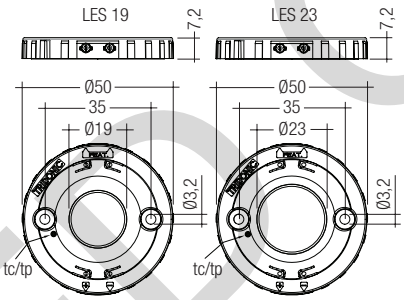
RoHS

TALEX(module STARK SLE GEN3 FOOD

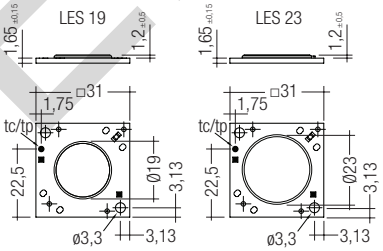
STARK SLE

Product description

- Application specific colours for attractive product presentation
- For spotlights
- High efficacy up to 97 lm/W for the LED module
- High system efficacy up to 75 lm/W at tp = 65 °C
- High colour consistency
- Small LES (light emitting surface) diameter enables small beam angle for spotlights
- Excellent thermal management by COB technology
- Uniform radiation with DAM&Fill technology
- Fixing holes for M3 screws
- Integrated LED module
- Cooling required
- Long life-time:
  L70 at HE operating mode ≥ 60,000 operating hours
- Flexible operating modes



With housing (tc/tp position same as without housing)



Without housing

Technical data

Beam characteristic	140°
Ambient temperature ta	-25 ... +55 °C
tp_rated temperature①	65 °C
Max. tc point temperature①	up to 90 °C
Risk group (EN 62471:2008)	1
Type of protection	IP00

→

Standards, page 3

Colour temperatures and tolerances, page 11

Ordering data

Type	Article number	Housing	Connection cable	Packaging	Weight per pc.
STARK-SLE-G3-19-GOLD	**89601856**	yes	no	15 pc(s).	0.011 kg
STARK-SLE-G3-19-GOLD+	**89601857**	yes	no	15 pc(s).	0.009 kg
STARK-SLE-G3-19-FM	**89601859**	yes	no	15 pc(s).	0.010 kg
STARK-SLE-G3-19-MEAT+	**89601858**	yes	no	15 pc(s).	0.014 kg
STARK-SLE-G3-23-GOLD	**89601860**	yes	no	15 pc(s).	0.009 kg
STARK-SLE-G3-23-GOLD+	**89601861**	yes	no	15 pc(s).	0.009 kg
STARK-SLE-G3-23-FM	**89601863**	yes	no	15 pc(s).	0.009 kg
STARK-SLE-G3-23-MEAT+	**89601862**	yes	no	15 pc(s).	0.008 kg
STARK-SLE-G3-PURE-19-GOLD	**89601848**	no	yes	20 pc(s).	0.009 kg
STARK-SLE-G3-PURE-19-GOLD+	**89601849**	no	yes	20 pc(s).	0.009 kg
STARK-SLE-G3-PURE-19-FM	**89601851**	no	yes	20 pc(s).	0.009 kg
STARK-SLE-G3-PURE-19-MEAT+	**89601850**	no	yes	20 pc(s).	0.009 kg
STARK-SLE-G3-PURE-23-GOLD	**89601852**	no	yes	20 pc(s).	0.009 kg
STARK-SLE-G3-PURE-23-GOLD+	**89601853**	no	yes	20 pc(s).	0.009 kg
STARK-SLE-G3-PURE-23-FM	**89601855**	no	yes	20 pc(s).	0.009 kg
STARK-SLE-G3-PURE-23-MEAT+	**89601854**	no	yes	20 pc(s).	0.009 kg

