



## Module LLE FLEX 8mm ADV3 low lumen output

Modules LLE FLEX advanced

### Product description

- Dimmable 24 V constant voltage LED flextape (SELV)
- Ideal for those applications where low lumen output is required such as shelf applications or furniture in general
- 1 reel = 5 m or 50 m (5 m reel on-demand)
- Long lifetime: 54,000 hours
- 5 years guarantee (conditions at [www.tridonic.com](http://www.tridonic.com))

### Optical properties

- Colour temperature 3,000 and 4,000 K with SDCM 3<sup>0</sup>
- Useful luminous flux 300 lm/m at  $t_p = 25\text{ °C}$
- Efficacy of the LED module 180 lm/W at  $t_p = 25\text{ °C}$
- Small colour tolerance (MacAdam 3)

### Mechanical properties

- High design freedom due to 10 cm cut-options
- Self-adhesive 3M tape at the backside for simple mounting on different surfaces
- Connection only via soldering wires
- reel2reel – No solder joints on the tape, easy to separate and low length tolerances<sup>2</sup>

### System solution

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



**Standards**, page 3

**Colour temperatures and tolerances**, page 5



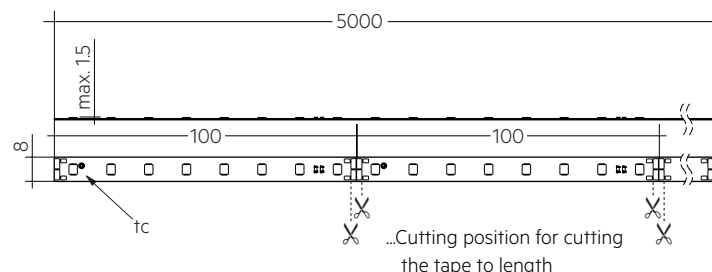


## Module LLE FLEX 8mm ADV3 low lumen output

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### Technical data

ESD classification	severity level 1
Classification acc. to IEC 62031	Built-in
Type of protection	IPO0
Lumen maintenance L70B50	54,000 h
Guarantee (conditions at www.tridonic.com)	5 years



80 LED's per meter

### Ordering data

Type	Article number	Packaging carton	Weight per pc.
LLE FLEX 8mm 1.7W 300lm/m 830 ADV3 R50	28004790	10 pc(s).	0.490 kg
LLE FLEX 8mm 1.7W 300lm/m 840 ADV3 R50	28004791	10 pc(s).	0.490 kg
LLE FLEX 8mm 1.7W 300lm/m 830 ADV3 R05	28004792	10 pc(s).	0.049 kg
LLE FLEX 8mm 1.7W 300lm/m 840 ADV3 R05	28004793	10 pc(s).	0.049 kg

### Photometric data

Type	Colour temperature	Photometric code	Useful luminous flux at tp = 25 °C <sup>Ⓢ</sup>	Luminous flux at tp rated <sup>Ⓢ</sup>			Efficacy of the module at tp = 25 °C	Expected efficacy of the module at tp rated	Beam characteristic	Colour rendering index CRI
				Min.	Typ.	Max.				
LLE FLEX 8mm 1.7W 300lm/m 830 ADV3 R50	3,000 K	830/359	280 lm/m	227 lm/m	267 lm/m	307 lm/m	171 lm/W	159 lm/W	120°	> 80
LLE FLEX 8mm 1.7W 300lm/m 840 ADV3 R50	4,000 K	840/359	300 lm/m	238 lm/m	281 lm/m	323 lm/m	180 lm/W	167 lm/W	120°	> 80
LLE FLEX 8mm 1.7W 300lm/m 830 ADV3 R05	3,000 K	830/359	280 lm/m	227 lm/m	267 lm/m	307 lm/m	171 lm/W	159 lm/W	120°	> 80
LLE FLEX 8mm 1.7W 300lm/m 840 ADV3 R05	4,000 K	840/359	300 lm/m	238 lm/m	281 lm/m	323 lm/m	180 lm/W	167 lm/W	120°	> 80

<sup>Ⓢ</sup> Integral measurement over the complete module.

