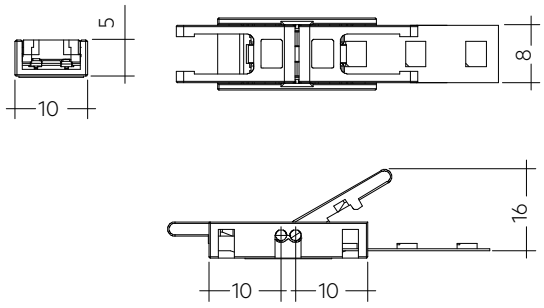
Type	Article number	Photometric code	Useful luminous flux at tp = 25 °C[3]	Expected luminous flux at tp rated[4]	Typ. current consumption at tp rated	Power consumption Pon at tp = 25 °C[5]	Efficacy of the module at tp = 25 °C	Expected efficacy of the module at tp rated	Colour rendering index CRI
LLE FLEX 8mm 24V 10W 1200lm 830 EXC4 R05	**28005245**	830/359	1,426 lm/m	1,324 lm/m	416 mA/m	10.0 W/m	143 lm/W	133 lm/W	>80
LLE FLEX 8mm 24V 10W 1200lm 840 EXC4 R05	**28005246**	840/359	1,482 lm/m	1,376 lm/m	416 mA/m	10.0 W/m	148 lm/W	138 lm/W	>80
LLE FLEX 8mm 24V 14W 1800lm 830 EXC4 R05	**28005249**	830/359	1,874 lm/m	1,740 lm/m	548 mA/m	13.2 W/m	142 lm/W	132 lm/W	>80
LLE FLEX 8mm 24V 14W 1800lm 840 EXC4 R05	**28005250**	840/359	1,947 lm/m	1,808 lm/m	548 mA/m	13.2 W/m	148 lm/W	137 lm/W	>80
LLE FLEX 8mm 24V 20W 2500lm 830 EXC4 R05	**28005253**	830/359	2,673 lm/m	2,481 lm/m	780 mA/m	18.8 W/m	143 lm/W	133 lm/W	>80
LLE FLEX 8mm 24V 20W 2500lm 840 EXC4 R05	**28005254**	840/359	2,777 lm/m	2,578 lm/m	780 mA/m	18.8 W/m	148 lm/W	138 lm/W	>80
LLE FLEX 8mm 24V 6W 600lm 927 EXC4 R05	**28005256**	927/359	577 lm/m	536 lm/m	216 mA/m	5.2 W/m	111 lm/W	103 lm/W	>90
LLE FLEX 8mm 24V 6W 600lm 930 EXC4 R05	**28005257**	930/359	605 lm/m	562 lm/m	216 mA/m	5.2 W/m	117 lm/W	108 lm/W	>90
LLE FLEX 8mm 24V 6W 600lm 940 EXC4 R05	**28005258**	940/359	626 lm/m	582 lm/m	216 mA/m	5.2 W/m	121 lm/W	112 lm/W	>90
LLE FLEX 8mm 24V 12W 1200lm 927 EXC4 R05	**28005260**	927/359	1,297 lm/m	1,204 lm/m	472 mA/m	11.4 W/m	114 lm/W	106 lm/W	>90
LLE FLEX 8mm 24V 12W 1200lm 930 EXC4 R05	**28005261**	930/359	1,360 lm/m	1,263 lm/m	472 mA/m	11.4 W/m	120 lm/W	111 lm/W	>90
LLE FLEX 8mm 24V 12W 1200lm 940 EXC4 R05	**28005262**	940/359	1,408 lm/m	1,307 lm/m	472 mA/m	11.4 W/m	124 lm/W	115 lm/W	>90
LLE FLEX 8mm 24V 12W 1200lm 965 EXC4 R05	**28005263**	965/359	1,441 lm/m	1,337 lm/m	472 mA/m	11.4 W/m	127 lm/W	118 lm/W	>90
LLE FLEX 8mm 24V 18W 1800lm 927 EXC4 R05	**28005264**	927/359	1,937 lm/m	1,798 lm/m	720 mA/m	17.3 W/m	112 lm/W	104 lm/W	>90
LLE FLEX 8mm 24V 18W 1800lm 930 EXC4 R05	**28005265**	930/359	2,032 lm/m	1,886 lm/m	720 mA/m	17.3 W/m	118 lm/W	109 lm/W	>90
LLE FLEX 8mm 24V 18W 1800lm 940 EXC4 R05	**28005266**	940/359	2,103 lm/m	1,952 lm/m	720 mA/m	17.3 W/m	122 lm/W	113 lm/W	>90
LLE FLEX 8mm 24V 18W 1800lm 965 EXC4 R05	**28005267**	965/359	2,152 lm/m	1,997 lm/m	720 mA/m	17.3 W/m	125 lm/W	116 lm/W	>90
LLE FLEX 8mm 24V 23W 2500lm 927 EXC4 R05	**28005268**	927/359	2,500 lm/m	2,321 lm/m	940 mA/m	22.6 W/m	111 lm/W	103 lm/W	>90
LLE FLEX 8mm 24V 23W 2500lm 930 EXC4 R05	**28005269**	930/359	2,620 lm/m	2,434 lm/m	940 mA/m	22.6 W/m	116 lm/W	108 lm/W	>90
LLE FLEX 8mm 24V 23W 2500lm 940 EXC4 R05	**28005270**	940/359	2,715 lm/m	2,520 lm/m	940 mA/m	22.6 W/m	120 lm/W	112 lm/W	>90
LLE FLEX 8mm 24V 23W 2500lm 965 EXC4 R05	**28005271**	965/359	2,776 lm/m	2,578 lm/m	940 mA/m	22.6 W/m	123 lm/W	114 lm/W	>90
LLE FLEX 8mm 24V 12W 1200lm 930 EXC4 R50	**28005352**	930/359	1,360 lm/m	1,263 lm/m	472 mA/m	11.0 W/m	124 lm/W	115 lm/W	>90
LLE FLEX 8mm 24V 18W 1800lm 930 EXC4 R50	**28005353**	930/359	2,032 lm/m	1,886 lm/m	720 mA/m	17.3 W/m	118 lm/W	109 lm/W	>90
LLE FLEX 8mm 24V 18W 1800lm 940 EXC4 R50	**28005354**	940/359	2,103 lm/m	1,952 lm/m	720 mA/m	16.8 W/m	122 lm/W	116 lm/W	>90
LLE FLEX 8mm 24V 23W 2500lm 930 EXC4 R50	**28005355**	930/359	2,620 lm/m	2,434 lm/m	940 mA/m	22.1 W/m	119 lm/W	110 lm/W	>90
LLE FLEX 8mm 24V 23W 2500lm 940 EXC4 R50	**28005356**	940/359	2,715 lm/m	2,520 lm/m	940 mA/m	22.1 W/m	123 lm/W	114 lm/W	>90

