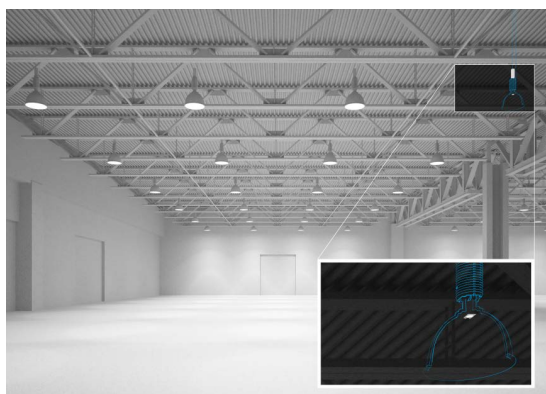




TALEXmodule STARK FLE GEN1 TALEXmodule FLE

Product description

- Luminous flux up to 18,550 lm at $t_p = 65^\circ\text{C}$
- High efficacy up to 142 lm/W for the LED module at $t_p = 25^\circ\text{C}$
- High system efficacy up to 115 lm/W at $t_p = 65^\circ\text{C}$
- High colour consistency (MacAdams 3)
- Excellent thermal management by COB technology
- KTY 82/210 for temperature control, compatible with ECO and TOP (up to 35 W) LED Driver
- Uniform radiation with Dam&Fill technology
- Fixing holes for M3 screws
- Built-in LED module
- Cooling required
- Flexible operating modes
- 5-year guarantee



Standards, page 4

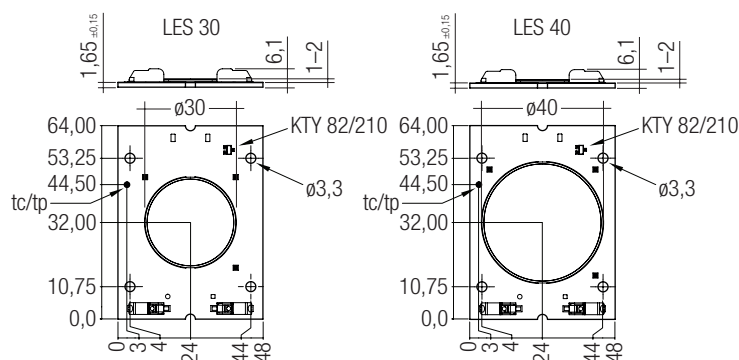
Colour temperatures and tolerances, page 7



TALEXmodule STARK FLE GEN1 TALEXmodule FLE

Technical data

Beam characteristic	115°
Ambient temperature range	-25 ... +50 °C
tp rated	65 °C
tc ^①	up to 90 °C
Max. DC forward current for LES30 [®]	1,750 mA
Max. DC forward current for LES40 [®]	3,500 mA
Max. permissible LF current ripple for LES30	2,400 mA
Max. permissible LF current ripple for LES40	5,000 mA
Max. permissible peak current for LES30	4,800 mA / max. 10 µs
Max. permissible peak current for LES40	10,000 mA / max. 10 µs
Max. permissible output voltage of LED Driver for LES30 [®]	250 V
Max. permissible output voltage of LED Driver for LES40 [®]	250 V
Insulation test voltage for LES30	1.5 kV
Insulation test voltage for LES40	1.5 kV
ESD classification	severity level 4
Risk group (EN 62471:2008)	1
Type of protection	IP00



Ordering data

Type	Article number	Colour temperature	Packaging	Weight per pc.
STARK-FLE-G1-LES30-830-CLA	89601873	3,000 K	20 pc(s).	0.014 kg
STARK-FLE-G1-LES30-840-CLA	89601874	4,000 K	20 pc(s).	0.014 kg
STARK-FLE-G1-LES30-765-IND	89601875	6,500 K	20 pc(s).	0.014 kg
STARK-FLE-G1-LES40-830-CLA	89601876	3,000 K	20 pc(s).	0.015 kg
STARK-FLE-G1-LES40-840-CLA	89601877	4,000 K	20 pc(s).	0.014 kg
STARK-FLE-G1-LES40-765-IND	89601878	6,500 K	20 pc(s).	0.014 kg

