



LUG & LED
Even greater efficacy

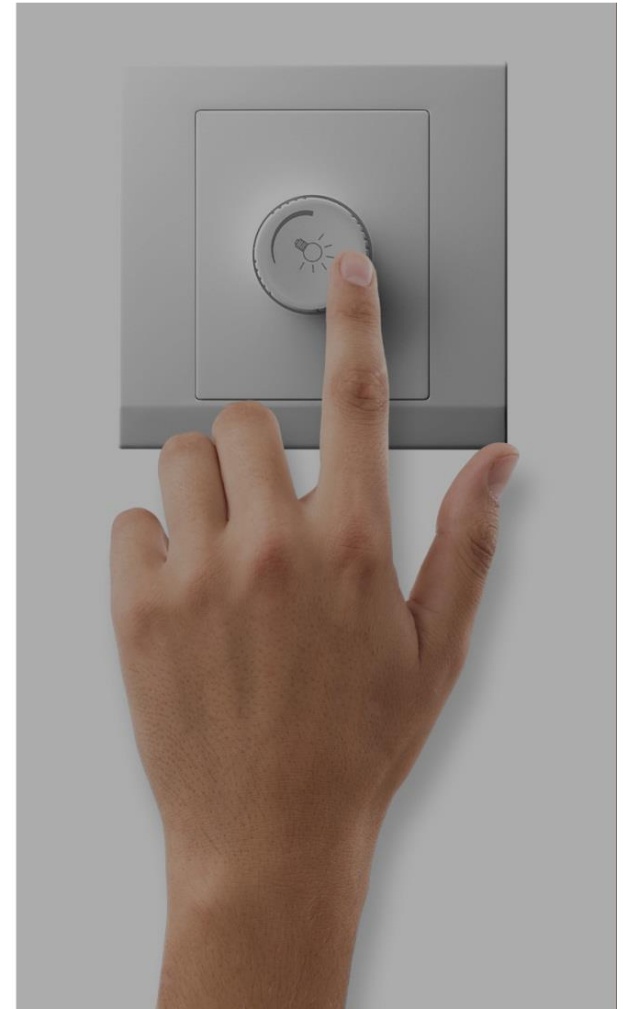
Why LED ?

Immediate
ignition



Why LED ?

Possibility
of light intensity
control



Why LED ?







Possibility
of white colour
temperature
change



Why LED ?

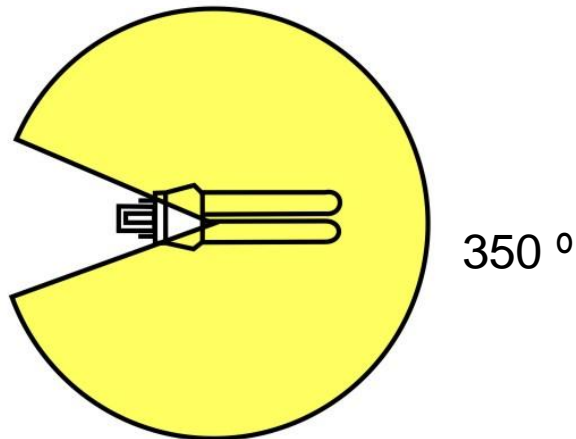
Possibility of light
colour changes
– colourful lighting
creating
the atmosphere



Light source		Efficacy
Traditional bulb		10 - 22lm/W
Compact fluorescent		60 lm/W
Linear Fluorescent		80 - 100 lm/W
Metal-halide lamp		60 - 100 lm/W
Sodium lamp		80 - 130 lm/W
LED		90 - 160 lm/W

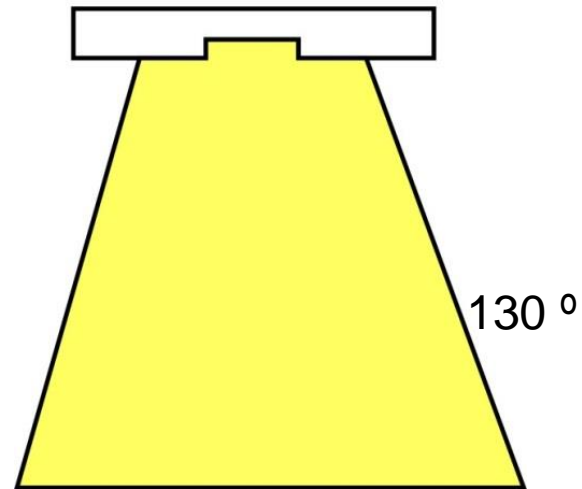
Why LED?

COMPACT FLUORESCENT



EFFICIENCY= 60 %

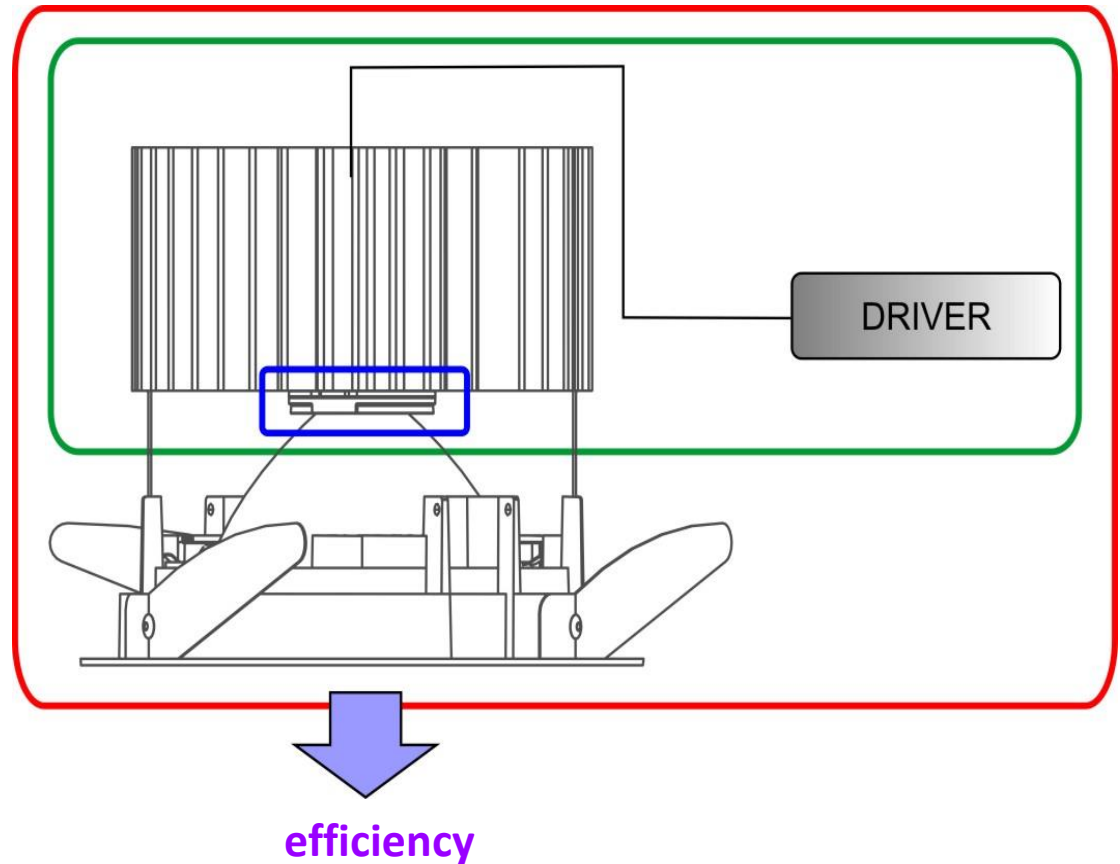
LED



EFFICIENCY > 85 %

Efficacy – important difference of interpreting

1. LED engine efficacy (120 lm/W)
2. LED + Driver (100 lm/W)
3. System efficacy (85 lm/W)



**LED
engine
efficacy** > **LED&Driver
efficacy** > **System
efficacy**

100lm/W

even greater efficacy!

Intelligent lighting control systems offered by LUG guarantee a system which provides maximum control and flexibility, increased energy savings, in addition ensuring comfortable living and working conditions for Users. Thanks to the wide possibilities provided by the use of LED technology LUG dynamically develops new luminaire concepts, which is evidenced by the number of LED solutions available in the company's offer.



100

LUMENS WATT

LUG marks the products with the highest possible level of energy efficiency with the “100lm/W” logo, which in this case means **full efficiency of the entire lighting system.**

LUGSTAR PREMIUM LED



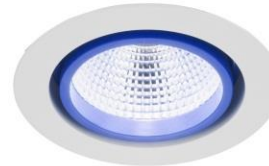
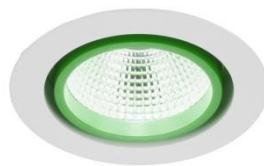
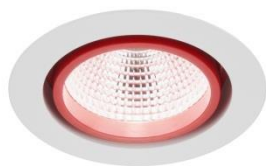
Product delivered to the following projects:

- JBC Chain Stores in Belgium
- THOMAS COOK Gent in Belgium
- WEB Tower in Berlin, Germany
- Computer Service Hannover, Germany



LUGSTAR PREMIUM LED

- Downlight luminaire of modern design
- Passive cooling system
- Light intensity control available
- **Estimated lifespan 50 000 h**
- Flux maintenance >70%
- OSRAM PrevaLed Core + OSRAM driver
- Colorful rings available







LUGSTAR PREMIUM LED

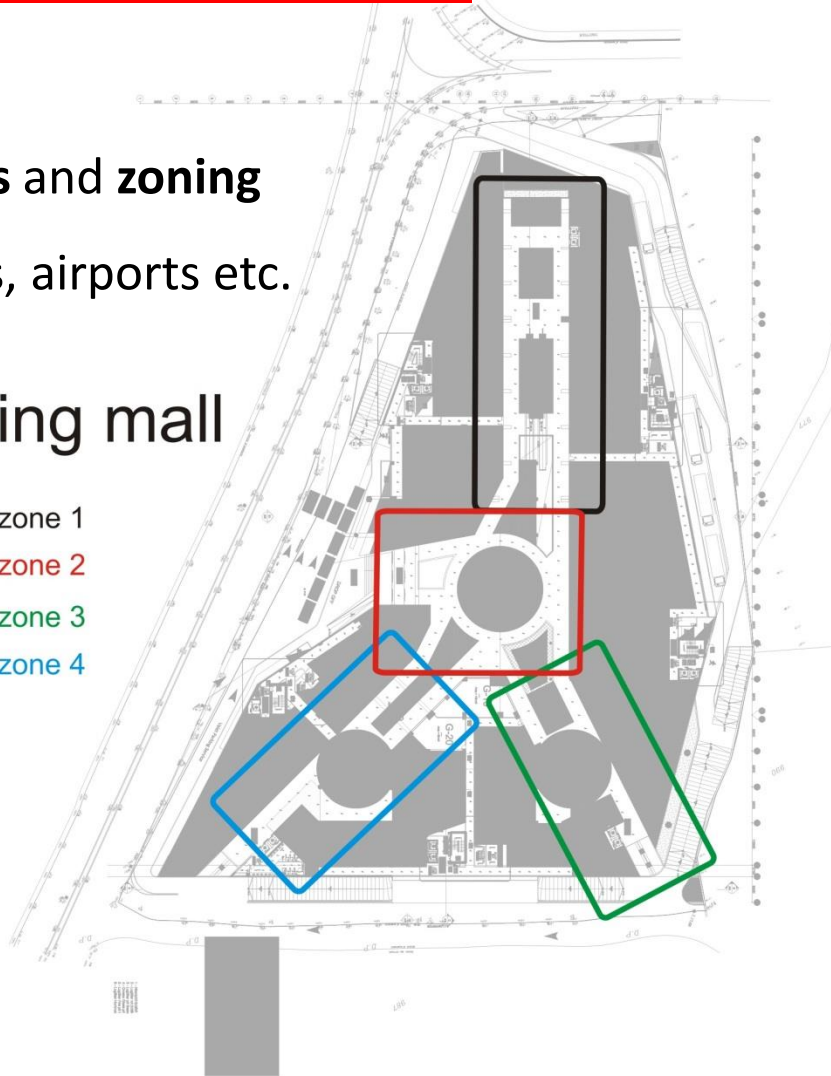
Colorful rings

for **corporate colours** and **zoning**

eg. at shopping malls, airports etc.

