



2020 - 2021

TED line ®



2020 to dla LED line[®] rok wyjątkowy. Dokładnie 10 lat temu produkty z naszym logo pojawiły się na świecie. Od tego czasu wielu z Was – naszych partnerów, szeroko rozwinęło swoje skrzydła zdobywając znaczny udział w rynku. To dla nas ogromna satysfakcja, że we współpracy z Wami możemy rozwijać naszą ofertę produktową. Każda oferowana przez nas oprawa znajduje w sobie pierwiastek Waszych cennych opinii i sugestii za co ogromnie dziękujemy.

Druga dekada XXI w. niesie ze sobą kolejną rewolucję w oświetleniu, w której rozpoczynamy swój udział. Nadchodzące trendy związane z podejściem do jakości światła, jego wpływu na zdrowie, komfort, funkcjonowanie oraz wydajność człowieka wprowadzają konieczność stosowania rozwiązań zebranych pod jednym wspólnym hasłem tj. Human Centric Lighting. Trend HCL zainspirował nas do ewolucji wybranych produktów z oferty LED line[®] o funkcje ściemniania, regulacji temperatury barwowej oraz sterowania programowanego przez użytkownika.

Mam nadzieję, że wśród wszystkich kategorii produktowych, które zamieściliśmy w tegorocznej edycji katalogu znajdziecie Państwo te, które spełnią oczekiwania i wpiszą się na stałe do Waszej oferty. Jestem pewien, że współpraca z marką LED line® przyniesie Wam wymierne korzyści w nadchodzących latach, a Waszym Klientom szybkie zwroty z inwestycji. Ze swojej strony gwarantuję, że we wdrożenie każdego z produktów włożyliśmy mnóstwo sił, serca i rzetelnej inżynierskiej pracy, aby świeciły przez lata dobrym i zdrowym światłem.

The year 2020 is a truly exceptional year for LED line[®]. Exactly 10 years ago, products with our logo reached their first customers across the world. Since then many of you have spread your business wings as our business partners, gaining significant market share. It is a great satisfaction for us that we can develop our product range in cooperation with you. Every luminaire we offer finds an element of your valuable opinion and suggestions, which is something we are very grateful for.

The second decade of the 21st century brings another revolution in lighting technology, and this is the revolution which we begin to participate in. We observe that the future trends related to the approach to lighting are: lighting quality, its impact on health, comfort, functioning and human performance. These trends make it necessary to introduce lighting solutions under Human Centric Lighting. The HCL trend has inspired us to introduce a selection of LED line[®] products with dimming, colour temperature control and user-programmed control functions.

I hope that among all product categories we have included in this year's catalogue edition, you will find those that will meet your expectations and that these will become an integral part of your product portfolio. I am sure that cooperation with LED line[®] will bring you measurable benefits in the coming years and quick returns on investment for your customers. For my part, I guarantee that we have put a lot of energy, heart and reliable engineering work into the implementation of each of the products, so that they provide you with a "good and healthy" light for years to come.

Przemysław Kowalczyk

We are in control of quality

The main objective pursued by our laboratory is to professionalise the quality of LED line® products by ensuring continuous control of photometric and electromagnetic parameters.

The LED line® Lighting Research and Measurement Centre is a place where rigid quality tests of our products are carried out on a continuous basis. The prerequisite for the release of each batch of products for the sale purposes is a positive quality test performed by our team of experts in accordance with current directives and standards.



An important advantage of our LED line® Lighting Research and Measurement Centre is our highly qualified team of experts and a professional research and measurement equipment. We carry out a broad scope of research including determination of electromagnetic and photometric properties of products.

- High level of support for Industry Professionals using our Goniospectrometer, we create professional and reliable IES and EULUMDAT files we support
 designers in creating precise lighting designs, which are the basis for successful lighting projects and investments. We create high quality photometric files which
 are subsequently imported to Dialux or Relux software, on the basis of which we can then advise and recommend the right type of luminaire and its required
 quantity for each project.
- We take care of visual comfort and eye's health with the GL Spectis + Flicker device we examine the optical parameters of our products: ripple frequency, Flicker index, Flicker percent, SVM (stroboscopic effect visibility measure), PstLM (short-time flicker index) which can have highly negative impact on human's eyes.
- We guarantee failure-free operation of our products all of our luminaires and LED lamps are subject to thorough quality testing, using our Aging Test device. Each product is prone to several hundred cycles of work in extreme ranges of input voltage. Thanks to this, we have full confidence and trust in our products and we can assure the products will prove to work reliably in the full range of declared power supply parameters.
- Temperature is under our control we picture and record the temperature distribution in LED systems using a thermal imaging camera and a multi-channel temperature gauge. The correct operating temperature of a LED is the basic factor determining its lifetime.



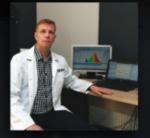
- We publish parameters that are genuinely tested with the help of our Goniospectrometer located in a darkroom, photometric sphere and Ulbricht's integrating sphere, we take measurements in C-coordinates and γ angles (gamma), photometric and electrical values, luminous flux measurements, light distribution curves and light output. Each product parameter published by us is confirmed by earlier tests.
- We look after the quality and colour of the light we create polar and cone diagrams, determine the colour rendering indicators (Ra, CRI), colour temperature (CCT and Duv), as well as we take control of the colour temperature for McAdam's ellipse purposes.
- We ensure the electromagnetic compatibility of products with the Spectrum Analyser we test products for electromagnetic compatibility of products in accordance with the PN-55015 standard in order not to exceed the applicable conductive interference values.



We share our knowledge

The years of our experience in the lighting industry together with highly qualified engineering experts and cooperation with research workers are a huge asset for us, which allows for continuous development and the supply of most innovative lighting solutions. We are happy to share our knowledge during regular meetings with our partners during their visits in our laboratory.

The LED line[®] Light Research and Measurement Centre is the place where we organise various trainings in the field of photometry, photometric measurements and quality control. We perform such trainings for our strategic business partners, distributors, customers and employees. We are also open to share our expertise in the sphere of photometry with engineering students.



In order to improve research processes, we have established cooperation with research workers of the leading Polish Technical Universities. As part of this cooperation, we test new as well as already known solutions. We create our own prototypes, which, thanks to our extensive laboratory equipment, we can test thoroughly. We do experiments with various light sources, we test the best solutions in terms of light output and lifetime. Scientific cooperation provides us with a new perspective, thanks to which we are able to meet any challenge and provide our customers with only the best quality products.

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INDUSTRIAL LIGHTS

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CEILING LIGHTS

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Universal lighting dedicated for passageways (both, indoor and outdoor use), as well as for production and storage halls, social and office areas or residential buildings. The luminaires work efficiently even in the most difficult conditions. These products are featured with a high level of protection against the ingress of dust and water and are resistant to mechanical impact. New models are equipped with a motion sensor and an automatic switch-off function; its control panel is located outside the luminaire. The "Stand by-DIMM" function allows the user to set the luminaire's switch on time, and set the luminaire to dim to 20% brightness when no movement is detected within its detection area. The quality of components, which this luminaire is equipped with, guarantees a failure-free operation and resistance to UV radiation, thanks to which the luminaires is fully protected against yellow degeneration, thanks to which it retains its white colour and aesthetics for many years.

FLOOD LIGHTS

page 11

Lights designed and manufactured for the illumination of production plants and storage buildings.

The IP65 protection rating and the very wide range of operating temperature ensure reliable operation of these luminaires even in the harshest conditions, both inside and outside buildings. The densely ribbed aluminium housing performs a important function of highly efficient heat sink that effectively dissipates the heat generated by the LEDs to the outside of the luminaire. Additionally, the use of high quality thermal paste is used to eliminate air gaps (thermal insulation) in order to maximise heat exchange. Such an effective cooling system extends the life of the LEDs.

HIGH BAY LIGHTS

page 21

HIGH BAY luminaires are dedicated for the professional illumination of warehouses, production plants and any space where exceptionally long and trouble-free operation of the luminaire is required. The casing is made of cold forged 100% aluminium, which provides more efficient heat dissipation to the outside and thus extends the life of LEDs. The use of a polycarbonate lens ensures excellent light transmission. A choice of lenses with different beam angles (60°, 90° and 120°) as well as a choice of different powers (100 W, 150 W, 200 W) will provide a full range of solutions for every lighting project. For demanding applications we recommend our new solution equipped with CREE LEDs, Mean Well power supply and 1-10 V dimming function.

TRI_PROOF LIGHTS

page 29

These HERMETIC LUMINAIRES are certified by the Polish National Institute of Hygiene. They have been designed for installation in medical care buildings, industrial facilities and warehouses intended for food storage, grocery stores, multi-storey car parks as well as home garages and farm buildings. High resistance to mechanical damage (IK08) and protection against dust and water ingress (IP65) guarantee efficient operation in a wide temperature range ($-25 \,^{\circ}$ C $- + 45 \,^{\circ}$ C). Thanks to adjustable mounting clamps, the lamp will fit into most existing mounting holes.

The Easy-Link version offers truly quick installation of the luminaires in "long light strings" (no need for the use of tools; installation performed comfortably and quickly thanks to the specially designed couplings).



LED PANELS

page 35-4<u>5</u>

FXPFRT

page 37

The EXPERT series is our innovative solution designed for professional lighting projects and investments. A choice from a wide range of colours makes it possible to use these panels as decorative lighting in schools, pre-schools (kindergartens) as well as in shopping salons or shops where the colour identifies the brand. Our LED EXPERT panels offer a unique and interesting design, high luminous efficiency and extremely low glare rating (UGR). The warranty is granted for up to 5 years

EASY FI>

page 41

The main advantage of these LED panels is: extremely easy installation. The luminaires are suitable for both, recessed and surface installation. Thanks to the adjustable mounting clamps, the panels will fit into most existing mounting holes. All panels with an output of 6W, 12W, 18W are equipped with LGP (light guide plate) glass which ensures even and smooth distribution of light over the entire surface. 24W version is equipped with PMMA (acrylic glass) LGP. All diffusers used in the panels are UV-resistant, so that the panels do not turn yellow and maintain their original white color, aesthetic appearance and high light parameters for many years.

LED LIGHTS

page 47-67

GLASS

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With its insulating properties, the GLASS series provides a high level of safety for the user. This solution is very attractive not only in terms of safety, but also for visual and economic reasons.

FILAMENT

page 53

This is a great combination of a retro-style EDISON bulb with the most advanced and modern LED technology. The use of graphene in the construction of FILAMENT LIGHTS allows to achieve exceptional lighting parameters and at the same time extends the life of LEDs.

CFRAMIC

page 57

Ceramic housing guarantees optimal thermal conductivity, which results in effective heat dissipation. CERAMIC series has proven to be a highly reliable light source, providing exceptional performance, durability and safety for users.

STANDARD

page 67

Energy-saving light sources which reduce energy consumption. Long life and high efficiency are the features of the LEDs used in the construction of these lights.



FIXTURES

page 69-101

CLASSIC

page 71

The variety of colours, shapes and materials makes them suitable for any application. Depending on its intended use, adjustable or fixed models are available for installation. Aluminium, which the downlight fixtures are made of, performs an additional heat sink function for the lamps installed in the fixtures. This solution extends the life of the light source.

GLASS

page 89

The unique design gives our fixtures their exceptional appearance and character. Due to its insulating properties, glass ensures high safety for the users.

WATERPROOF

page 92

Waterproof (aluminium) downlights are designed for spaces of high moisture levels. The design and the use of dedicated gaskets ensures protection at IP44 / IP20 level. The fixtures are ideal for places with high level of humidity.

TUBE

page 98

Modern spotlights designed for surface installation with an aesthetic appearance and high quality. These spotlights not only offer a beautiful and stylish decoration, but also provide protection for the LED lights placed inside the tube. Fixtures are made of aluminium, which performs an additional heatsink function, providing extra protection for the light source placed inside; this extends the life of the LEDs.



LED STRIPS

page 103-115

FXPFRT

page 105

LED strips from EXPERT series are designed for professional use. These products have various functions, various diode density and high efficiency. These LED strips are designed to be installed in customised locations and to create a unique effect. Most models are available in two voltage options, 12V and 24V.

WATERPROOF

page 110

WATERPROOF strips are placed inside a flexible transparent silicone cover (IP67) or coated with a PU glue (adhesive layer) (IP65) with strong resistance to yellow degeneration. They have full protection against dust and water ingress. Most models are available in two voltage options, 12V and 24V.