Specific technical data

Type[6]	Forward current[3] [4] [5]	Luminous flux at tp = 25 °C[2]	Luminous flux at tp = 65 °C[2]	Power consumption[7]	Min. forward voltage at tp = 65 °C	Max. forward voltage at tp = 25 °C	Energy classification
STARK-SLE-19 – Operating mode HE at 350 mA							
STARK-SLE-G3-19-GOLD	350 mA	1,130 lm	970 lm	11.7 W	32.2 V	36.5 V	A
STARK-SLE-G3-19-GOLD+	350 mA	840 lm	730 lm	11.7 W	32.2 V	36.5 V	A
STARK-SLE-G3-19-FM	350 mA	790 lm	680 lm	11.7 W	32.2 V	36.5 V	A
STARK-SLE-G3-19-MEAT+	350 mA	760 lm	660 lm	11.7 W	32.2 V	36.5 V	A
STARK-SLE-19 – Operating mode HO at 1,400 mA							
STARK-SLE-G3-19-GOLD	1,400 mA	3,930 lm	3,380 lm	54.0 W	37.4 V	41.8 V	A
STARK-SLE-G3-19-GOLD+	1,400 mA	2,950 lm	2,530 lm	54.0 W	37.4 V	41.8 V	B
STARK-SLE-G3-19-FM	1,400 mA	2,760 lm	2,380 lm	54.0 W	37.4 V	41.8 V	B
STARK-SLE-G3-19-MEAT+	1,400 mA	2,620 lm	2,250 lm	54.0 W	37.4 V	41.8 V	B
STARK-SLE-23 – Operating mode HE at 700 mA							
STARK-SLE-G3-23-GOLD	700 mA	2,250 lm	1,930 lm	23.8 W	32.9 V	37.2 V	A
STARK-SLE-G3-23-GOLD+	700 mA	1,650 lm	1,420 lm	23.8 W	32.9 V	37.2 V	B
STARK-SLE-G3-23-FM	700 mA	1,530 lm	1,320 lm	23.8 W	32.9 V	37.2 V	B
STARK-SLE-G3-23-MEAT+	700 mA	1,500 lm	1,290 lm	23.8 W	32.9 V	37.2 V	B
STARK-SLE-23 – Operating mode HO at 1,750 mA							
STARK-SLE-G3-23-GOLD	1,750 mA	5,000 lm	4,310 lm	66.0 W	36.5 V	40.9 V	A
STARK-SLE-G3-23-GOLD+	1,750 mA	3,720 lm	3,200 lm	66.0 W	36.5 V	40.9 V	B
STARK-SLE-G3-23-FM	1,750 mA	3,500 lm	3,000 lm	66.0 W	36.5 V	40.9 V	B
STARK-SLE-G3-23-MEAT+	1,750 mA	3,340 lm	2,870 lm	66.0 W	36.5 V	40.9 V	B

[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 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 life-time or even destruction of the TALEX module.

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

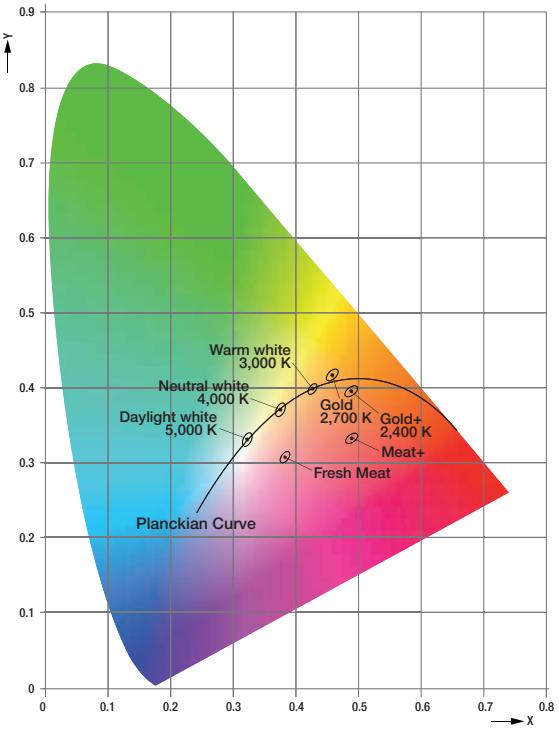
[5] Max. permissible repetitive peak current for STARK-SLE-G3-19: 1,680 mA. Max. permissible repetitive peak current for STARK-SLE-G3-23: 2,400 mA.

[6] HE ... high efficiency, HO ... high output.

[7] All values at tp = 65 °C.

Application specific colours for attractive product presentation

- Gold: This product emits a warm and brilliant light. This light colour is ideal for bakery goods or jewellery.
- Gold+: This light colour has a light brown tinge to give an oven-fresh appearance to crusty bakery products such as croissants and baguettes.
- Fresh Meat: The perfect light colour for the meat counter. White threads in the meat are not highlighted by this light colour but the red of the meat looks really appetising.
- Meat+: Fresh and cooked meats have a saturated red colour under this light. Even white threads appear red. A boost of red for the meat counter.



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.

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 G3 will be greatly reduced or the TALEXmodule STARK SLE G3 may be destroyed.

Therefore the TALEXmodule STARK SLE G3 needs to be mounted onto a heat sink heat sink which does not exceed the value for $R_{th,max}$.