Shopping mall

-  — zone 1
-  — zone 2
-  — zone 3
-  — zone 4





LUGSTAR PREMIUM LED

- Luminaire efficacy over 90 lm/W
- Available flux 1500, 2000, 3000lm and 5000lm
5000 lm is replacement of 70W MH,
3000K and 4000K, HI-CRI available (> 90)
- White colour temperature 3000 and 4000K
- CRI > 80
- SPECIAL RANGE:
2300 lm = 2x26W CFL 100 lmW/system



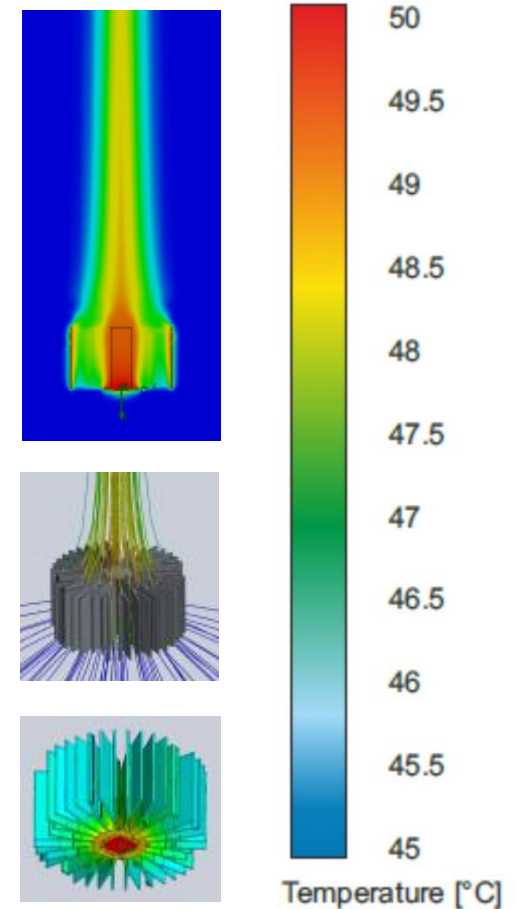
**System efficacy
over 90 lm/W**



LUGSTAR PREMIUM LED

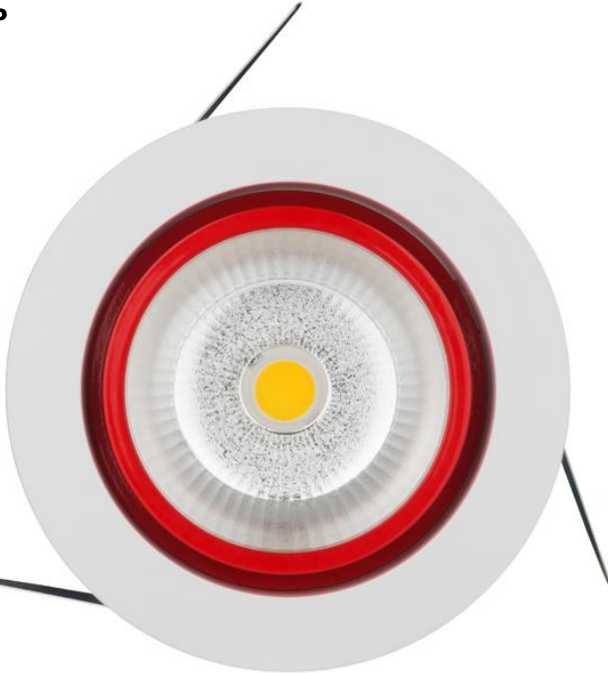
Advantages of passive cooling system in LUGSTAR Premium LED:

- silent work
- extra power not necessary
- lack of mechanical elements that could wear out
- higher resistance for dust and dirt
- reliability

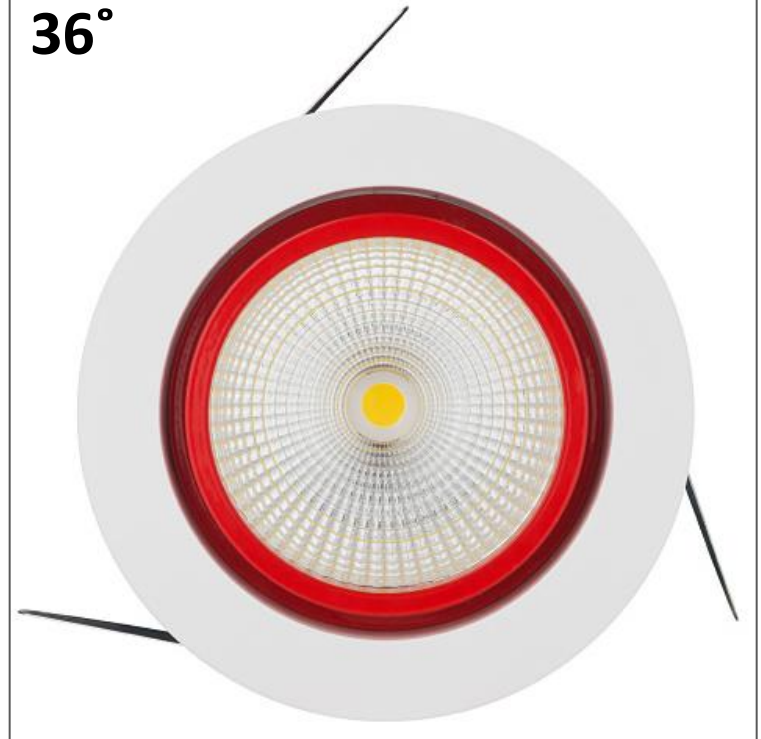


LUGSTAR PREMIUM LED – two reflector types

76°

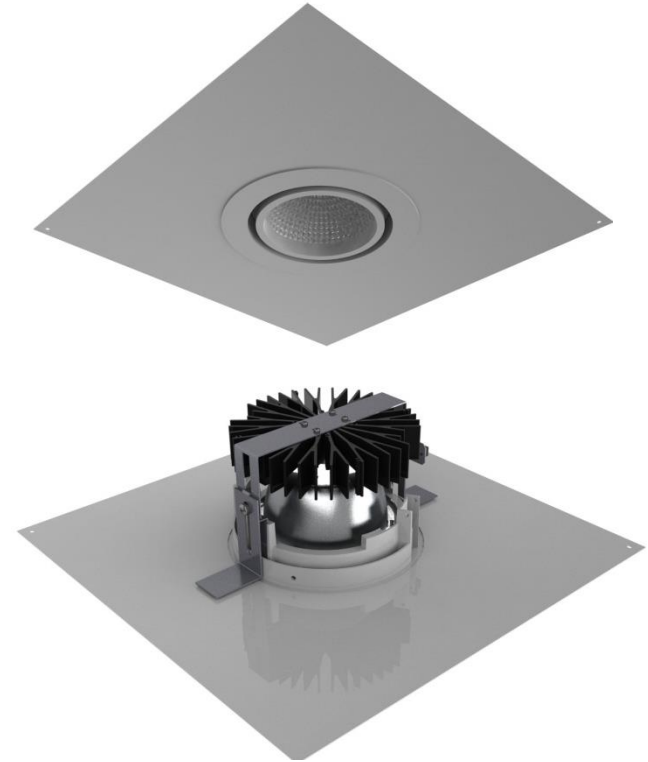
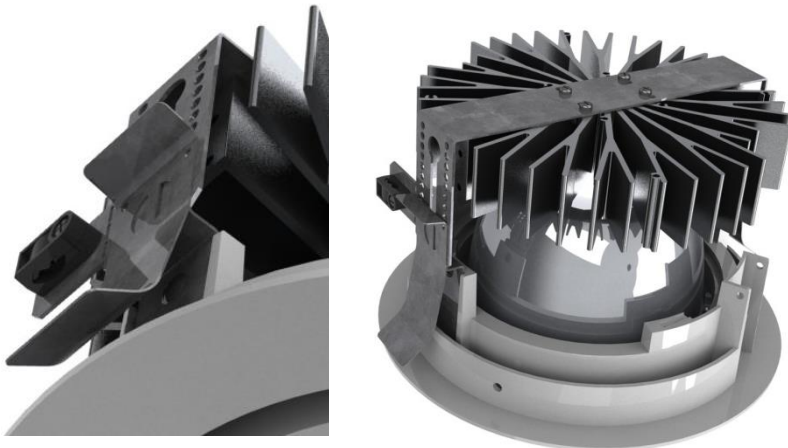


36°



LUGSTAR PREMIUM LED

- Easy tool-less mounting system
- Available special versions for specific ceilings
eg. soft ceiling
- Available special solution for mounting
in bigger mounting holes (additional plate)



System efficacy over 90 lm/W

LUGSTAR Premium LED Case Study



Type of luminaire	Other European brand 2x26W	LUGSTAR PREMIUM LED
System power	54W	29 W
Light source flux	3600 lm	3000 lm
Luminaire efficiency	61%	82%
Luminaire flux	2196 lm	2460 lm
Efficacy	45,5 lm/W	85 lm/W
Energy cost per one luminaire* <small>*3000h; 0,27 EUR = 1 kWh</small>	44 EUR	23,5 EUR

LUGSTAR PREMIUM LED

LED Flux [lm]	Luminaire flux [lm]	White colour temperature	Luminaire power [W]	Replacement of
1500	1245	3000	13	1 x 18 W
1500	1245	4000	13	1 x 18 W
2000	1660	3000	20	2 x 18 W
2000	1660	4000	20	2 x 18 W
3000	2490	3000	29	2 x 26 W
3000	2490	4000	29	2 x 26 W
5000	4150	3000	48	70W MH
5000	4150	4000	48	70 W MH



Boutique,
100m²



**BENEFIT from LUGSTAR PREMIUM LED use:
up to 70% in the year**



LUGSTAR Hi-CRI LED

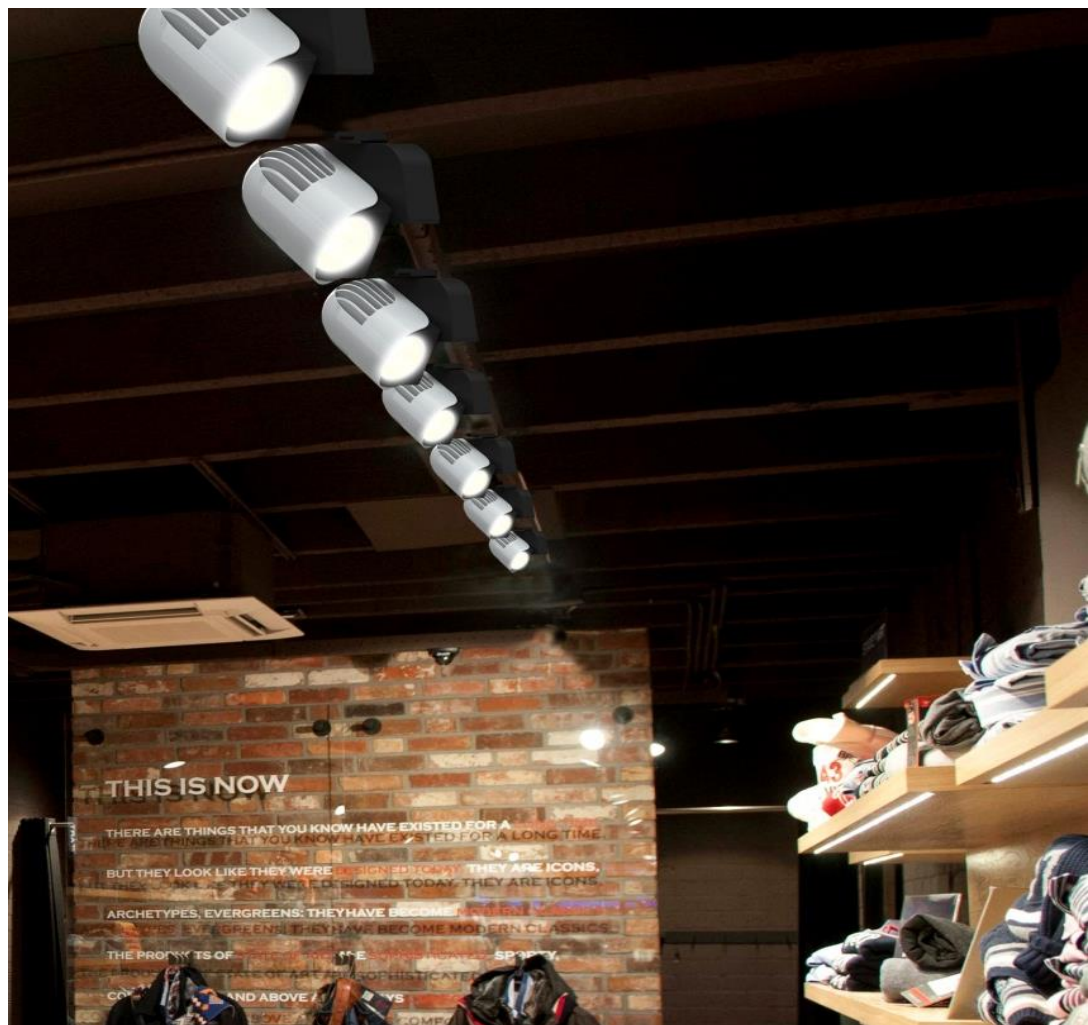
Perfect for retail applications due to the high colour rendering index