② Exceeding the max. operating voltage leads to an overload on the LLE FLEX. This may in turn result in a significant reduction in lifetime or even in destruction.
③ Tolerance of useful light flux - 0 / + 15 %. Measurement uncertainty 10 %. Values given for 1 m LLE FLEX.
④ Measurement uncertainty 10 %. Values given for 1 m LLE FLEX. Based on calculation.
⑤ Tolerance of power consumption Pon ± 15 %. Measurement uncertainty ± 5 %. Values given for 1 m LLE FLEX.

Connector for LLE FLEX

Accessory





Product description
_ For connection of LLE FLEX module
_ For internal wiring only (no strain relief functionality)
_ Connector can be closed and re-opened easily: For assembly instructions see application note available at www.tridonic.com
_ Glow wire test according to IEC 60695-2-11
_ Max. 5 A in connection with LLE FLEX
_ Urated = 24 – 48 V
_ Wire cross section AWG 18

Website
http://www.tridonic.com/28004985

Ordering data

Type	Article number	Packaging, carton	Weight per pc.
ACL flex connector Wire - PCB 100mm	**28004985**	20 pc(s).	0.004 kg
ACL flex connector Wire - PCB 500mm	**28004986**	20 pc(s).	0.020 kg
ACL flex connector Wire - PCB 2000mm	**28004987**	10 pc(s).	0.072 kg
ACL flex connector PCB - PCB	**28004988**	25 pc(s).	0.001 kg

1. Standards

IEC 62031
IEC 62471
IEC 62778
IEC 61000-4-2
UL 8750 (for CLASS2 circuits and dry locations)

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

Type	Risk group
LLE FLEX 8mm 24V EXC4	RG0

1.3 Energy classification

Type	Colour temperature	Energy classification	Energy consumption
LLE FLEX 8mm 24V 10W 1200lm 830 EXC4 R05	3,000 K	D	10 kWh / 1,000 h
LLE FLEX 8mm 24V 10W 1200lm 840 EXC4 R05	4,000 K	D	10 kWh / 1,000 h
LLE FLEX 8mm 24V 14W 1800lm 830 EXC4 R05	3,000 K	D	13 kWh / 1,000 h
LLE FLEX 8mm 24V 14W 1800lm 840 EXC4 R05	4,000 K	D	13 kWh / 1,000 h
LLE FLEX 8mm 24V 20W 2500lm 830 EXC4 R05	3,000 K	E	19 kWh / 1,000 h
LLE FLEX 8mm 24V 20W 2500lm 840 EXC4 R05	4,000 K	D	19 kWh / 1,000 h
LLE FLEX 8mm 24V 6W 600lm 927 EXC4 R05	2,700 K	E	5 kWh / 1,000 h
LLE FLEX 8mm 24V 6W 600lm 930 EXC4 R05	3,000 K	E	5 kWh / 1,000 h
LLE FLEX 8mm 24V 6W 600lm 940 EXC4 R05	4,000 K	E	5 kWh / 1,000 h
LLE FLEX 8mm 24V 12W 1200lm 927 EXC4 R05	2,700 K	F	11 kWh / 1,000 h
LLE FLEX 8mm 24V 12W 1200lm 930 EXC4 R05	3,000 K	E	11 kWh / 1,000 h
LLE FLEX 8mm 24V 12W 1200lm 940 EXC4 R05	4,000 K	E	11 kWh / 1,000 h
LLE FLEX 8mm 24V 12W 1200lm 965 EXC4 R05	6,500 K	E	11 kWh / 1,000 h
LLE FLEX 8mm 24V 18W 1800lm 927 EXC4 R05	2,700 K	F	17 kWh / 1,000 h
LLE FLEX 8mm 24V 18W 1800lm 930 EXC4 R05	3,000 K	E	17 kWh / 1,000 h
LLE FLEX 8mm 24V 18W 1800lm 940 EXC4 R05	4,000 K	E	17 kWh / 1,000 h
LLE FLEX 8mm 24V 18W 1800lm 965 EXC4 R05	6,500 K	E	17 kWh / 1,000 h
LLE FLEX 8mm 24V 23W 2500lm 927 EXC4 R05	2,700 K	F	23 kWh / 1,000 h
LLE FLEX 8mm 24V 23W 2500lm 930 EXC4 R05	3,000 K	F	23 kWh / 1,000 h
LLE FLEX 8mm 24V 23W 2500lm 940 EXC4 R05	4,000 K	E	23 kWh / 1,000 h
LLE FLEX 8mm 24V 23W 2500lm 965 EXC4 R05	6,500 K	E	23 kWh / 1,000 h
LLE FLEX 8mm 24V 12W 1200lm 930 EXC4 R50	3,000 K	E	11 kWh / 1,000 h
LLE FLEX 8mm 24V 18W 1800lm 930 EXC4 R50	3,000 K	E	17 kWh / 1,000 h
LLE FLEX 8mm 24V 18W 1800lm 940 EXC4 R50	4,000 K	E	17 kWh / 1,000 h
LLE FLEX 8mm 24V 23W 2500lm 930 EXC4 R50	3,000 K	F	23 kWh / 1,000 h
LLE FLEX 8mm 24V 23W 2500lm 940 EXC4 R50	4,000 K	E	23 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 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	-25 … +75 °C