<sup>Ⓢ</sup> For 5 m reel max. 2 solder joints.

<sup>Ⓢ</sup> Tolerance of useful light flux - 0 % / + 20 %. Measurement uncertainty ± 10 %. Values given for 1 m LLE FLEX.

<sup>Ⓢ</sup> Tolerance of expected light flux - 0 % / + 20 %. Measurement uncertainty ± 10 %. Values given for 1 m LLE FLEX. Based on calculation.

### Electrical data

Type	Typ. current consumption at tp rated	Supply voltage DC <sup>Ⓢ</sup>	Supply voltage range DC	Power consumption Pon at tp = 25 °C <sup>Ⓢ</sup>	Energy classification	Energy consumption	Type of light source
LLE FLEX 8mm 1.7W 300lm/m 830 ADV3 R50	70 mA/m	24 V	21.5 – 26.4 V	1.68 W/m	D	2 kWh / 1,000 h	Non-directional
LLE FLEX 8mm 1.7W 300lm/m 840 ADV3 R50	70 mA/m	24 V	21.5 – 26.4 V	1.68 W/m	C	2 kWh / 1,000 h	Non-directional
LLE FLEX 8mm 1.7W 300lm/m 830 ADV3 R05	70 mA/m	24 V	21.5 – 26.4 V	1.68 W/m	D	2 kWh / 1,000 h	Non-directional
LLE FLEX 8mm 1.7W 300lm/m 840 ADV3 R05	70 mA/m	24 V	21.5 – 26.4 V	1.68 W/m	C	2 kWh / 1,000 h	Non-directional

<sup>Ⓢ</sup> 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.

<sup>Ⓢ</sup> Tolerance of power consumption Pon ± 15 %. Measurement uncertainty ± 5 %. Values given for 1 m LLE FLEX.

### Specific technical data

Type	Max. working voltage for insulation SELV	Electrical strength	ta	tp rated	tc
LLE FLEX 8mm 1.7W 300lm/m 830 ADV3 R50	60 V	0.5 kV	-25 ... +50 °C	65 °C	75 °C
LLE FLEX 8mm 1.7W 300lm/m 840 ADV3 R50	60 V	0.5 kV	-25 ... +50 °C	65 °C	75 °C
LLE FLEX 8mm 1.7W 300lm/m 830 ADV3 R05	60 V	0.5 kV	-25 ... +50 °C	65 °C	75 °C
LLE FLEX 8mm 1.7W 300lm/m 840 ADV3 R05	60 V	0.5 kV	-25 ... +50 °C	65 °C	75 °C

## 1. Standards

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

### 1.1 Photometric code

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

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

### 1.2 Risk group

Type	Risk group
LLE FLEX 8mm 1.7W 300lm/m 8x0 ADV3	RG0

### 1.3 Energy classification

Type	Colour temperature	Energy classification	Energy consumption
LLE FLEX 8mm 1.7W 300lm/m 830 ADV3 R50	3,000 K	D	2 kWh / 1,000 h
LLE FLEX 8mm 1.7W 300lm/m 840 ADV3 R50	4,000 K	C	2 kWh / 1,000 h
LLE FLEX 8mm 1.7W 300lm/m 830 ADV3 R05	3,000 K	D	2 kWh / 1,000 h
LLE FLEX 8mm 1.7W 300lm/m 840 ADV3 R05	4,000 K	C	2 kWh / 1,000 h

Energy label and further information at [www.tridonic.com](http://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
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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 1.7W 300lm/m 8x0 ADV3

ta	tp	R <sub>th, hs-a</sub> <sup>①</sup>	Cooling area <sup>①</sup>
25 °C	65 °C	524.51 K/W	self cooling
35 °C	65 °C	393.36 K/W	self cooling
40 °C	65 °C	327.79 K/W	self cooling
45 °C	65 °C	262.21 K/W	self cooling
50 °C	65 °C	196.64 K/W	self cooling

<sup>①</sup> Values for a single segment of the LLE FLEX (100 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 100 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 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](http://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

