

# LED LINEAR ALLROUND – 5050 GEN. 4

## BUILT-IN MODULES



## LED LINEAR ALLROUND – 5050 GEN. 4

### MSP SC 2R/Z15/5050 NTC G4

These modules were designed for built-in into luminaire casings. They enable a modular luminaire design.

The modules are available in four shapes (4, 8, 12 or 16 LEDs) and in up to 4 white colour tones.

### Typical Applications (depending on the choice of optics)

- Integration in luminaires
- Street lighting, urban street lighting
- Tunnel lighting
- Flood and area lighting
- Indoor lighting
- Industrial lighting for:
  - Production halls
  - Warehouses
- Lighting for sports facilities

### LED Linear Allround SMD 5050 Gen. 4

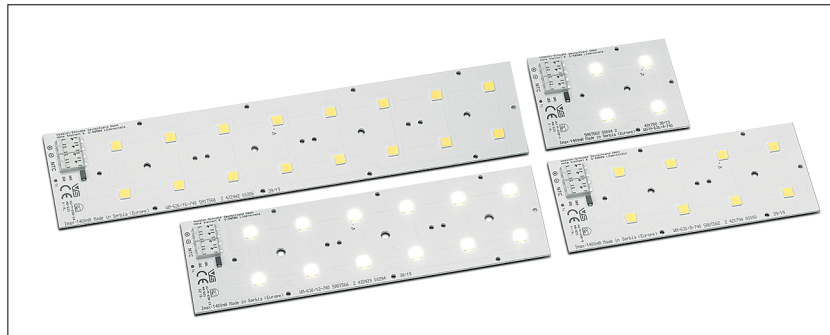
- **HIGHLY EFFICIENT: UP TO 216 LM/W**  
AT  $T_P = 65^\circ\text{C}$ ,  $I_F = 350\text{ mA}$
- **FLEXIBLE LIGHT DISTRIBUTION BY VARIOUS ATTACHMENT OPTICS**
- **INITIAL COLOUR ACCURACY: 5 SDCM**
- **ON-BOARD SURGE PROTECTION UP TO 10 KV**  
(IN COMBINATION WITH VS STREETLIGHT DRIVERS)
- **ENEC AND VDE**  
(ACC. TO EN 62031)



## LED Linear Allround 5050 Gen. 4

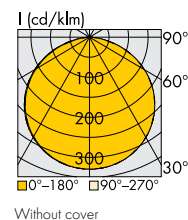
### Technical Notes

- LED built-in module for integration into luminaires
- 4, 8, 12 or 16 high-efficiency High Power LEDs
- Dimensions (excl. optics) LxVxH
  - 4 LEDs: 70.6x49.5x5 mm
  - 8 LEDs: 121.4x49.5x5 mm
  - 12 LEDs: 172.2x49.5x5 mm
  - 16 LEDs: 223x49.5x5 mm
- Driving currents: 350mA / 500mA / 700mA / 1050mA / 1200mA
- Push-in terminals for quick and simple wiring
- Suitable for 5050-optimized 2x2 optics made by VS
- Design for optimum thermal management
- Degree of protection: IP00
- ESD protection class 2 (up to 4 kV)
- NTC resistor for external driver feedback of module temperature (type: NCP18xH103J03RB)



### Typical Light Distribution Curve

Data are available in .ldt format for download under [www.vossloh-schwabe.com](http://www.vossloh-schwabe.com).



### Electrical Characteristics

at  $T_p = 65^\circ\text{C}$

Type	No. of LEDs	Typ. voltage DC					Temperature coefficient [mV/K]	Typ. power consumption				
		350 mA	500 mA	700 mA	1050 mA	1200 mA		350 mA	500 mA	700 mA	1050 mA	1200 mA
		V	V	V	V	V		W	W	W	W	W
<b>LED Linear Allround 5050 Gen. 4</b>												
MSP SC 2R/Z15/5050 T/4/yzz NTC G4	4	10.7	10.9	11.1	11.5	11.6	-5.95	3.8	5.4	7.8	12.0	13.9
MSP SC 2R/Z15/5050 T/8/yzz NTC G4	8	21.4	21.8	22.2	22.9	23.2	-11.90	7.5	10.9	15.6	24.1	27.8
MSP SC 2R/Z15/5050 T/12/yzz NTC G4	12	32.2	32.7	33.3	34.4	34.8	-17.85	11.3	16.3	23.3	36.1	41.7
MSP SC 2R/Z15/5050 T/16/yzz NTC G4	16	42.9	43.6	44.4	45.8	46.4	-23.80	15.0	21.8	31.1	48.1	55.7

Voltage and power consumption tolerance:  $\pm 10\%$ . Use of external LED constant current driver required.