- CRI = 93
- High system efficacy > 80 lm/W
- Light source according to Zhaga standard
- Colour temperature 3000K and 4000K
- Available beam angle 36°, 76°
- Lack of UV and IR radiation

CRI = 93



NUOVO LED



NUOVO LED



- Modern design
- Efficacy over **88 lm/W !**
- Passive cooling – ensures proper air circulation, what increases lifespan of LED sources
- Luminaire in 95% made of recycable components
- Luminaire output: 3000 lm / 5000 lm
- 5000 lm = replacement of 70W MH

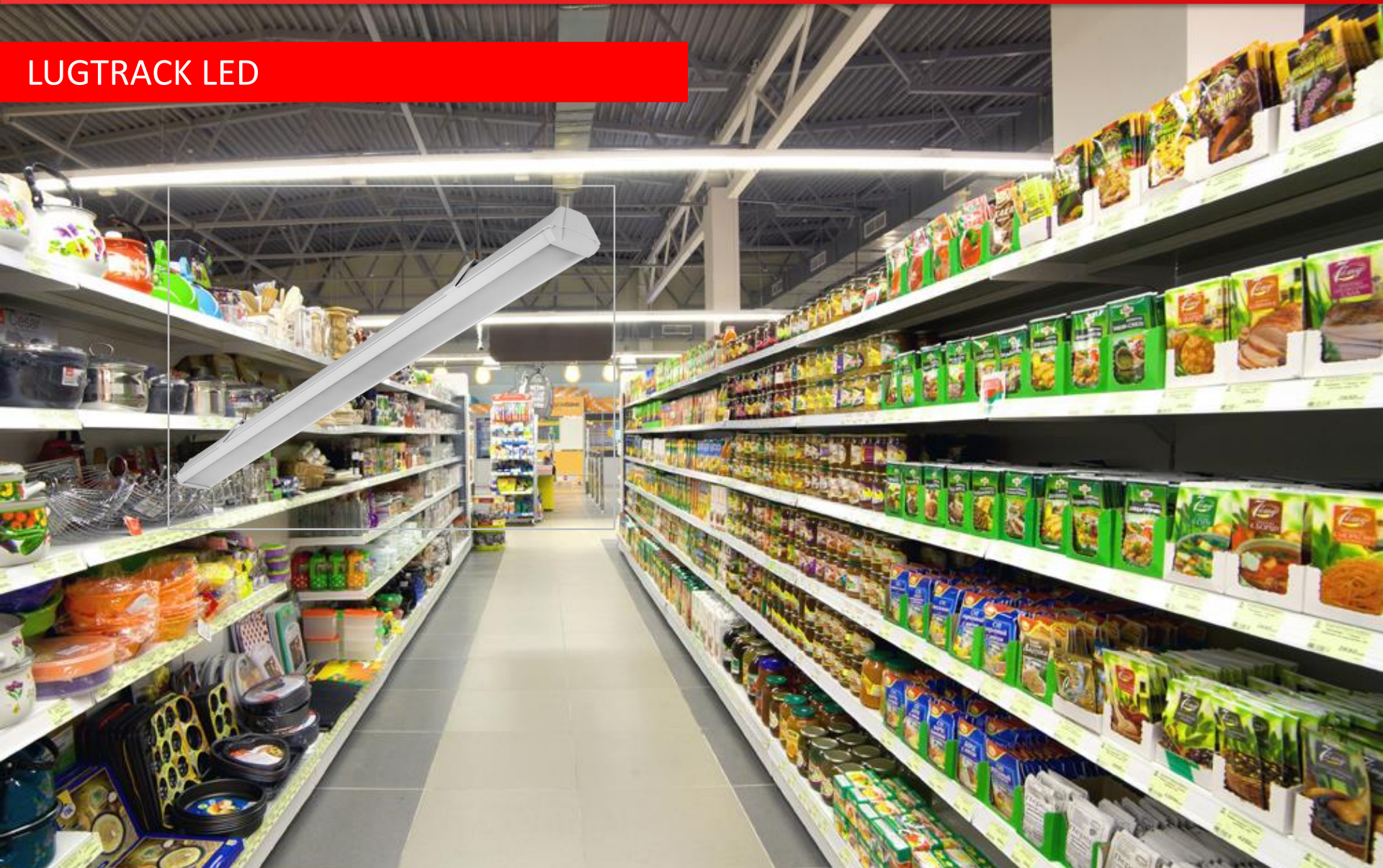
NUOVO LED

White colour temp.	Luminaire flux [lm]	Luminaire power [W]	Luminaire efficacy
3000	2760	34	81 lm/W
4000	2830	34	83 lm/W
3000	2920	34	86 lm/W
4000	2990	34	88 lm/W
3000	2680	34	79 lm/W
4000	2760	34	81 lm/W
3000	3980	52	76 lm/W
4000	4220	52	81 lm/W
3000	3980	52	76 lm/W
4000	4220	52	81 lm/W
3000	4080	52	78 lm/W
4000	4320	52	83 lm/W

NUOVO LED



LUGTRACK LED



LUGTRACK LED

LUGTRACK LED is a professional innovative quick assembly line for LED sources of light



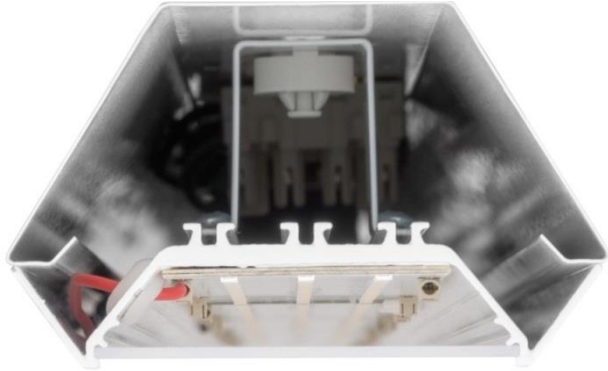
3x
more
efficient



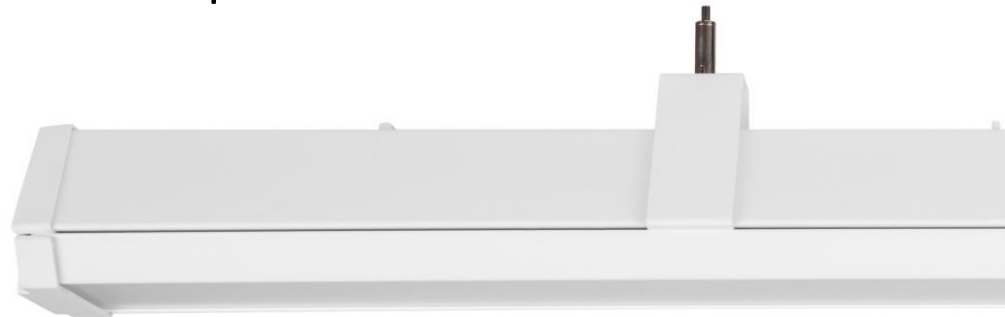
2x
less
energy



50⁰⁰⁰h
lifetime



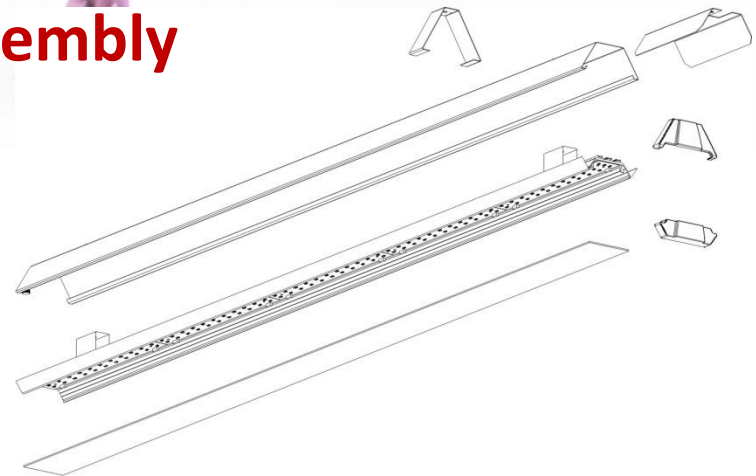
- efficacy up to 103 lm/W!
- efficiency > 90%
- 5 year warranty
- lifespan 50 000 h
- 3 types of diffuser available :
 - satin plexiglass
 - half-mat
 - microprismatic



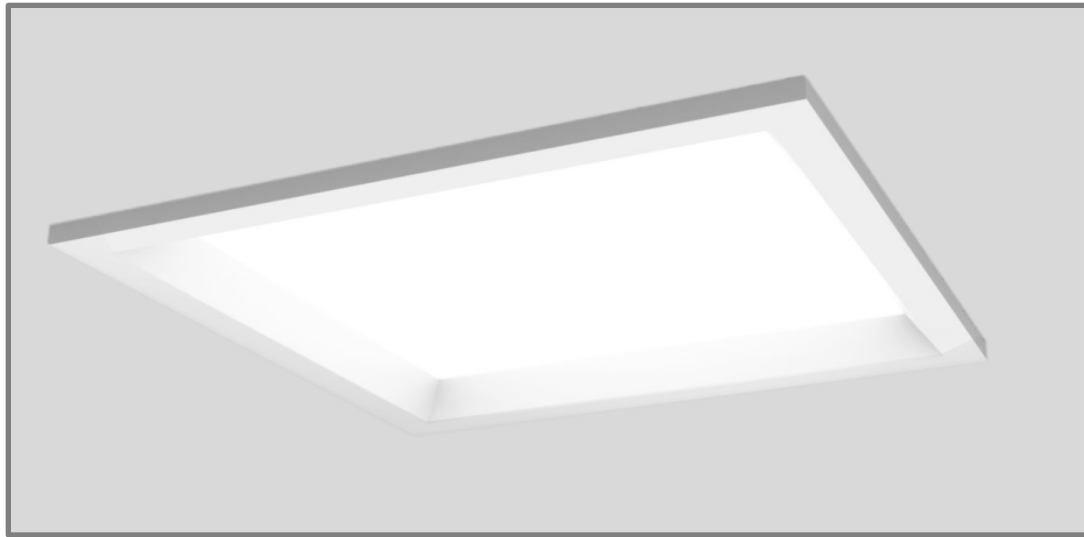
5 year
guarantee
for **LED**



Fast and toolless installation and assembly



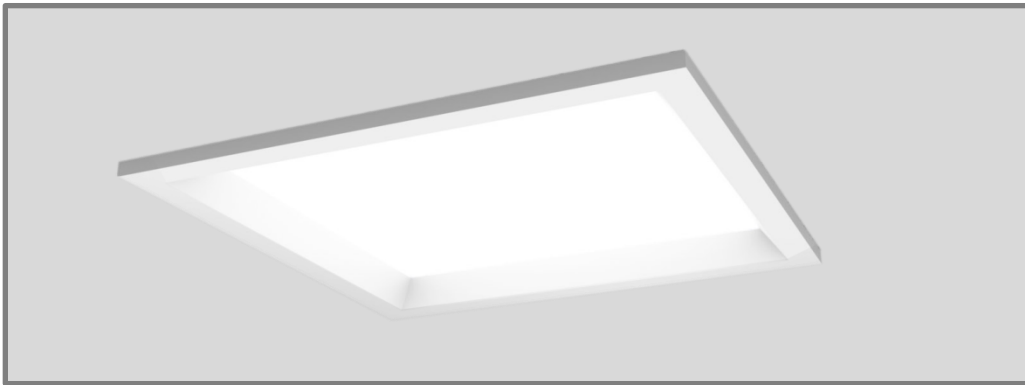
LEDCLASSIC SQUARE



System efficacy up to 100 lm/W



LEDCLASSIC SQUARE



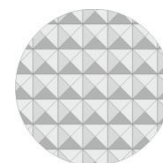
- Modern LED luminaire
- Available flux: 1250 lm and 2500lm
- Available types of covers:

- microprismatic

- satin plexiglass



SATIN



MPRM

System efficacy up to 100 lm/W



Version 350x350mm PB and SURF



LED flux [lm]	LED power [W]	LED modules efficacy	White colour temp.	Luminaire flux [lm]	Luminaire power [W]	Luminaire efficacy	Replacement of
2700	20	135lm/W	3000	2 200	23	96lm/W	2x18 W
2900	20	145lm/W	4000	2 250	23	98lm/W	2x18 W
3500	27	130lm/W	3000	2 750	31	89lm/W	2x26 W
3800	27	141lm/W	4000	2 850	31	92lm/W	2x26 W
4600	37	124lm/W	3000	3 600	42	86lm/W	1x70 W
4900	37	132lm/W	4000	3 700	42	88lm/W	1x70 W

Version 600x600mm PB and SURF



LED flux [lm]	LED power [W]	LED modules efficacy	CRI	White colour temp.	Luminaire flux [lm]	Luminaire power [W]	Luminaire efficacy	Replacement of
6000	44	136lm/W	>80	3000	4 920	48	102lm/W	3x14 / 18 W
6400	44	145lm/W	>80	4000	5 230	48	109lm/W	3x14 / 18 W
8400	63	133lm/W	>80	3000	6 650	68	98lm/W	4x14 / 18 W
8800	63	140lm/W	>80	4000	7 100	68	104lm/W	4x14 / 18 W

PUBLIC UTILITY BUILDINGS

LEDCLASSIC SQUARE



EUROPEAN CENTER OF MUSIC OF K.PENDERECKI , POLAND



LUGCLASSIC LED



100
LUMENS WATT



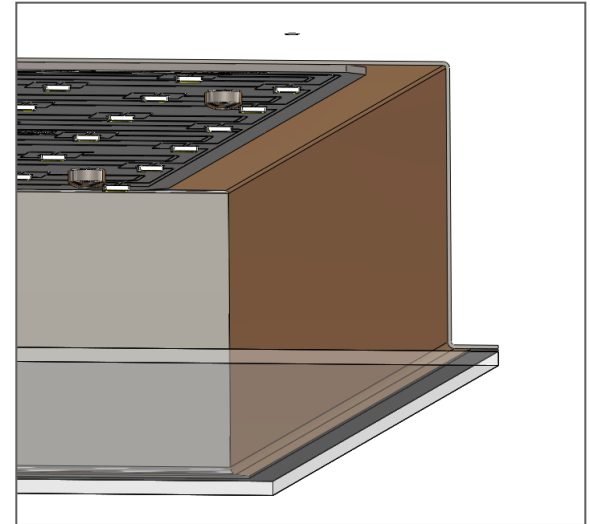
Product delivered to
Centre Hospitalier de Mouscron,
Belgium

100
LUMENS WATT

System efficacy 100 lm/W



- Modern recessed luminaire for LED light sources
- Passive cooling system
- Modern design
- Luminaire efficiency > 90%





LUGCLASSIC LED Case Study



Type of luminaire	Other European brand 4x18 W	LUGCLASSIC LED rec
System power	75W	39W
Light source flux	4050lm	3300 lm
Luminaire efficiency	72%	90%
Luminaire flux	2961 lm	2970 lm
Efficacy	39,5 lm/W	99 lm/W
Energy cost per one luminaire* *3000h; 0,27 EUR = 1 kWh	60,75 EUR	24,30 EUR



„ARENA OSTRODA” CONFERENCE AND FAIR CENTER, POLAND

LUGCLASSIC ECO LED



System efficacy up to 98 lm/W

LUGCLASSIC ECO LED



- Body made of steel sheet
- Aluminium frame
- Two sizes of luminaire
- The best rate lm/EUR

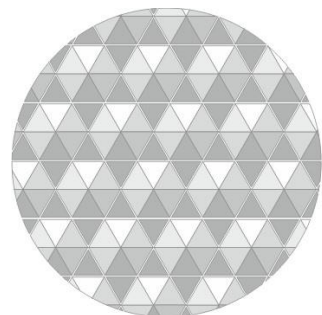


System efficacy up to 98 lm/W

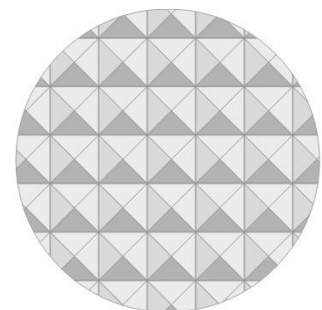
LUGCLASSIC ECO LED



SATIN



LOW UGR



MPRM

- Modern LED luminaire for modular ceilings in two sizes :

- 600mmx600mm
- 625mmx625mm

- Available diffusers:

- SATIN
- LOW UGR
- MPRM

System efficacy up to 98 lm/W

LUGCLASSIC ECO LED



LED OUTPUT	SYSTEM OUTPUT	WHITE COLOUR TEMP	LED POWER	LUMINAIRE POWER	EFFICACY	Replacement Of
4320lm	3420lm	4000K	33 W	37 W	92 lm/W	3 x 14W/18W
4000lm	3160lm	3000K	33 W	37 W	85 lm/W	3 x 14W/18W
4860lm	3850lm	4000K	37 W	41 W	94 lm/W	4 x 14W/18W
4500lm	3560lm	3000K	37 W	41 W	87 lm/W	4 x 14W/18W

LUGCLASSIC ECO LED

Case Study



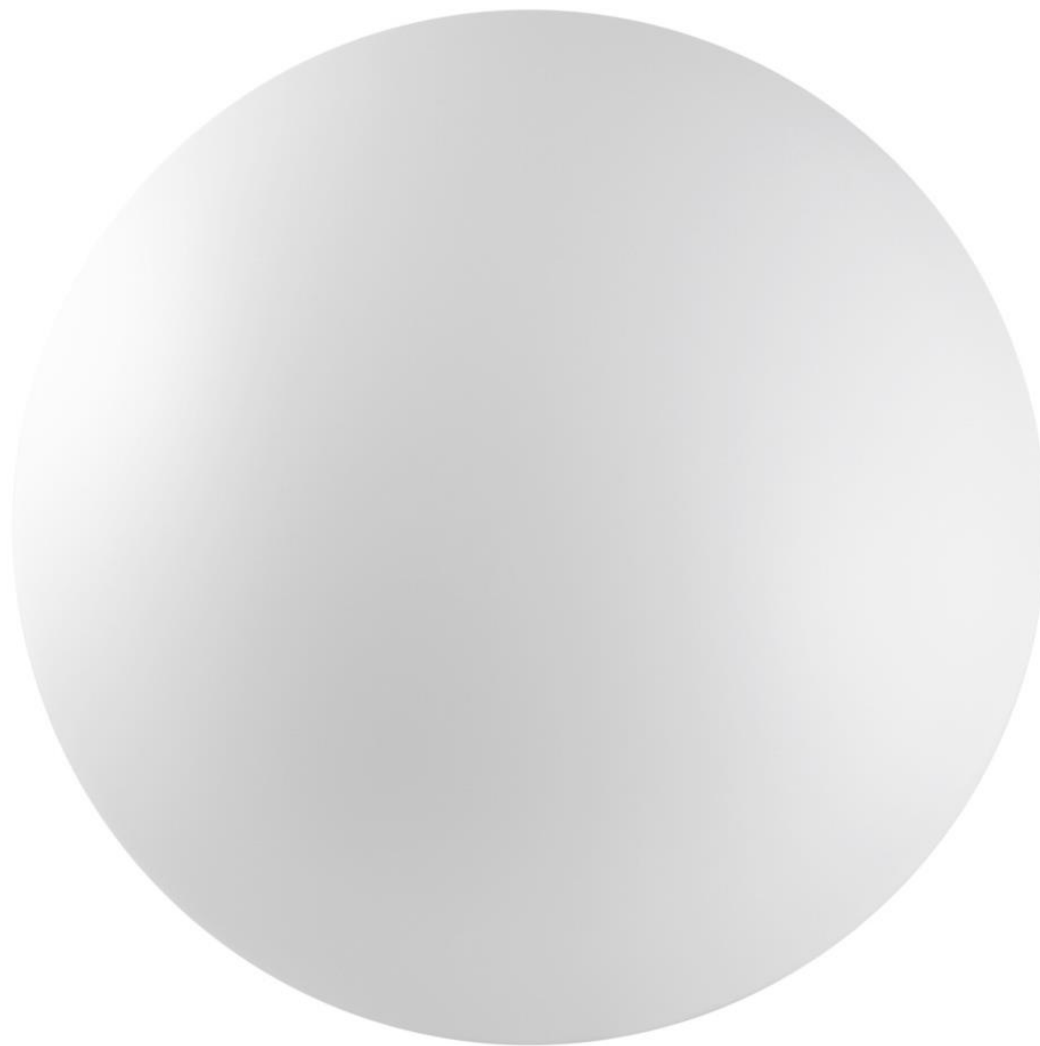
Type of luminaire	Other European brand 4x18 W	LUGCLASSIC ECO LED rec
System power	80W	41W
Light source flux	5400 lm	4500 lm
Luminaire efficiency	55%	85%
Luminaire flux	2970 lm	3825 lm
Efficacy	37lm/W	93 lm/W
Energy cost per one luminaire* *3000h; 0,27 EUR = 1 kWh	43,20 EUR	22,14 EUR

AMBRA LED

- Modern LED plafond IP40
- Base made of steel painted white
diffusor made of opal acryl



AMBRA LED

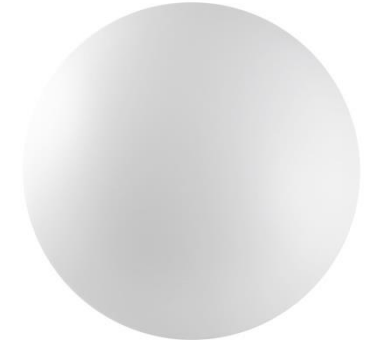
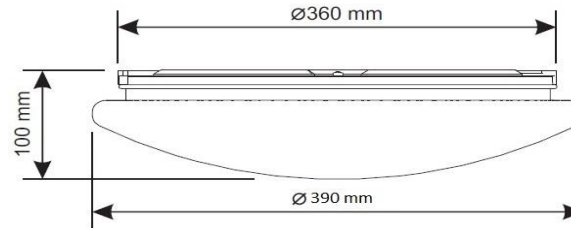


AMBRA LED Case Study



Type of luminaire	Other European brand 2x26 W	AMBRA LED
System power	45W	22W
Light source flux	3600lm	2400 lm
Luminaire efficiency	38%	58%
Luminaire flux	1400 lm	1392 lm
Efficacy	31 lm/W	63 lm/W
Energy cost per one luminaire* *3000h; 0,27 EUR = 1 kWh	36,45 EUR	17,82 EUR

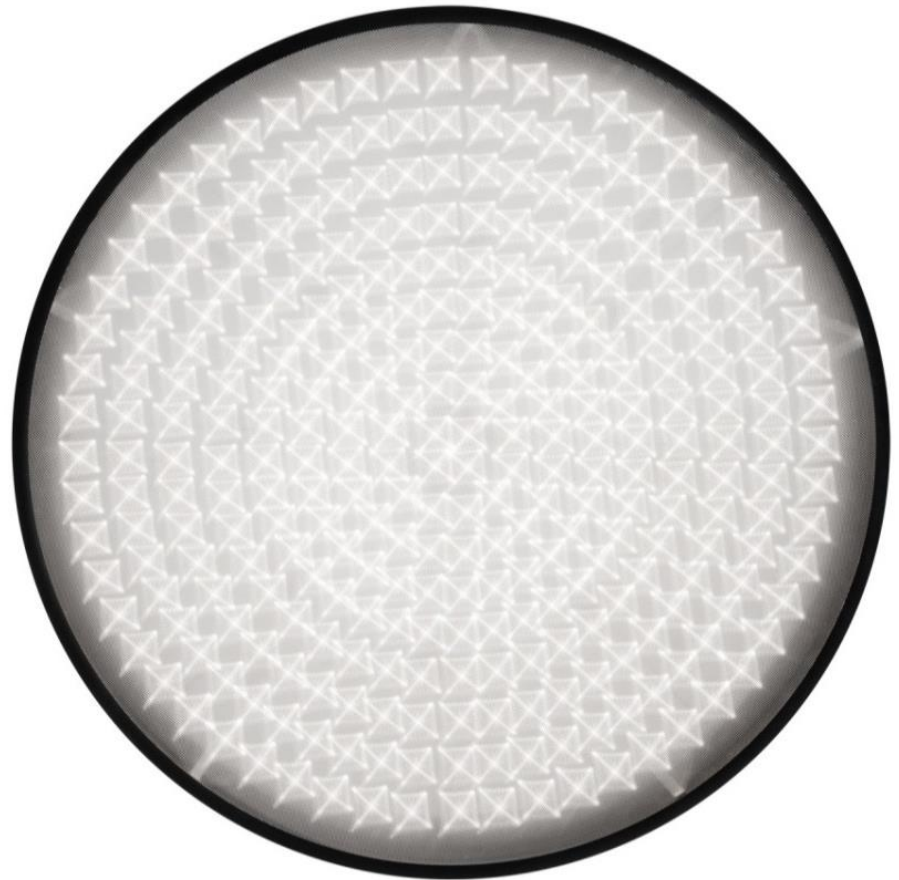
AMBRA LED



LED OUTPUT	SYSTEM OUTPUT	WHITE COLOUR TEMP	LED POWER	LUMINAIRE POWER	EFFICACY
735 lm	488 lm	3000K	8 W	10 W	48,8 lm/W
745 lm	495 lm	4000K	7 W	10 W	49,5 lm/W
2850 lm	1660 lm	3000K	25 W	29 W	57 lm/W
3110 lm	1810 lm	4000K	25 W	29 W	62 lm/W
2850 lm	1660 lm	3000 K	25 W	31 W	53,5 lm/W
3110 lm	1810 lm	4000 K	25 W	31 W	58 lm/W