Supply voltage	tp temperature	L90/B10	L90/B50	L80/B10	L80/B50	L70/B10	L70/B50
24 V	40 °C	>54 k h	>54 k h	>54 k h	>54 k h	>54 k h	>54 k h
	45 °C	>54 k h	>54 k h	>54 k h	>54 k h	>54 k h	>54 k h
	50 °C	>54 k h	>54 k h	>54 k h	>54 k h	>54 k h	>54 k h
	55 °C	44k h	53k h	>54 k h	>54 k h	>54 k h	>54 k h
	60 °C	43k h	51k h	>54 k h	>54 k h	>54 k h	>54 k h
	65 °C	41k h	49k h	>54 k h	>54 k h	>54 k h	>54 k h
	70 °C	40k h	48k h	>54 k h	>54 k h	>54 k h	>54 k h
	75 °C	38k h	46k h	>54 k h	>54 k h	>54 k h	>54 k h

#### 4.3 Switching capability

100,000 cycles

Tridonic test according to IEC 62717 Cl 10.3.3

30 s on / 30 s off at I<sub>max</sub>

## 6. Photometric characteristics

### 6.1 Coordinates and tolerances according to CIE 1931

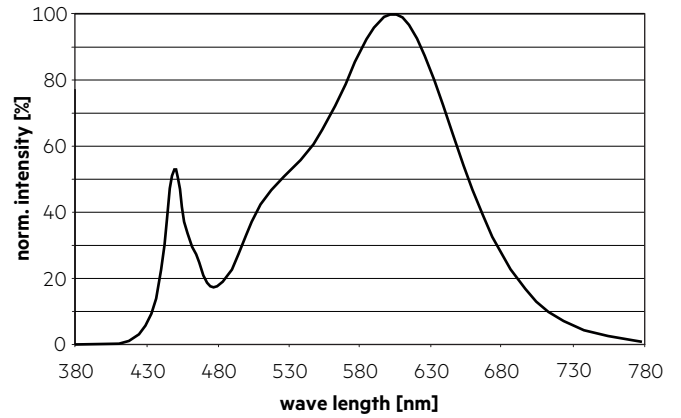
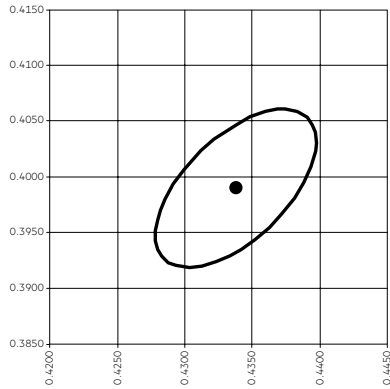
The specified colour coordinates are measured integral by a current impulse with typical values of module and a duration of 100 ms.

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

The measurement tolerance of the colour coordinates are  $\pm 0.01$ .

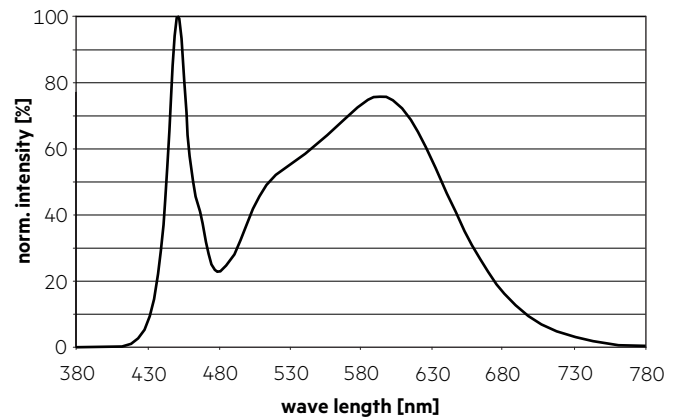
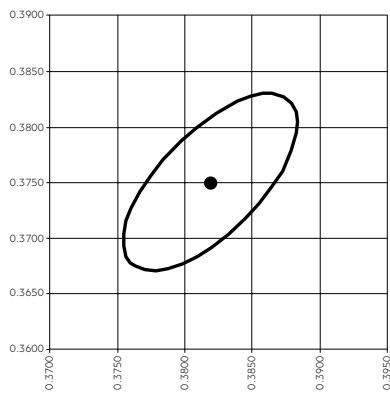
#### 3,000 K