### Maximum Ratings

Exceeding the maximum ratings can lead to destruction of the module.

Type	Operation current mA	Operation temperature range at $t_c$ point		Storage temperature range		Max. allowed repetitive peak current mA
		$^\circ\text{C min.}$	$^\circ\text{C max.}$	$^\circ\text{C min.}$	$^\circ\text{C max.}$	
All types	$\leq 1050$	-30	+85	-40	+85	1600
	$\leq 1400$	-30	+75	-40	+85	1600

### Operating Life

Lumen degradation	Operating life in hours at stated $t_c$ point temperature								
	$I_f \leq 350\text{ mA}$			$I_f 500\text{ mA}$			$I_f 700\text{ mA}$		
	60 $^\circ\text{C}$	70 $^\circ\text{C}$	80 $^\circ\text{C}$	60 $^\circ\text{C}$	70 $^\circ\text{C}$	80 $^\circ\text{C}$	60 $^\circ\text{C}$	70 $^\circ\text{C}$	80 $^\circ\text{C}$
L70/B10	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000
L80/B10	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000
L90/B10	>102.000	>99.000	>92.000	>102.000	>99.000	>92.000	>102.000	>98.000	>92.000

These values do not refer to the colour temperature. |  $L_{xx}/B_{yy}$  (lumen maintenance at xx%, failure rate yy%)

Lumen degradation	Operating life in hours at stated $t_c$ point temperature					
	$I_f 1050\text{ mA}$			$I_f 1200\text{ mA}$		
	60 $^\circ\text{C}$	70 $^\circ\text{C}$	80 $^\circ\text{C}$	60 $^\circ\text{C}$	70 $^\circ\text{C}$	80 $^\circ\text{C}$
L70/B10	>75.000	>75.000	>75.000	>75.000	>75.000	>75.000
L80/B10	>47.000	>47.000	>46.000	>47.000	>47.000	>46.000
L90/B10	>23.000	>22.000	>21.000	>23.000	>22.000	>21.000

These values do not refer to the colour temperature. |  $L_{xx}/B_{yy}$  (lumen maintenance at xx%, failure rate yy%)