Tridonic's excellent thermal design for the TALEXmodule STARK SLE G3 products provides the lowest thermal resistance and therefore allowing new compact designs without sacrificing quality, safety and life-time.

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.
The opeating temperature of a Talex product is crucial for the light output, the product life-time but also for the product safety.
The thermal limits can be checked at the tp/tc point and at tr.
On page 10 the lumen maintenance is shown in relation to the temperature at tp.
tp,rated shows the temperature at which the rated values are reached.
tc shows the thermal limit for safety reason und must never be exceeded under normal conditions.
For the interchangeablity with othe Zhaga products, $t_{r,max}$ is specified directly at the thermal interface to the heatsink of the luminaire.

For TALEXmodule STARK SLE G3 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.

Mounting instruction

TALEXmodule STARK SLE G3 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 G3 (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.

Max. torque for fixing: 0.5 Nm.

The PURE modules are mounted with 2 screws per module.
In order not to damage the modules only rounded head screws and an additional plastic flat washer should be used.

For further information please refer to to the brochure entitled "Technical Design-In-Guide SLE GEN3".

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.

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

Electrical supply/choice of LED control gear
TALEXmodule STARK SLE G3 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 G3 guarantees the necessary protection for safe and reliable operation.

TALEXmodule STARK SLE G3 are basic isolated up to 110 V against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the led control gear (also against earth) is above 110 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.

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 G3 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 G3.

Heat sink values

TALEXmodule STARK-SLE-G3-19

ta	tp	If	$R_{th, hs-a}$
25 °C	65 °C	350 mA	4,80 K/W
30 °C	65 °C	350 mA	4,20 K/W
40 °C	65 °C	350 mA	2,98 K/W
50 °C	65 °C	350 mA	1,77 K/W
25 °C	65 °C	1,400 mA	0,86 K/W
30 °C	65 °C	1,400 mA	0,75 K/W
40 °C	65 °C	1,400 mA	0,52 K/W
50 °C	65 °C	1,400 mA	0,29 K/W

TALEXmodule STARK-SLE-G3-23

ta	tp	If	$R_{th, hs-a}$
25 °C	65 °C	700 mA	2,28 K/W
30 °C	65 °C	700 mA	1,99 K/W
40 °C	65 °C	700 mA	1,40 K/W
50 °C	65 °C	700 mA	0,82 K/W
25 °C	65 °C	1,750 mA	0,71 K/W
30 °C	65 °C	1,750 mA	0,62 K/W
40 °C	65 °C	1,750 mA	0,43 K/W
50 °C	65 °C	1,750 mA	0,23 K/W

Notes

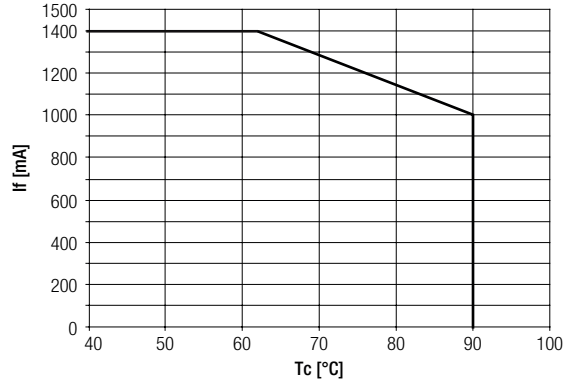
The actual cooling can differ because of the material, the structural shape, outside influences and the installation situation. A thermal connection between TALEXmodule STARK SLE G3 and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary.
Additionally the TALEXmodule STARK SLE G3 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 $l > 1$ 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 $b < 50$ µmmK/W.

Thermal behaviour

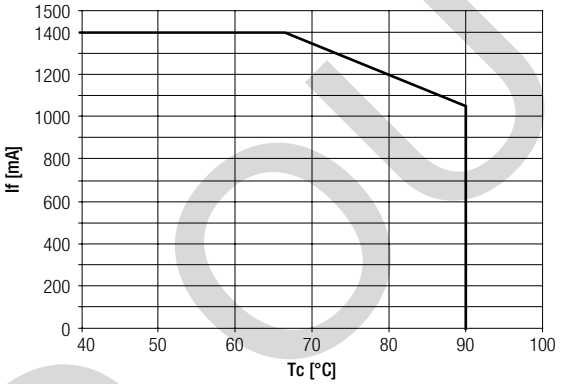
storage temperature	-30 ... +80 °C
operating temperature ta	-20 ... +50 °C
tp (at typ. current)	65 °C
tc max. (at typ. current)	acc. to the derating curves
max. humidity*	0 ... 80 %