Operation only in non condensing environment.
Humidity during processing of the module should be between 0 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 8mm 1200lm 24V 8xx EXC4

ta	tp	$R_{th, hs-a}$ ①	Cooling area ①
25 °C	65 °C	194.93 K/W	self cooling
35 °C	65 °C	146.15 K/W	5 cm²
40 °C	65 °C	121.76 K/W	5 cm²
45 °C	65 °C	97.37 K/W	7 cm²
50 °C	65 °C	72.98 K/W	9 cm²

LLE FLEX 8mm 1800lm 24V 8xx EXC4

ta	tp	$R_{th, hs-a}$ ①	Cooling area ①
25 °C	65 °C	171.86 K/W	self cooling
35 °C	65 °C	128.84 K/W	5 cm²
40 °C	65 °C	107.34 K/W	6 cm²
45 °C	65 °C	85.83 K/W	8 cm²
50 °C	65 °C	64.33 K/W	10 cm²

LLE FLEX 8mm 2500lm 24V 8xx EXC4

ta	tp	$R_{th, hs-a}$ ①	Cooling area ①
25 °C	65 °C	107.56 K/W	6 cm²
35 °C	65 °C	80.62 K/W	8 cm²
40 °C	65 °C	67.15 K/W	10 cm²
45 °C	65 °C	53.68 K/W	12 cm²
50 °C	65 °C	40.22 K/W	17 cm²

LLE FLEX 8mm 600lm 24V 9xx EXC4

ta	tp	$R_{th, hs-a}$ [1]	Cooling area [1]
25 °C	65 °C	340.24 K/W	self cooling
35 °C	65 °C	255.13 K/W	self cooling
40 °C	65 °C	212.58 K/W	self cooling
45 °C	65 °C	170.03 K/W	self cooling
50 °C	65 °C	127.47 K/W	5 cm²

LLE FLEX 8mm 1200lm 24V 9xx EXC4

ta	tp	$R_{th, hs-a}$ [1]	Cooling area [1]
25 °C	65 °C	150.76 K/W	4 cm²
35 °C	65 °C	113.02 K/W	6 cm²
40 °C	65 °C	94.15 K/W	7 cm²
45 °C	65 °C	75.28 K/W	9 cm²
50 °C	65 °C	56.42 K/W	12 cm²

LLE FLEX 8mm 1800lm 24V 9xx EXC4

ta	tp	$R_{th, hs-a}$ [1]	Cooling area [1]
25 °C	65 °C	94.49 K/W	7 cm²
35 °C	65 °C	70.82 K/W	9 cm²
40 °C	65 °C	58.98 K/W	11 cm²
45 °C	65 °C	47.15 K/W	14 cm²
50 °C	65 °C	35.32 K/W	19 cm²

LLE FLEX 8mm 2500lm 24V 9xx EXC4

ta	tp	$R_{th, hs-a}$ [1]	Cooling area [1]
25 °C	65 °C	76.55 K/W	9 cm²
35 °C	65 °C	57.37 K/W	12 cm²
40 °C	65 °C	47.77 K/W	14 cm²
45 °C	65 °C	38.18 K/W	17 cm²
50 °C	65 °C	28.59 K/W	23 cm²

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

Notes

The module has to be mounted on a heat sink and operated within the specified temperature range.

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 modules 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.

Insulation must be ensured at the contact area of the segments (e. g. by using additional insulation in the area of the solder connection).

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.

For details see Application Note: www.tridonic.com

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).

