LEDGINE

The future-proof solution for outdoor luminaires

PHILIPS

sense and simplicity

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CitySoul installation
Marseille, France

LEDGINE - the future-proof Philips solution

Highly efficient, long-lasting, environmentally friendly and controllable, LEDs have opened up a whole new world of possibilities for lighting. Over the past decade technology has advanced at an incredible rate, enabling you to light exciting spaces and create flexible ambiences with high-intensity white or colored light, and using a fraction of the energy consumed by conventional lighting technologies.

Philips luminaires incorporating LEDGINE provide a long-lasting solution that can be upgraded simply by replacing the module. This enables you to create a city with authentic, aesthetic appeal now, confident in the knowledge that you will still be able to benefit from new LED innovations that become available in the future. This means that LEDGINE luminaires will continue to represent a great investment in years to come. It also means you will be prepared for any changes in legislation, because when a module becomes outdated it can simply be replaced by a new, fully compliant version. Furthermore, LEDGINE means you have one light source type for all your luminaires, saving you the burden of having to manage all kinds of logistical issues resulting from having numerous types of light source.

As a solution based on a LED plate, LEDGINE provides the same excellent light quality and building blocks as mimicked lighting solutions. LEDGINE also performs exceptionally well in terms of night preservation, ensuring minimum light spillage, glare and disruption. LEDGINE also offers considerably more scope than mimicked light sources when it comes to the range of outdoor applications available.

LEDGINE offers multiple benefits

LEDGINE offers municipal and highway authorities a host of benefits which will continue to deliver value over time – making LEDGINE-based luminaires solutions a sure-fire investment.

LEDGINE

Energy saving

Save energy compared to traditional solutions

Serviceable

Be easily serviceable

Upgradeable

Be future-proof

Lighting Quality

Maintain great lighting quality over lifetime

Preference / Strategy

Have the right light color

All ranges

Available in different luminaires, with distinctive designs to choose from

Multi Application

Cover all road and street-lighting applications

Up to 80% savings on energy compared with HPL

Compared with conventional light sources (e.g. HPL), LEDGINE can reduce energy consumption by up to 80%, thereby helping to reduce CO_2 emissions. LEDs are highly efficient, have an extremely long lifetime and require very little maintenance. What's more, because the LEDGINE module is a building block that has been designed to allow easy upgrades, you will also benefit from future efficiency gains as well. In conjunction with its dedicated controls, LEDGINE is ready to deliver optimized energy savings.

Light - exactly the level you want, using only the energy you need

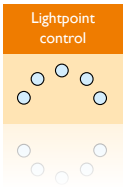
With a broad range of LED boards and highly flexible drivers, LEDGINE enables you to achieve exactly the right light level, especially for refurbishment projects. This means you consume no more than the energy you actually need.

Controls enable further energy savings

LED technology opens up new opportunities for using controls: a solution with a fixed light output is no longer appropriate. Networked or stand-alone, LEDGINE is compatible with all kinds of control options that are available on the market.

Light-point management	Light-point control	Group management
Starsense Power-line	Dynadimmer	Amplight
Starsense Wireless	Lumistep	
	SDU	
	1-10 V	
	DALI	

Example of controls available for LEDGINE solutions



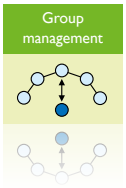
Lightpoint control

CLO

Constant Light Output is a function that is integrated into the driver and enabled on demand, thus making it possible for the lumen depreciation of the LED to be controlled throughout its life. This represents extra energy savings without any reduction in light level.

DynaDimmer

Stand-alone auto-dimming that can easily give rise to as much as 20% savings on your electricity bill. With up to five steps, DynaDimmer offers different timelines for different levels of dimming.



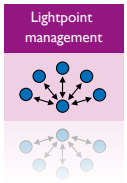
Group management

Besides stand-alone controls, Philips offers a group management solution as well: Amplight.

AmpDimming

Available in LEDGINE luminaires, AmpDimming is one of the possible dimming options available with Amplight. It enables you to dim the light down by reducing the mains input. With LEDGINE luminaires, the AmpDimming option can be also used in installations already set up with mains dimming.

CitySpirit Street - Foligno, Italy



Light-point management

In addition to the facility to dim via 1-10 V and DALI, it is also possible to connect telemanagement systems such as CityTouch via RF (wireless) or Power-line.

With CityTouch you have real-time lighting status reporting, energy use reporting, light level scheduling, automatic failure reporting and many other features which are available at a click.

These are some of our state-of-the-art control systems which allow easy and efficient management of your lighting.