* not condensed

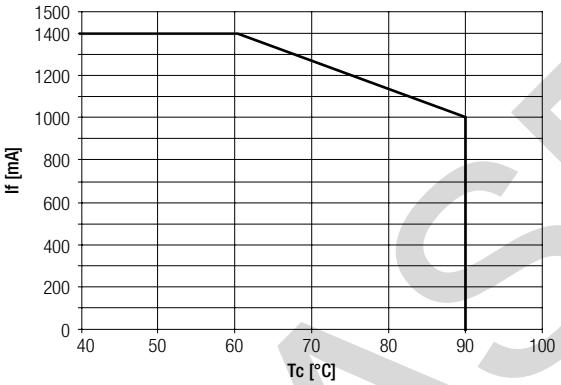
Derating curve for TALEXmodule STARK SLE G3 19 GOLD



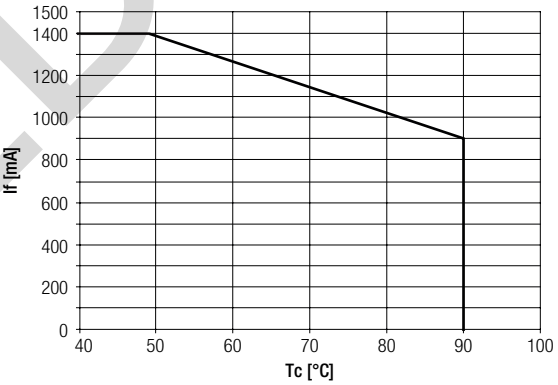
Derating curve for TALEXmodule STARK SLE G3 19 GOLD+



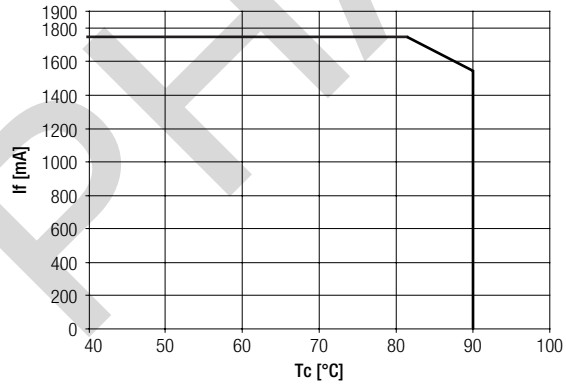
Derating curve for TALEXmodule STARK SLE G3 19 MEAT+



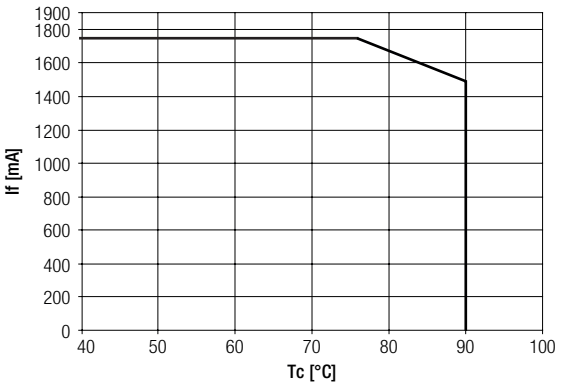
Derating curve for TALEXmodule STARK SLE G3 19 FM



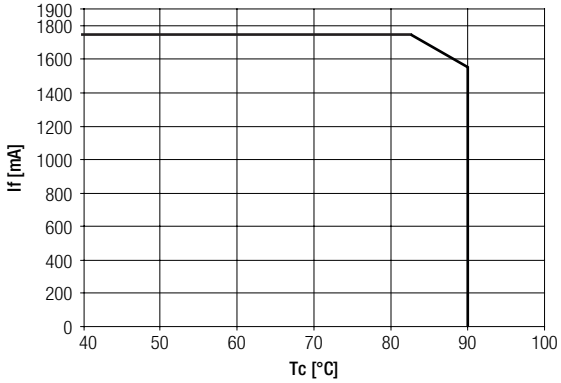
Derating curve for TALEXmodule STARK SLE G3 23 GOLD



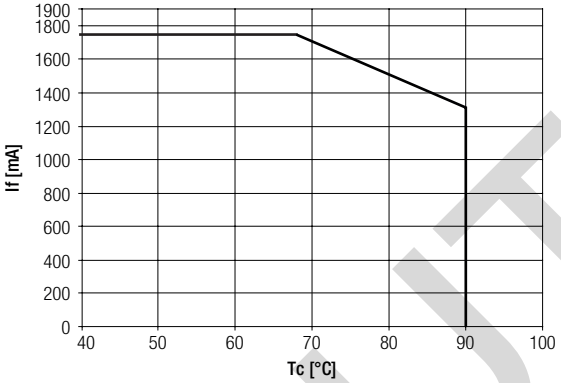
Derating curve for TALEXmodule STARK SLE G3 23 GOLD+



Derating curve for TALEX(module STARK SLE G3 23 MEAT+



Derating curve for TALEX(module STARK SLE G3 23 FM



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 maintenace 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 inital luminous flux, respectivly 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.