CLASSIC

page 113

LED strips designed to be an impressive addition to interior design. Available in different colour temperatures, different colours and in RGB palette. Most models are available in two voltage options: 12V and 24V.



LED MODULES

page 117-119

EXPERT

page 118

LED line® OPTO modules are a wide beam angle solution designed for the illumination of advertising cassettes and spatial letters. This solution ensures reliable operation in the temperature range from -40° C to $+55^{\circ}$ C, both inside and outside. Its highest quality is evidenced by 7 years warranty and IP65 protection.



INDUSTRIAL LIGHTS

Advanced LED technology for business and industry



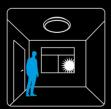








daylight sensor



 The lamp remains inactive with daylight level above the LUX setting even if movement is detected.

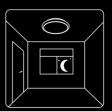


The lamp activates with daylight level below the LUX setting when the movement is detected.

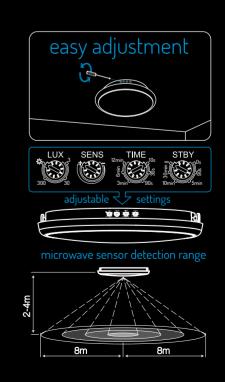
stand-by mode



1. The lamp dims to 20% for the duration of STBY time setting when no movement is detected.



2. The lamp deactivates automatically after the STBY time setting has elapsed.









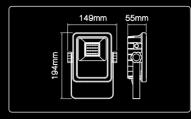
1760lm

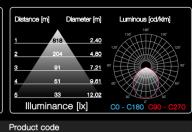
16W

4000K



470508





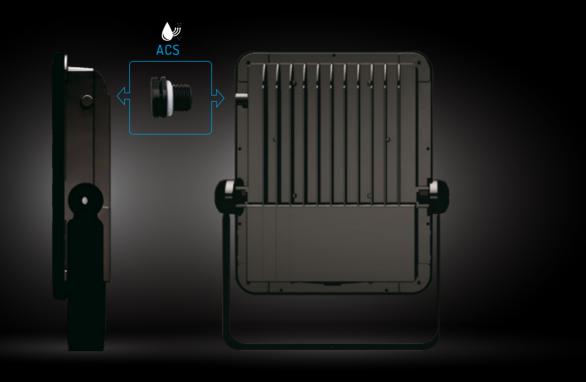


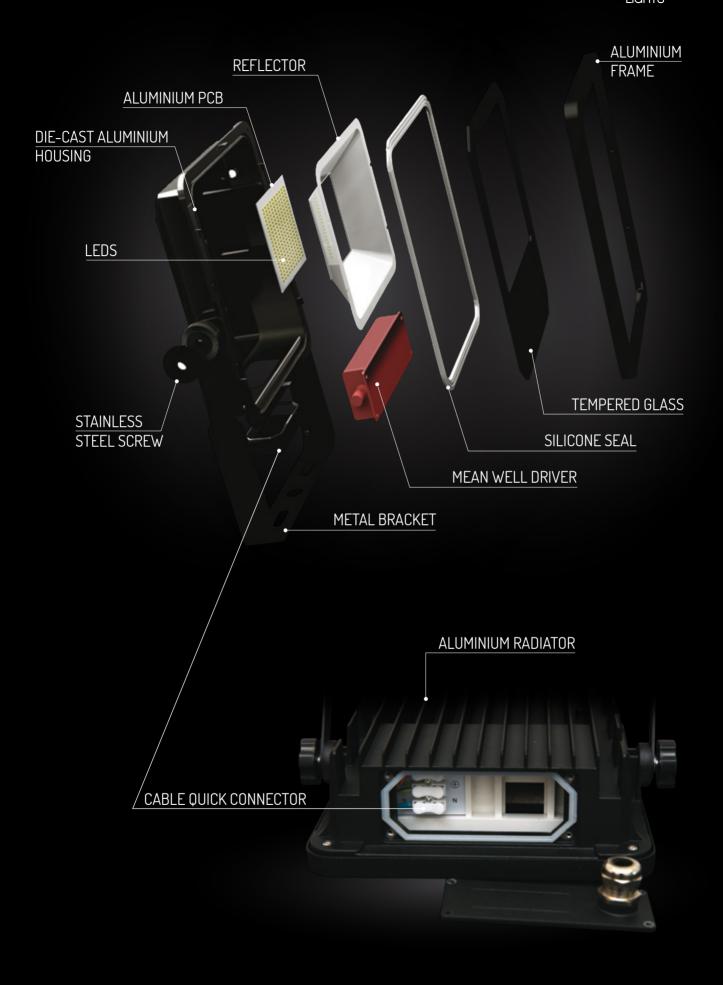














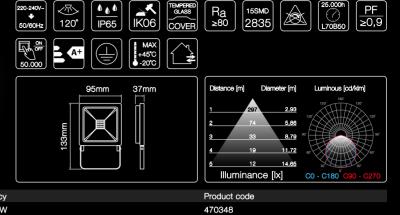












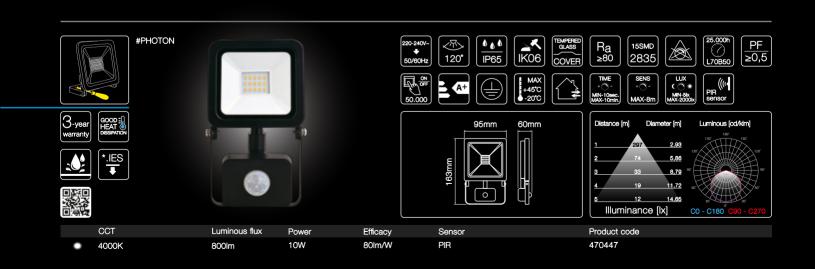




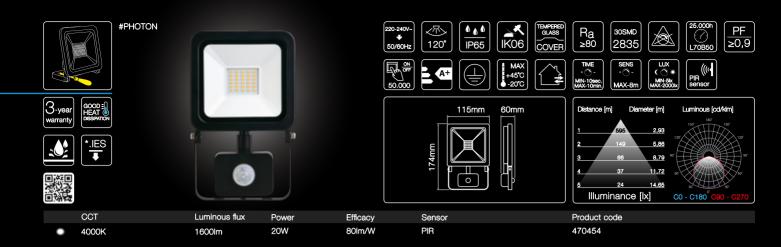










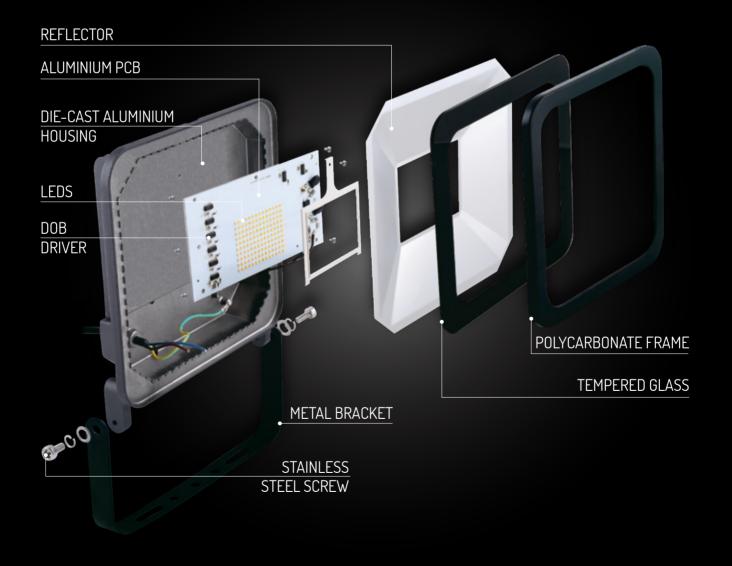
















PF

≥0,95





Luminous flux

13000lm

13000lm

Power

100W

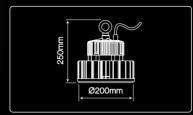
100W

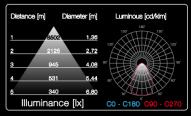
CCT

4000K

4000K







Product code

249907

249914



Efficacy

130lm/W





CCT

CCT

4000K

4000K



Luminous flux

Luminous flux

19500lm

Power

150W

19500lm

Power

150W

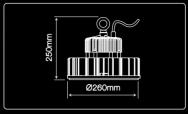


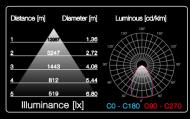
Product code

Product code

249945

249938







Efficacy

130lm/W

Efficacy





PF ≥0,95



Luminous flux

Luminous flux

26000lm

Power

200W

26000lm

Power

200W

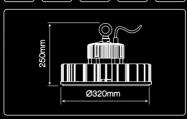
CCT

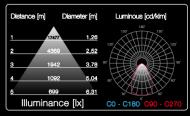
CCT

4000K

4000K







Product code

Product code

248733

248184

LED provided by	₽	220-240V- \$50/60Hz\$ 220-240V- 50/60Hz\$ 50/60Hz\$ 50/60H	Ra ≥80 324SMD 3030 €	100.000h
LUMILEDS		50.000 A+		
			Distance [m] Diameter [m]	Luminous [cd/klm]
LiFud flicker free DRIVER	Cutter min	250mm	2 2990 4,20 3 1329 6,30	90'
*.IES		Ø320mm	4 748 8,40 5 478 10,50 Illuminance [x]	C0 - C180 C90 - C270

Efficacy

130lm/W

Efficacy





CCT

4000K



Luminous flux

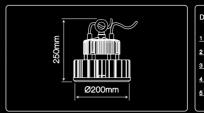
15000lm

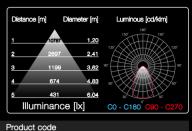
Power

100W



244018







Efficacy





























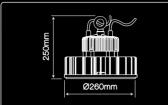


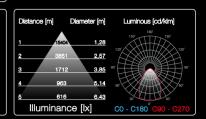












CCT Luminous flux Efficacy Power Product code 4000K 22500lm 150W 150lm/W 245343





























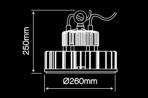


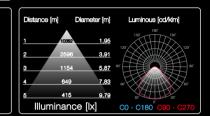




PF ≥0,95







Luminous flux Efficacy Power Product code 22500lm 150W 150lm/W 245633 4000K





















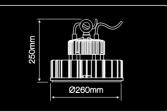














3030

Power Efficacy Product code 150W 150lm/W 245640 22500lm 4000K



CCT

CCT

4000K

4000K



Luminous flux

Luminous flux

30000lm

Power

200W

30000lm

Power

200W

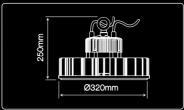


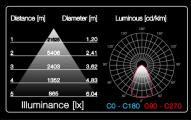
Product code

Product code

247323

247316







Efficacy

150lm/W

Efficacy





1-10V **MICROWAVE SENSOR**























Product name Product code Microwave sensor 241857



daylight sensor



1. The lamp remains inactive with daylight level above the LUX setting even if movement is detected.

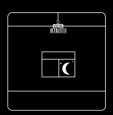


2. The lamp activates with daylight level below the LUX setting when the movement is detected.

stand-by mode

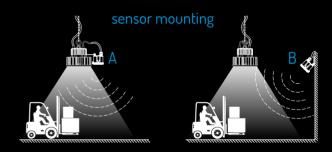


The lamp dims to set brightnes level for the duration of STBY time setting when no movement is detected.