TLON LED

- decorative pendant or surface mounted LED luminaire
- body made of top quality aluminium components
- microprismatic diffuser in standard, opal diffuser available on request
- different body colours (on request)



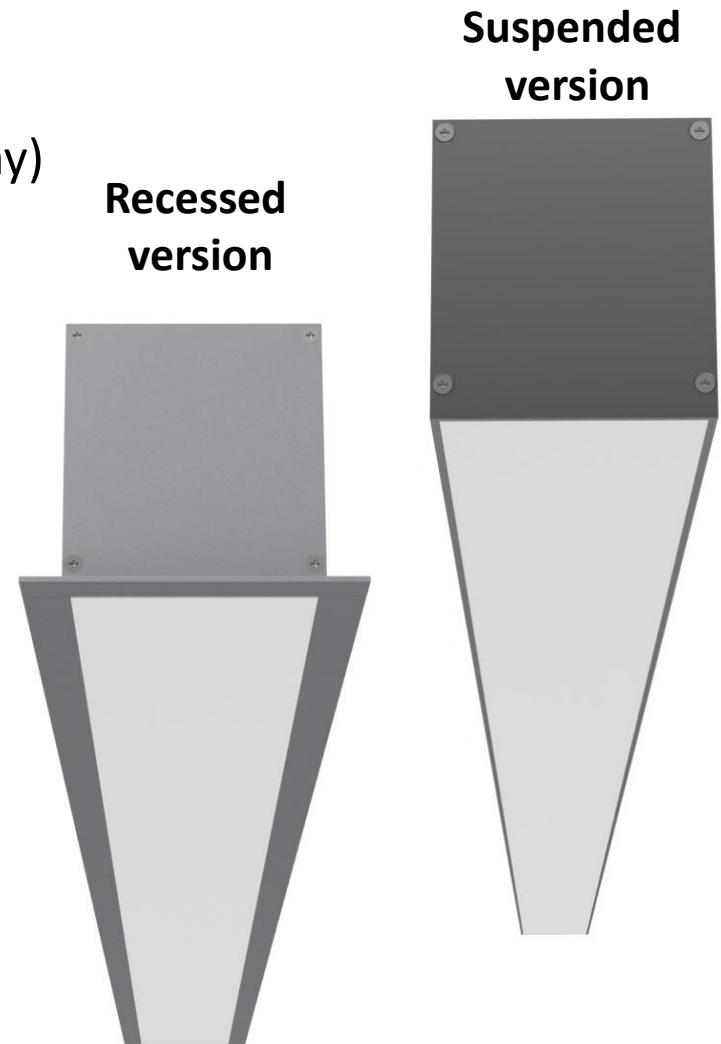
TLON LED

- DALI control system available
- RGB LED version available (on request)
- Different diameters available



VOLICA LED

- Decorative luminaire with anodized C-31 (gray) aluminium profile
- Simplicity of the form meets expectations of architects
- Available size: 1200mm
- Mounting: recessed and suspended
- LOR 75%

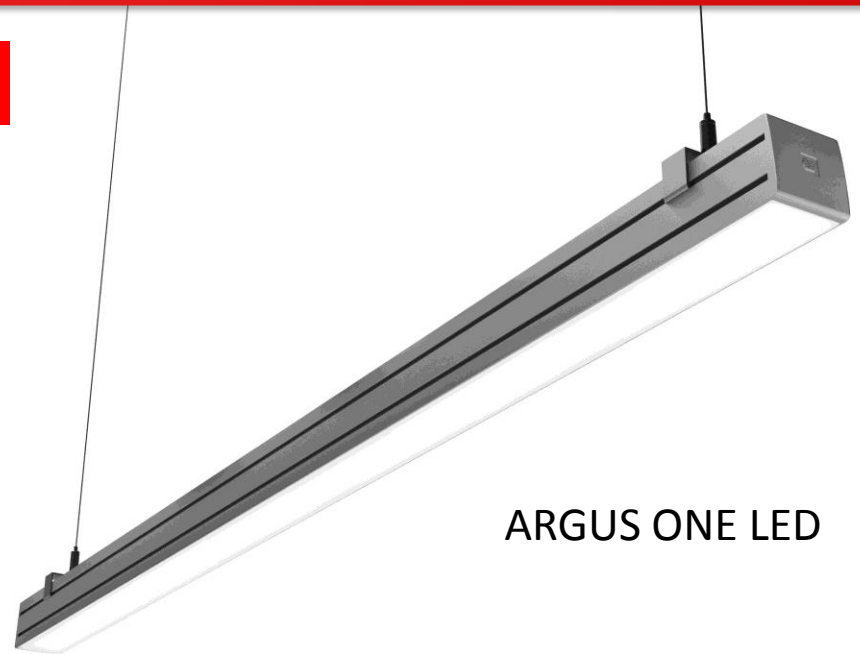


OFFICE LIGHTING

Aluminium profile luminaires

VIGO LED, ARGUS LED, A-LINE LED

- Available size: 1200mm
- Flux: 4500 lm
- 3000 K and 4000 K
- Power supply 40 W
- LOR 75%



ARGUS ONE LED



VIGO LED

OFFICE LIGHTING

Aluminium profile luminaires



EUROPEAN CENTER OF MUSIC OF K.PENDERECKI , POLAND

HB 886

FLASH&DQ



2012

100
LUMENS WATT

Great efficacy – not only impressive design!

HB 886

 **FLASH&DQ**

**Impressive decorative LED high bay
designed for modern interiors**

Key features:

- Optics: microprismatic diffuser for LED
- Construction based on plastic polyester material (resin)
- Up to 13.000 lm
- **Efficacy: 100 lm/W**

100
LUMENS WATT

Great efficacy – not only design!

1000
LUMENS WATT





„Czajka” Sewage Treatment Plant , POLAND

111
LUMENS WATT

111
lumen per WATT



111
LUMENS^{WATT}



ATLANTYK STRONG LED



- Industrial hermetic luminaire IP65
- Colour temperature: 3000K and 4000K
- Colour rendering index >80
- Efficiency > 90%
- Available flux up to 7100 lm

System efficacy up to: 111 lm/W

ATLANTYK STRONG LED

111
LUMENS/WATT

LED OUTPUT [lm]	SYSTEM OUTPUT [lm]	WHITE COLOUR TEMP [K]	LED POWER [W]	LUMINAIRE POWER [W]	EFFICACY	Replacement of
3100	2800	4000	25	28	100 lm/W	1x36W
4400	3900	4000	33	35	111 lm/W	1x58W
5300	4700	4000	42	45	104 lm/W	2x36W
7400	6640	4000	57	61	108 lm/W	2x58W
2950	2650	3000	25	28	94 lm/W	1x36W
4200	3650	3000	33	35	104 lm/W	1x58W
5100	4500	3000	42	45	100 lm/W	2x36W
7100	6380	3000	57	61	104 lm/W	2x58W

ATLANTYK STRONG LED



CRI > 80



50 - CRI - 90

111
LUMENS/WATT

ATLANTYK STRONG LED

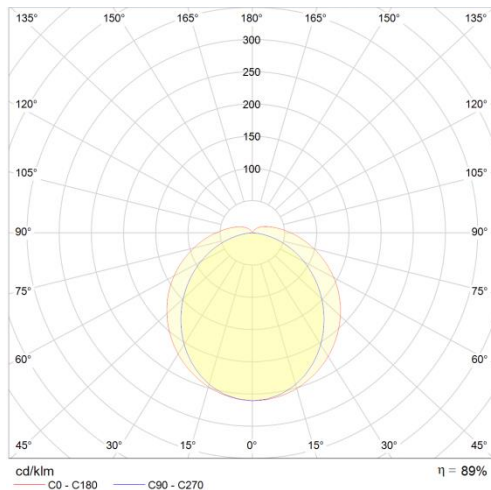
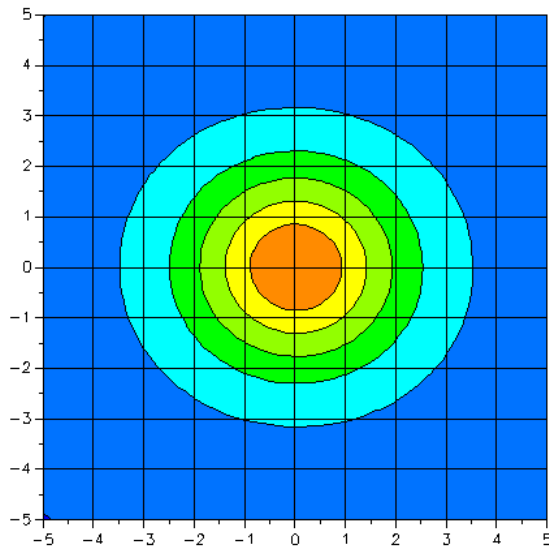


ATLANTYK STRONG LED

- Opal diffuser
- High transparency > 90%
- LED modules produced by LUG Light Factory
- Diods: Osram Duris E5 / LED of medium power



Lighting curve



Illuminance Unit : Lux

Distance : 3 m

Half map width : 5 m

Levels : 7

Nb of points : 61

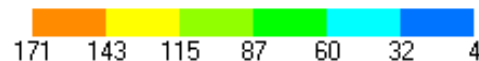
Unit

- ☒ International
☐ US

Display

- ☒ Grid
☒ 2D
☐ 3D

Map along: -Z



111
LUMENS/WATT

ATLANTYK STRONG LED

Case Study



Type of luminaire	Other European brand 1x58W	ATLANTYK STRONG LED
System power	68W	36 W
Light source flux	6700lm	4400 lm
Luminaire efficiency	62%	91%
Luminaire flux	4020 lm	4004 lm
Efficacy	59 lm/W	111 lm/W
Energy cost per one luminaire* *3000h; 0,27 EUR = 1 kWh	55 EUR	29 EUR



BENEFITS from ATLANTYK STRONG LED use:
energy cost lower up to 49 Euro/year

Payback period – less than 24 months

ATLANTYK STRONG LED



CRUISER LED – great quality for industry

100
LUMENS WATT

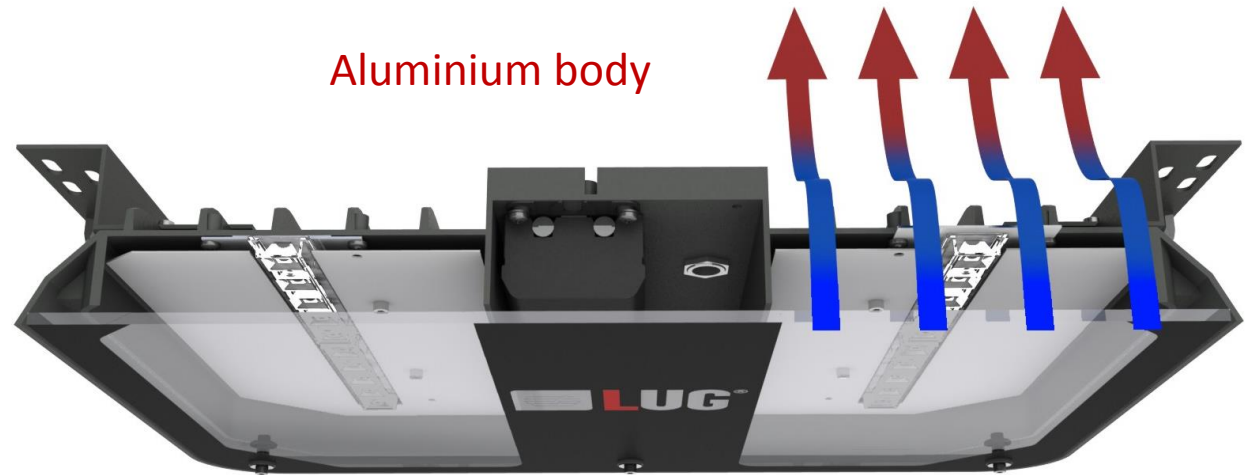


CRUISER LED – great quality for industry

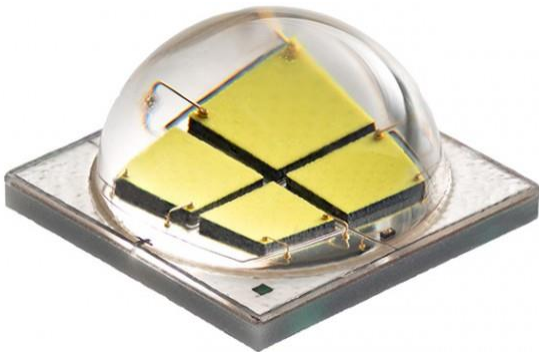
- Up to **16 300 lm** luminaire output
- Max power consumption up to **155W**
- Up to **105 lm/W**
- IP66 IK07
- Available LLOC and DALI light control