The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

# LED Linear Allround 5050 Gen. 4 – Linear Built-in Modules

## Optical Characteristics

at  $T_p = 65^\circ\text{C}$ ,  $\text{CRI}^{**} \geq 70$

Type	Ref. No.	Colour	Correl. colour temp. K	Luminous flux* (lm) and typ. efficiency (lm/W)									
				350 mA		500 mA		700 mA		1050 mA		1200 mA	
				typ. lm	typ. lm/W	typ. lm	typ. lm/W	typ. lm	typ. lm/W	typ. lm	typ. lm/W	typ. lm	typ. lm/W
<b>LED Linear Allround 5050 Gen. 4 - 4 LEDs</b>													
MSP SC 2R/Z15/5050 T/4/718 NTC G4	<b>573840</b>	WW	1800	565	151	785	144	1065	137	1505	125	1685	121
MSP SC 2R/Z15/5050 T/4/722 NTC G4	<b>573841</b>	WW	2200	690	184	960	176	1295	167	1840	153	2055	148
MSP SC 2R/Z15/5050 T/4/727 NTC G4	<b>573842</b>	WW	2700	770	205	1070	196	1445	186	2050	171	2280	164
MSP SC 2R/Z15/5050 T/4/730 NTC G4	<b>573843</b>	WW	3000	780	208	1080	198	1460	188	2075	172	2345	169
MSP SC 2R/Z15/5050 T/4/740 NTC G4	<b>573844</b>	NW	4000	810	216	1125	206	1520	196	2160	179	2410	173
MSP SC 2R/Z15/5050 T/4/750 NTC G4	<b>573845</b>	CW	5000	810	216	1125	206	1520	196	2160	179	2410	173
<b>LED Linear Allround 5050 Gen. 4 - 8 LEDs</b>													
MSP SC 2R/Z15/5050 T/8/718 NTC G4	<b>573848</b>	WW	1800	1130	151	1570	144	2125	137	3015	125	3370	121
MSP SC 2R/Z15/5050 T/8/722 NTC G4	<b>573849</b>	WW	2200	1380	184	1920	176	2595	167	3675	153	4110	148
MSP SC 2R/Z15/5050 T/8/727 NTC G4	<b>573850</b>	WW	2700	1540	205	2140	196	2895	186	4105	171	4585	165
MSP SC 2R/Z15/5050 T/8/730 NTC G4	<b>573851</b>	WW	3000	1560	208	2165	198	2925	188	4150	172	4635	167
MSP SC 2R/Z15/5050 T/8/740 NTC G4	<b>573852</b>	NW	4000	1620	216	2250	206	3045	196	4315	179	4820	173
MSP SC 2R/Z15/5050 T/8/750 NTC G4	<b>573853</b>	CW	5000	1620	216	2250	206	3045	196	4315	179	4820	173
<b>LED Linear Allround 5050 Gen. 4 - 12 LEDs</b>													
MSP SC 2R/Z15/5050 T/12/718 NTC G4	<b>573857</b>	WW	1800	1700	151	2360	144	3190	137	4520	125	5050	121
MSP SC 2R/Z15/5050 T/12/722 NTC G4	<b>573858</b>	WW	2200	2070	184	2875	176	3890	167	5515	153	6160	148
MSP SC 2R/Z15/5050 T/12/727 NTC G4	<b>573859</b>	WW	2700	2310	205	3210	196	4340	186	6155	171	6845	164
MSP SC 2R/Z15/5050 T/12/730 NTC G4	<b>573860</b>	WW	3000	2335	208	3245	198	4385	188	6225	172	6950	167
MSP SC 2R/Z15/5050 T/12/740 NTC G4	<b>573861</b>	NW	4000	2430	216	3375	206	4565	196	6475	179	7230	173
MSP SC 2R/Z15/5050 T/12/750 NTC G4	<b>573862</b>	CW	5000	2430	216	3375	206	4565	196	6475	179	7230	173
<b>LED Linear Allround 5050 Gen. 4 - 16 LEDs</b>													
MSP SC 2R/Z15/5050 T/16/718 NTC G4	<b>573865</b>	WW	1800	2265	151	3145	144	4250	137	6030	125	6735	121
MSP SC 2R/Z15/5050 T/16/722 NTC G4	<b>573866</b>	WW	2200	2760	184	3835	176	5185	167	7355	153	8215	148
MSP SC 2R/Z15/5050 T/16/727 NTC G4	<b>573867</b>	WW	2700	3080	205	4280	196	5785	186	8205	171	9165	165
MSP SC 2R/Z15/5050 T/16/730 NTC G4	<b>573868</b>	WW	3000	3115	208	4325	198	5850	188	8295	172	9270	167
MSP SC 2R/Z15/5050 T/16/740 NTC G4	<b>573869</b>	NW	4000	3240	216	4500	206	6085	196	8630	179	9640	173
MSP SC 2R/Z15/5050 T/16/750 NTC G4	<b>573870</b>	CW	5000	3240	216	4500	206	6085	196	8630	179	9640	173

1800, 2200, 2700 und 3000 K = warm white (WW), 4000 K = neutral white (NW), 5000 K = cool white (CW)

\* Colour tolerance: 5 MacAdam | \*\* Production tolerance of luminous flux and efficiency:  $\pm 10\%$