Specific technical data

Type ^②	Photo-metric code	Forward current	Luminous flux at tp = 25 °C ^③	Luminous flux at tp = 65 °C ^④	Power consumption module ^⑤ ⑥	Min. forward voltage at tp = 65 °C	Max. forward voltage at tp = 25 °C	Luminous efficacy module at tp = 25 °C	Luminous efficacy module at tp = 65 °C	Luminous efficacy system at tp = 65 °C ^⑦	Colour rendering index CRI
STARK-FLE-LES30 – Operating mode at 900 mA											
STARK-FLE-G1-LES30-830-CLA	830/349	900 mA	5,100 lm	4,500 lm	44.3 W	47.5 V	54.0 V	113 lm/W	102 lm/W	92 lm/W	80
STARK-FLE-G1-LES30-840-CLA	840/349	900 mA	5,850 lm	5,150 lm	44.3 W	47.5 V	54.0 V	129 lm/W	116 lm/W	104 lm/W	80
STARK-FLE-G1-LES30-765-IND	765/349	900 mA	6,400 lm	5,650 lm	44.3 W	47.5 V	54.0 V	141 lm/W	128 lm/W	115 lm/W	70
STARK-FLE-LES30 – Operating mode at 1,400 mA											
STARK-FLE-G1-LES30-830-CLA	830/349	1,400 mA	7,500 lm	6,600 lm	72.4 W	50.0 V	56.2 V	101 lm/W	91 lm/W	82 lm/W	80
STARK-FLE-G1-LES30-840-CLA	840/349	1,400 mA	8,500 lm	7,500 lm	72.4 W	50.0 V	56.2 V	115 lm/W	104 lm/W	94 lm/W	80
STARK-FLE-G1-LES30-765-IND	765/349	1,400 mA	9,350 lm	8,200 lm	72.4 W	50.0 V	56.2 V	127 lm/W	113 lm/W	102 lm/W	70
STARK-FLE-LES30 – Operating mode at 1,750 mA											
STARK-FLE-G1-LES30-830-CLA	830/349	1,750 mA	9,100 lm	8,000 lm	93.5 W	51.7 V	57.9 V	95 lm/W	86 lm/W	77 lm/W	80
STARK-FLE-G1-LES30-840-CLA	840/349	1,750 mA	10,200 lm	8,950 lm	93.5 W	51.7 V	57.9 V	107 lm/W	96 lm/W	86 lm/W	80
STARK-FLE-G1-LES30-765-IND	765/349	1,750 mA	11,200 lm	9,850 lm	93.5 W	51.7 V	57.9 V	117 lm/W	105 lm/W	95 lm/W	70
STARK-FLE-LES40 – Operating mode at 1,750 mA											
STARK-FLE-G1-LES40-830-CLA	830/349	1,750 mA	9,800 lm	8,650 lm	80.5 W	44.4 V	50.3 V	119 lm/W	107 lm/W	96 lm/W	80
STARK-FLE-G1-LES40-840-CLA	840/349	1,750 mA	10,650 lm	9,400 lm	80.5 W	44.4 V	50.3 V	129 lm/W	117 lm/W	105 lm/W	80
STARK-FLE-G1-LES40-765-IND	765/349	1,750 mA	11,700 lm	10,300 lm	80.5 W	44.4 V	50.3 V	142 lm/W	128 lm/W	115 lm/W	70
STARK-FLE-LES40 – Operating mode at 2,600 mA											
STARK-FLE-G1-LES40-830-CLA	830/349	2,600 mA	13,800 lm	12,150 lm	124.5 W	46.3 V	52.1 V	109 lm/W	98 lm/W	88 lm/W	80
STARK-FLE-G1-LES40-840-CLA	840/349	2,600 mA	15,000 lm	13,200 lm	124.5 W	46.3 V	52.1 V	118 lm/W	106 lm/W	95 lm/W	80
STARK-FLE-G1-LES40-765-IND	765/349	2,600 mA	16,500 lm	14,500 lm	124.5 W	46.3 V	52.1 V	130 lm/W	116 lm/W	104 lm/W	70
STARK-FLE-LES40 – Operating mode at 3,500 mA											
STARK-FLE-G1-LES40-830-CLA	830/349	3,500 mA	17,600 lm	15,500 lm	174.7 W	48.3 V	54.2 V	99 lm/W	89 lm/W	80 lm/W	80
STARK-FLE-G1-LES40-840-CLA	840/349	3,500 mA	19,100 lm	16,800 lm	174.7 W	48.3 V	54.2 V	107 lm/W	96 lm/W	86 lm/W	80
STARK-FLE-G1-LES40-765-IND	765/349	3,500 mA	21,100 lm	18,550 lm	174.7 W	48.3 V	54.2 V	118 lm/W	106 lm/W	95 lm/W	70