Telemanagement software

Control system	User benefits	Control options	User benefits	Energy saving
Networked				
RF antenna Starsense	To **fully control** and **monitor** each **individual** light point	DALI	• Global universal interface (compatibility) • On/Off switching • Stepless dimming • Provide detailed info on lamp system	Maximum energy savings up to 40%
		1-10 V	• Simple stepless dimming	
Amplight Cabinet dimming	To provide **Monitoring and control over groups** of light points	Mains dimming *	• Simple dimming by lowering mains	Energy savings up to 25%
		SDU Pilot line *	• Simple dimming by extra control line	
Stand-alone				
	To locally set the **right amount** of efficient light at the **right place** at the **right time**	Light level adjustment	• Adjust the light level to the application	Energy savings up to 20%
		Dynadimmer	• Programmable auto dimming (5 steps)	
		Lumistep	• Auto dimming (1 step)	

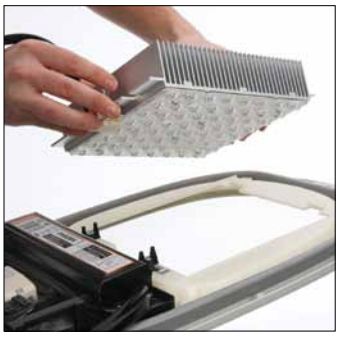
* For suitable installations only

Easily serviceable

The modularity of LEDGINE makes servicing simple and straightforward. The LED engine and driver can be replaced easily in a very short space of time. Our thermal management provides the best operating conditions for LEDs. The flat glass closure protects the LED lenses and improves the maintenance factors.

Fast and easy upgrades

LEDGINE offers all the advantages of white LED light together with a new, future-proof design that makes upgrading safe and simple. One-to-one replacement of HID technology is possible without compromising on light quality, spacing or mounting height. And thanks to 'replace-what-you-need' upgrades, maintenance and servicing, you can make the switch in just one minute.



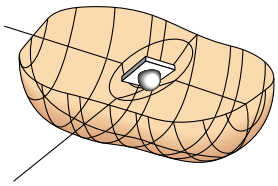
Take out the light engine to service or upgrade it in an easy and fast way!

Lighting quality

The multi-layer optics allow customized solutions for any major road, urban street, city center or residential application, with the option to upgrade quickly and simply at any time in the future. This enables significant energy savings through 1-to-1 replacement of HID installations without any compromise on lighting quality or safety.

Our optical system stands out due to:

- Excellent facial recognition to promote safety and security
- Surrounding ratio in line with expectations (no sharp cut-offs)
- Excellent uniformity thanks to a very smooth light distribution
- Controlled beams to ensure minimum glare
- Dark sky-friendly (0 candela). The flat glass closure ensures excellent night preservation