CRUISER LED – passive cooling system

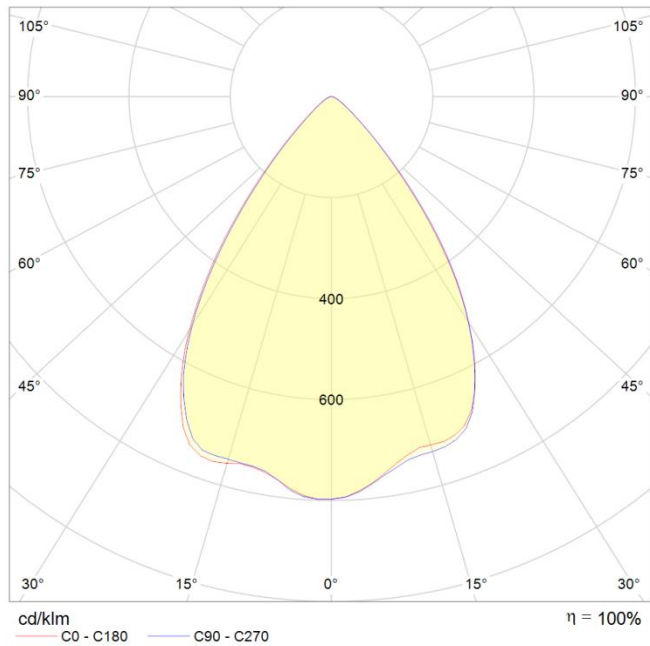


Strengthened glass



- LED modules
- 10 LEDs in a module
- 4000K and 6500K

Lighting curve



0.5	0.71	E(0°) E(C0)	35.4°	51974 14081
1.0	1.42	E(0°) E(C0)	35.4°	12993 3520
1.5	2.13	E(0°) E(C0)	35.4°	5775 1565
2.0	2.84	E(0°) E(C0)	35.4°	3248 880
2.5	3.55	E(0°) E(C0)	35.4°	2079 563
3.0	4.26	E(0°) E(C0)	35.4°	1444 391
Distance [m]	Cone Diameter [m]	Illuminance [lx]		



Accessories

Tight connectors in a set
– installation without opening the
luminaire



Robust construction:
for suspended version – special hangers
appropriate up to 140 kg

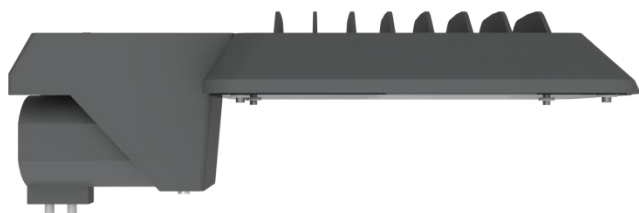


CITY LED

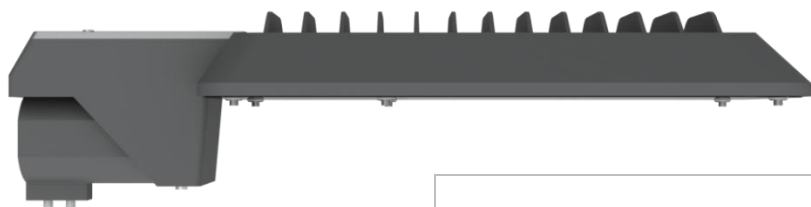


- LED street lighting luminaire
- Aluminium body in a grey colour
- Luminaire application without opening the body
- Supply wire included

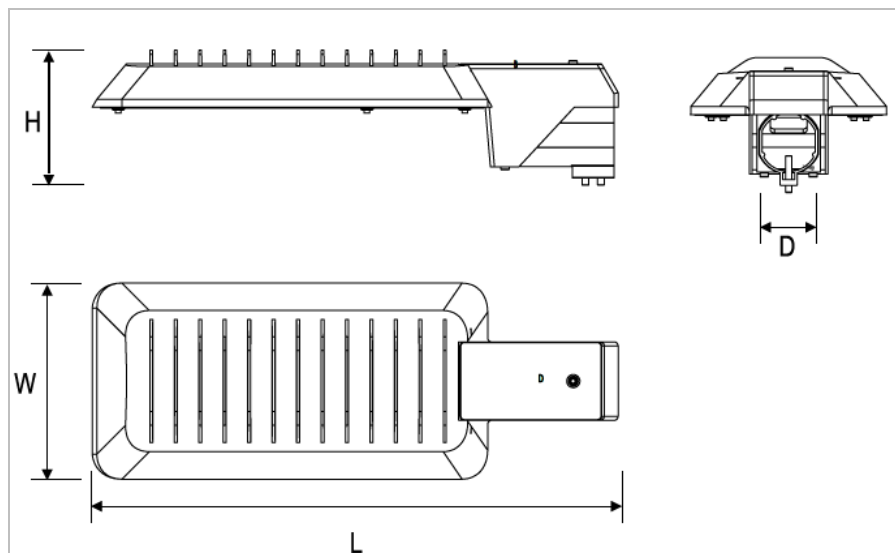
Two sizes of the body



490x240x170



645x240x170



CITY LED



LED OUTPUT [lm]	SYSTEM OUTPUT [lm]	WHITE COLOUR TEMP [K]	LED POWER [W]	LUMINAIRE POWER [W]	EFFICACY	Replacement of
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DALI LLOC

3750	2925	4000	33	35	84 lm/W	45W
7500	5850	4000	66	70	84 lm/W	70(60)W
9350	7293	4000	82	90	81 lm/W	100W
4320	3370	5700	33	35	96 lm/W	45W
8640	6739	5700	66	70	96 lm/W	100W
10800	8424	5700	82	90	94 lm/W	100W
4320	3370	6500	33	35	96 lm/W	45W
8640	6739	6500	66	70	96 lm/W	100W
10800	8424	6500	82	90	94 lm/W	100W

ED

3750	2925	4000	33	35	84 lm/W	45W
4320	3370	5700	33	35	96 lm/W	45W
4320	3370	6500	33	35	96 lm/W	45W

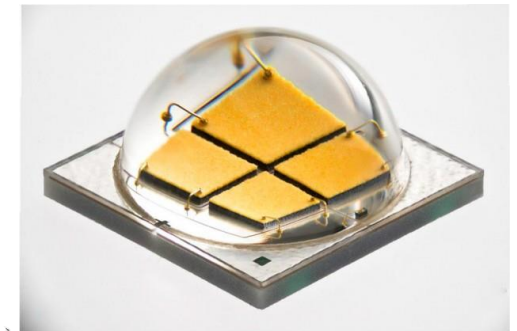
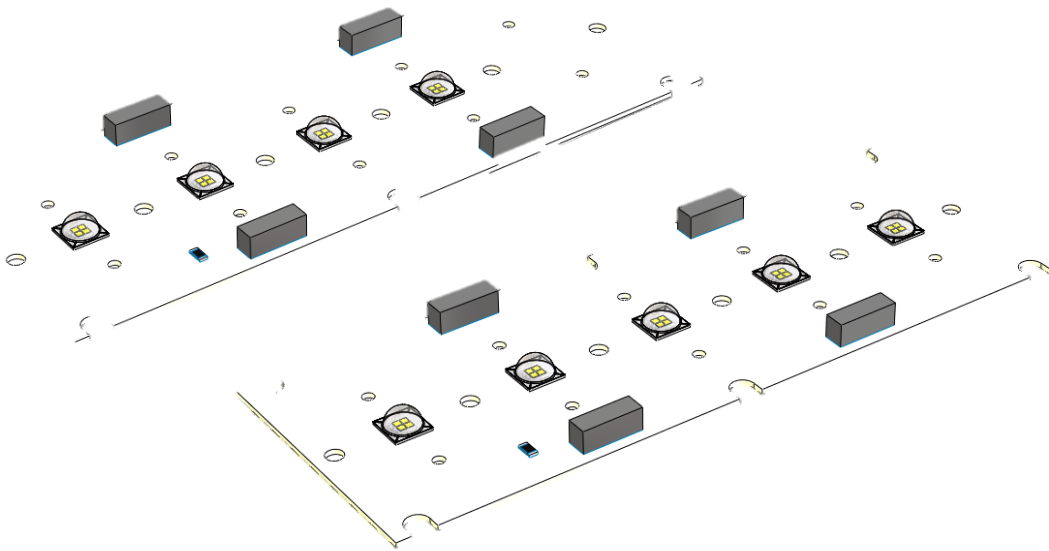
CITY LED Case Study



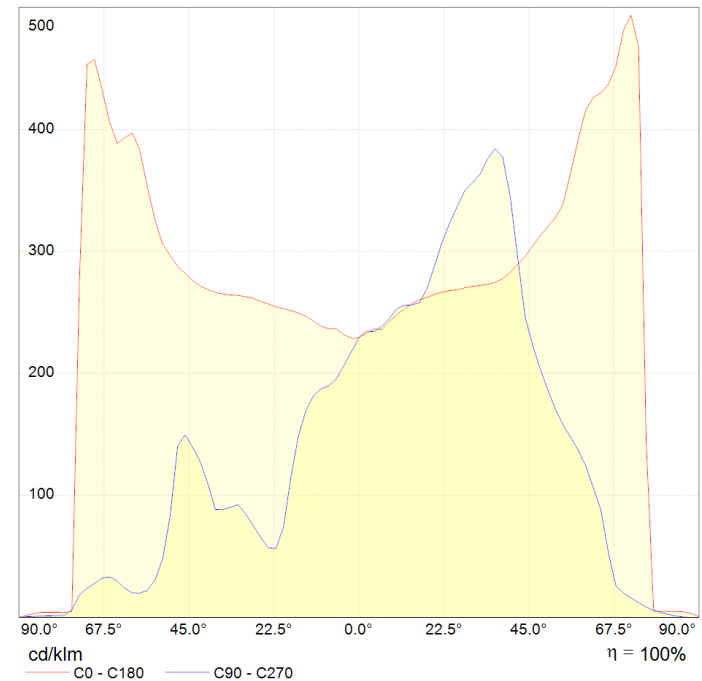
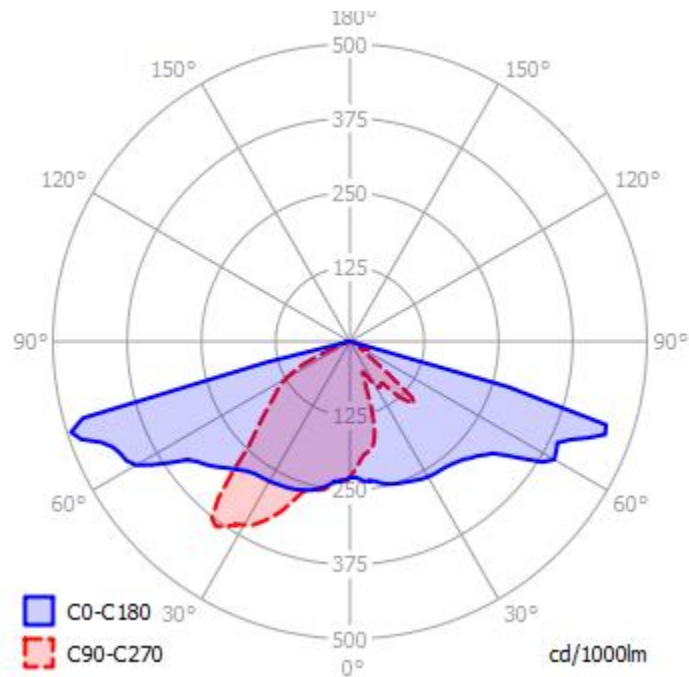
Type of luminaire	Other leading European brand 1 x 150 W	CITY LED
System power	170W	90W
Light source flux	14.400lm	10.800 lm
Luminaire efficiency	69%	78%
Luminaire flux	9750 lm	8424 lm
Light use ratio	0,8 (7800 lm)	0,92 (7750 lm)
Efficacy	38 lm/W	99 lm/W
Energy cost per one luminaire* *3500h; 0,27 EUR = 1 kWh	160,65 EUR	85 EUR