3.3 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

LLE FLEX 8mm 24V 600lm EXC4
LLE FLEX 8mm 24V 1200lm EXC4

Supply voltage	tp temperature	L90/B10	L90/B50	L80/B10	L80/B50	L70/B10	L70/B50
24 V	40 °C	30k h	44k h	60k h	>60k h	>60k h	>60k h
	45 °C	29k h	43k h	59k h	>60k h	>60k h	>60k h
	50 °C	28k h	41k h	57k h	>60k h	>60k h	>60k h
	55 °C	28k h	41k h	56k h	>60k h	>60k h	>60k h
	60 °C	27k h	39k h	55k h	>60k h	>60k h	>60k h
	65 °C	26k h	38k h	54k h	>60k h	>60k h	>60k h
	70 °C	26k h	37k h	52k h	>60k h	>60k h	>60k h
	75 °C	25k h	36k h	51k h	>60k h	>60k h	>60k h

LLE FLEX 8mm 24V 1800lm EXC4
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Supply voltage	tp temperature	L90/B10	L90/B50	L80/B10	L80/B50	L70/B10	L70/B50
24 V	40 °C	30k h	44k h	60k h	>60k h	>60k h	>60k h
	45 °C	29k h	43k h	59k h	>60k h	>60k h	>60k h
	50 °C	28k h	41k h	57k h	>60k h	>60k h	>60k h
	55 °C	28k h	40k h	56k h	>60k h	>60k h	>60k h
	60 °C	27k h	39k h	55k h	>60k h	>60k h	>60k h
	65 °C	26k h	37k h	53k h	>60k h	>60k h	>60k h
	70 °C	26k h	36k h	52k h	>60k h	>60k h	>60k h
	75 °C	25k h	35k h	50k h	>60k h	>60k h	>60k h

L0C10 >60 kh. At tp 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

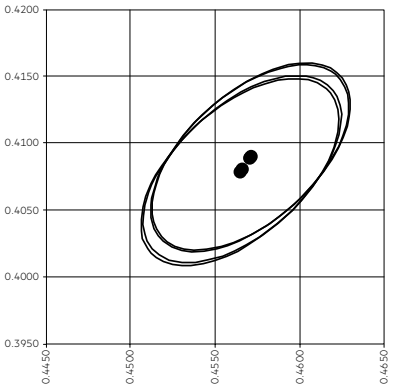
6. Photometric characteristics

6.1 Coordinates and tolerances according to CIE 1931

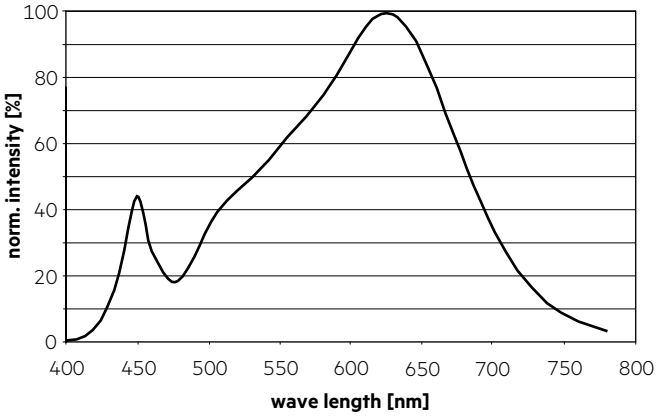
The specified colour coordinates are measured integral by a current impulse with typical values of module and a duration of 100 ms.
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

2.700 K – CRI90

	x0	y0
Centre 600 lm/m	0.4553	0.4058
Centre 1.200 lm/m	0.4565	0.4079
Centre 1.800 lm/m	0.4570	0.4089
Centre 2.500 lm/m	0.4574	0.4095

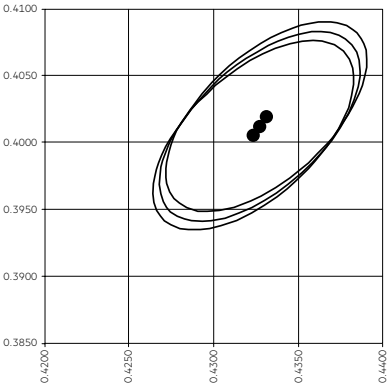


MacAdam Ellipse: 3SDCM

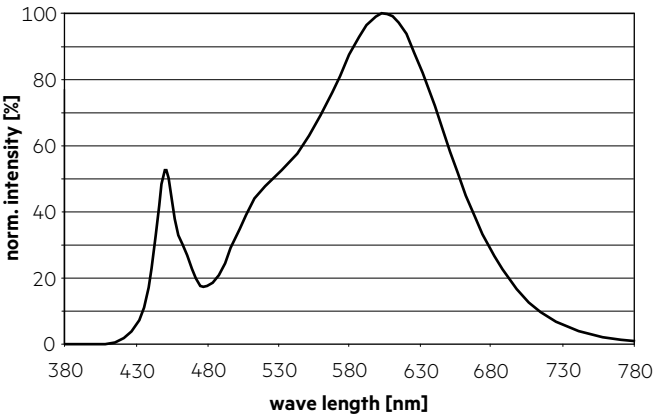


3,000 K – CRI80

	x0	y0
Centre 1,200 lm/m	0.4323	0.4005
Centre 1,800 lm/m	0.4327	0.4012
Centre 2,500 lm/m	0.4331	0.4019