	x0	y0
Centre	0,4338	0,3990



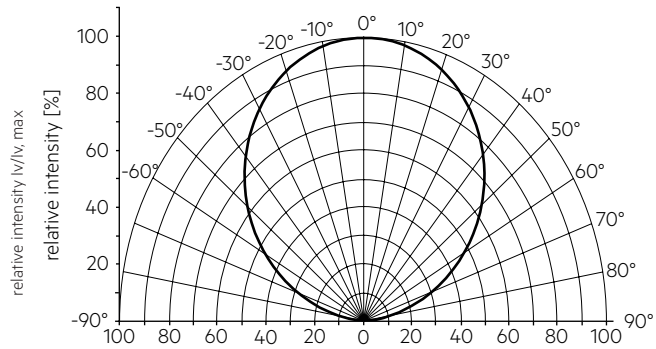
#### 4,000 K

	x0	y0
Center	0,3818	0,3750



## 6.2 Light distribution

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

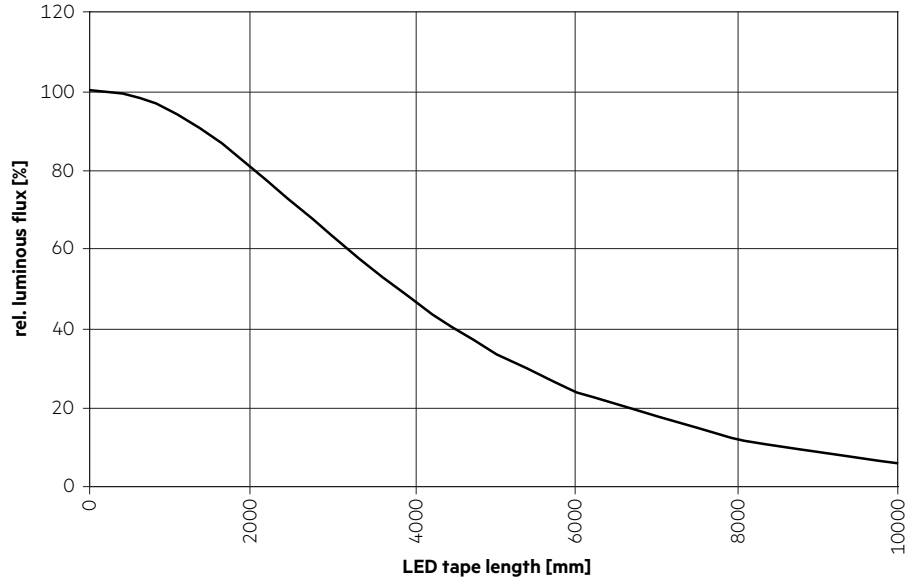


The colour temperature is measured over the complete module. To ensure an ideal mixture of colours and a homogeneous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 1.5 cm) should be used.

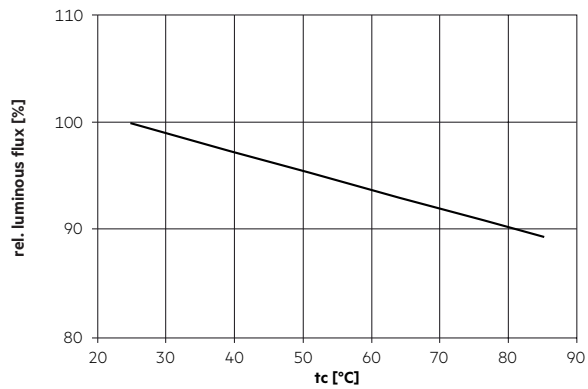
## 6.4 Relative luminous flux vs. LED tape length

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

LLE FLEX 8mm 1.7W 300lm/m 8x0 ADV3



### 6.3 Relative luminous flux vs. tc temperature



## 7. Miscellaneous

### 7.1 Additional information

Additional technical information at [www.tridonic.com](http://www.tridonic.com) → Technical Data

Energy label and further information at [www.tridonic.com](http://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.