2. The lamp deactivates automatically after the STBY time setting has elapsed.















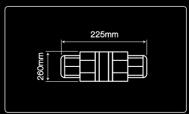












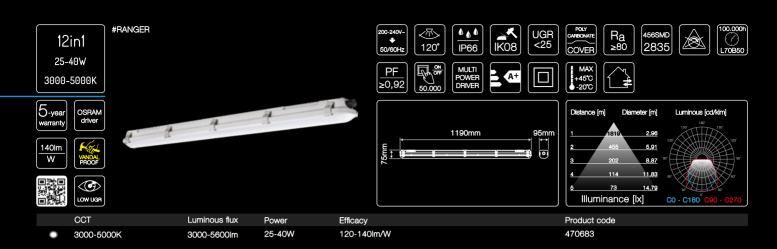
Product name Product code 246074 Hermetic connector IP68

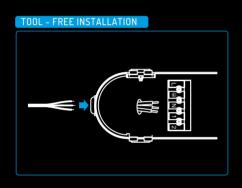
Recommended for:

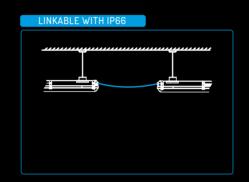
FLOOD LIGHTS / HIGH BAY LIGHTS / TRI-PROOF LIGHTS / CEILING LIGHTS



TRI-PROOF LIGHTS







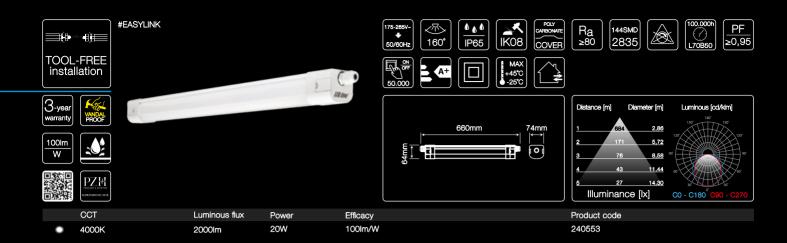


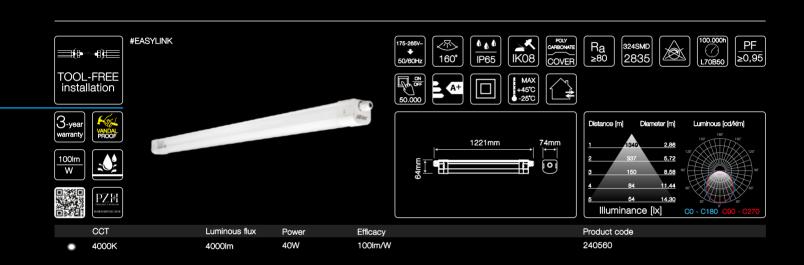


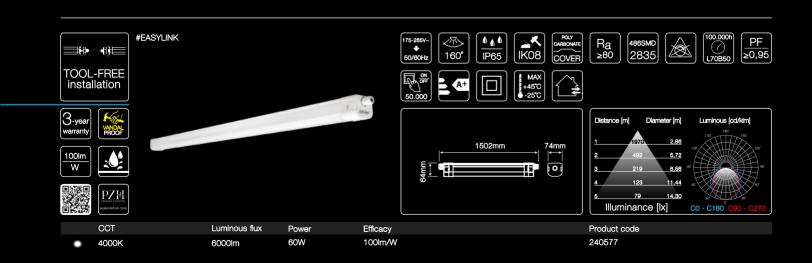




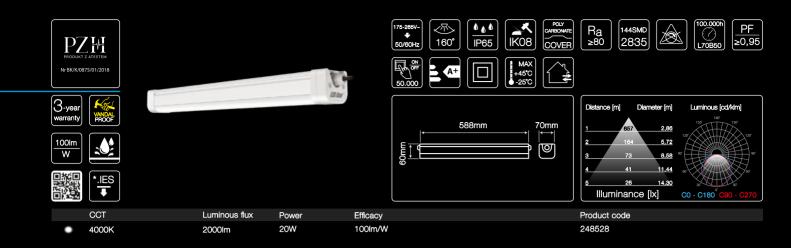
TRI-PROOF ===

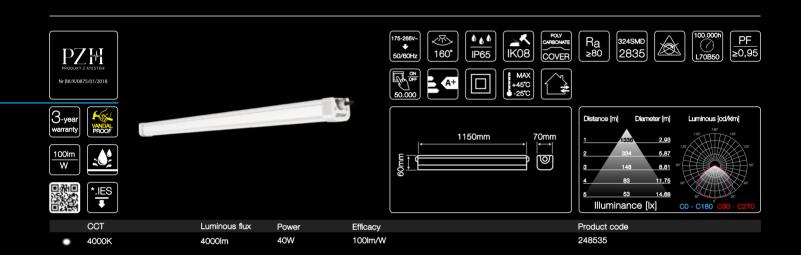


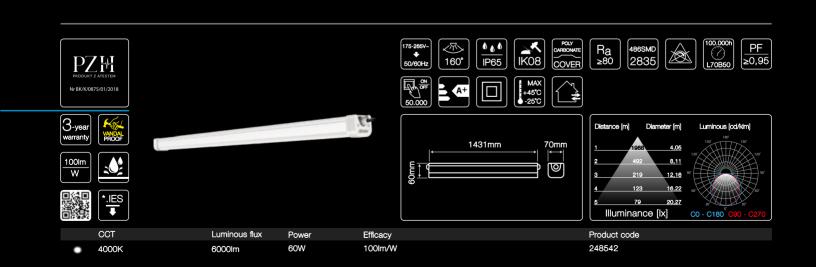




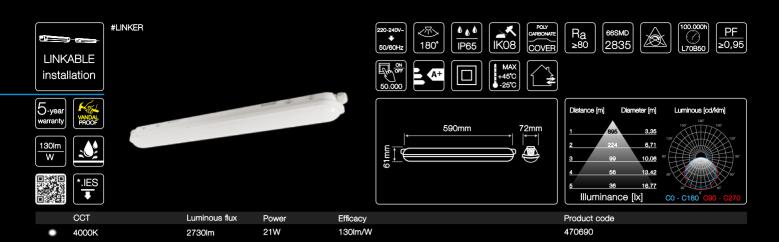


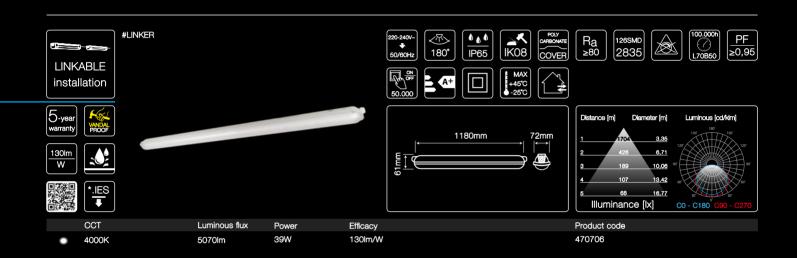


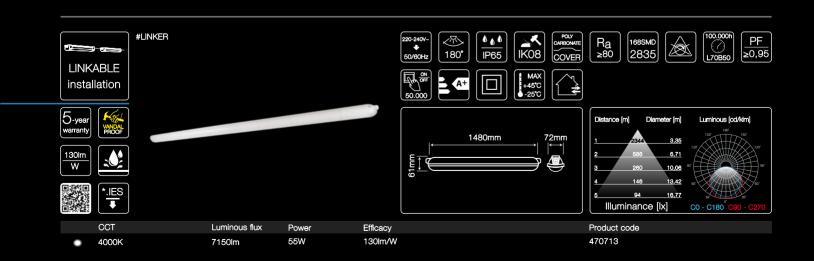


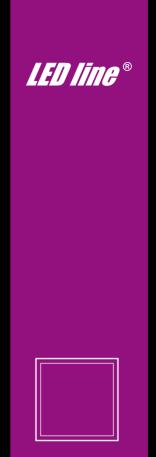


TRI-PROOF ===









LED PANELS





PF ≥0,9



#DIORA



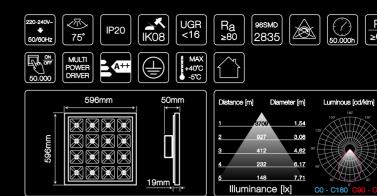












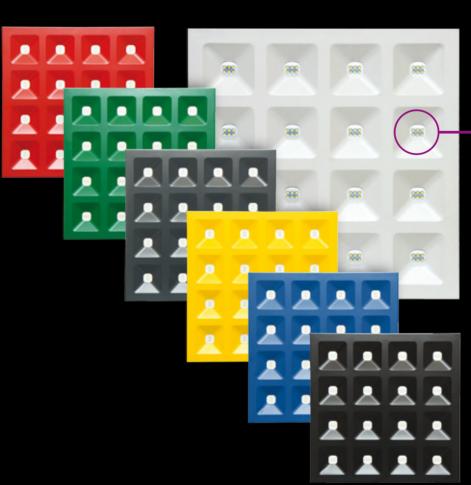
Product code

244193

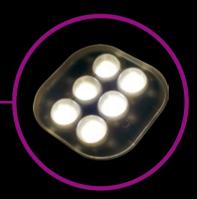
	CCT	Luminous flux	Power	Efficacy
•	4000K	2250Im 2700Im 3150Im 3480Im 3915Im 4200Im 4620Im	15W 18W 21W 24W 27W 30W 33W 36W	150lm/W 150lm/W 150lm/W 145lm/W 145lm/W 140lm/W 140lm/W
		5040lm	3000	1401111799







8in1 15-36W 2250-5040lm











120lm W

*.IES

3-year warranty





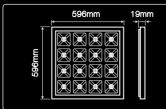


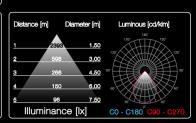
300SMD 2835

PMMA LGP

240SMD 4014







PF ≥0,9

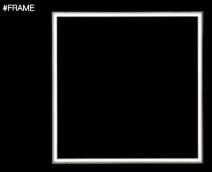
	CCT	Luminous flux	Power	Efficacy	Product code
•	4000K	3240lm	27W	120lm/W	244186



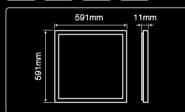
flicker free *



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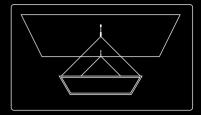
	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K 4000K	3200lm 3200lm	40W 40W	80lm/W 80lm/W	248757 248764









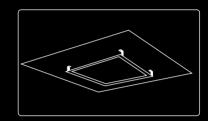


Product code 245701

Product name WIRE SUSPENSION KIT



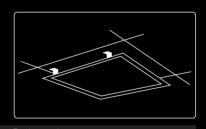




Product name Product code HOOKS SURFACE KIT 245718







Product name Product code SPRINGS RECESSED KIT 245725























CCT

2700K 4000K



Luminous flux

450lm 470lm

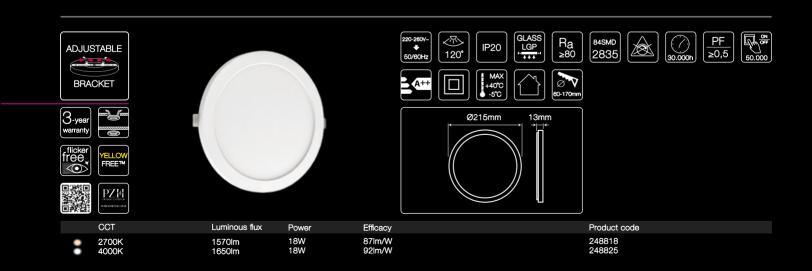




28SMD

2835





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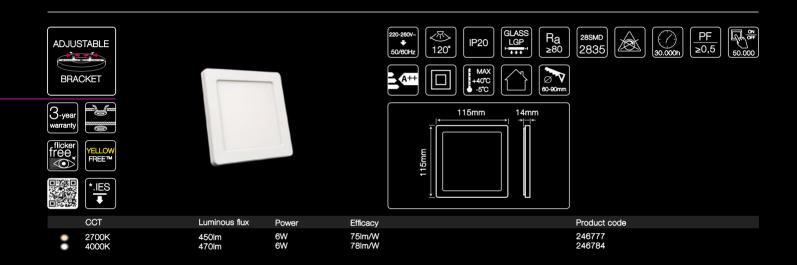
PF ≥0,5