Lumen maintenance for TALEXXmodule STARK-SLE-G3-19-Gold & Meat+

Operating current	tp temperature	L80 / F10	L80 / F50	L70 / F10	L70 / F50
350 mA	65 °C	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	60,000 h	60,000 h	60,000 h	60,000 h
	85 °C	60,000 h	60,000 h	60,000 h	60,000 h
1,400 mA	65 °C	56,000 h	60,000 h	60,000 h	60,000 h
	75 °C	42,000 h	60,000 h	60,000 h	60,000 h
	85 °C	32,000 h	47,000 h	50,000 h	60,000 h

Lumen maintenance for TALEXXmodule STARK-SLE-G3-19-Gold+ & Fresh Meat

Operating current	tp temperature	L80 / F10	L80 / F50	L70 / F10	L70 / F50
350 mA	65 °C	44,000 h	60,000 h	60,000 h	60,000 h
	75 °C	36,000 h	55,000 h	58,000 h	60,000 h
	85 °C	29,000 h	44,000 h	47,000 h	60,000 h
1,400 mA	65 °C	21,000 h	31,000 h	33,000 h	50,000 h
	75 °C	17,000 h	26,000 h	28,000 h	42,000 h
	85 °C	14,000 h	21,000 h	22,000 h	33,000 h

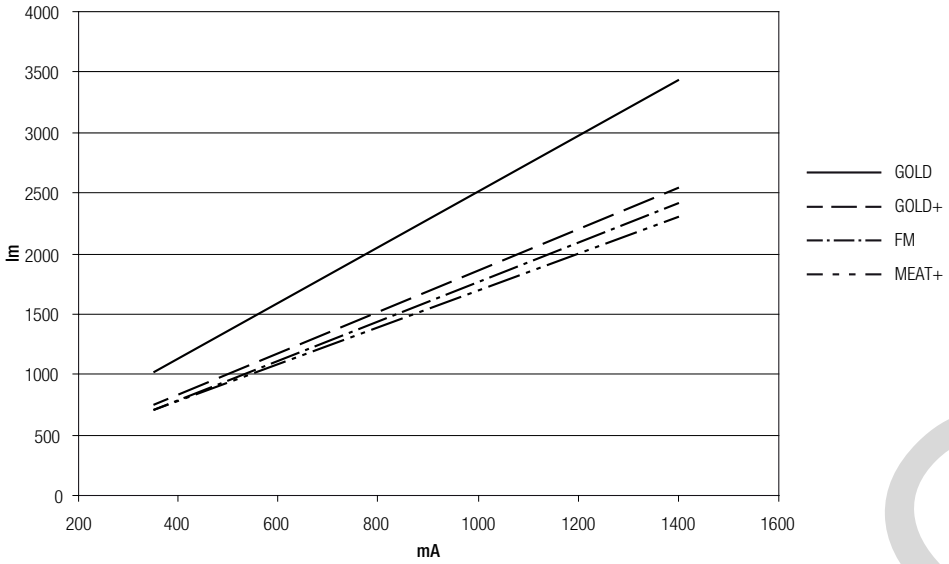
Lumen maintenance for TALEXXmodule STARK-SLE-G3-23-Gold & Meat+

Operating current	tp temperature	L80 / F10	L80 / F50	L70 / F10	L70 / F50
700 mA	65 °C	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	60,000 h	60,000 h	60,000 h	60,000 h
	85 °C	60,000 h	60,000 h	60,000 h	60,000 h
1,750 mA	65 °C	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	50,000 h	60,000 h	60,000 h	60,000 h
	85 °C	38,000 h	57,000 h	60,000 h	60,000 h