CITY LED

- LED modules by LUG – own production with CREE MK-R
700mA 8W
- One modul includes 4 or 5 leds
- 4000K, 5700K and 6500K

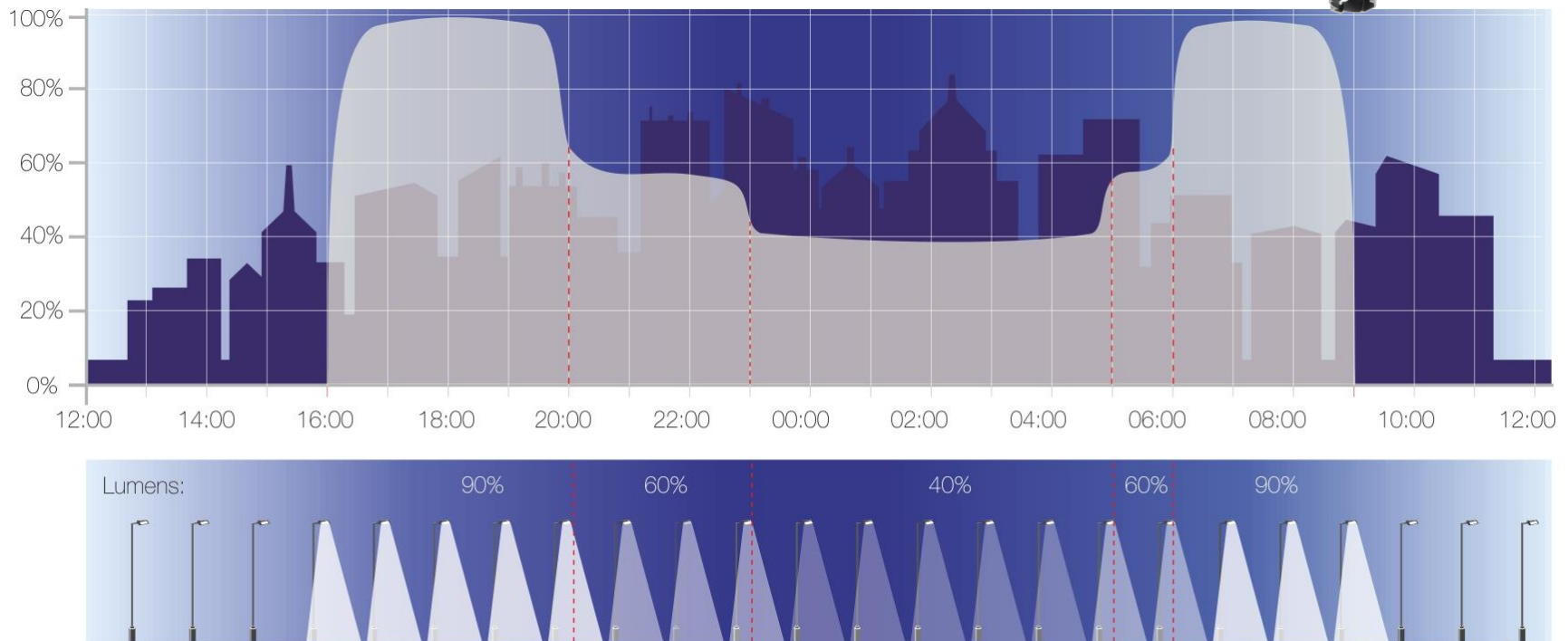


Lighting curve



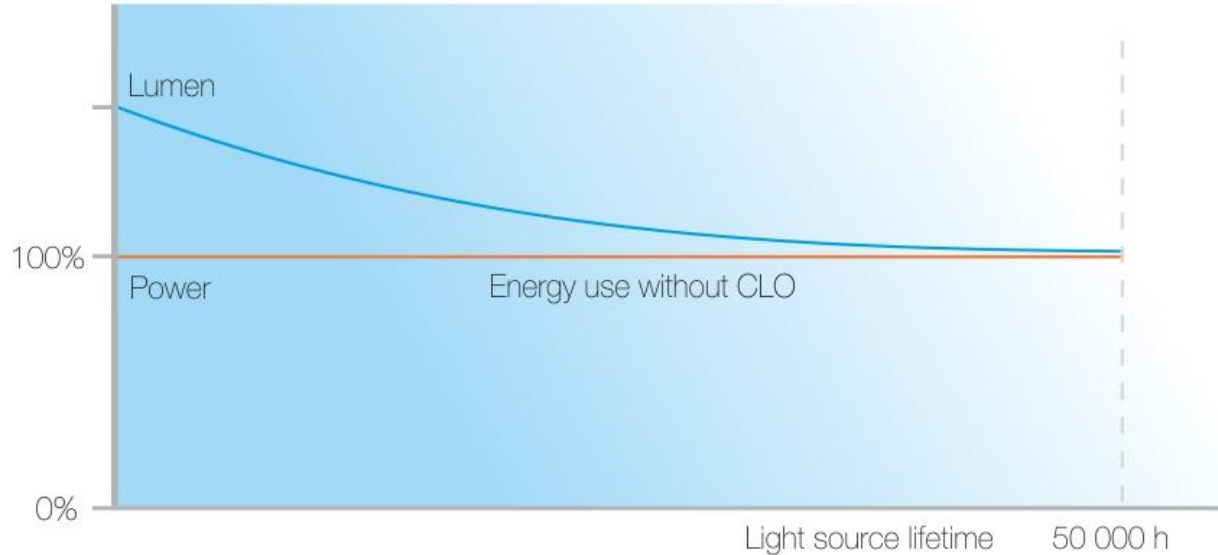
LLOC- LUG Light Outdoor Control

Dynadimmer



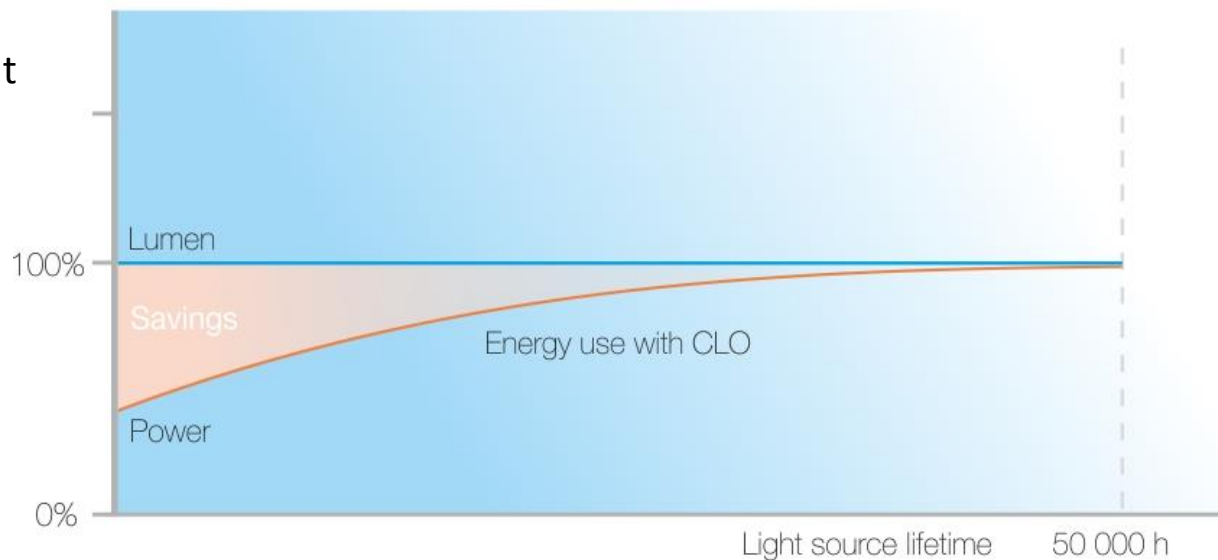
Switching on and of at set hours, flux dependent of the time and about of the cars on the road

LLOC- LUG Light Outdoor Control



CLO – constant light output

Switching with different level of luminaire flux



LLOC- LUG Light Outdoor Control



Possibility of particular luminaire control or control of the group of luminaires from central terminal



Modern footbridge in Rzeszów, POLAND



To illuminate this object we used **MODENA LED** – in standard it's a wallwasher, but for this project we redesigned it to fit in a handrail as specified by the architect

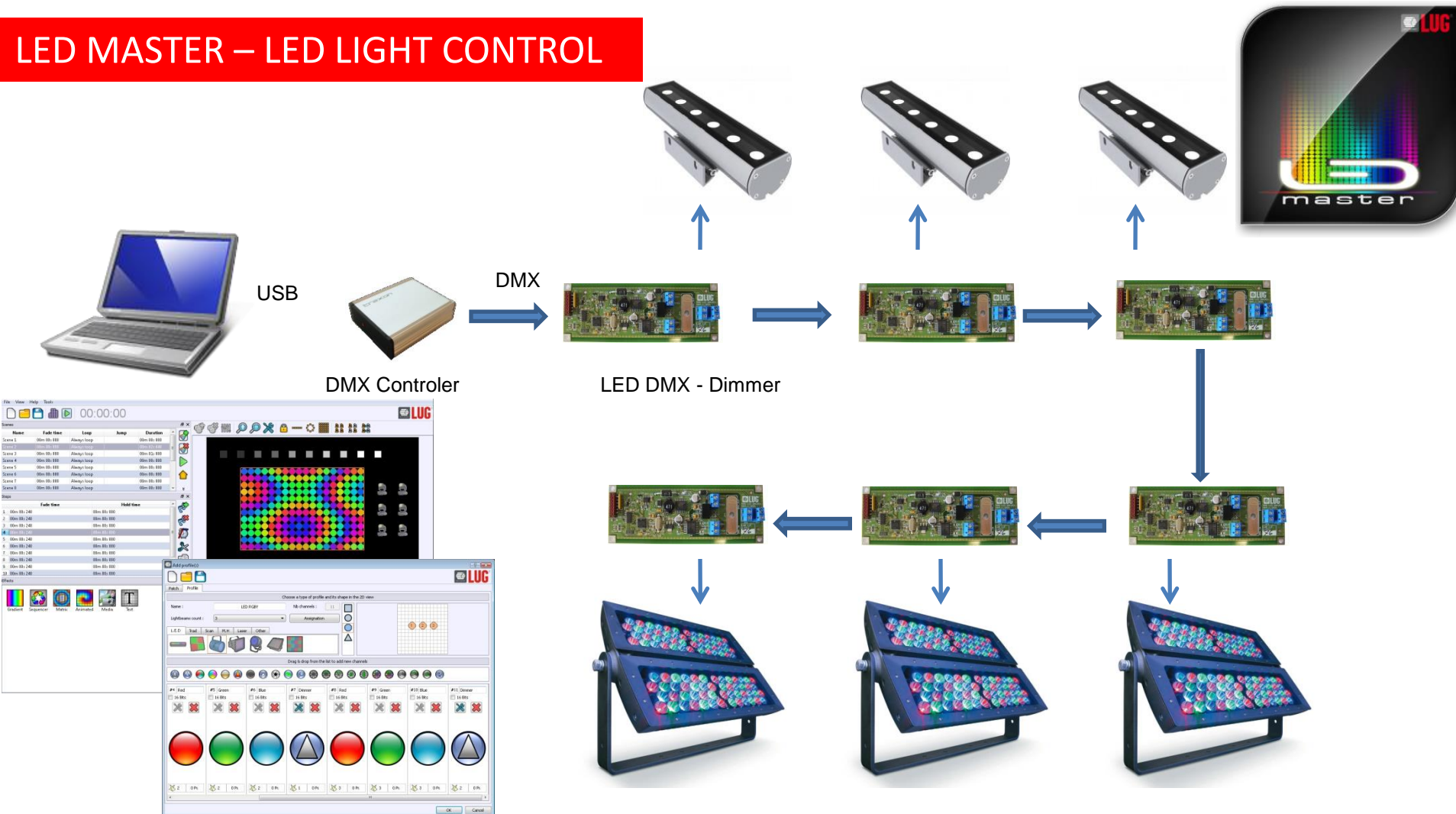
Modern footbridge in Rzeszów, POLAND

MODENA LED

- Decorative architectural wallwasher IP 65
- LED in one of 5 monochromatic colours: white, red, green, blue or amber
- RGB version available



