



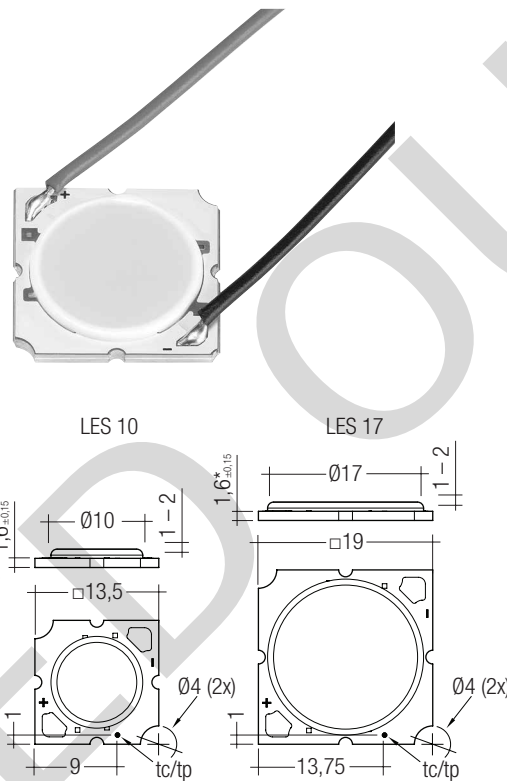
TALEXmodule STARK SLE GEN2 Mini
STARK SLE

Product description

- For spotlights and downlights
- High efficiency up to 119 lm/W for the LED module
- High system efficiency up to 88 lm/W at $t_p = 65\text{ °C}$
- High colour consistency (MacAdams 3)
- Small LES (light emitting surface) diameter enables small beam angle for spotlights
- Excellent thermal management by COB technology
- Uniform radiation with DAM&Fill technology
- Built-in LED module
- Cooling required
- Long life time: up to 80 % luminous flux after 50,000 operating hours
- Flexible operating modes

Technical data

Beam characteristic	140°
Ambient temperature t_a	-25 ... +55 °C
t_p rated temperature ^①	up to 65 °C
Max. t_c point temperature ^②	up to 75 °C
Risk group (EN 62471:2008)	1
Type of protection	IP00



PURE (without housing)

* From April 2013 the PCB-thickness will change from 1.6 to 1.1 mm.



Standards, page 6

Colour temperatures and tolerances, page 8

Ordering data

Type	Article number	Colour temperature	Housing	Connection cable	Packaging	Weight per pc.
STARK SLE PURE G2 LES10 830 CLA	89601736	3,000 K	no	yes	20 pc(s).	0.01 kg
STARK SLE PURE G2 LES10 840 CLA	89601691	4,000 K	no	yes	20 pc(s).	0.01 kg
STARK SLE PURE G2 LES17 830 CLA	89601692	3,000 K	no	yes	20 pc(s).	0.01 kg
STARK SLE PURE G2 LES17 840 CLA	89601693	4,000 K	no	yes	20 pc(s).	0.01 kg
STARK SLE PURE G2 LES10 830 CLA W/O C	89601732	3,000 K	no	no	20 pc(s).	0.01 kg
STARK SLE PURE G2 LES10 840 CLA W/O C	89601733	4,000 K	no	no	20 pc(s).	0.01 kg
STARK SLE PURE G2 LES17 830 CLA W/O C	89601734	3,000 K	no	no	20 pc(s).	0.01 kg
STARK SLE PURE G2 LES17 840 CLA W/O C	89601735	4,000 K	no	no	20 pc(s).	0.01 kg