## Optical Characteristics

at  $T_p = 65^\circ\text{C}$ ,  $\text{CRI}^{**} \geq 80$

Type	Ref. No.	Colour	Correl. colour temp. K	Luminous flux* (lm) and typ. efficiency (lm/W)									
				350 mA		500 mA		700 mA		1050 mA		1200 mA	
				typ. lm	typ. lm/W	typ. lm	typ. lm/W	typ. lm	typ. lm/W	typ. lm	typ. lm/W	typ. lm	typ. lm/W
<b>LED Linear Allround 5050 Gen. 4 - 4 LEDs</b>													
MSP SC 2R/Z15/5050 T/4/830 NTC G4	<b>573846</b>	WW	3000	695	185	965	177	1300	167	1845	153	2060	148
MSP SC 2R/Z15/5050 T/4/840 NTC G4	<b>573847</b>	NW	4000	740	198	1030	189	1395	179	1975	164	2205	159
<b>LED Linear Allround 5050 Gen. 4 - 8 LEDs</b>													
MSP SC 2R/Z15/5050 T/8/830 NTC G4	<b>573854</b>	WW	3000	1385	185	1925	177	2605	167	3695	153	4125	148
MSP SC 2R/Z15/5050 T/8/840 NTC G4	<b>573856</b>	NW	4000	1485	198	2060	189	2785	179	3950	164	4415	159
<b>LED Linear Allround 5050 Gen. 4 - 12 LEDs</b>													
MSP SC 2R/Z15/5050 T/12/830 NTC G4	<b>573863</b>	WW	3000	2080	185	2890	177	3905	167	5540	153	6185	148
MSP SC 2R/Z15/5050 T/12/840 NTC G4	<b>573864</b>	NW	4000	2225	198	3090	189	4180	179	5925	164	6620	159
<b>LED Linear Allround 5050 Gen. 4 - 16 LEDs</b>													
MSP SC 2R/Z15/5050 T/16/830 NTC G4	<b>573871</b>	WW	3000	2755	185	3850	177	5205	167	7385	153	8250	148
MSP SC 2R/Z15/5050 T/16/840 NTC G4	<b>573872</b>	NW	4000	2965	198	4120	189	5570	179	7900	164	8825	159

3000 K = warm white (WW), 4000 K = neutral white (NW)

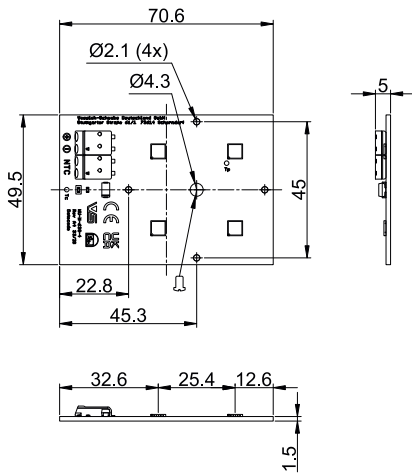
\* Colour tolerance: 5 MacAdam | \*\* Production tolerance of luminous flux and efficiency:  $\pm 10\%$

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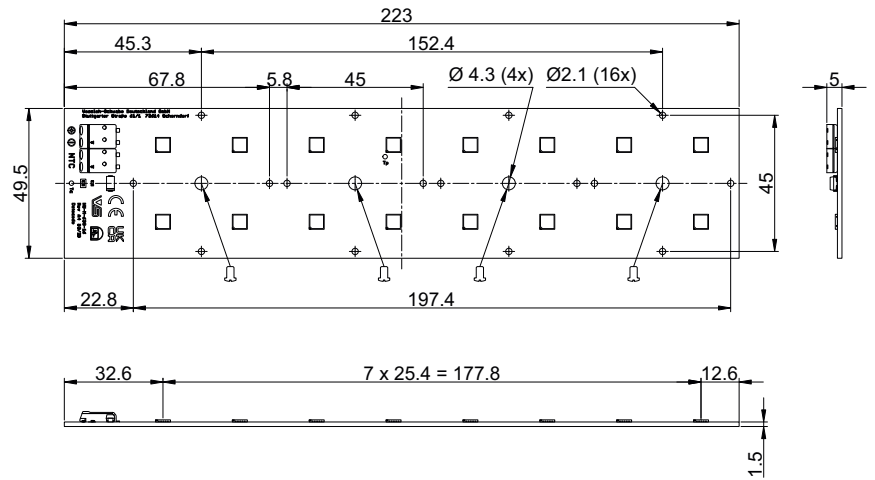
# LED Linear Allround 5050 Gen. 4 – Linear Built-in Modules