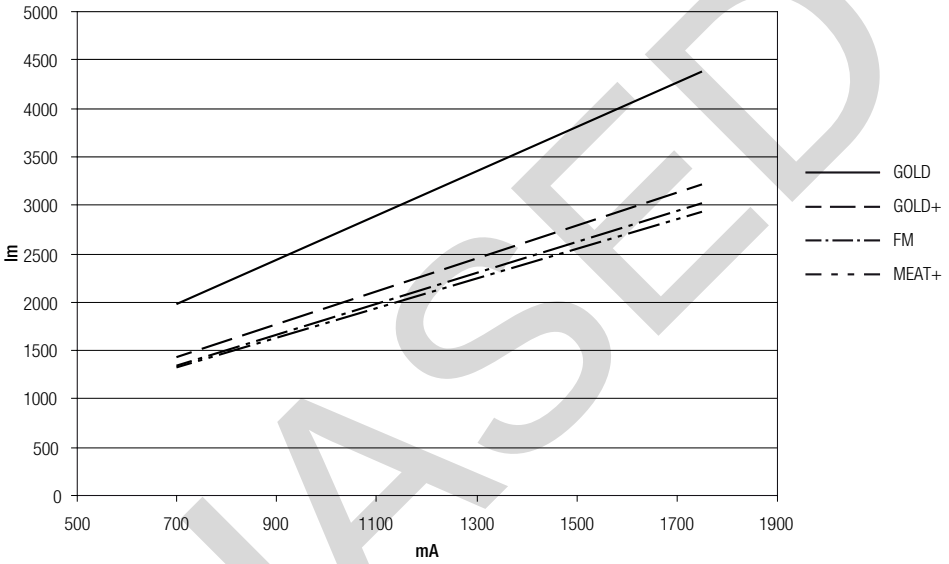
Lumen maintenance for TALEXXmodule STARK-SLE-G3-23-Gold+ & Fresh Meat

Operating current	tp temperature	L80 / F10	L80 / F50	L70 / F10	L70 / F50
700 mA	65 °C	40,000 h	60,000 h	60,000 h	60,000 h
	75 °C	34,000 h	51,000 h	54,000 h	60,000 h
	85 °C	27,000 h	41,000 h	43,000 h	60,000 h
1,750 mA	65 °C	25,000 h	37,000 h	39,000 h	59,000 h
	75 °C	21,000 h	31,000 h	33,000 h	49,000 h
	85 °C	16,000 h	25,000 h	26,000 h	40,000 h

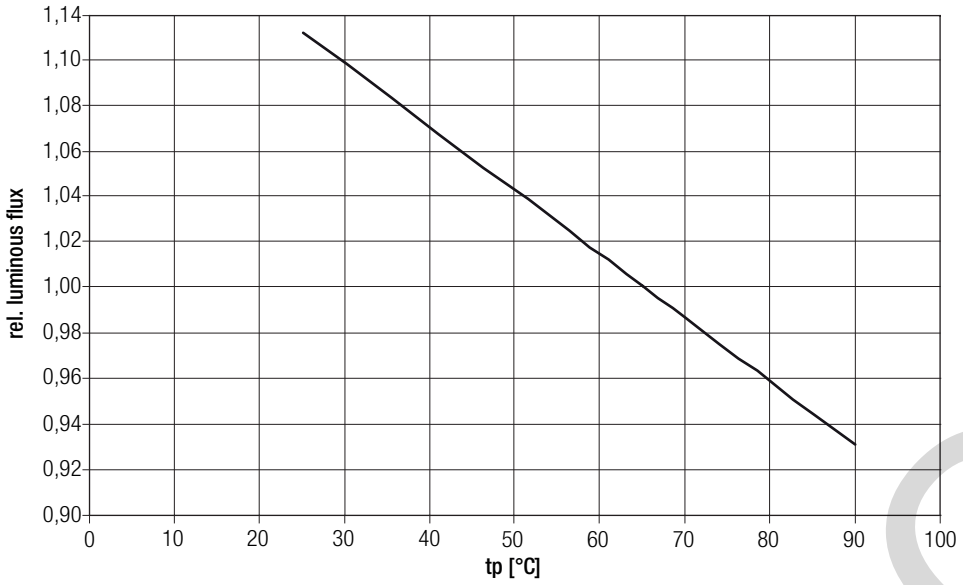
Luminous flux and operating current for SLE-GEN3-19 at tp = 65 °C