Specific technical data

Type [®]	Photometric code	Forward current ^{® ④ ⑤}	Luminous flux at tp = 25 °C [®]	Luminous flux at tp_rated temperature ^{® ⑥}	Power consumption module [®]	Forward voltage module ^{® ⑦}	Luminous efficacy module at tp = 25 °C	Luminous efficacy module at tp_rated temperature [®]	Luminous efficacy system at tp_rated temperature [®]	Colour rendering index CRI	Energy classification
STARK SLE LES10 – Operating mode HE at 350 mA											
STARK SLE PURE G2 LES10 830 CLA	830/349	350 mA	550 lm	450 lm	5.1 W	14.6 V	108 lm/W	88 lm/W	79 lm/W	80	A+
STARK SLE PURE G2 LES10 840 CLA	840/349	350 mA	650 lm	550 lm	5.1 W	14.6 V	127 lm/W	108 lm/W	97 lm/W	80	A+
STARK SLE LES10 – Operating mode NM at 500 mA											
STARK SLE PURE G2 LES10 830 CLA	830/349	500 mA	750 lm	650 lm	7.6 W	15.1 V	99 lm/W	86 lm/W	77 lm/W	80	A+
STARK SLE PURE G2 LES10 840 CLA	840/349	500 mA	850 lm	750 lm	7.6 W	15.1 V	112 lm/W	99 lm/W	89 lm/W	80	A+
STARK SLE LES10 – Operating mode HO at 700 mA											
STARK SLE PURE G2 LES10 830 CLA	830/349	700 mA	950 lm	800 lm	11.1 W	15.9 V	86 lm/W	72 lm/W	65 lm/W	80	A
STARK SLE PURE G2 LES10 840 CLA	840/349	700 mA	1,100 lm	950 lm	11.1 W	15.9 V	99 lm/W	86 lm/W	77 lm/W	80	A+
STARK SLE LES17 – Operating mode HE at 350 mA											
STARK SLE PURE G2 LES17 830 CLA	830/349	350 mA	1,350 lm	1,150 lm	12.2 W	34.9 V	111 lm/W	94 lm/W	85 lm/W	80	A+
STARK SLE PURE G2 LES17 840 CLA	840/349	350 mA	1,500 lm	1,300 lm	12.2 W	34.9 V	123 lm/W	107 lm/W	96 lm/W	80	A+
STARK SLE LES17 – Operating mode NM at 500 mA											
STARK SLE PURE G2 LES17 830 CLA	830/349	500 mA	1,850 lm	1,550 lm	18.1 W	36.1 V	102 lm/W	86 lm/W	77 lm/W	80	A+
STARK SLE PURE G2 LES17 840 CLA	840/349	500 mA	2,000 lm	1,750 lm	18.1 W	36.1 V	110 lm/W	97 lm/W	87 lm/W	80	A+
STARK SLE LES17 – Operating mode HO at 700 mA											
STARK SLE PURE G2 LES17 830 CLA	830/349	700 mA	2,400 lm	2,000 lm	26.5 W	37.8 V	91 lm/W	75 lm/W	68 lm/W	80	A
STARK SLE PURE G2 LES17 840 CLA	840/349	700 mA	2,600 lm	2,200 lm	26.5 W	37.8 V	98 lm/W	83 lm/W	75 lm/W	80	A

^① If the max. temperature limits are exceeded, the life of the system will be greatly reduced or the system may be damaged.

The temperature of the TALEX module at the tp-point is to be measured in the thermally stable state with a temperature sensor or temperature-sensitive sticker as per EN 60598-1. For the precise position of the tp point see the drawing above.

^② Tolerance range for optical data: ±10 %.

^③ Exceeding the max. operating current leads to an overload on the TALEX module. This may in turn result in a significant reduction in lifetime or even destruction of the TALEX module.

^④ Max. permissible surge current: 3 A, duration max. 10 µs.

^⑤ Ripple max. 35 % of typ. forward current.

^⑥ Tolerance range voltage: ±10 %.

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

^⑧ All values are valid for LES10 in HE and NM mode tp_rated = 65 °C, for LES10 in HO mode tp_rated = 55 °C. For LES17 tp_rated = 65 °C is valid.

LED control gear matrix – TALEX(module STARK SLE PURE G2 LES10 CLASSIC

Type	REMOTE			IN-BUILT
	LCAI 015/0350 A020 one4all	LCCI 016/0350 B020	LCI 015/0350 M020	LCCI 016/0350 Q010
Art. no.	86458899	86459210	86459179	86459213
Type	Assignable LED control gear			
Operating mode HE at 350 mA				
STARK SLE PURE G2 LES10 CLA	✓	✓	✓	✓