## Mechanical Dimensions

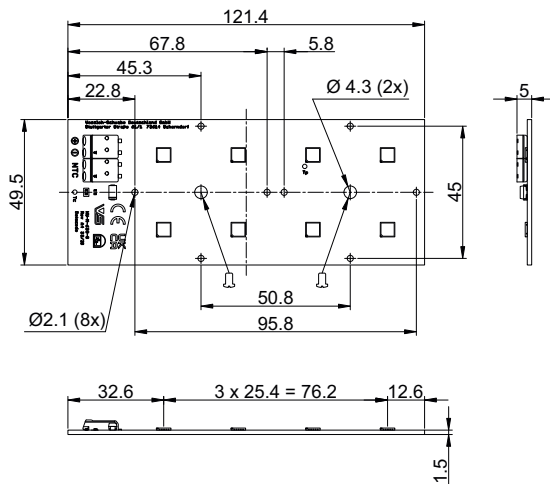
**MSP SC 2R/Z15/5050 T/4/yzz NTC G4**



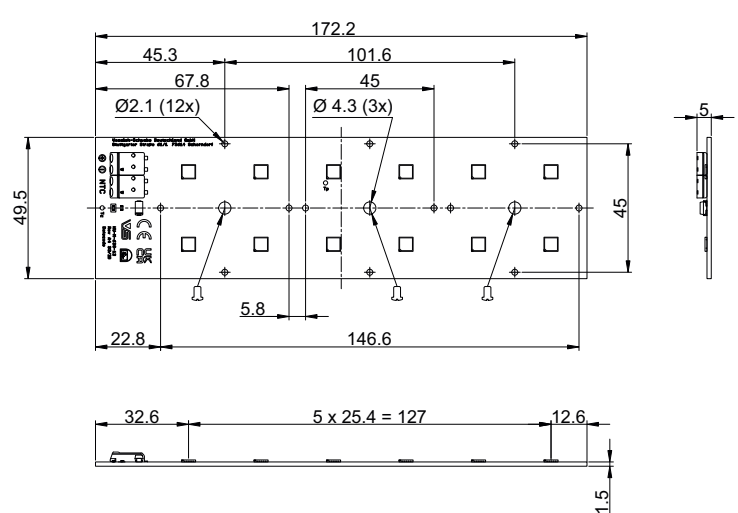
**MSP SC 2R/Z15/5050 T/16/yzz NTC G4**



**MSP SC 2R/Z15/5050 T/8/yzz NTC G4**

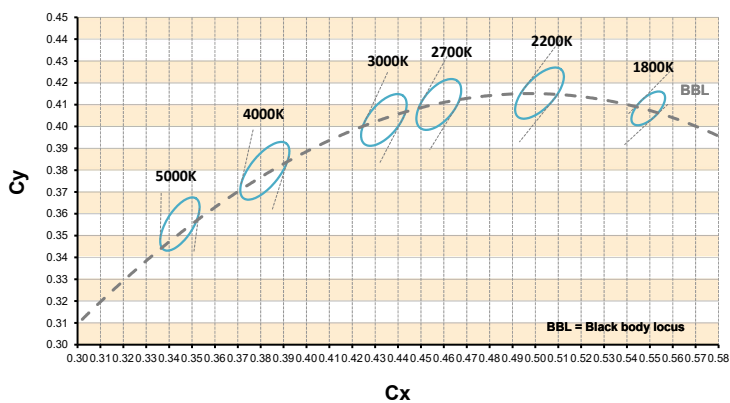


**MSP SC 2R/Z15/5050 T/12/yzz NTC G4**



All holes Ø 2.1 mm are fixing holes for optics. | All holes Ø 4.3 mm are fixing holes for PCB.

## Bins



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## Nomenclature example

**MSP SC 2R/Z15/5050 T/4/840 NTC G4**

Generation

NTC Including

CCT

18 = 1800 K

22 = 2200 K

27 = 2700 K

30 = 3000 K

40 = 4000 K

50 = 5000 K

CRI

7 = 70 CRI minimum

8 = 80 CRI minimum

Number of LEDs

Connection

T = Top

Type of LED

Shape

Check drawing

Technology

SC = SMD Constant Current

Product Line

P = Prime

Product Area & Shape

MS = Module Street

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## Assembly and Safety Information

Installation must be carried out under observation of the relevant regulations and standards. The LED modules are designed for operation within a casing or luminaire. Safety regulations acc. to EN 60598 has to be observed. Installation must be carried out in a voltage-free state (i.e. disconnection from the mains).