① See Derating curves in data sheet section 2.3.

② Max. DC forward current varies over the temperature of the LED module. See derating curves in data sheet section 2.3.

③ The detailed explanation, see data sheet section 3.1.

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

⑤ Assumed efficiency for the LED Driver is 0.9.

⑥ All values at tp = 65 °C.

⑦ HE ... high efficiency, NM ... nominal mode, HO ... high output.

1. Standards

EN 62031
EN 62471
EN 61547
EN 55015
IEC 62717

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	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)		
					Code	Luminous flux	
					7	≥ 70 %	
					8	≥ 80 %	
9	≥90				9	≥ 90 %	

1.2 Energy classification

Type	Forward current	Energy classification
FLE-G1-LES30-830-CLA	900 mA	A+
	1,400 mA	A+
	1,750 mA	A
FLE-G1-LES30-840-CLA	900 mA	A+
	1,400 mA	A+
	1,750 mA	A+
FLE-G1-LES30-765-IND	900 mA	A+
	1,400 mA	A+
	1,750 mA	A+
FLE-G1-LES40-830-CLA	1,750 mA	A+
	2,600 mA	A+
	3,500 mA	A+
FLE-G1-LES40-840-CLA	1,750 mA	A+
	2,600 mA	A+
	3,500 mA	A+
FLE-G1-LES40-765-IND	1,750 mA	A+
	2,600 mA	A+
	3,500 mA	A+

2. Thermal details

2.1 tp point, ambient temperature and life-time

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

For TALEXmodule STARK FLE a tp temperature of 65 °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 tp 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.

2.2 Storage and humidity

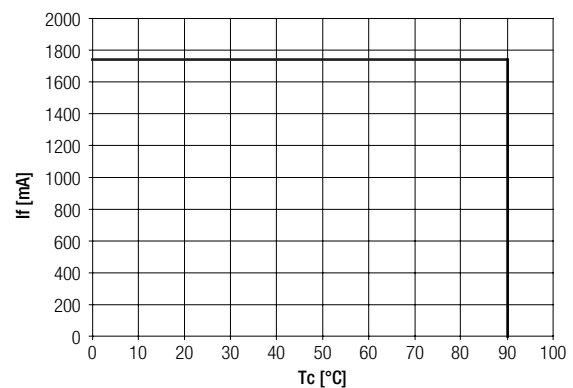
storage temperature	-30 ... +80 °C
---------------------	----------------

Operation only in non condensing environment.