LED control gear matrix – TALEX(module STARK SLE PURE G2 LES10 CLASSIC

Type	REMOTE			IN-BUILT
	LCAI 020/0500 A120 one4all	LCCI 016/0500 B020	LCI 015/0500 M020	LCCI 016/0500 Q010
Art. no.	86459107	86459211	86459180	86459214
Type	Assignable LED control gear			
Operating mode NM at 500 mA				
STARK SLE PURE G2 LES10 CLA	✓	✓	✓	✓

LED control gear matrix – TALEX(module STARK SLE PURE G2 LES10 CLASSIC

Type	REMOTE			IN-BUILT
	LCCI 016/0700 B020	LCI 015/0700 M020	LCI 015/0700 E020	LCCI 016/0700 Q010
Art. no.	86459212	86459181	24166313	86459215
Type	Assignable LED control gear			
Operating mode H0 at 700 mA				
STARK SLE PURE G2 LES10 CLA	✓	✓	✓	✓

LED control gear matrix – TALEX(module STARK SLE PURE G2 LES17 CLASSIC

Type	REMOTE				IN-BUILT	
	LCAI 015/0350 A020 one4all	LCI 20W 350mA TEC SR	LCAI 020/0500 A120 one4all	LCI 20W 500mA TEC SR	LCCI 016/0350 Q010	LCI 015/0350 E020
Art. no.	86458899	87500187	86459107	87500189	86459213	24166312
Type	Assignable LED control gear					
Operating mode HE at 350 mA						
STARK SLE PURE G2 LES17 CLA	✓	✓	–	–	✓	✓
Operating mode NM at 500 mA						
STARK SLE PURE G2 LES17 CLA	–	–	✓	✓	–	–

LED control gear matrix – TALEX(module STARK SLE PURE G2 LES17 CLASSIC

Type	REMOTE					
	LCAI 030/0700 A120 one4all	LCI 030/0700 E020	LCI 030/0700 A120	LCI 030/0700 M120	LCI 033/0700 U010	LCI 35W 700mA TEC SR
Art. no.	86458900	24166314	86458901	86459178	25000669	87500197
Type	Assignable LED control gear					
Operating mode H0 at 700 mA						
STARK SLE PURE G2 LES17 CLA	✓	✓	✓	✓	✓	✓

Standards

EN 62031
 EN 62471
 EN 61547
 EN 55015
 IEC 62717

Glow wire test

according to EN 62031 with increased temperature of 960 °C passed.

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	McAdams initial	McAdams after 25% of the lifetime (max.6000h)	Lumen maintenance after 25% of the lifetime (max.6000h)	
				Code	Remaining lumen
7 67 – 76				7	≥ 70 %
8 77 – 86				8	≥ 80 %
9 87 – ≥90			9	≥ 90 %	

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 SLE PURE G2 will be greatly reduced or the TALEXmodule STARK SLE PURE G2 may be destroyed.

Therefore the TALEXmodule STARK SLE PURE G2 needs to be mounted onto a heat sink.

Tridonic's excellent thermal design for the TALEXmodule STARK SLE PURE G2 products provides the lowest thermal resistance and therefore allowing new compact designs without sacrificing quality, safety and life time.

tp point, ambient temperature and lifetime

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

For TALEXmodule STARK SLE PURE G2 a tp temperature up to 65 °C (depends on LES and operating mode, see page 1) 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.

**Mounting instruction**

TALEXmodule STARK SLE PURE G2 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 TALEX modules to remove all dirt, dust and grease.

None of the components of the TALEXmodule STARK SLE PURE G2 (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.

Max. torque for fixing: 0.5Nm.

For further information please refer to the brochure entitled "Technical Design-In-Guide SLE GEN2".

**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/com/en/technical-docs.asp>

Electrical supply/choice of LED control gear

TALEXmodule STARK SLE PURE G2 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 control gear which complies with the relevant standards. The use of TALEX LED control gears from Tridonic in combination with TALEXmodule STARK SLE PURE G2 guarantees the necessary protection for safe and reliable operation.

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

- Short-circuit protection
- Overload protection
- Overtemperature protection



TALEXmodule STARK SLE PURE G2 must be supplied by a constant current LED control gear.

Operation with a constant voltage LED control gear will lead to an irreversible damage of the module.

Wrong polarity can damage the TALEXmodule STARK SLE PURE G2.