- LED built-in modules must not be subjected to any undue mechanical stress, e. g.:
  - handle LED modules carefully
  - avoid shear and compressive forces onto the optics during handling and installation
  - avoid vibrations of more than 2 kHz, 40 G
- The module must be fixed onto a thermally conductive surface with 1 to 4 M3 screws (respectively M4). Max. allowed torque for M3: 0.5 Nm and M4: 1.2 Nm
  - In case of using VS 2x2-array lenses the max. allowed torque to be applied to the screws M3 is 0.5 Nm and for M4 it is 1.4 Nm.
  - In this regard please observe also the usage of proper thermal interface material. Make sure not to go below the min. contact pressure needed. The installation instructions of the selected interface materials have to be followed.
- The wiring can be done by solid or stranded wires having a cross section of 0.2–0.75 mm<sup>2</sup>; stripped length of lead ends of 7–9 mm. For inserting/removing stranded wires press lightly on the push button.
- When installing/screwing the module into a luminaire, please ensure that the cables are not squeezed between luminaire/heat sink and LED module. Also ensure that the mounting surface is clean and flat. For a reliable thermal attachment, we recommend the mounting surface flatness of  $\leq 0.2$  mm.
- Safe operation only possible by the use of external constant current sources ( $I_{\max}$ , see table "Electrical Characteristics").
- Operation is dependent on constant current drivers that should provide the following protective measures:
  - short-circuit protection
  - overload protection
  - overheating protection
- Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- The maximum output of the power supply must be observed.
- For optimal load of used constant current driver the modules can only be connected in series. The quantity of LED modules is limited by the sum of forward voltage and the capacity of used constant current driver. Safety regulations acc. to EN 60598 has to be observed if the sum of forward voltage exceed the permitted touchable value.
- The clearance and creepage distances of LED modules MSP SC 2R/Z15/5050 T/x/yz NTC G4 are designed for working voltages up to 500 V DC (basic insulation) acc. to EN 62031/EN 60598.
- If a system consists of multiple LED Linear Allround modules connected to a single driver, only one module will be monitored by the NTC. That means that one module is in "master" mode operated and the rest are operated in "slave" mode.
- Please ensure standard ESD (electrostatic discharge) protection measures are employed when handling and installing LED modules. Electrostatic discharge can damage LEDs.
- To ensure problem-free operation, the specified maximum temperature at the  $t_c$  and  $t_p$  point (see "Operating Life") must be observed (measured in accordance with EN 60598-1). To satisfy this point, it is necessary to put measures in place to ensure any heat is dissipated from the LED module to the environment.
- To ensure good thermal contact, it is recommended to use proper thermal interface material (e.g. thermal paste, phase change or thermal pads).
- When mounting LED Linear Allround modules directly on the luminaire housing, we recommend to use aluminum of at least 3 mm thickness. Thicker material will improve the heatflow through the luminaire, resulting in a lower  $t_p$  temperature on the module itself.
- Use anodised or painted surfaces rather than blank surfaces to enhance the heat-transfer via thermal radiation.
- Try to limit as far as possible the number of thermal interfaces in the primary heat path towards ambient air. For the primary heat path use solely materials with high thermal conductivity (e.g. aluminum).
- To ensure problem-free operation, the specified maximum temperature at the  $t_c$  and  $t_p$  point (see "Operating Life") must be observed (and measured in accordance with EN 60598-1). To satisfy this point, it may be necessary to put measures in place to ensure any heat is dissipated from the PCB to the environment.
- The LED Linear Allround modules are built-in modules and have no IP-classification (IP00). They are not designed for operation in "open air". In the event of outdoor applications or applications in damp locations, care must be taken to protect LED assembly modules against humidity, splashes and jets of water. Any corrosion damage resulting from humidity or contact with condensation will not be recognised as a defect or manufacturing fault. LED assembly modules are not specially protected against foreign bodies or dust. Depending on the type of application, further protection must be ensured to prevent dust and foreign bodies from entering.
- A parallel connection of the modules is not allowed.
- Operating LED modules in the presence of certain chemical substances or in chemically enriched (aggressive) environments can impair module functionality or even cause total module failure. Detailed information can be found in our "Chemical Incompatibility" PDF on our website [www.vossloh-schwabe.com](http://www.vossloh-schwabe.com)
- The photobiological safety of the LED modules must be classified into risk groups in accordance with EN 62471: 2008. Rating in accordance with IEC / TR 62778: risk group 1  
As long as subsequent table is fulfilled:

CCT K	Max. operating current for risk group 1 mA	Limit illuminance ( $E_{thr}$ ) for higher operating currents to be risk group 1 lx
3000	1340.6	2467.42
4000	830.8	1474.67
5000	628.4	1071.56
6500	582.2	891.07

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## Applied standards

EN 62031

LED modules for general lighting – Safety specifications



EN 62471

Photobiological safety of lamps and lamp systems

## Product Guarantee

- 5 years
- The conditions for the Product Guarantee of the Vossloh-Schwabe Group shall apply as published on our homepage ([www.vossloh-schwabe.com](http://www.vossloh-schwabe.com)).  
We will be happy to send you these conditions upon request.