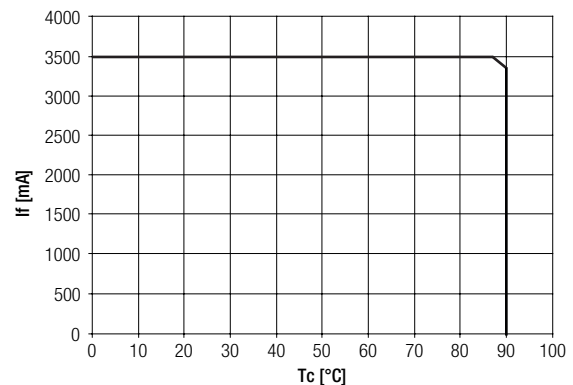
Humidity during processing of the module should be between 30 to 70 %.

2.3 Derating curves

TALEXmodule STARK FLE-G1-LES30



TALEXmodule STARK FLE G1-LES40



2.4 Thermal design and heat sink

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

2.5 Heat sink values

TALEXmodule STARK-FLE-G1-LES30

ta	tp	Operating current	R _{th, hs-a}
25 °C	65 °C	900 mA	1.20 K/W
30 °C	65 °C	900 mA	1.04 K/W
40 °C	65 °C	900 mA	0.73 K/W
50 °C	65 °C	900 mA	0.42 K/W
25 °C	65 °C	1,400 mA	0.69 K/W
30 °C	65 °C	1,400 mA	0.59 K/W
40 °C	65 °C	1,400 mA	0.41 K/W
50 °C	65 °C	1,400 mA	0.22 K/W
25 °C	65 °C	1,750 mA	0.51 K/W
30 °C	65 °C	1,750 mA	0.44 K/W
40 °C	65 °C	1,750 mA	0.30 K/W
50 °C	65 °C	1,750 mA	0.16 K/W

TALEXmodule STARK-FLE-G1-LES40

ta	tp	Operating current	R _{th, hs-a}
25 °C	65 °C	1,750 mA	0.65 K/W
30 °C	65 °C	1,750 mA	0.56 K/W
40 °C	65 °C	1,750 mA	0.38 K/W
50 °C	65 °C	1,750 mA	0.21 K/W
25 °C	65 °C	2,600 mA	0.38 K/W
30 °C	65 °C	2,600 mA	0.33 K/W
40 °C	65 °C	2,600 mA	0.22 K/W
50 °C	65 °C	2,600 mA	0.11 K/W
25 °C	65 °C	3,500 mA	0.25 K/W
30 °C	65 °C	3,500 mA	0.21 K/W
40 °C	65 °C	3,500 mA	0.14 K/W
50 °C	65 °C	3,500 mA	0.06 K/W

Notes

The actual cooling can differ because of the material, the structural shape, outside influences and the installation situation. A thermal connection between TALEXmodule STARK FLE and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary.

Additionally the TALEXmodule STARK FLE has to be fixed on the heat sink with M3 screws to optimise the thermal connection.

Use of thermal interface material with thermal conductivity of $\lambda > 1 \text{ W/mK}$ and layer thickness of interface material with max. 50 µm or a similar interface material where the quotient of layer thickness and thermal conductivity $b < 50 \text{ µmmK/W}$.

3. Installation / wiring

3.1 Electrical supply/choice of LED Driver

TALEXmodule FLE 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 TALEX LED Drivers from Tridonic in combination with TALEXmodule FLE guarantees the necessary protection for safe and reliable operation.

If a LED Driver other than Tridonic TALEXconverter is used, it must provide the following protection:

- Short-circuit protection
- Overload protection
- Overtemperature protection



TALEXmodule FLE 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 TALEXmodule FLE.