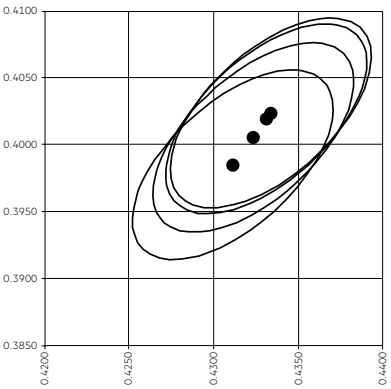


MacAdam Ellipse: 3SDCM

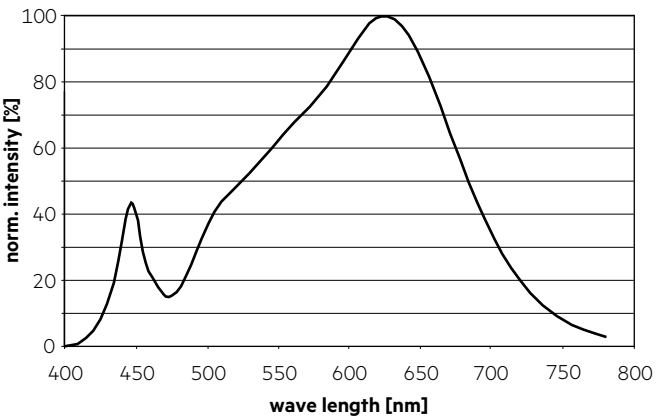


3,000 K – CRI90

	x0	y0
Centre 600 lm/m	0.4311	0.3985
Centre 1,200 lm/m	0.4323	0.4005
Centre 1,800 lm/m	0.4331	0.4019
Centre 2,500 lm/m	0.4334	0.4024

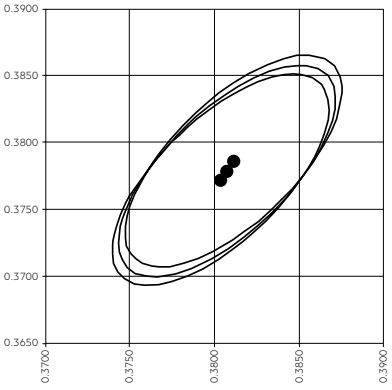


MacAdam Ellipse: 3SDCM

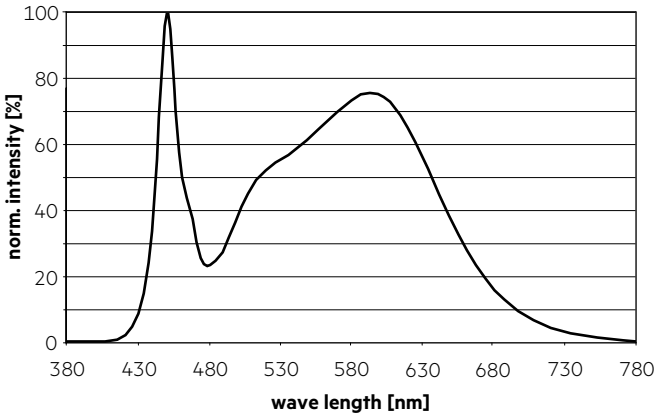


4,000 K – CRI80

	x0	y0
Centre 1,200 lm/m	0.3803	0.3772
Centre 1,800 lm/m	0.3807	0.3779
Centre 2,500 lm/m	0.3811	0.3786

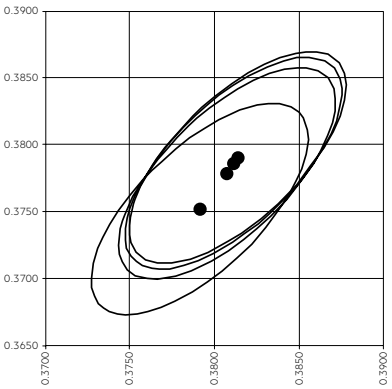


MacAdam Ellipse: 3SDCM

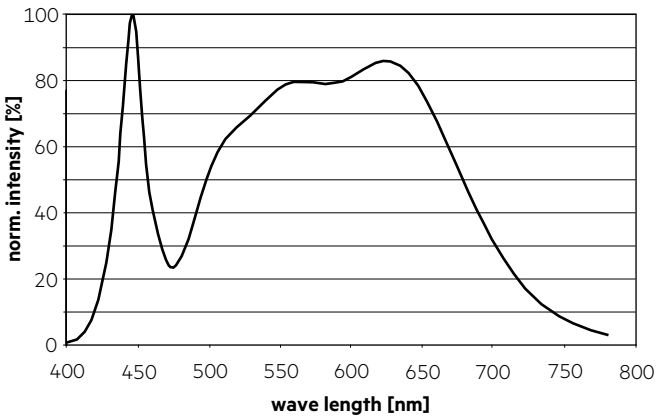


4,000 K – CRI90

	x0	y0
Centre 600 lm/m	0.3791	0.3752
Centre 1,200 lm/m	0.3803	0.3772
Centre 1,800 lm/m	0.3811	0.3786
Centre 2,500 lm/m	0.3814	0.3791