Heat sink values

TALEXmodule STARK SLE PURE G2 LES10 CLASSIC

ta	tp	If	Rth, hs-a
25 °C	65 °C	350 mA	10.80 K/W
30 °C	65 °C	350 mA	9.44 K/W
40 °C	65 °C	350 mA	6.73 K/W
50 °C	65 °C	350 mA	4.02 K/W
25 °C	65 °C	500 mA	7.07 K/W
30 °C	65 °C	500 mA	6.18 K/W
40 °C	65 °C	500 mA	4.40 K/W
50 °C	65 °C	500 mA	2.62 K/W
25 °C	55 °C	700 mA	4.63 K/W
30 °C	55 °C	700 mA	4.04 K/W
40 °C	55 °C	700 mA	2.87 K/W
50 °C	55 °C	700 mA	1.70 K/W

TALEXmodule STARK SLE PURE G2 LES17 CLASSIC

ta	tp	If	Rth, hs-a
25 °C	65 °C	350 mA	4.68 K/W
30 °C	65 °C	350 mA	4.09 K/W
40 °C	65 °C	350 mA	2.90 K/W
50 °C	65 °C	350 mA	1.72 K/W
25 °C	65 °C	500 mA	3.05 K/W
30 °C	65 °C	500 mA	2.66 K/W
40 °C	65 °C	500 mA	1.89 K/W
50 °C	65 °C	500 mA	1.11 K/W
25 °C	65 °C	700 mA	1.92 K/W
30 °C	65 °C	700 mA	1.67 K/W
40 °C	65 °C	700 mA	1.18 K/W
50 °C	65 °C	700 mA	0.69 K/W

Notes

The actual cooling surface can differ because of the material, the structural shape, outside influences and the installation situation. A thermal connection between TALEXmodule STARK SLE PURE G2 and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary.

Additionally the TALEXmodule STARK SLE PURE G2 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. $50 \mu\text{m}$ or a similar interface material where the quotient of layer thickness and thermal conductivity $b < 50 \mu\text{mmK/W}$.

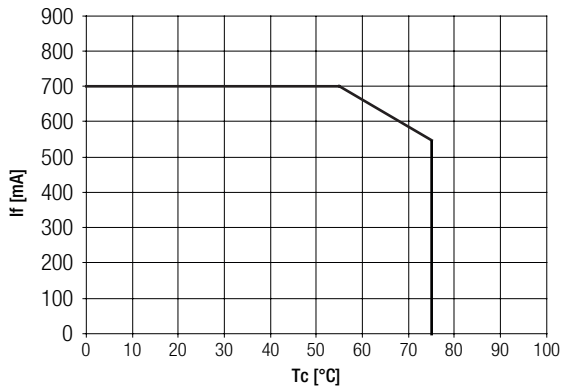
Thermal behaviour

storage temperature	-30 ... +80 °C
operating temperature t_a	+25 ... +55 °C
t_p (at typ. current)	up to 65 °C
t_c max. (at typ. current)*	75 °C
max. humidity	0 ... 80%

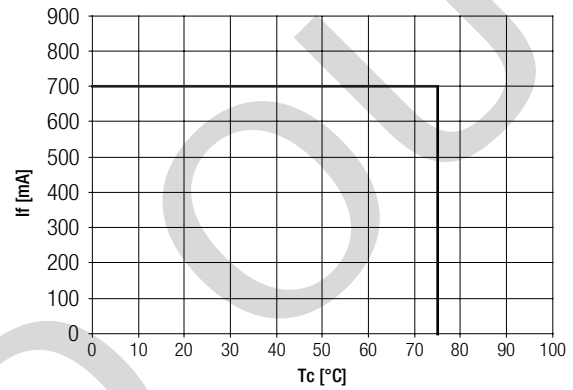
* according to the derating curves

Condensation on the module is not allowed. During the processing of the LED modules in the lamp the humidity has to be between 30 and 70%.