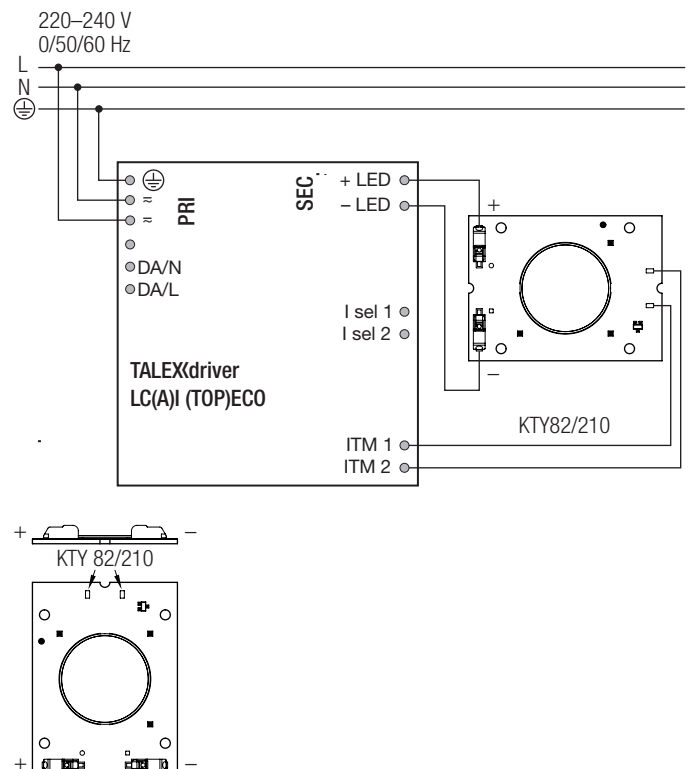
TALEXmodule FLE are basic isolated up to 250 V against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the LED Driver (also against earth) is above 250 V, an additional isolation between LED module and heat sink is required (for example by isolated 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



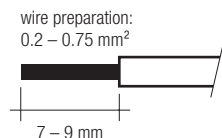
The temperature monitoring is available with Tridonic LED Driver series TOP (up to 35 W) and ECO with the ITM feature in combination with the thermal sensor KTY 82/210.

If the temperature monitoring function want to be used it has to be wired as shown below in the wiring diagram.



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 (7–9 mm).



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

3.4 Mounting instruction



TALEXmodule STARK FLE from Tridonic which have to be installed on a heat sink have to be connected with heat-conducting paste or heat conducting adhesive film and fixed with M3 screws.

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

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

Max. torque for fixing: 0.5 Nm.



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.

3.5 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

Life-time declarations are informative and represent no warranty claim.

Operating mode	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
HE	65 °C	51,000 h	60,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	38,000 h	57,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	85 °C	29,000 h	43,000 h	60,000 h	60,000 h	60,000 h	60,000 h
NM	65 °C	40,000 h	60,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	30,000 h	44,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	85 °C	22,000 h	33,000 h	47,000 h	60,000 h	60,000 h	60,000 h
HO	65 °C	32,000 h	48,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	24,000 h	36,000 h	50,000 h	60,000 h	60,000 h	60,000 h
	85 °C	18,000 h	27,000 h	38,000 h	57,000 h	60,000 h	60,000 h

5. Photometric characteristics

5.1 Coordinates and tolerances according to CIE 1931

The specified colour coordinates are measured integral after a settling time of 200 ms. The current impuls depends on the module type.

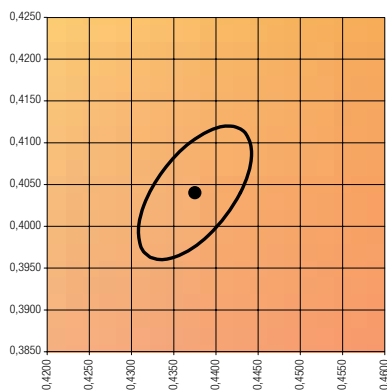
Module type	Current impulse
TALEX(module STARK-FLE-G1-LES30	1,400 mA
TALEX(module STARK-FLE-G1-LES40	2,600 mA