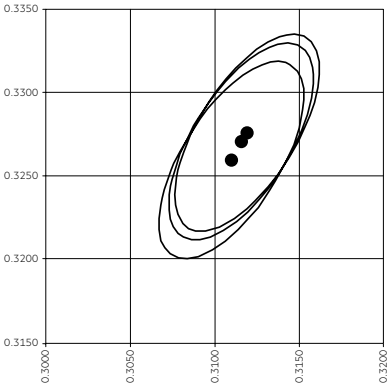


MacAdam Ellipse: 3SDCM

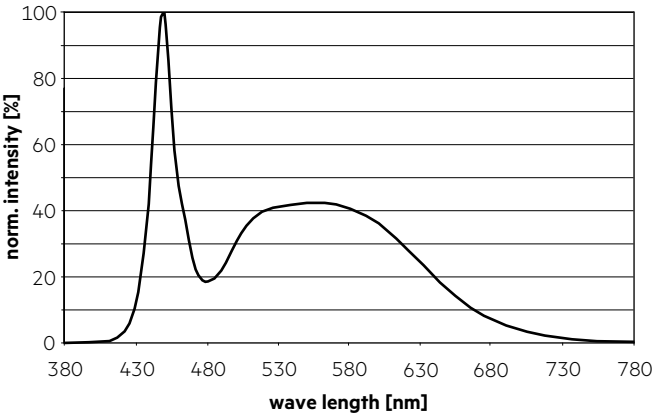


6,500 K – CRI90

	x0	y0
Centre 1,200 lm/m	0.3110	0.3260
Centre 1,800 lm/m	0.3116	0.3271
Centre 2,500 lm/m	0.3119	0.3276

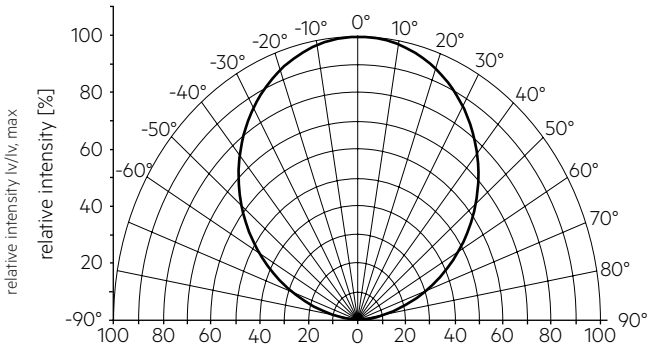


MacAdam Ellipse: 3SDCM



6.2 Light distribution

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

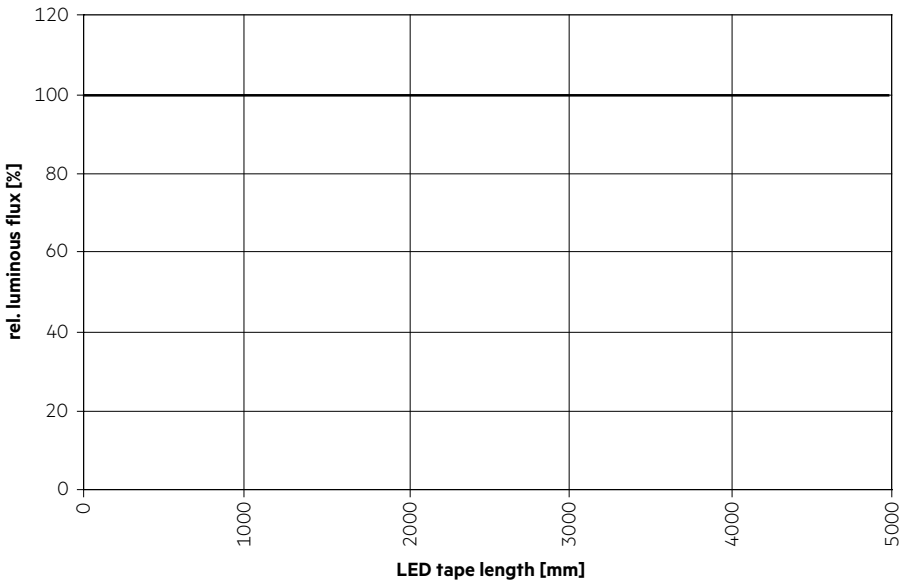


The colour temperature is measured over the complete module. To ensure an ideal mixture of colours and a homogeneous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 1.5 cm) should be used.

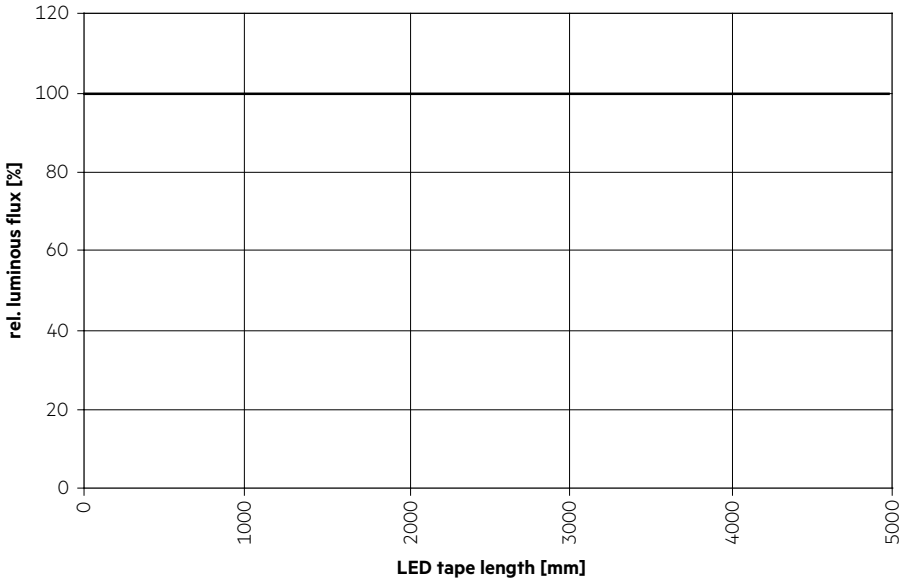
6.4 Relative luminous flux vs. LED tape length

The graphs show the luminous flux drop of the first compare to the last segment over the used tape length.