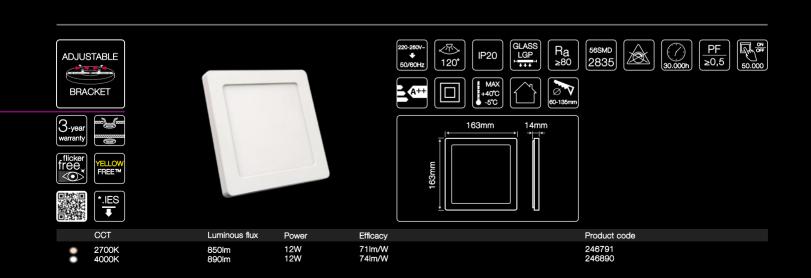


PF ≥0,5 50.000

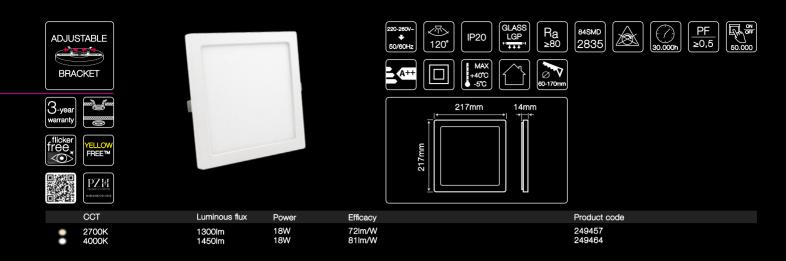


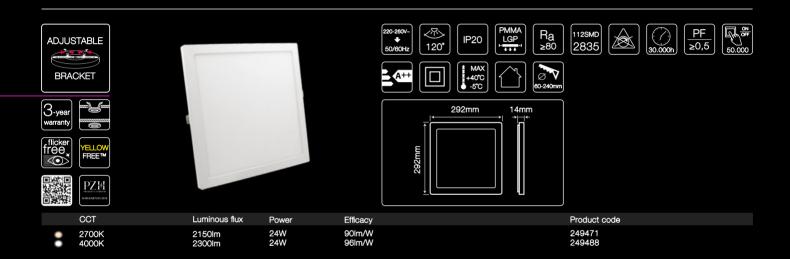












EASY INSTALLATION

Adjustable clips







Recessed









LED LIGHTS

Tradition made modern

























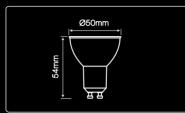












	CCT	Luminous flux	Power	Efficacy	Product code
••	2200-3000K	13 - 345lm	5,5W	63lm/W	248948





















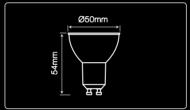












	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	500lm 550lm	5,5W 5.5W	91lm/W 100lm/W	240621 240638













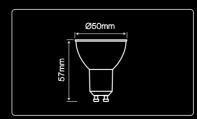












	CCT	Luminous flux	Power	Efficacy	Ra	Energy class	Product code
•	2700K 4000K 6500K	80lm 80lm 80lm	1W 1W 1W	80lm/W 80lm/W 80lm/W	≥80 ≥80 ≥80	A++ A++ A++	242250 248337 242267
	Colour	Wavelength	Power				Product code
•	red green blue yellow	620nm 520nm 465nm 590nm	1W 1W 1W 1W				242274 242298 242281 242304



















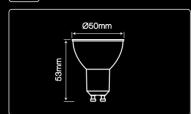












	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K 4000K 6500K	273lm 273lm 273lm	3W 3W	91lm/W 91lm/W 91lm/W	247835 247828 247811



















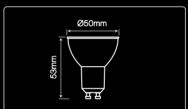












	ССТ	Luminous flux	Power	Efficacy	Product code
•	2700K	410lm	5W	82lm/W	248306
	4000K	410lm	5W	82lm/W	248313
	6500K	410lm	5W	82lm/W	248320





























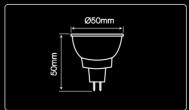
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	CCT
•	2700K
	4000K
	RECOL



Power	Efficac
ЗW	91lm/
3W	91lm/
3W	91lm/
	3W 3W



Produ	ct	CC
24780)4	
24779	98	
24778	31	



PF ≥0,4

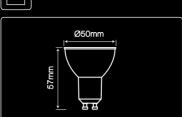












(A) 120°

Ra ≥80

SMD 2835

					<u>+</u>	<u> </u>	
	CCT	Luminous flux	Power	Efficacy			Product code
:	2700K 4000K 6500K	273lm 273lm 273lm	3W 3W 3W	91lm/W 91lm/W 91lm/W			241901 241918 271925

















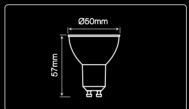












	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	450lm	5W	90lm/W	241963
	4000K	450lm	5W	90lm/W	241970
	6500K	450lm	5W	90lm/W	241987

























LED

LED FILAMENT

Ra ≥80

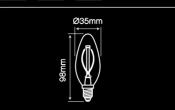
PF ≥0,5

PF ≥0,5









	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K 4000K	260lm 260lm	2W 2W	130lm/W 130lm/W	249051 249518









CCT 2700K 4000K







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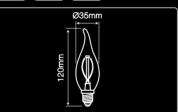
maide.		
ıminous flux	Power	Efficac
60lm	2W	130lm/







COVER



Luminous flux	Power	Efficacy	Product code
260lm	2W	130lm/W	249068
	2W	130lm/W	249525







CCT

2700K 4000K



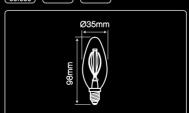
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61	
1	

Luminous

flux	Power	Efficacy
	4W 4W	122lm/W 122lm/W





	Product code
N N	249075 249136

320°

FILAMENT

LED LIGHTS









190-285V- ↓ 50/60Hz	Ra LED SO.500h PF. ≥0,5
50.000 A++	
Ø35mm	

₹ 320°

COVER

A60

Ø60mm

Ra ≥80

LED FILAMENT

LED FILAMENT

PF ≥0,5

PF ≥0,5

CCT	Luminous flux	Power	Efficacy	Product code
2700K	488lm	4W	122lm/W	249082
4000K	488lm	4W	122lm/W	249532

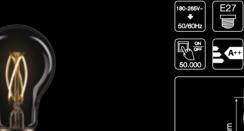












	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K 4000K	488lm 488lm	4W 4W	122lm/W 122lm/W	249099 249549

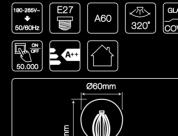












	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	726lm	6W	121lm/W	249105
	4000K	726lm	6W	121lm/W	249556

LED LIGHTS





















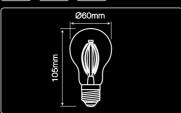












CCT	Luminous flux	Power	Efficacy	Product code
2700K 4000K	968lm 968lm	8W 8W	121lm/W 121lm/W	249112 249563

















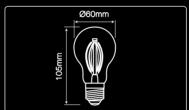












	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	968lm	8W	121lm/W	249129
	4000K	968lm	8W	121lm/W	249990







PF ≥0,5







CCT

2700K 4000K



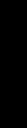


Luminous flux

500lm 500lm

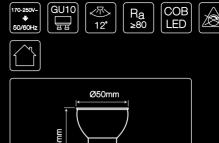
Power

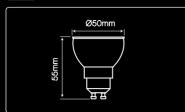
8W 8W



Efficacy

62lm/W 62lm/W















CCT

2700K 4000K





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	1	50		

MAN	1	3	

	- 39	-	
1	24		

- 6		
Luminous flux	Power	Efficacy
500lm 500lm	8W 8W	62lm/W 62lm/W











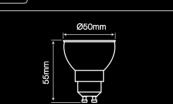
Product code

470270 470287















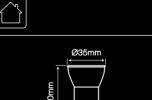


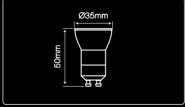












38°

	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	255lm	3W	85lm/W	248108
	4000K	255lm	3W	85lm/W	248115
	6000K	255lm	3W	85lm/W	248122

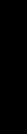












T70-250V-	30.000h	PF ≥0,5 50.000
Ø50mm		

SMD 2835

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SMD 2835

A+

PF ≥0,5

					J
	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K 4000K 6500K	630lm 630lm 630lm	7W 7W 7W	90lm/W 90lm/W 90lm/W	247613 247620 240737

55mr

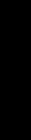
GU10

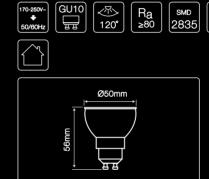












② 120°

	CCT	Luminous flux	Power	Efficacy	Product code
•	2700K	1000lm	10W	100lm/W	248580
	4000K	1000lm	10W	100lm/W	248597
	6500K	1000lm	10W	100lm/W	248603









	Ø50mm <
56mm	
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	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	1000lm	10W	100lm/W	470218
	4000K	1000lm	10W	100lm/W	470225























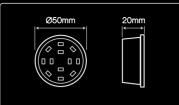












	CCT	Luminous flux	Power	Efficacy	Product code
•	2700K	400lm	5W	80lm/W	247286
	4000K	400lm	5W	80lm/W	247293
	6500K	400lm	5W	80lm/W	470560



















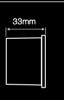














	CCT	Luminous flux	Power	Efficacy	Product code
•	2700K	100% - 550lm 50% - 310lm 20% - 125lm	7W 3,5W 1,5W	79lm/W 88lm/W 83lm/W	248283
•	4000K	100% - 550lm 50% - 310lm 20% - 125lm	7W 3,5W 1.5W	79lm/W 88lm/W 83lm/W	248290

















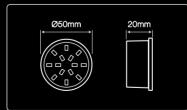












	CCT	Luminous flux	Power	Efficacy	Product code
•	2700K	400lm	5W	80lm/W	470720
	4000K	400lm	5W	80lm/W	470737
	6500K	400lm	5W	80lm/W	470744

















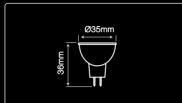












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	001
:	2700K 4000K 6000K

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K	2551
K	2551
K	2551

nous flux	Power
m m	3W 3W
m	3W























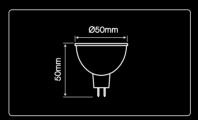












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270	nok
210	M
400	nok
700	010

CCT	
2700K	
4000K	

)K		
X		

Luminous
595lm
595lm

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m	7	W	ı
m	7	٧	I

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	85lr
	85h

cacy m/W m/W

Product code 247637 247644















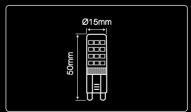












	CCT
•	2700K 4000K
	000017











Efficacy

Product code 245480 245534 245541











C	CT	Luminous flux	Power	Efficacy	Product code
• 4	.000K	550lm 550lm 550lm	6W 6W 6W	92im/W 92im/W 92im/W	245947 245954 245961





CCT 2700K 4000K 6000K









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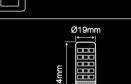
sмр 2835

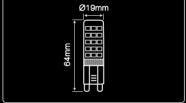






A+





ous flux	Power	Efficacy	Product code
1	8W	94lm/W	247903
1	8W	94lm/W	247910
1	8W	94lm/W	247927

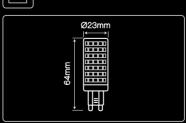
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少 270°

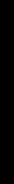
	CCT	Luminous flux	Power	Efficacy	Product code
•	2700K	1080lm	12W	90lm/W	248900
	4000K	1080lm	12W	90lm/W	248917
	6000K	1080lm	12W	90lm/W	248924











170-250V- ◆ 50/60Hz E14 F37 F37 GLASS COVER	Ra ≥80
SO.COO	
128mm	

	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	425lm	5W	85lm/W	242618
	4000K	425lm	5W	85lm/W	247002













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100	NAME OF TAXABLE PARTY.