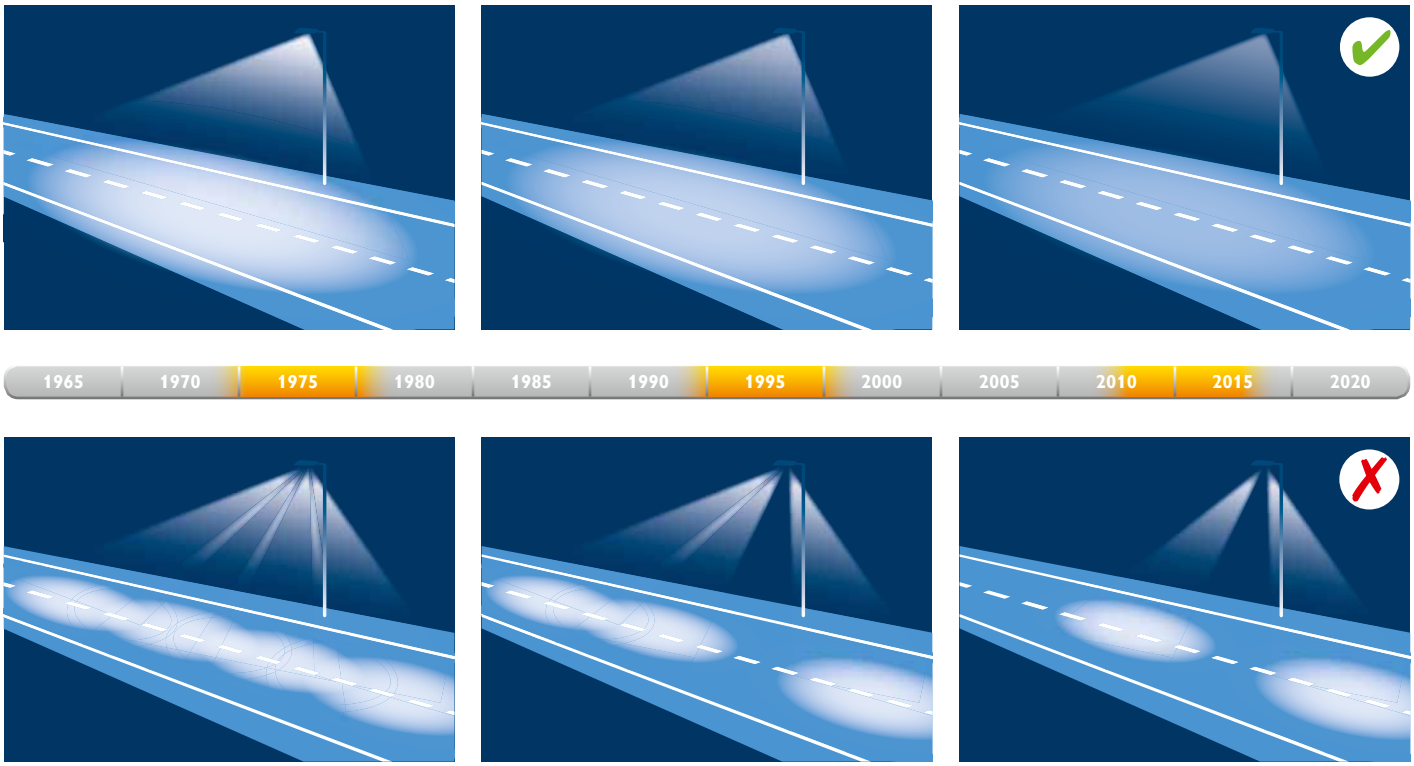
Patented lens

Unique optical system enables perfect lighting

The multi-layer system is based on three aspects:

- Our patented lens, which offers an excellent spread of light from each individual LED
- The distance between the LEDs, which is optimized to ensure that every LED lights up the required surface area
- Every single LED delivers the full light distribution, allowing perfect lighting uniformity

The multilayer optical system ensures an excellent uniformity and consistent light distribution during the system lifetime.



Iridium2 installation
Stockholm, Sweden

Choosing an investment strategy without compromising on color temperature

With LEDGINE you can choose between the two strategies/lines below, independently of color temperature.

LEDGINE offers 3 color temperatures:

- Warm White (3000 K)
- Neutral White (4000 K)
- Cool White (5700 K)

Furthermore, there are two lines available, depending on your strategy.

"I want the most energy-efficient solution that will reduce my energy bill and carbon footprint as far as possible."

GreenLine

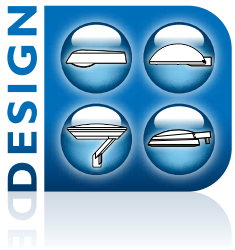
Most efficient, consumes least energy

"I am ready to compromise on the efficiency of the solution if I can get a better price."

EconomyLine

Trade-off price/efficiency

Koffer² installation,
Faid, Germany



Distinctive design

LEDGINE is available in different luminaires, with a choice of distinctive designs: Iridium2 LED, CitySoul LED, SpeedStar, OptiFlood LED, etc.

Available with a dedicated range of masts and brackets, these luminaires provide a complete solution that contributes to the identity of your city rather than just providing light points. LEDGINE allows you to switch from HID to LED, or to expand your existing installation with a flawless continuity of design.

Pedestrian Areas and Streets				Roads	
Pedestrians streets, paths, cyclepaths	Residential streets	Mixed traffic, commercial streets in urban areas	Rural roads	Motorized traffic, roads in urban areass	Motorways, highways, expressways, ring roads

Koffer² 100 LED

Iridium² LED

SpeedStar

MileWide LED

Copenhagen LED

CitySwan LED

CitySoul LED

UrbanStar

CitySpirit LEDGINE

StraightLine

UrbanSky

Recreation sport and area lighting			Tunnels
OptiFlood LED	Mini 300 Stealth LED	Mini 300 LED gen2	TuneLite LED

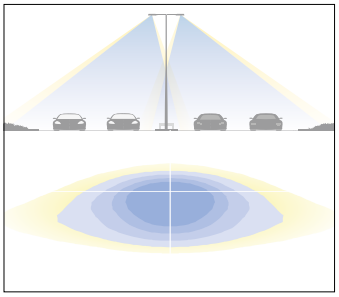
With LEDGINE a wide range of outdoor applications are possible

With LEDGINE, Philips is supplying one light engine that will enable different outdoor applications. Thanks to LEDGINE, LEDs can now be used for applications ranging from pedestrian areas to major roads, parking lots and large areas.