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

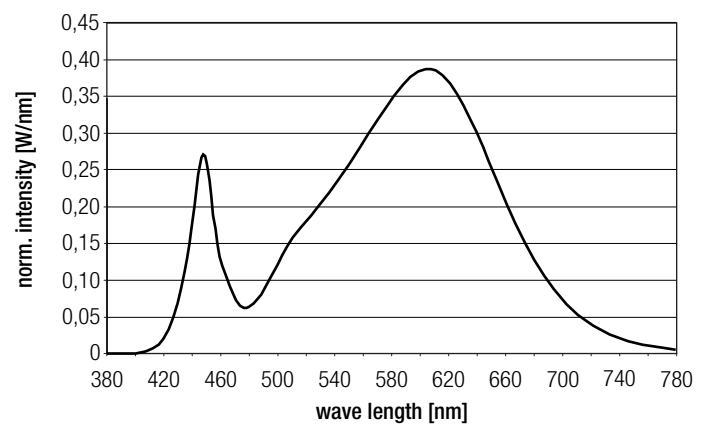
The measurement tolerance of the colour coordinates are ± 0.01 .

3,000 K

	x0	y0
Centre	0.4369	0.4041

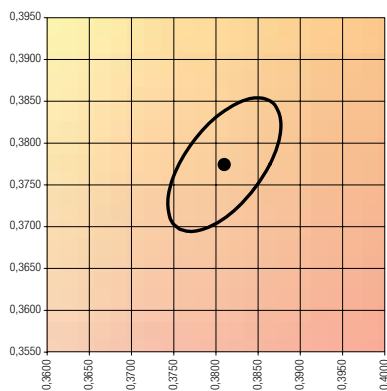


MacAdam ellipse: 3SDCM

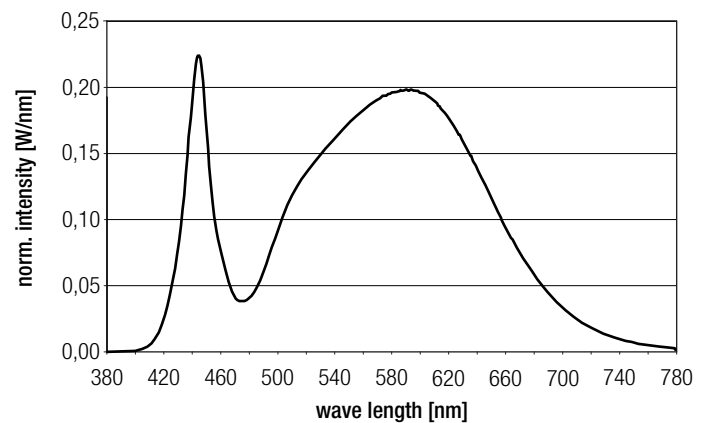


4,000 K

	x0	y0
Centre	0.3804	0.3767

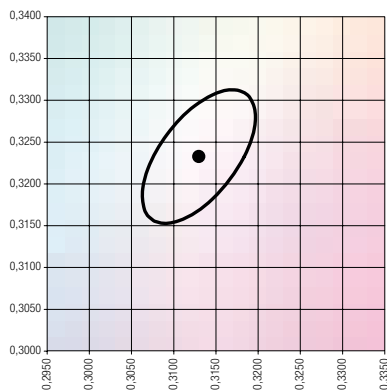


MacAdam ellipse: 3SDCM

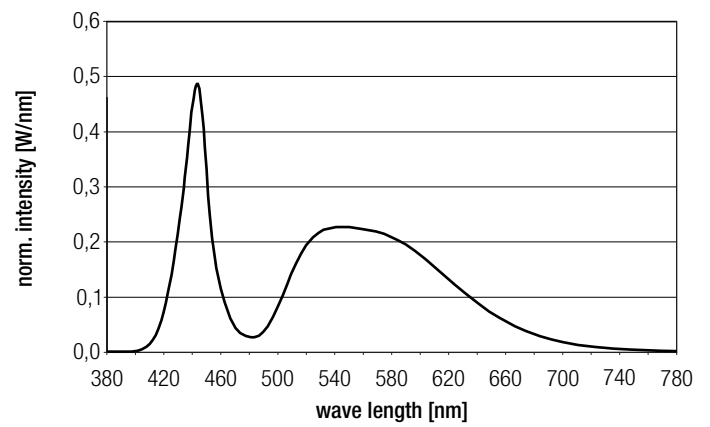


6,500 K

	x0	y0
Centre	0.3135	0.3236