ıminous flux	Power
30lm	7W





A+











sмр 2835





Ø37mm	
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	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	630lm	7W	90lm/W	247576
	4000K	630lm	7W	90lm/W	247583





CCT

2700K 4000K







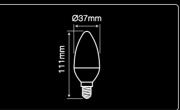
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inous flux	Power	Efficacy
m m	9W	110lm/W 110lm/W







220°

PF ≥0,5





















Product code 470232 470249



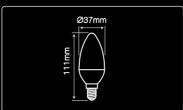








A+



	CCT	Luminous flux	Power	Efficacy
:	2700K	992lm	9W	110lm/W
	4000K	992lm	9W	110lm/W













A+







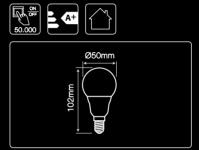












	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	630lm	7W	90lm/W	470195
	4000K	630lm	7W	90lm/W	470201













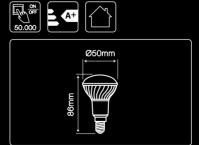












	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	560lm	7W	80lm/W	243295
	4000K	595lm	7W	85lm/W	247057



















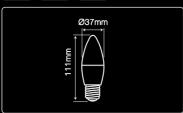












	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K 4000K	630lm 630lm	7W 7W	90lm/W 90lm/W	249204 249211



















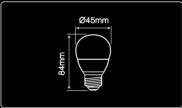












	ССТ	Luminous flux	Power	Efficacy	Product code
:	2700K	630lm	7W	90lm/W	247590
	4000K	630lm	7W	90lm/W	247606









800lm 800lm

W8 W8





A+









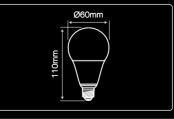






2700K 4000K





Product code 241697 241703











Luminous	flux	Power













Ra ≥80





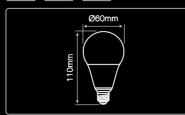
sмd 2835

PF ≥0,5









	CCT	Luminous flux	Power	Efficacy
•	2700K 4000K	1000lm 1000lm	10W 10W	100lm/W 100lm/W



ZP>

280°

A65

















50.000
11 Mm 31 Mm 32 Mm

	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	1300lm	13W	100lm/W	241734
	4000K	1300lm	13W	100lm/W	241772

170-250V~ **Ψ**50/60Hz

OFF OFF

A+









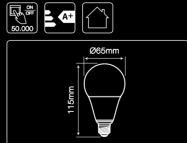


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CCT	Luminous flux	Power	Efficacy	Product code
2700K	1300lm	13W	100lm/W	470256
4000K	1300lm	13W	100lm/W	470263





















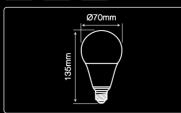








A+



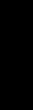
	CCT	Luminous flux	Power	Efficacy	Product code
•	2700K	1800lm	18W	100lm/W	241833
	4000K	1800lm	18W	100lm/W	241840























sмd 2835





PF ≥0,9



CCT 2700K 4000K





Luminous flux	Power	Efficacy
2500lm 2500lm	25W 25W	100lm/W 100lm/W



	Product code
N N	242403 243257





CCT

2700K 4000K



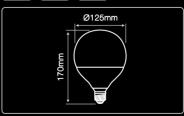




	1
	4
M	1
SW.	

Luminous flux	Power	Efficac
3500lm 3500lm	35W 35W	100lm 100lm





G125

280°

Product code	
243264 244247	





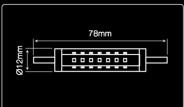








220-240V- ↓ 50/60Hz R7s	GLASS 360° COVER	na	SMD 2835	30.000h	PF ≥0,5	50.000
A+						



	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	500lm	6W	83lm/W	248955
	4000K	500lm	6W	83lm/W	248962

STANDARD LED LIGHTS



















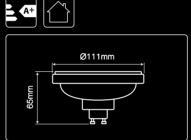












	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	720lm	12W	60lm/W	470324
	4000K	750lm	12W	62lm/W	470331















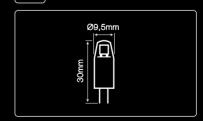












	CCT	Luminous flux	Power	Efficacy	Product code
:	2700K	120lm	1,5W	80lm/W	248979
	6000K	120lm	1,5W	80lm/W	248986





FIXTURES

The right direction for LED light





















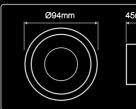














241314

Colour

Gold & White











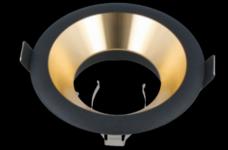




















Colour

Gold & Black

Product code

241321





















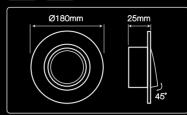












Colour

White

Product code 248344

















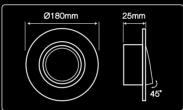












Colour

Silver

Product code 248351

















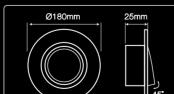








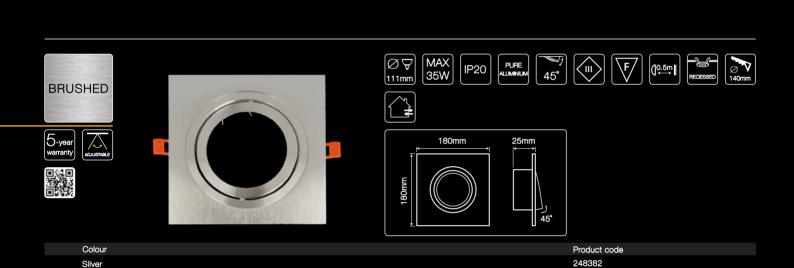




Colour Black





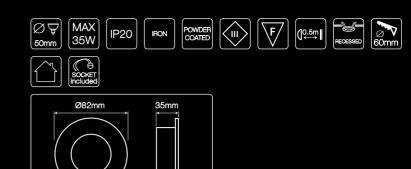












(0.5m) RECESSED

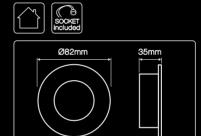
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Colour Product code White 242731









IP20

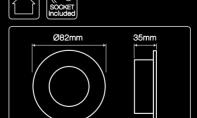
MAX 35W

Colour Product code Chrome 242724









IP20

MAX 35W

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Colour Product code 242700 Satin































Colour Product code Gold 242694















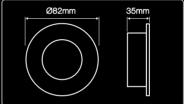












Colour Product code Patina 242717





















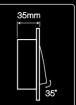












Colour White

















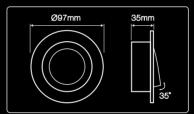
Product code

242793









Colour Product code Chrome 242786

















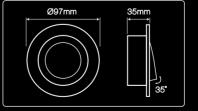
















warranty

















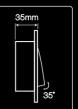












Colour Product code Gold 242755



















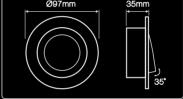












Colour Product code Patina 242779





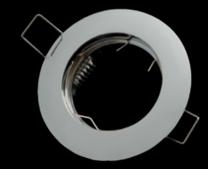


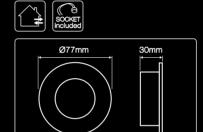


Colour Product code White 242854









IP20

MAX 35W

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abla

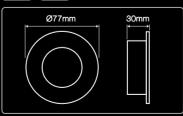
Colour Product code Chrome 242847











IP20

Colour Product code Satin 242823

0.5m RECESSED

(10.5m) RECESSED



















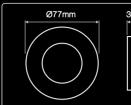


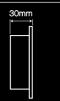












Colour Product code Gold 242816



























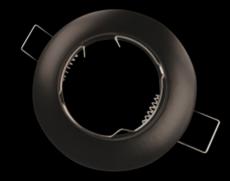




Colour Product code Patina 242830













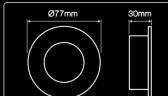












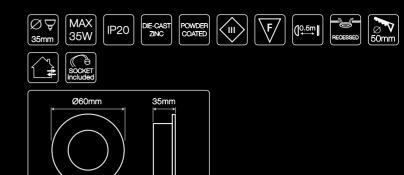
Colour Black







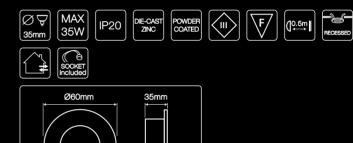




Colour Product code White 245114





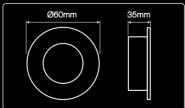


Colour Product code Chrome 243028









Colour Product code 243004 Satin

(]0.5m























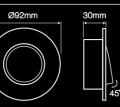














Colour White

242915























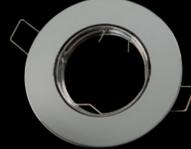






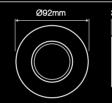
Colour

Chrome











Product code 242908















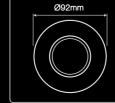














Colour Product code Satin 242885























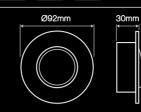












Colour Product code Gold 242878





















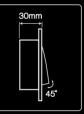












Colour Product code Patina 242892















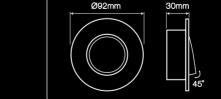












Colour Product code 249259 Black



(]0.5m











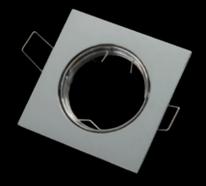
Colour Product code White 242977

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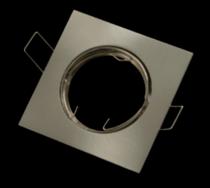
IP20

Colour Product code Chrome 242960



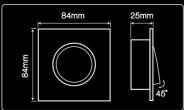








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IP20

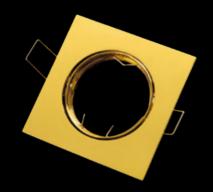
Colour Product code Satin 242946



















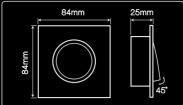








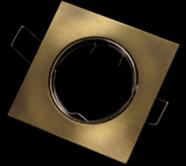




Colour Product code Gold 242939





























Colour Product code Patina 242953

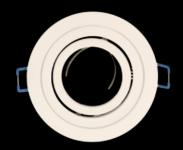




















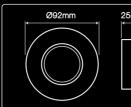














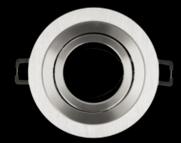




















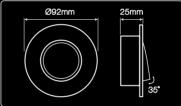










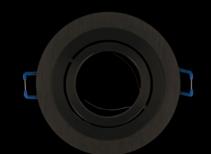


















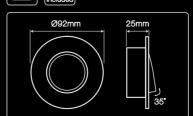












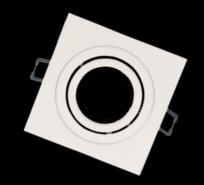
Colour Product code 241253 Black



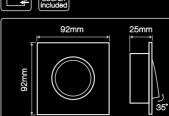












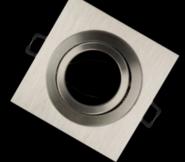
IP20

Colour Product code White 241222



















35°

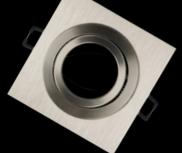


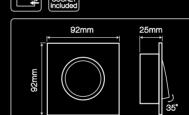
0.5m RECESSED









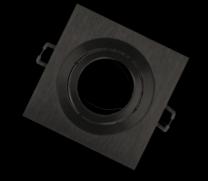


Colour Product code Silver 241215



















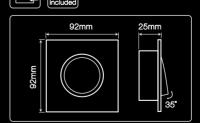












Colour Product code 241208 Black





















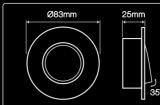












Colour Product code Silver 244896

















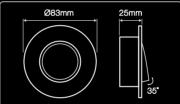












Colour Product code Silver 244810















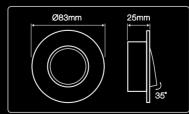












Colour Product code 244902 Black

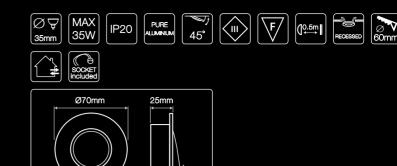












45°

(10.5m) RECESSED

(10.5m) RECESSED

Colour Product code Gold 244865











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Colour Product code Silver 244919