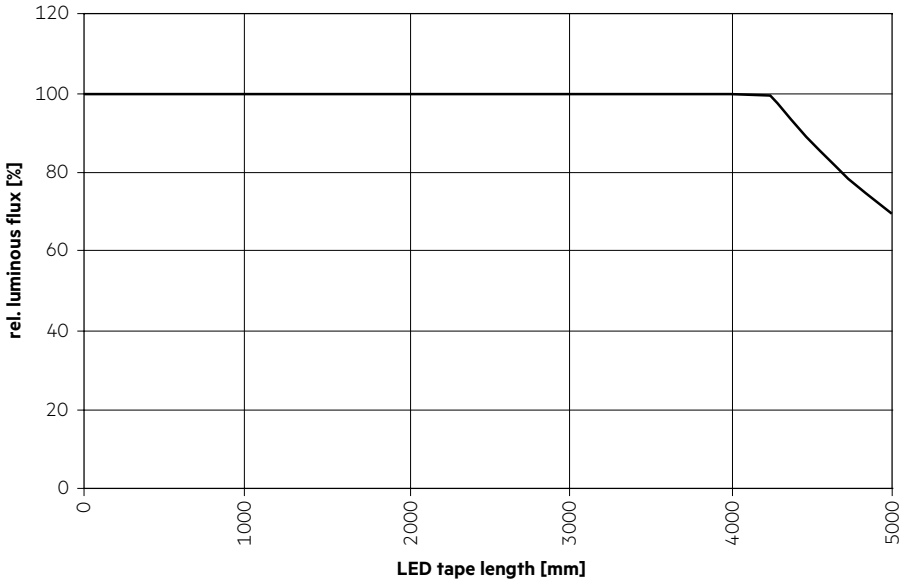
LLE FLEX 8mm 24V 1200lm 8xx EXC4



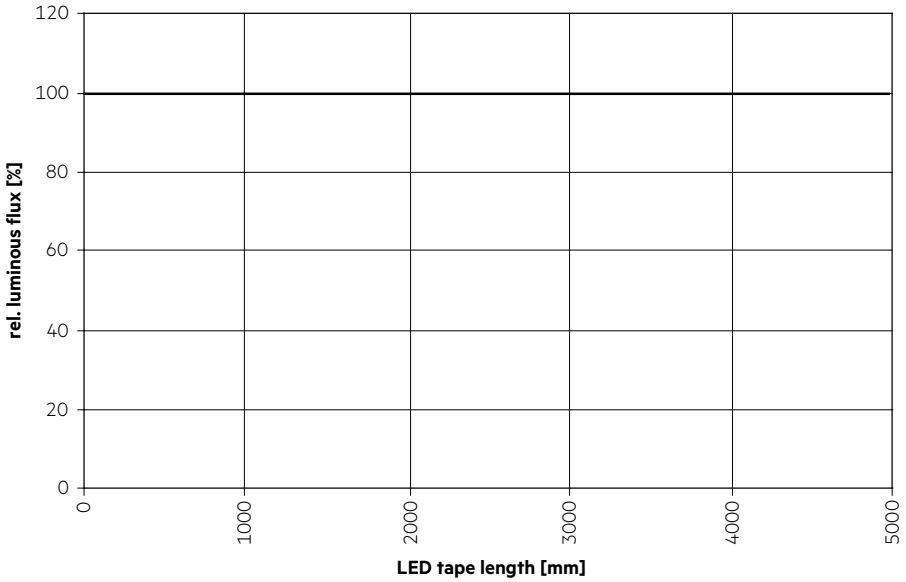
LLE FLEX 8mm 24V 1800lm 8xx EXC4



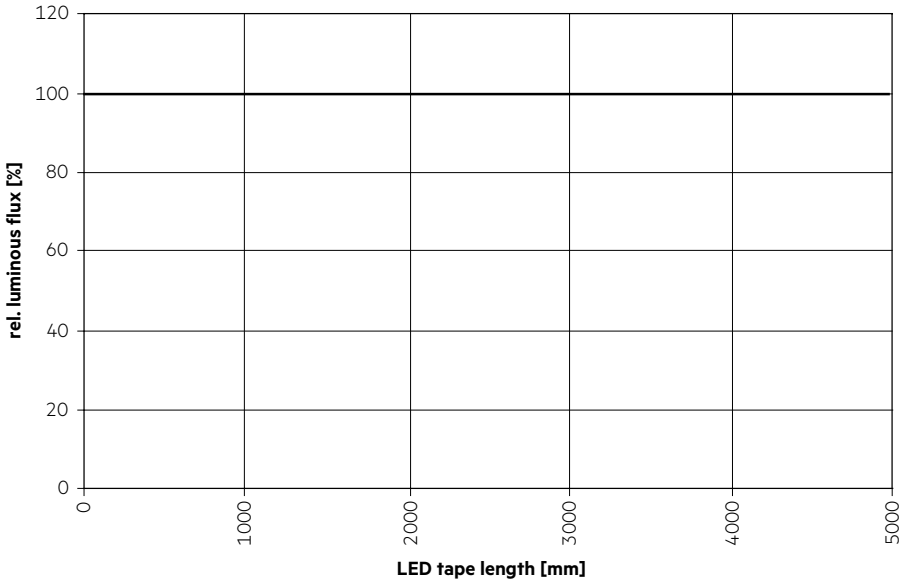
LLE FLEX 8mm 24V 2500lm 8xx EXC4



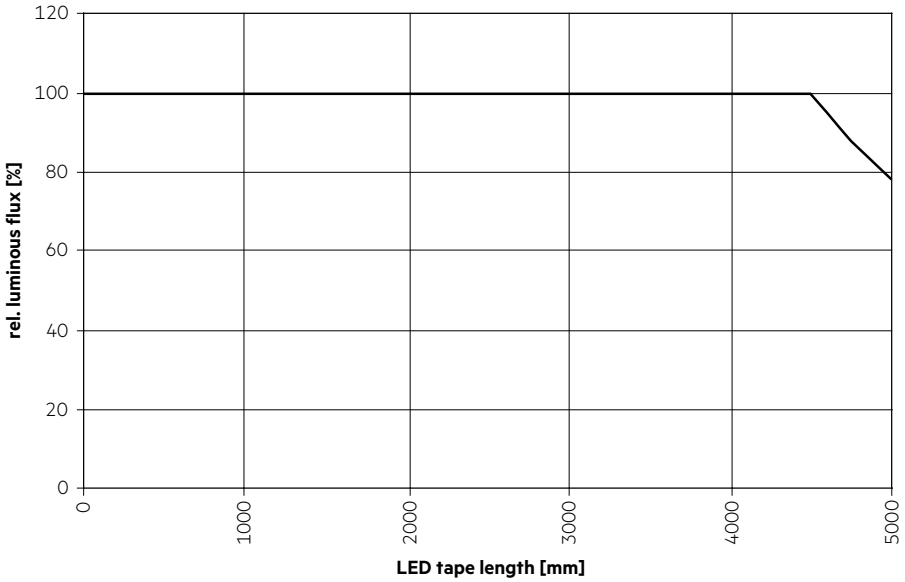
LLE FLEX 8mm 24V 600lm 9xx EXC4



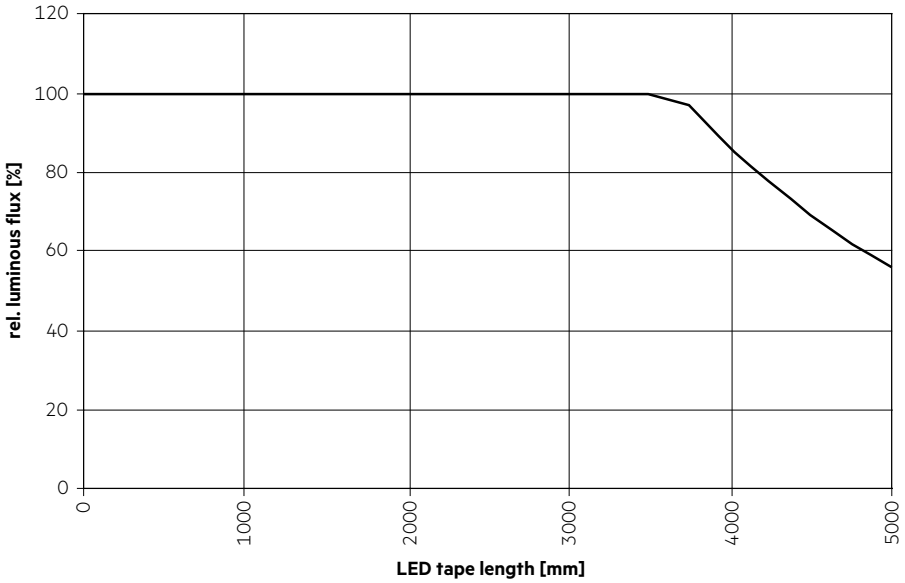
LLE FLEX 8mm 24V 1200lm 9xx EXC4



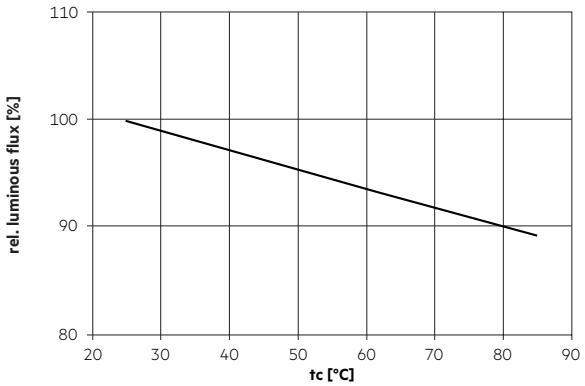
LLE FLEX 8mm 24V 1800lm 9xx EXC4



LLE FLEX 8mm 24V 2500lm 9xx EXC4



6.3 Relative luminous flux vs. tc temperature



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/

Lifetime declarations are informative and represent no warranty claim.