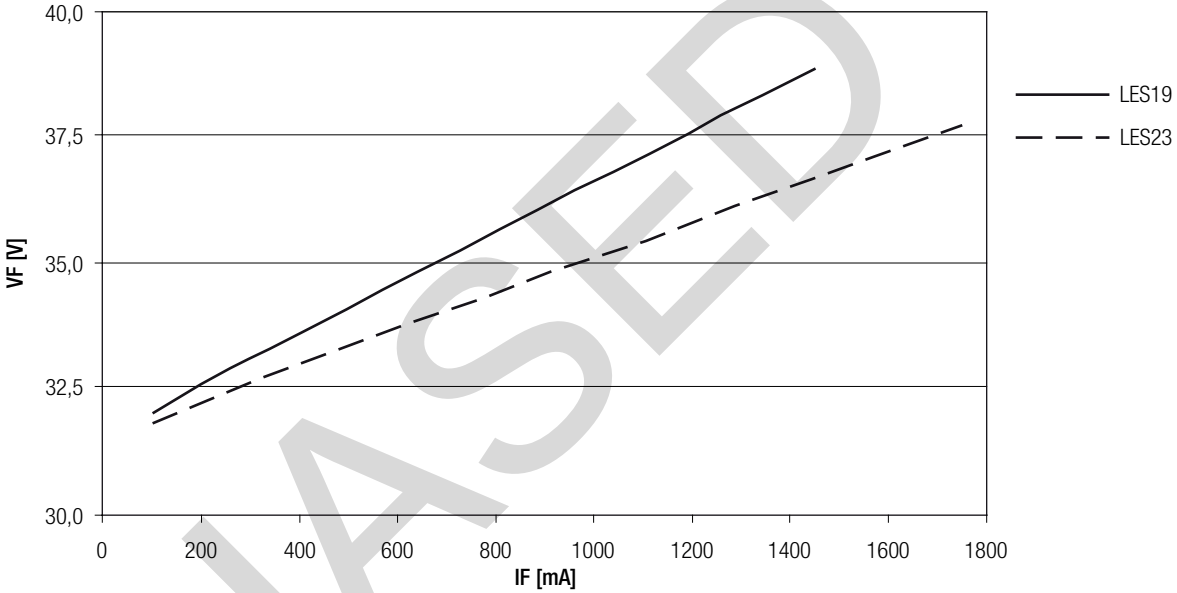
Luminous flux and operating current for SLE-GEN3-23 at tp = 65 °C



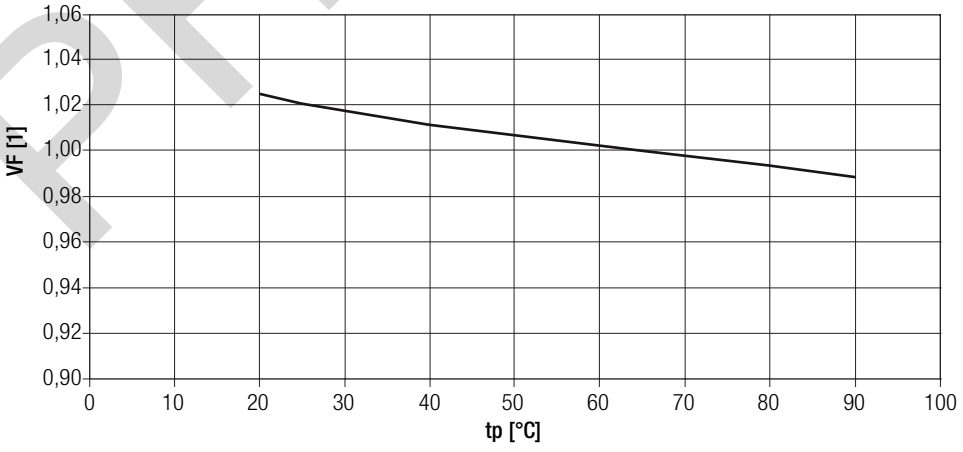
Relative luminous flux



Forward current vs. forward voltage

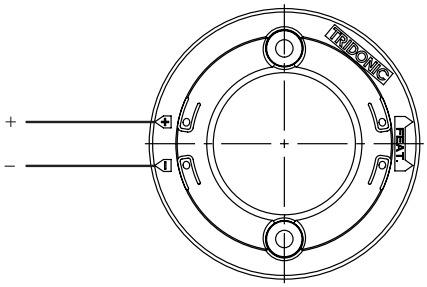


tp temperature vs. forward voltage

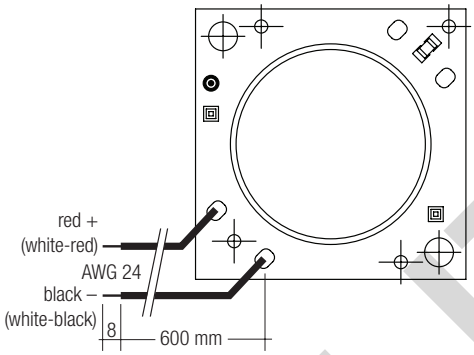


The diagrams based on statistic values.
The real values can be different.