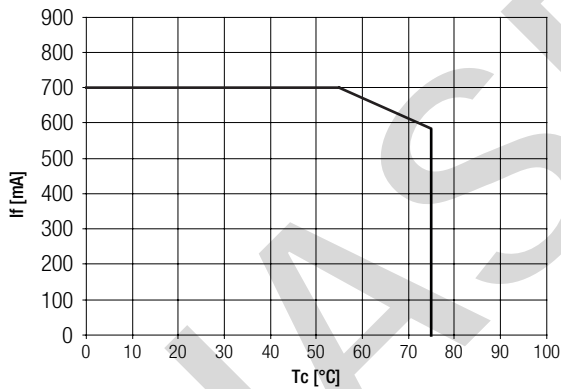
Derating curve for TALEX(module STARK SLE PURE G2 LES10 CLASSIC 3,000 K



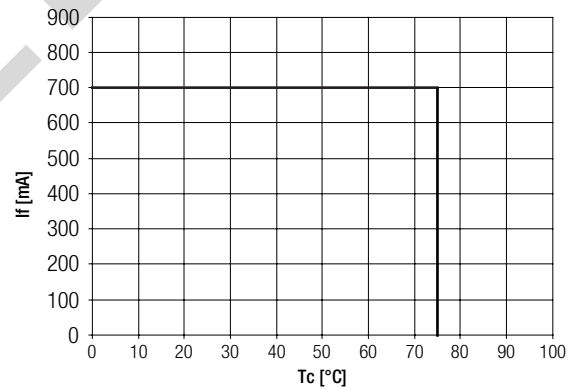
Derating curve for TALEX(module STARK SLE PURE G2 LES17 CLASSIC 3,000 K



Derating curve for TALEX(module STARK SLE PURE G2 LES10 CLASSIC 4,000 K



Derating curve for TALEX(module STARK SLE PURE G2 LES17 CLASSIC 4,000 K



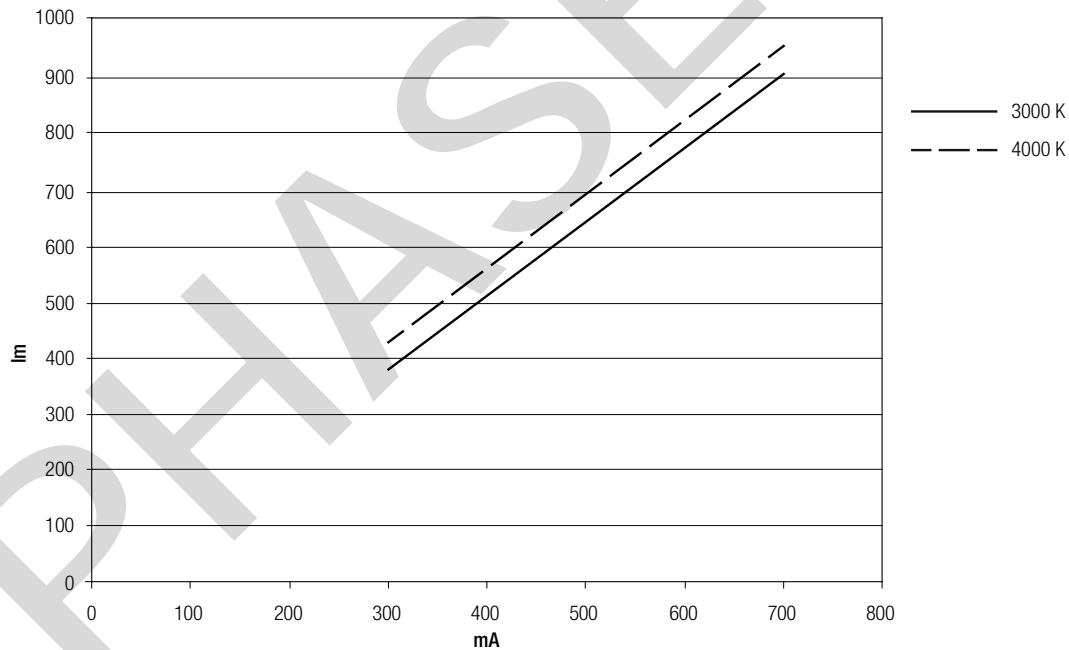
Lumen maintenance for LES10

Operating mode	tc temperature in °C	luminous flux in %	operating time in h
HE	55	85	> 50,000
	65	80	> 50,000
	75	80	50,000
NM	55	75	> 50,000
	65	70	> 50,000
	75	70	50,000
HO	55	70	30,000