LED MASTER – LED LIGHT CONTROL





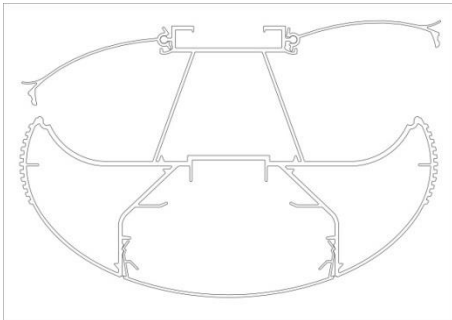
JUWENTUS office building, POLAND

POZNAŃ Integrated Communication Center

Poznan Integrated Communication Center was illuminated by LUGTRAIN by LUG

LUGTRAIN - modern lighting system incorporating:

- luminaires
- sound system
- electrical installations,
- low voltage wiring system
- warning beep system



LIGHTING PROJECT STUDY: POZNAN Integrated Communication Center



POZNAN Integrated Communication Center

LIGHTING PROJECT STUDY: POZNAN Integrated Communication Center



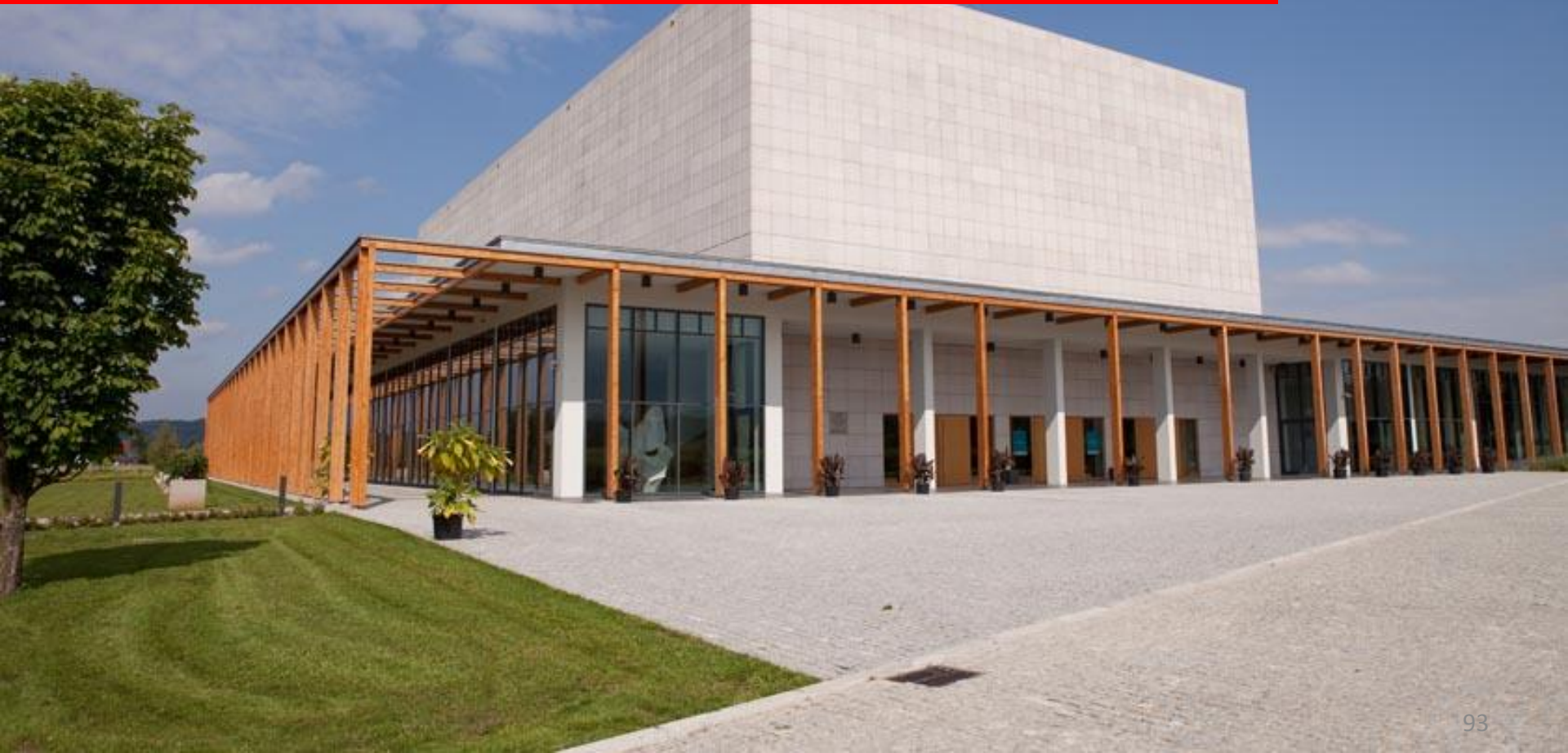
POZNAŃ Integrated Communication Center

LED LIGHTING PROJECT STUDY: Penderecki European Center of Music

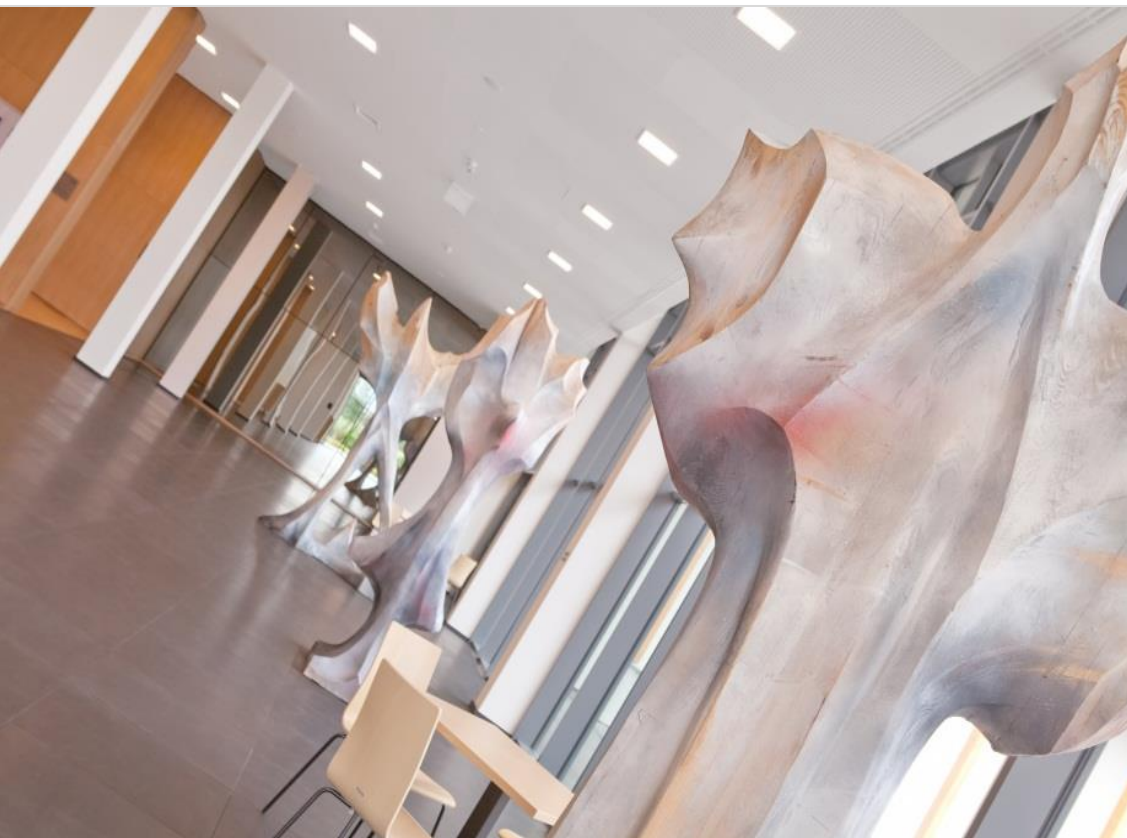
European Center of Music

– place to educate and contemplate music

100% LED lighting



European Center of Music 100% LED lighting



Technical assumptions:

Height of the room = mounting height: 4,5 m

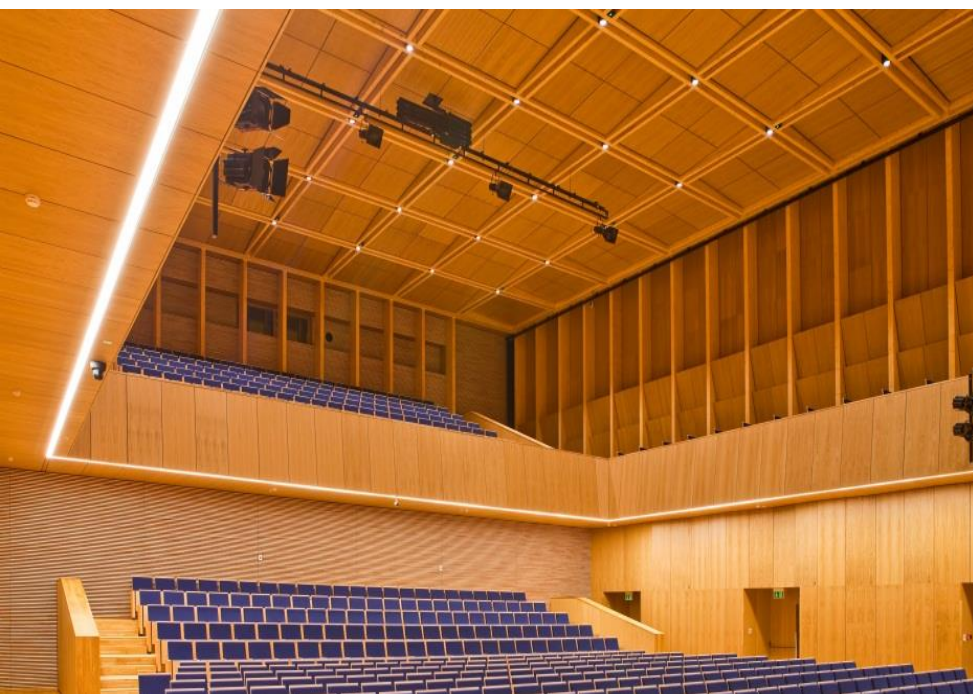
Luminaires:

85 pcs LEDCLASSIC SQUARE recessed

$4.02 \text{ W/m}^2 = 1.80 \text{ W/m}^2/100 \text{ lx}$

Foyer		
Work: hours per day	16	
Work: days per a year	360	
Energy cost [€]	€0,27	
Used solution	T5	LED
Total luminaires power [kW]	1,378	0,6864
Annual energy consumption [kWh]	7 937	3 954
Annual energy cost [€]	€2142,99	€1067,58
Annual savings		
Energy [kWh]	3 984	
Energy cost [€]	€ 1075,41	

Krzysztof Penderecki European Center of Music - 100% LED lighting



Details:

Height of the room: 13 m

Luminaires:

44 pcs ARGUS ONE LED 3K 4400LM (1.000)

72 pcs LUGSTAR PREMIUM LED 3000 3K WHITE (1.000)

Calculation of savings for concert hall

Work: hours per day	16	
Work: days per a year	360	
Energy cost [€]	€	0,27
Used solution	T5	LED
Total luminaires power [kW]	28,281	18,2904
Annual energy consumption [kWh]	162 899	105 353
Annual energy cost [€]	€ 43 982,61	€ 28 445,23
Annual savings		
Energy [kWh]	57 546	
Energy cost [€]	€ 15 537,38	

Krzysztof Penderecki European Center of Music - 100% LED lighting



Calculation of savings for entire objects

Work: hours per day	16	
Work: days per a year	360	
Energy cost [€]	€	0,27
Used solution	T5	LED
Total luminaires power [kW]	142,9	99,9
Annual energy consumption [kWh]	822885	575525
Annual energy cost [€]	€ 222 179	€ 155392
Annual savings		
Energy [kWh]	247360	
Energy cost [€]	€ 66787	

Centre Hospitalier de Muscron, Belgium



Applied product: LUGCLASSIC LED surf

Calculation of savings for concert hall

Work: hours per day	22,2	
Work: days per a year	365	
Energy cost [€]	€	0,27
Used solution	T5	LED
Total luminaires power [kW]	105,6	42,24
Annual energy consumption [kWh]	855677	342271
Annual energy cost [€]	€ 231033	€ 92413
Annual savings		
Energy [kWh]	513406	
Energy cost [€]	€ 138620	

London, UK

Paris, France

Dubai, UAE

Sao Paulo, Brazil

Berlin, Germany

Zielona Gora, Poland

Kiev, Ukraine

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