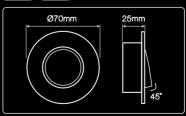












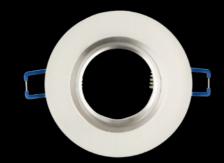
IP20

Colour Product code 244872 Black

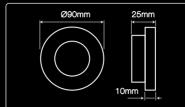








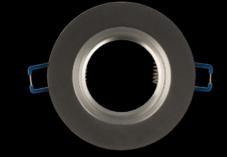




Colour Product code White 241413

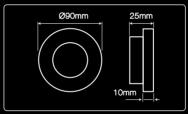












Colour Product code Black 241420















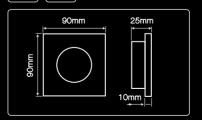


(]0.5m |







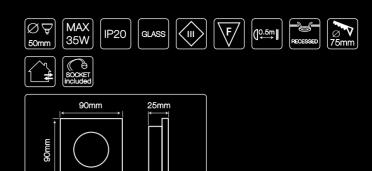


Colour Product code 241338 White







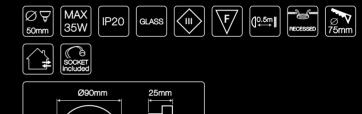


Colour Product code Black 241345





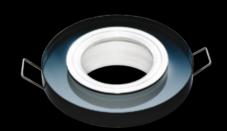




Colour Product code Silver 246364

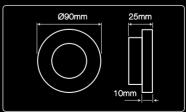












IP20

Colour Product code 246371 Black

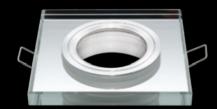
0.5m RECESSED 75mm

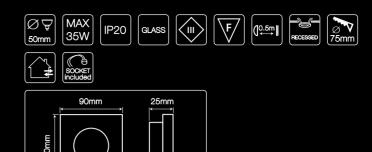












Colour Product code Silver 246388











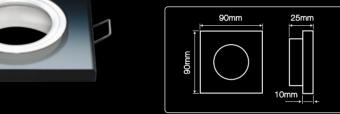












Colour Product code Black 246395

WATERPROOF























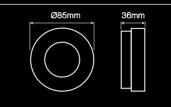












Colour

White

Product code 245404















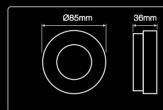












Colour Chrome

Product code 245411



























Colour Satin





















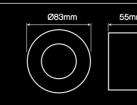












Colour

White

Product code 245428



















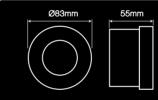












Colour Chrome Product code 245435





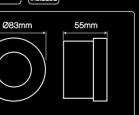












Colour Satin

WATERPROOF

FIXTURES





















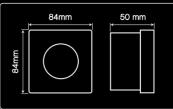












Colour

White

Product code 245374















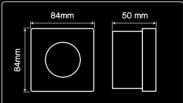












Colour Chrome

Product code 245381











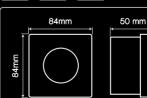












Colour Satin

Product code

245398

94























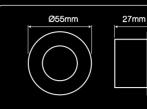












Colour Product code White 249266















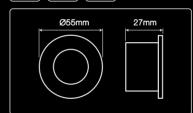












Colour Product code Chrome 249273







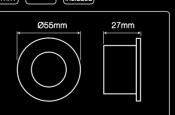












Colour Product code 249297 Black

WATERPROOF

















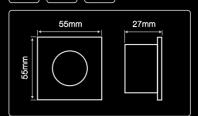












Colour Product code White 249303















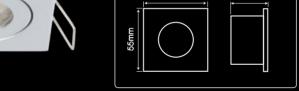












Colour Product code Chrome 249310















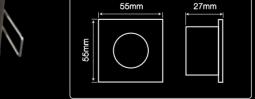












Colour Product code 249334 Black

FIXTURES





















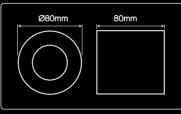












Colour

White

Product code 242540

















80mm











Colour Black























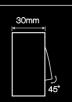












Colour

White

Product code 243851





















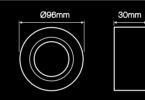












Colour

Silver

Product code 243134



















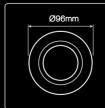


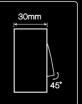








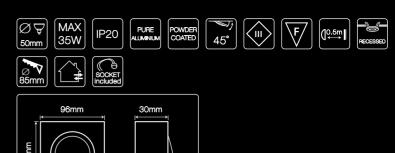




Colour Black







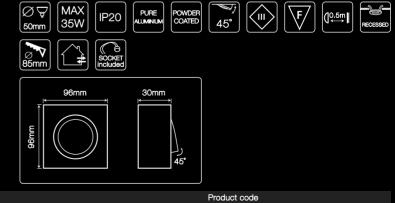
Colour Product code
White 243141





Colour Product code
Silver 243738





Black 243172

Colour























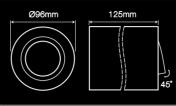












Colour Product code White 249693















IP20









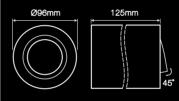












Colour Product code Silver 249716

















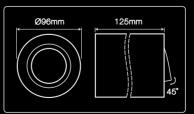












Colour Product code 249709 Black



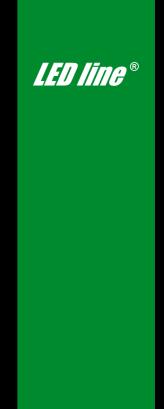
(]0.5m



Colour Product code White 249723







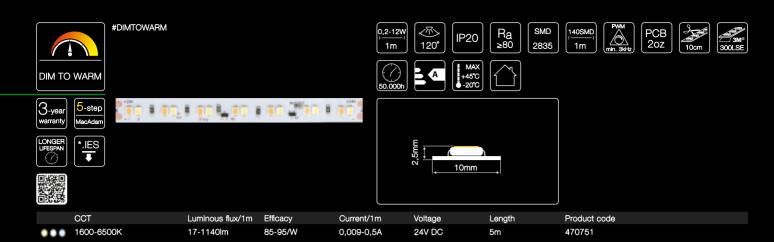


LED STRIPS

The only limits to creating illumination are the limits of your imagination



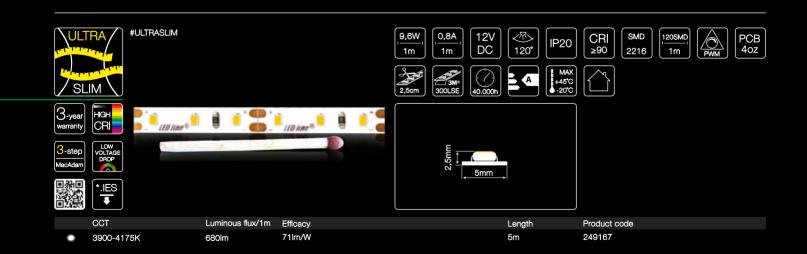




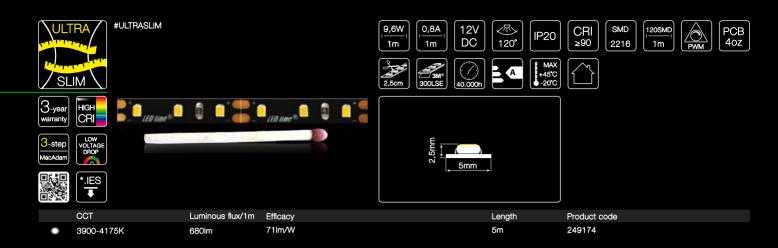


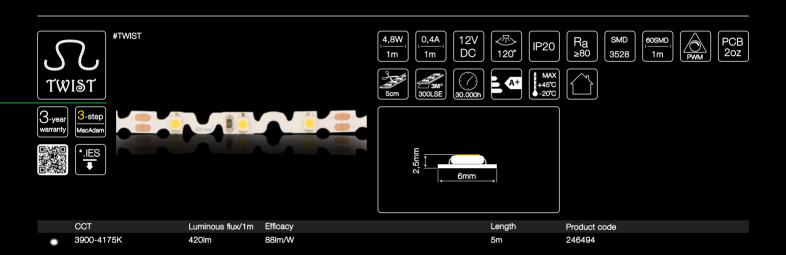


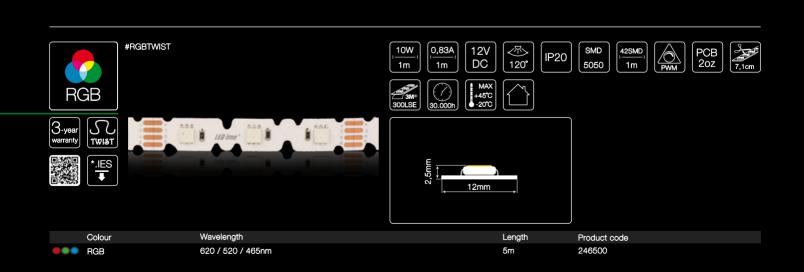










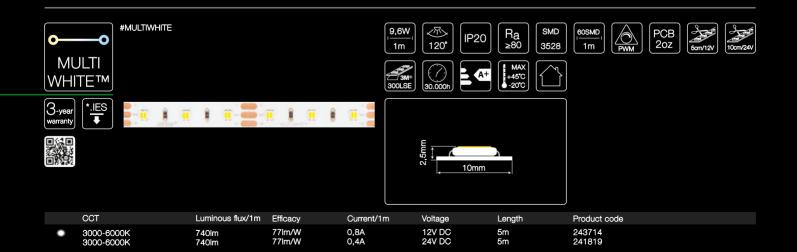




RGB

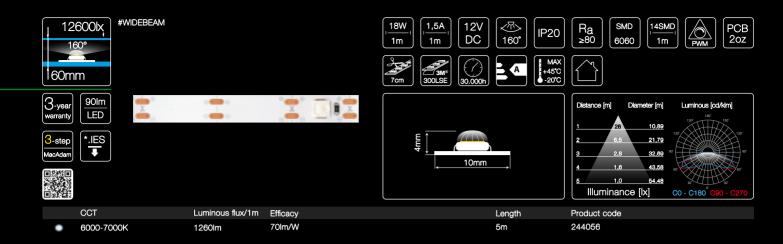
620 / 520 / 465nm



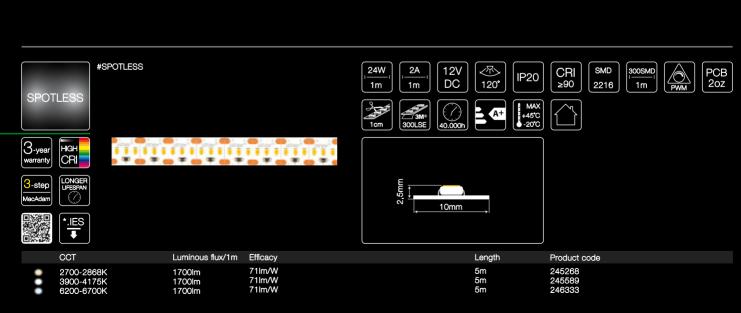


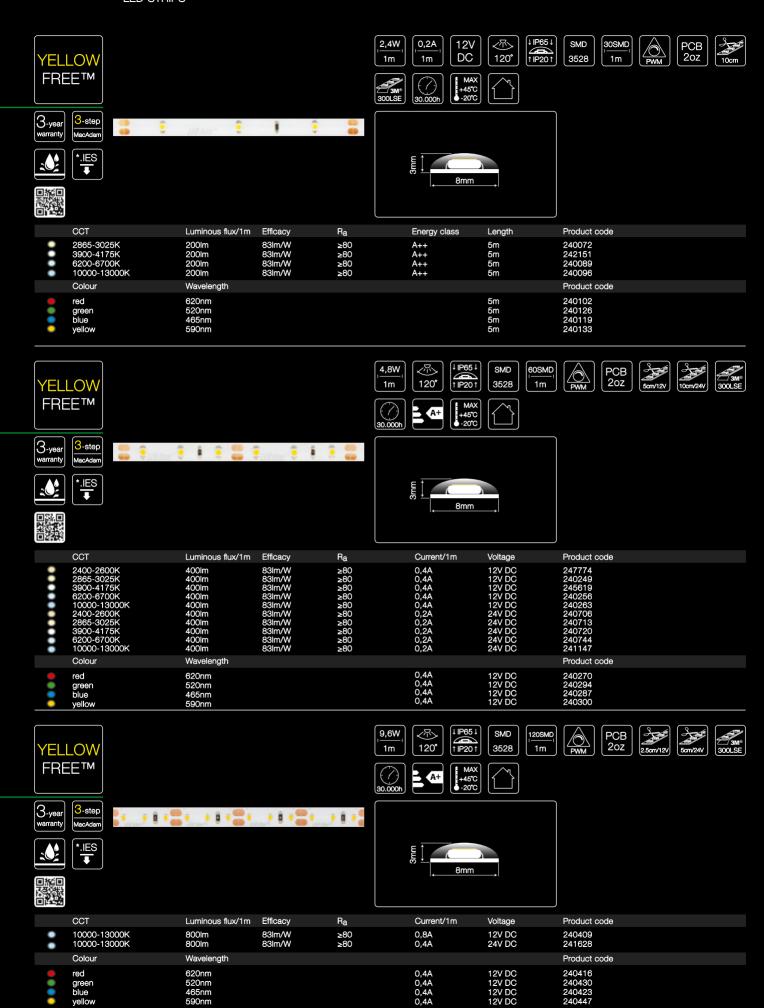
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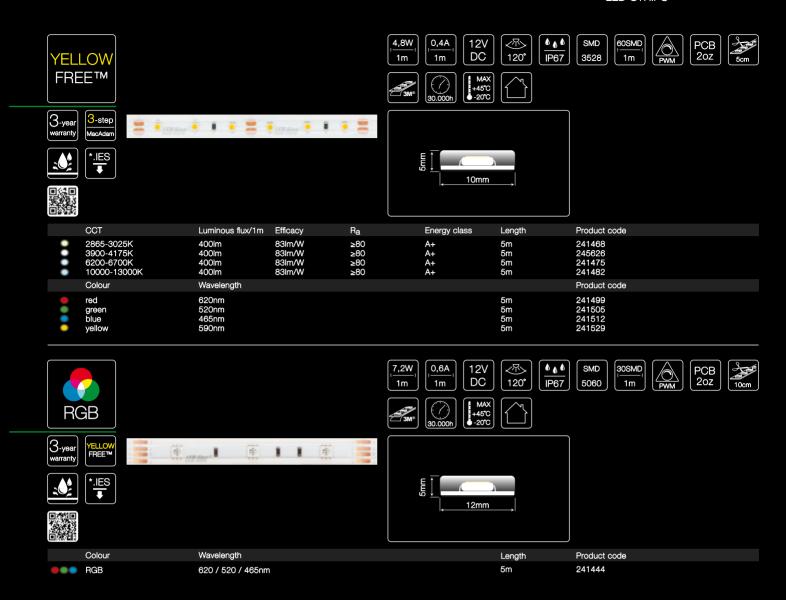