Different LED optics for different applications

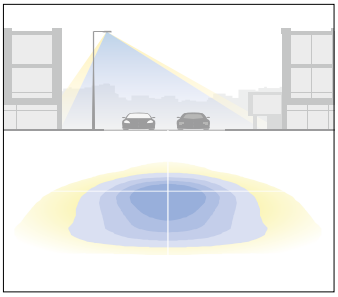
In order to serve different applications in the most effective way, Philips supplies a range of different optical plates. Work is being carried out continuously to ensure improved performance and backward compatibility.

DN Distribution Narrow



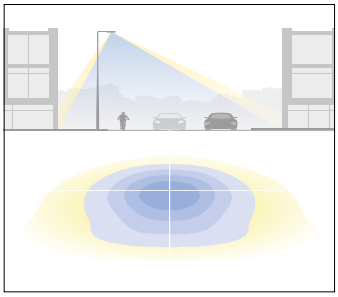
Narrow distribution for road & street lighting

DM Distribution Medium



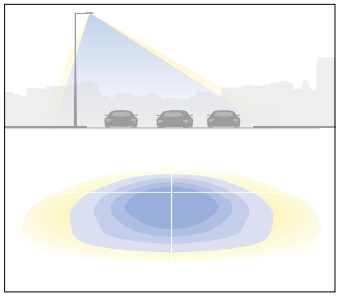
Medium distribution for road & street lighting

DW Distribution Wide



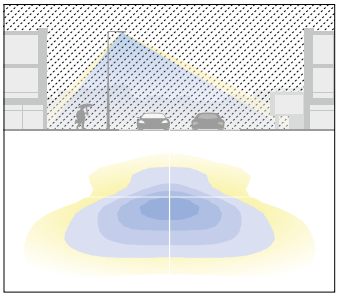
Wide distribution for road & street lighting

DC Distribution Comfort



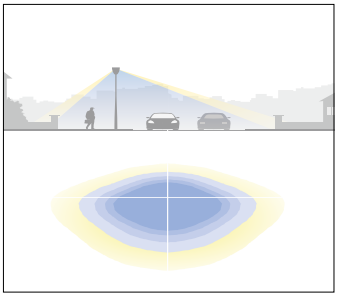
Medium distribution focusing on comfort for road lighting (TI < 10)

DK Distribution Wet Roads



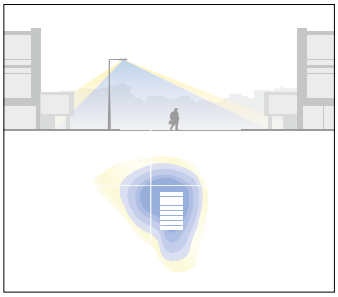
Medium distribution for road lighting under wet conditions

DRW Distribution Residential Wide



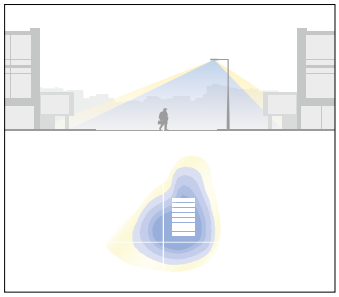
Wide distribution for residential street lighting

DP-L Distribution Pedestrian Crossing - Left



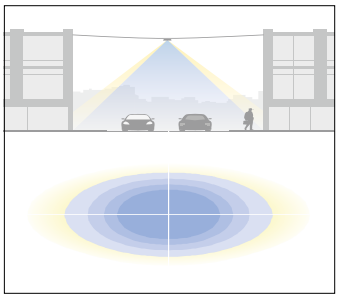
Lighting distribution for pedestrian crossing (left)

DP-R Distribution Pedestrian Crossing - Right



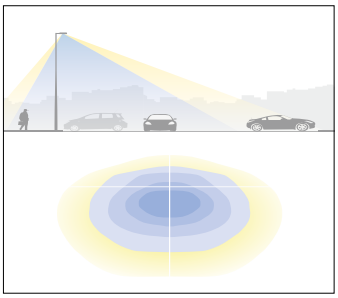
Lighting distribution for pedestrian crossing (right)

DSN Distribution Symmetric Narrow



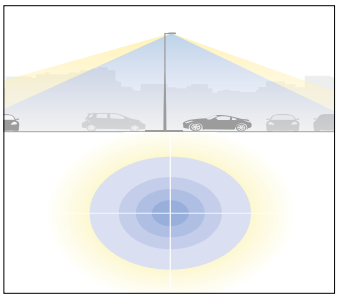
Symmetric narrow distribution for tunnel & catenary installation