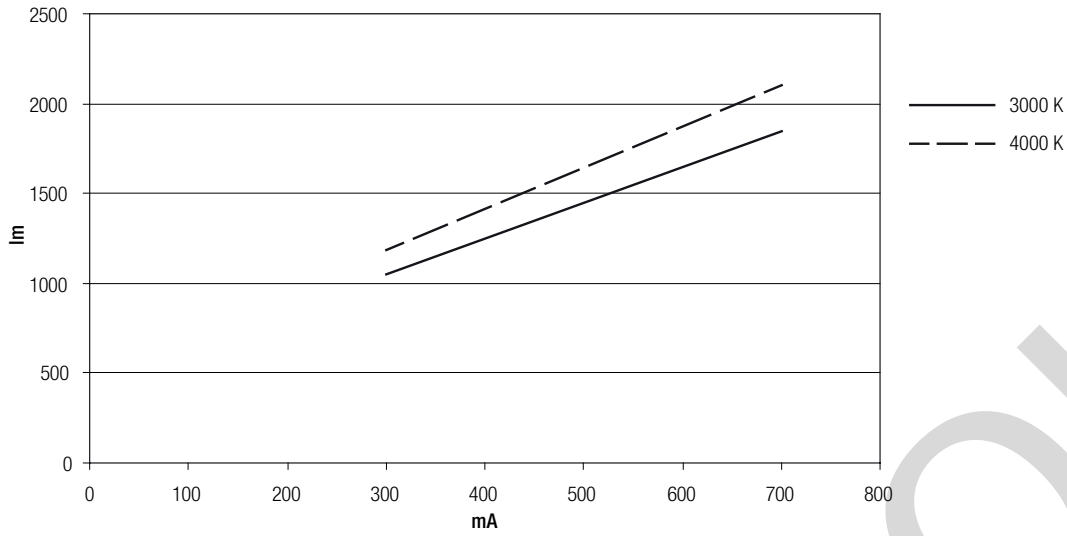
Lumen maintenance for LES17

Operating mode	tc temperature in °C	luminous flux in %	operating time in h
HE	55	85	> 50,000
	65	80	> 50,000
	75	80	50,000
NM	55	75	> 50,000
	65	70	> 50,000
	75	70	50,000
HO	55	75	> 40,000
	65	70	40,000
	75	70	30,000

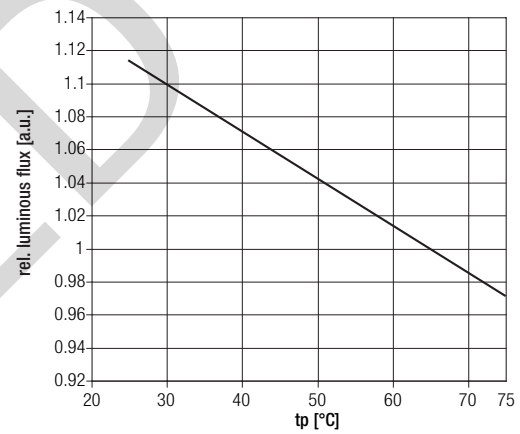
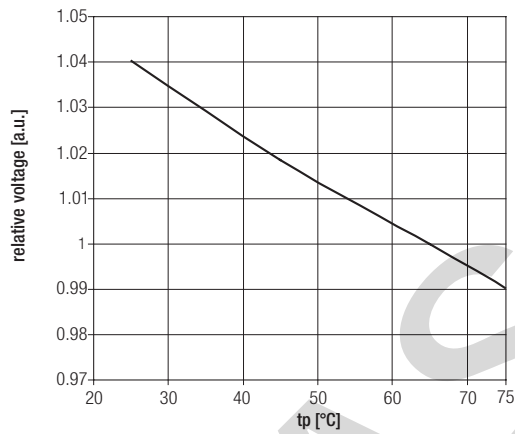
Luminous flux and operating current for LES10 at tp_{rated}