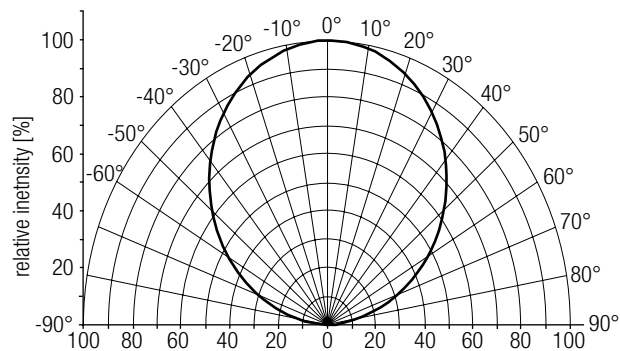


MacAdam ellipse: 3SDCM



5.2 Light distribution

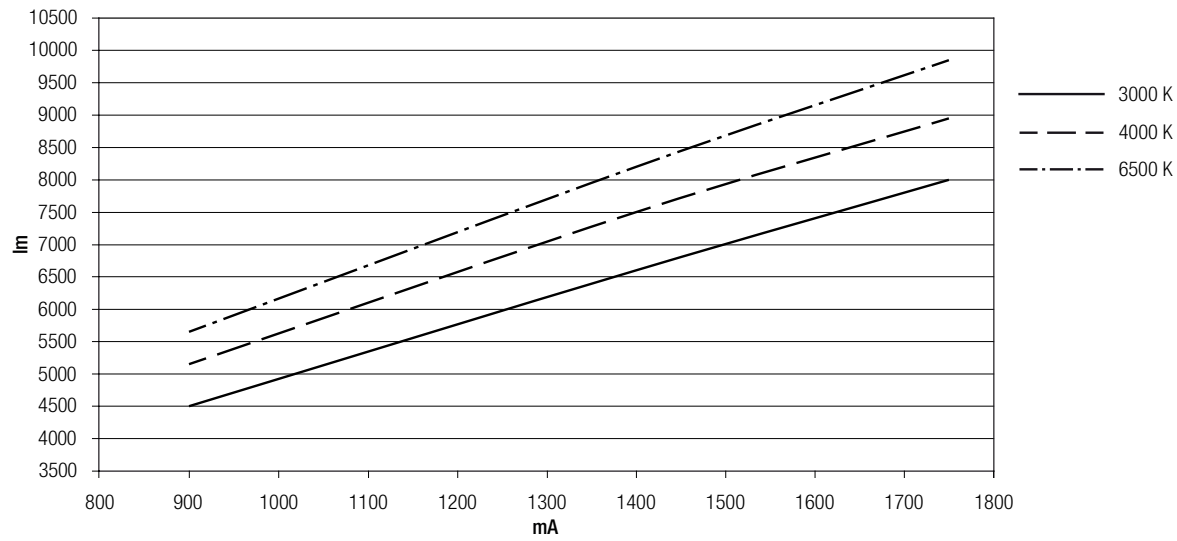
The optical design of the TALEXmodule SLE product line ensures optimum homogeneity for the light distribution.



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

5.3 Relative luminous flux vs. operating current

TALEX(module STARK FLE-G1-LES30 at $t_p=65^\circ\text{C}$)



TALEX(module STARK FLE-G1-LES40 at $t_p=65^\circ\text{C}$)