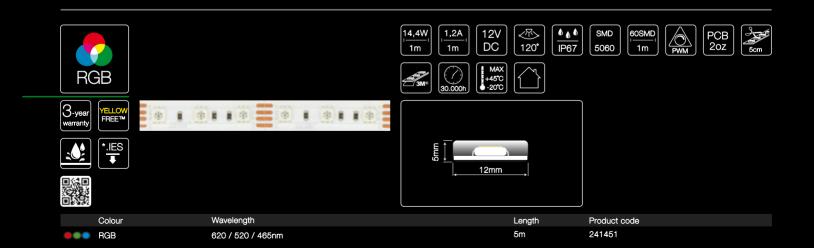






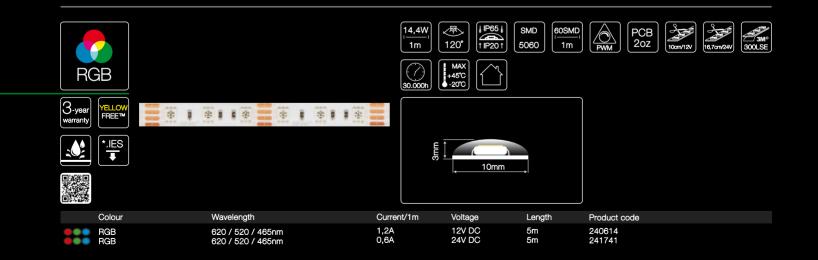




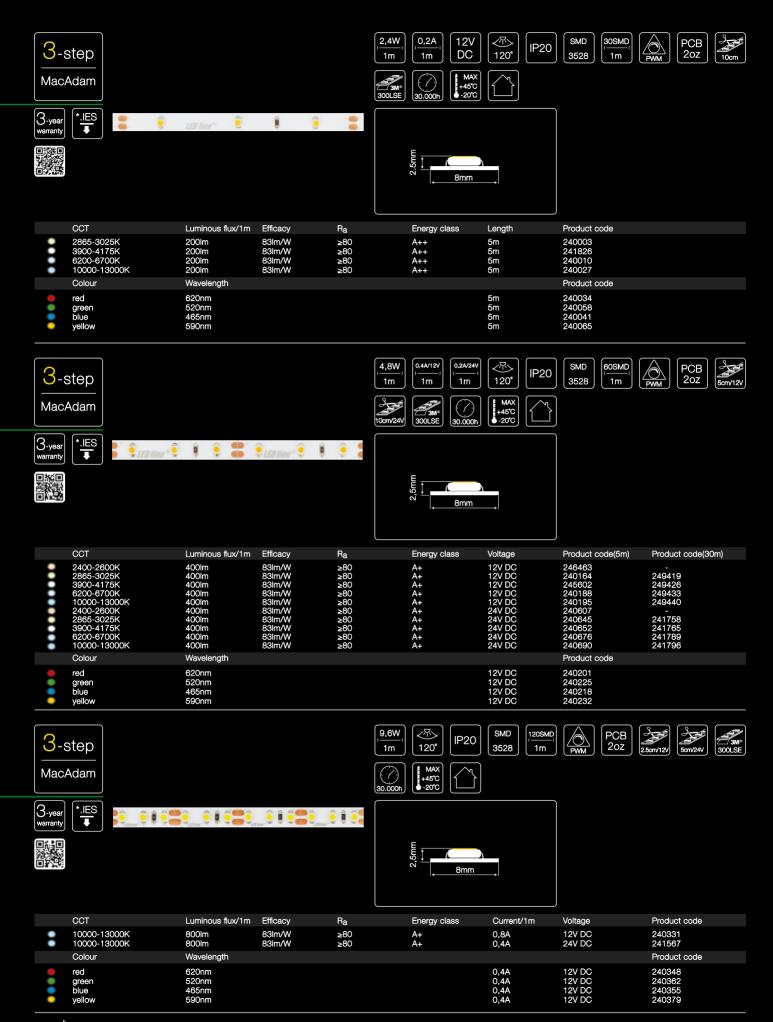






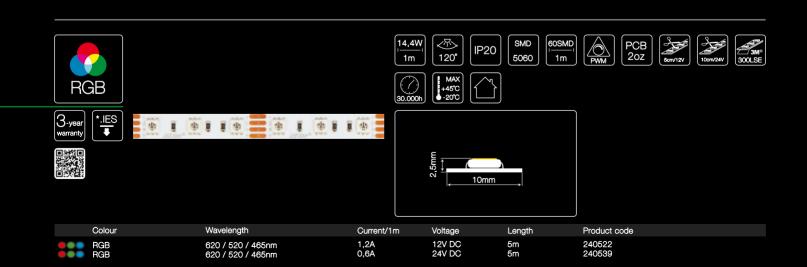


12V DC 12V DC 12V DC









0,6A 0.3A 12V DC 24V DC

5m 5m

> 12V DC 12V DC 12V DC

240140 241659

RGB RGB 620 / 520 / 465nm 620 / 520 / 465nm











0.010. - 0.010.

Product name

CLICK corner connector for 12mm LED line® strips 5 pin type +

Product code

247859

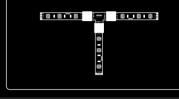












Product name

CLICK corner connector for 10mm LED line® strips 4 pin type T

Product code

246524











Product name

CLICK corner connector for 10mm LED line® strips 4 pin type L

Product code

246517

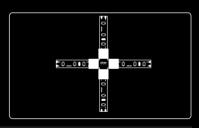












Product name

CLICK corner connector for 8mm LED line® strips 2 pin type +

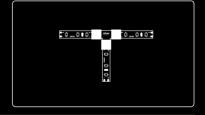
Product code 246548





PCB





Product name

CLICK corner connector for 8mm LED line® strips 2 pin type T

Product code 246555











Accessories

CLICK corner connector for 8mm LED line® strips 2 pin type L

Product code

246562



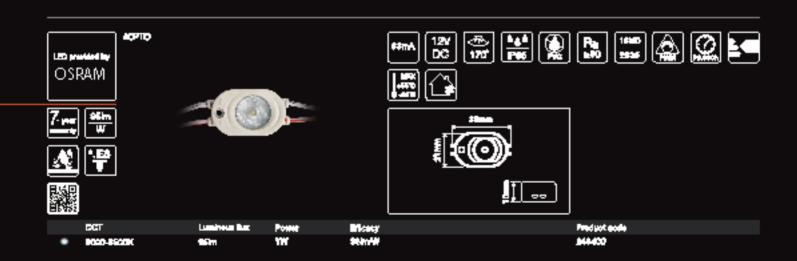


LED MODULES

Perfect choice for the advertising industry

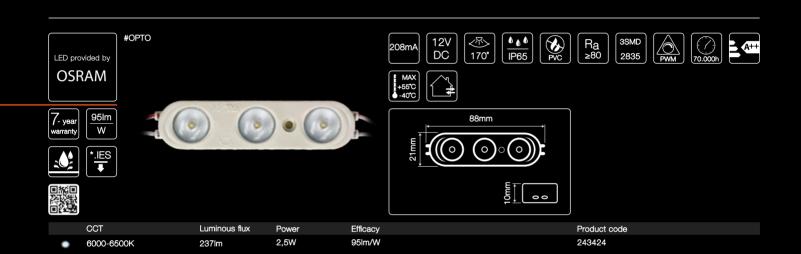


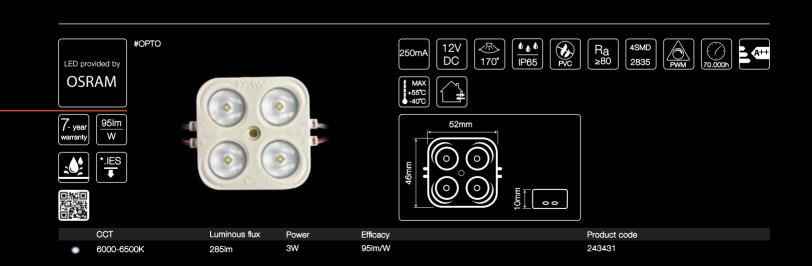












ICONOGRAPHY

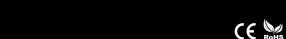
2,4W 1m wattage consumption for one metre of LED strip 0,2A 1m current for 1 metre of LED strip 12V DC voltage range and voltage type IP20 ingress protection rating against dust and water SMD 3528 LED type 1m LED quantity for one metre of LED strip PWM dimming type PCB 2oz amount of copper used for PCB cutting sections of LED strip, measured in centimetres 3M™ 300 LSE double-adhesive tape () L70B50 LED lifespan, measured in hours ambient temperature range suitable for operation for indoor use LED strip ingress protection rating against dust and water energy efficiency class CRI ≥90 colour rendering index (CRI) 90lm LED luminous flux per 1 LED P943 IC integrated chip type Ra ≥80 colour rendering index (Ra) 160° beam angle 1111 number of PINs per connector 12mm the width of suitable PCB for a specific connector 83mA current non-flammable material for indoor and outdoor use

cover material ≥0,95 power factor number of on / off cycles IEC protection classes (class I) IEC protection classes (class II) IEC protection classes (class III) non-dimmable detection angle and detection range MIN-10sek. MAX-7min. sensor's stay-on time settings MIN-1m MAX-12m sensor's detection sensitivity settings sensor's LUX sensitivity settings 0s-∞ sensor's stand-by time settings 3-15m sensor's mounting height 1-2,5mm² wire thickness range MAX 450V maximum suitable voltage MAX 24A maximum suitable current 35W maximum suitable wattage driver with option to adjust the wattage (() PIR sensor fitting type cover shape (]0.5m distance from illuminated surface UGR <16 Unified Glare Rating GLASS LGP

LGP type

light source diameter

 $\emptyset \nabla$



possible installation methods: recessed and surface

IK08

the degree of protection of the device against external impacts

PURE ALUMINIUM

fixture's material



installation method



mounting hole diameter



electrical socket included in the box



mountable on surfaces with standard degree of flammability



breather valve



adjustable angle range



product dimmable



painting technique



colour temperature range according to McAdam's ellipse formula, which ensures colour consistency for the LED strip



applicable warranty period



photometric data files available



high Colour Rendering Index. The higher the CRI value, the better the colours of illuminated object/surface are revealed



extended life span



product produces desired light from RGB colour palette



high resistance to yellowing degeneration caused by UV radiation



waterproof product



luminous flux and beam angle values for specified distance from illuminated surface



LED strip with side emitting LEDs



high density LED strip emitting continuous line of light



product with decreased voltage drop



LED brand



narrow width for easy installation



bendable LED strip



product produces any light from RGB+W colour palette



programmable multicolour LED strip used for advanced lighting projections



LED strip with adjustable colour temperature of white light within given range



mounting bracket designed for comfortable installation



product compatible with TUYA system



driver brand



no undesirable flickering effect



product certified by Polish National Institute of Hygiene



product resistant to external impacts



no specialised tools required to adjust alignment of the product



product configurable by the user



product compatible with 1-10V dimmable drivers



product containing graphene substrate which extends the lifespan of the LEDs and is very flexible



vintage style product



product with good heat dissipation qualities



product equipped with optics focusing the beam angle of the light



product featured with slim housing



step dimmable product. Dimming is achieved by quickly turning the light on and off



product with dim to warm function changes colour temperature to more warm light while dimming



high user-safety thanks to the housing material



product offered in the choice of 7 colours



product with low glare factor



mounting clips can be moved along the mounting bracket allowing the product to fit into most existing mounting holes



no specialised tools required



product designed for quick installation



adjustable fix<u>ture</u>

type of paint finish



?