Luminous flux and operating current for LES17 at $t_p = 65^\circ\text{C}$

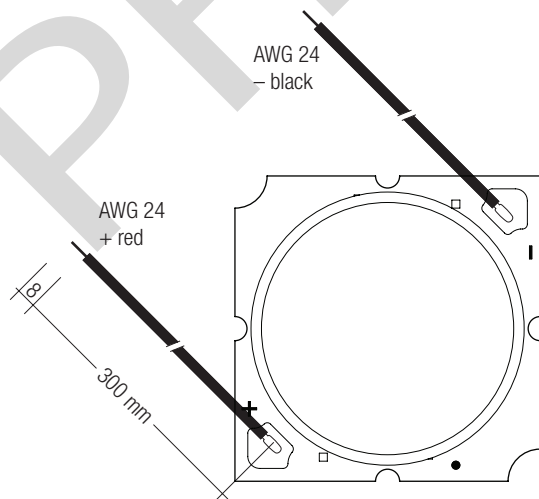


Relative forward voltage and relative luminous flux



The diagrams based on statistic values.
The real values can be different.

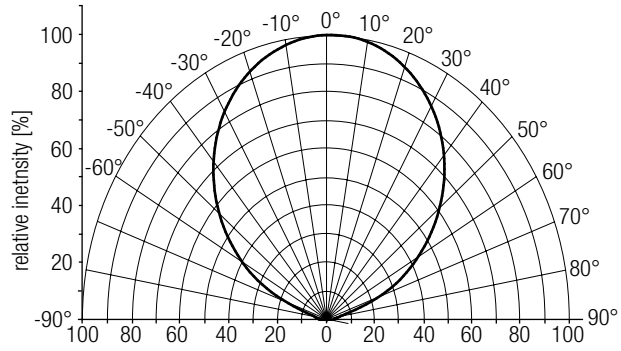
Wiring



Optical characteristics TALEXmodule STARK SLE PURE G2

The optical design of the TALEXmodule STARK SLE PURE G2 product line ensures optimum homogeneity for the light distribution.

Light distribution

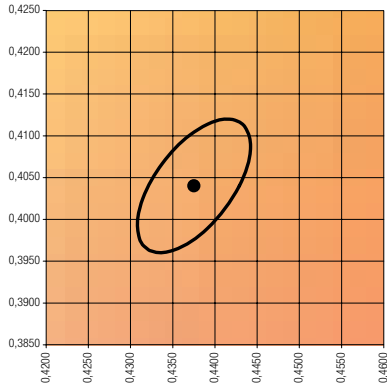


Coordinates and tolerances according to CIE 1931

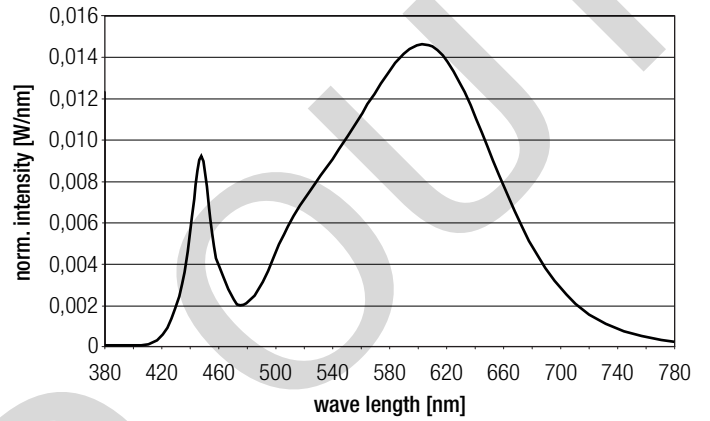
The specified colour coordinates are measured integral by a current impulse with nominal values of module after a settling time of 100 ms.
The ambient temperature of the measurement is $t_a = 25\text{ }^\circ\text{C}$.
The measurement tolerance of the colour coordinates are ± 0.01 .

3,000 K

	x0	y0
Centre	0.4369	0.4041

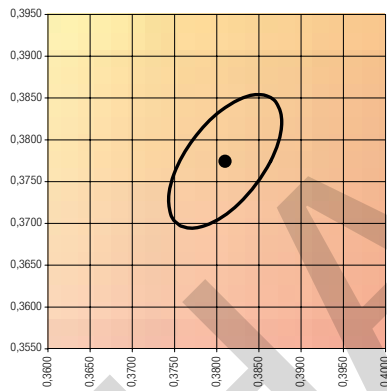


MacAdam ellipse: 3SDCM



4,000 K

	x0	y0
Centre	0.3804	0.3767



MacAdam ellipse: 3SDCM