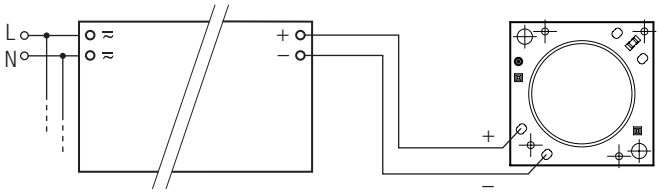
Wiring with housing



Wiring without housing



Wiring example



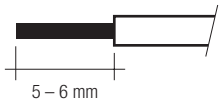
TALEXconverter LC...

Wiring type and cross section

The wiring has to be solid cable with a cross section of 0.5 to 0.75 mm² or with stranded wire with soldered ends with a cross section of 0.5 mm².
For the push-wire connection you have to strip the insulation (5 – 6 mm).

Removing wires by lightly pressing on the push button.

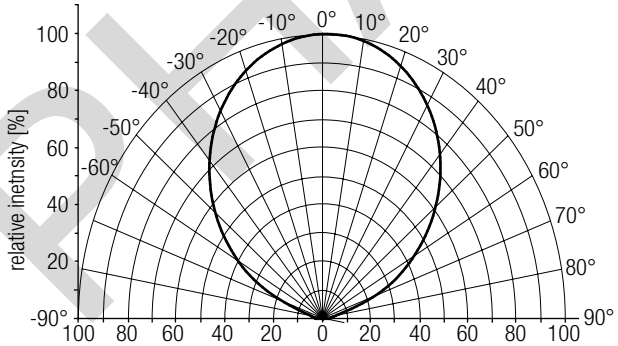
wire preparation:



Optical characteristics TALEXmodule STARK SLE G3

The optical design of the TALEXmodule STARK SLE G3 product line ensures optimum homogenity for the light distribution.

Light distribution



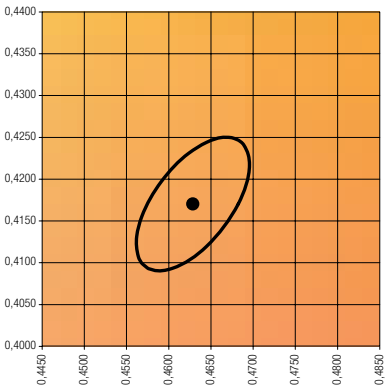
Coordinates and tolerances according to CIE 1931

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
TALEXmodule STARK-SLE-G3-19 CLASSIC	1,050 mA
TALEXmodule STARK-SLE-G3-23 CLASSIC	1,400 mA

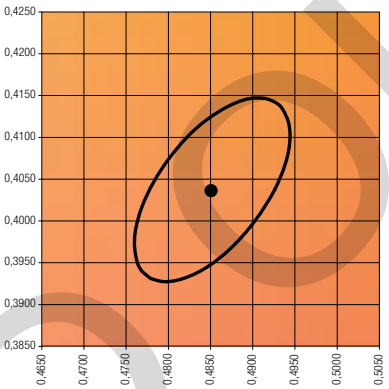
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

Gold



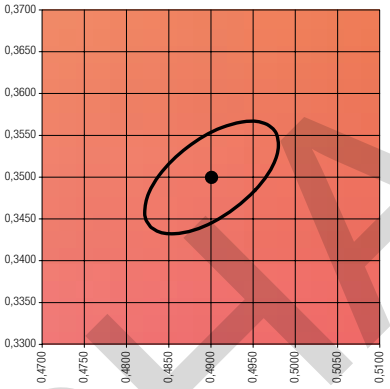
MacAdam ellipse: 3SDCM

Gold+



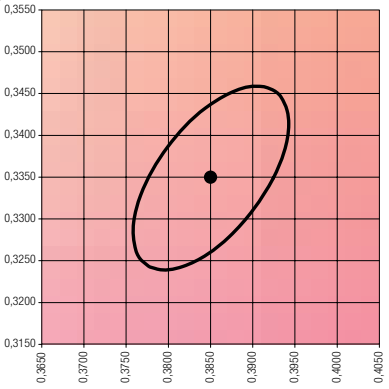
MacAdam ellipse: 4SDCM

Meat+



MacAdam ellipse: 3SDCM

Fresh Meat



MacAdam ellipse: 4SDCM