Luminous flux [(Im)] - is the measure of brightness of a light source in terms of energy being emitted. It is a measurement of energy released in the form of visible light from a light-producing source.

Illuminance [[Ix]] - is a measure of the intensity, as perceived by the human eye, of light that hits or passes through a surface. It is equal to one lumen per square metre.

Luminous efficacy [(Im / W)] - is a measure of how well a light source produces visible light. It is the ratio of luminous flux to power, measured in lumens per watt in the International System of Units.

CRI / Ra (Colour rendering index) – is a quantitative measure of the ability of a light source to reveal the colours of various objects faithfully in comparison with an ideal or natural light source. Numerically, the highest possible CRI value is 100 and would only be given to a source identical to standardised daylight (sunlight with a colour temperature of 6670K). The higher the CRI value, the better the colours of illuminated object/surface are revealed. Ra is the average value of 8 colour samples, whereas CRI uses a palette of 14 colours and tends to be more accurate.

CCT (Correlated Colour Temperature or Colour Temperature) - is expressed in Kelvins [K]. It is a measure of the colour appearance of a given light source. CCT values are intended by the lighting industry to give a general indication of the apparent "warmth" or "coolness" of the light emitted by the source. According to lighting industry convention, lamps with low CCT values provide light that appears "warm," while lamps having high CCT values provide light that appears "cool."

Fixture efficiency – is the ratio of light output emitted by the luminaire to the light output emitted by its lamps $\eta = \Phi$ opr./ Φ

Light distribution curve – provides information on how light is emitted from a lamp or a light fixture. It is a diagram that represents a section cut through the fixture and shows the intensity of light emitted in each direction. The portion of the graph above the horizontal $90^{\circ}-270^{\circ}$ line indicates light that shines above the fixture (indirect), while the portion of the graph below represents light shining down (direct). The straight lines radiating from the centre point identify the angle of the light emitted while the circles represent the intensity

Fig. A - Light distribution curve diagram

The graph shows the distribution of light in two planes:

- In the vertical plane passing through the longitudinal axis of the fitting, plane C90-C270,
- In the plane perpendicular to the axis of the luminaire, plane CO-C180.

If the luminaire is rotational-symmetrical, the light distribution is given only in one plane C. If the light distribution is asymmetrical, the luminous intensity distribution is given in planes C at angles of 30° or even 15°. The light distribution diagram provides basic information about the shape of the luminaire's light distribution.

FLICKER - flickering is a constant fluctuation of the luminous flux from on to off. The Lighting

Engineering Society (IES) has developed two parameters of quantitative flickering.

Percent Flicker - indicates the average amount of modulation or reduction in the luminous flux in one turn on and off cycle. A source of light with 100% flickering would indicate that at some point in the above on/off cycle the luminaire does not produce light, while a completely stable light would have zero percent flickering.

Flicker Index - it is the percentage of flickering and two other variables: the shape of the light wave or the output curve and the work cycle,

Flicker Index - it is the percentage of flickering and two other variables: the shape of the light wave or the output curve and the work cycle, which refers to the percentage time in which the light source is switched on in a single on and off cycle. The lower the flicker percentage and the flicker indicator, the less the source fluctuates.

UGR (glare) - is a method of calculating glare, bright light sources, from luminaires. The UGR rating helps to determine how likely a luminaire is to cause discomfort to those around it. UGR is not a standalone technical parameter of the luminaire - it rather indicates what UGR rating is to be achieved in a lighting project with given parameters using a given luminaire.

Protection against mechanical impact (IK rating) – are an international numeric classification to indicate the degrees of protection provided by light fixtures against external mechanical impacts. It provides a means of specifying the capacity of a fixture (luminaire) to protect its parts (components) from external impacts. The range of protection is measured on the scale from 00 (no protection) up to 10 (impact resistance against 20J). The higher the numerical value of the IK parameter, the greater the mechanical protection of the given device.



IK rate	Impact energy	Impact equivalent
00	0 J	no protection
01	0.15 J	impact of a 200g mass dropping from 7.5 cm height
02	0.20 J	impact of a 200g mass dropping from 10 cm height
03	0.35 J	impact of a 200g mass dropping from 17.5 cm height
04	0.50 J	impact of a 200g mass dropping from 25 cm height
05	0.70 J	impact of a 200g mass dropping from 35 cm height
06	1J	impact of a 500g mass dropping from 20 cm height
07	2 J	impact of a 500g mass dropping from 40 cm height
08	5 J	impact of a 1700g mass dropping from 29.5 cm height
09	10 J	impact of a 5000g mass dropping from 20 cm height
10	20 J	impact of a 5000g mass dropping from 40 cm height

IEC protection class – this is an international standard set up by the International Electrotechnical Commission defining the protective-earth connection requirements for electronic devices. In other words, the protection class defines the means that should be adopted to ensure protection against electric shock. However, it is not in any extent a measure relating to the safety of the given product. The classification is set out in the PN-EN 61140: 2005 regulations. In summary, there are four classes of protection: 0, I, II, III. Protection classes are illustrated with symbols, except for protection class 0, which has no symbol and therefore no protective-earth connection whatsoever. The symbols are shown in the below picture.







IES (photometric file) - A file with the IES file extension is an IES Photometric file that stands for Illuminating Engineering Society. They are plain text files that contain data on light for architectural software (e.g. DIALUX, RELUX) that can simulate light. These files describe how various structures are affected by the product and illustrate how to display the correct lighting patterns on the chosen area.

Ingress Protection (IP) - IP protection class classifies and rates the degree of protection provided against ingress of body parts, solid objects, dust, water or other liquids to the inside of the luminaire. Depending on the degree of protection, the device may be dedicated to work in various conditions. This table below shows what each digit or part of the IP code represents.

First digit: protection against the ingress of solid objects (according to PN-EN 60529: 2003)

MOTTIBET	i i otectioni level
0	no protection
1	protection against contact with hazardous parts with a back of a hand
	protection against solid objects with a diameter of 50mm or more
2	protection against contact with hazardous parts with a finger
	protection against solid objects with a diameter of 12.5mm or more
3	protection against contact with hazardous parts with tools, tick wires, etc.
	protection against solid objects with a diameter of 2.5mm or more
4	protection against contact with hazardous parts with most wires, slender screws, etc.
	protection against solid objects with a diameter of 1mm or more
5	protection against contact with hazardous parts with wires
	dust protected - ingress of dust not entirely prevented (some ingress shall not have a harmful effect on the

dust protection against contact with hazar doos parts with whes dust protected – ingress of dust not entirely prevented (some ingress shall not have a harmful effect on the operation of the luminaire)

6 protection against contact with hazardous parts with wires dust tight – full protection against ingress of dust

accordance with DIN 40050

Second digit: protection against the ingress of liquids (according to PN-EN 60529: 2003)

Num.	Protection level
0	no protection
1	protection against water drops
2	protection against water drops when tilted at 15° (vertical dropping shall have no harmful effect on the operation of the
	luminaire)
3	protection against spraying water at any angle up to 60° from the vertical
4	protection against splashes of water from any direction
5	protection against a water jet (12.5 litre per minute) poured onto the housing from any direction
6	protection against a powerful water jet (100 litre per minute) poured into the housing from any direction
7	protection against the short immersion in water (30 minutes up to 1m of submersion)
8	protection against the continuous immersion in water (housing permanently submerged in water as per the conditions
	agreed between the producer and the user, but the depth should be greater than at IP7 above)
9	protection against nowerful high temperature and high pressure water jets (80-100 har and temperature + 80° C) in



Additional letters (according to PN-EN 60529: 2003)

Letter Degree of protection

A protection against access to dangerous parts with the front of hand

B protection against access to dangerous parts with a finger C protection against access to dangerous parts with a tool D protection against access to dangerous parts with a wire

Supplementary letters (according to PN-EN 60529: 2003)

Letter Meaning

H high voltage equipment
 M device moving during water test
 S device standing still during water test

W Device is suitable for use under certain weather conditio

PWM (pulse-width modulation) - a method of controlling and regulating electric current or voltage signal of constant amplitude and frequency by changing the value of the current or voltage fed to the load. The average value of voltage (and current) fed to the load is controlled by turning the switch between supply and load on and off at a fast rate. The longer the switch is on compared to the off periods, the higher the total power supplied to the load.

1-10V (analogue control) - this is a system in which by controlling input voltage the user adjusts the output power level of the device. The control voltage is independent of the device power supply voltage. The value of 10V corresponds to 100% of the output power. The value of 1V corresponds to 5-10% of the output power.

Oz (ounce) - amount of Cu (copper) used in the production of PCB laminate. Copper is a very good conductor of heat and electricity. The greater amount of copper used on the laminate guarantees higher voltage and current stability as well as thermal resistance, which allows for the longer life span of LED light sources.

PMMA (poly methyl methacrylate) known as acrylic glass - material used for the production of lamps' covers and diffusers. This material is highly resistant to UV radiation which prevents the diffusor from yellowing (the diffusor remains pure white for many years of use). It also has a very good visible light transmission of 92%. The material is also easily recyclable.

PC (polycarbonate) - material used in the construction of LED luminaires. It has an excellent mechanical properties and is particularly resistant to mechanical impact. Compressive strength is similar to aluminium. Visible light transmission is at 90%.

Tempered glass - type of safety glass processed by controlled thermal or chemical treatments to increase its strength compared with normal glass. It is used in the production of lampshades and diaphragms in LED fittings. It has three times greater resistance to mechanical damage compared to ordinary glass. Tempered glass has much higher thermal resistance than standard glass and, when broken, the glass crumble into small granular chunks instead of splintering into jagged shards as plate glass.

LGP (LIGHT GUIDE PLATE) - material with a matrix of lines reflecting the light into the diffuser. This solution is dedicated for edge-lit luminaires.

PF (power factor) - the power factor of an AC electrical power system is defined as the ratio of the real power absorbed by the load to the apparent power flowing in the circuit. In simple terms, it determines what part of the energy taken from the electrical network will be used effectively by the device. A power factor of less than one indicates the voltage and current are not in phase, reducing the instantaneous product of the two (reactive power). This causes undesirable heat emission.

Functionality parameter	Requirement as from stage 1, except where indicated otherwise	
	P ≤ 2 W: no requirement	
Lamp power factor (PF) for lamps	2 W < P ≤ 5 W: PF > 0,4	
with integrated control gear	5 W < P ≤ 25 W: PF > 0,5	
	P > 25 W: PF > 0,9	



L70B50 - This parameter indicates the time in hours after which 50% of a population of LEDs parametrically reduced their lumen output, in a gradual way, and provides less than 70% of lumen output compared to the initial (original) luminous flux. A luminous flux lower than the lumen maintenance factor (expressed by Lx value) is called a "parametric failure" because the product produces less light, but remains working. By way of illustration, the life span marked as L70B50 50000h tells us that after a period of 50000 hours, 50% (B50) of a population of LEDs (which a given LED lamp is equipped with) provide up to 70% (L70) of the initial light output. Due to the fact that the temperature has a significant influence on the Lumen Maintenance Factor(Lx) it is necessary to give indication for the ambient temperature at which the life span of LxBy was determined.

SVM - The SVM is a method used to quantify the stroboscopic effect visibility in general illumination application. SVM is defined by measuring the visibility threshold of light waveforms modulated at several frequencies and uses Fourier analysis to convert the wavelength shape of the light intensity. The stroboscopic effect can cause an impression of slowness, stopping or even reversal of the direction of movement of an object, which can lead to various accidents.

PstLM - This is a short-term flicker perceptibility measurement and is used to measure visible light caused by modulation in the frequency range from 0.3 Hz to 80 Hz.

A value of PstLM = 1 means that the average observer has a 50% probability of detecting flickering (flickering = variations in light output over time from a light source).