A Distribution Asymmetric



Asymmetric distribution for area & square lighting

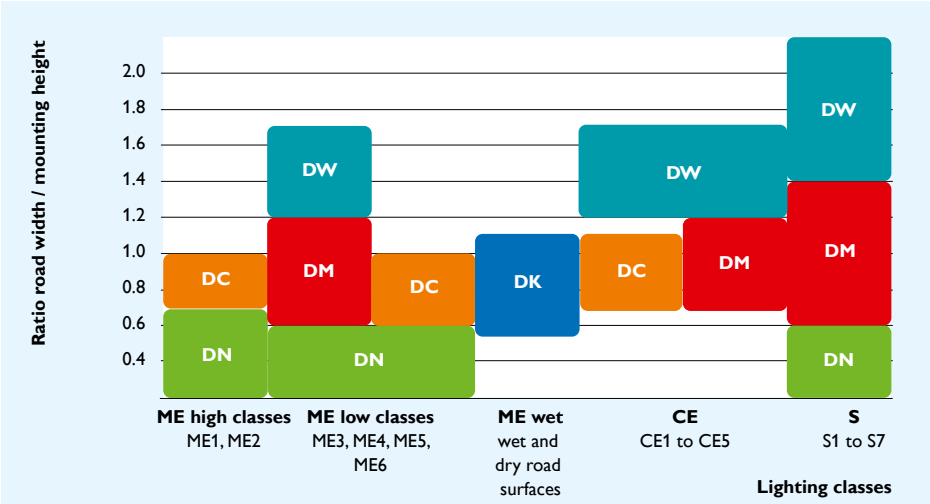
S Distribution Symmetric



Symmetric distribution for area & square lighting

Additional Area Optics:
- Distribution Symmetrical Medium beam (PRM)
- Distribution Symmetrical Wide beam (PRW)
- Distribution Asymmetrical Medium (PAM)

Example of how the optic is suitable for different applications (roads and streets)



Optics choice depending on installation type and lighting class

Key

DM	Distribution Medium
DW	Distribution Wide
DN	Distribution Narrow
DK	Distribution Wet Roads
DC	Distribution Comfort
A	Distribution Asymmetric
S	Distribution Symmetric
DSN	Distribution Symmetric Narrow

Installed position

Luminous Intensity class G	Tilt 0°	Tilt 3°	Tilt 5°	Tilt 10°
G6	DSN, DK, S			
G5		DSN, S	DSN	
G4	A, DC	A, DC		
G3	DM, DN, DW	DW, DM, DK, DN	DW, DC, DK, DN	DSN, DC, DK
G2			DM, A	DW, DN
G1				

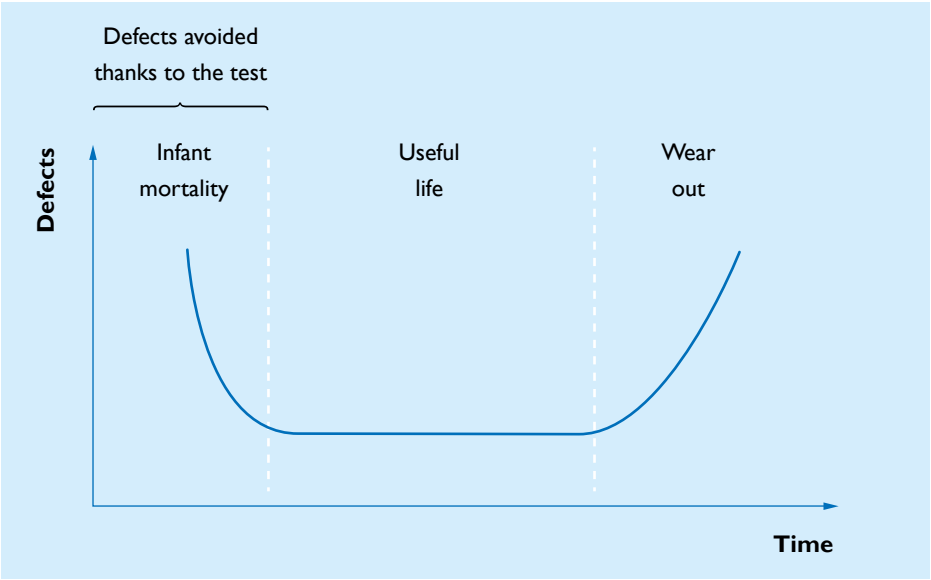
Optic choice for G class depending on installed position of the luminaire

Quality is at the heart of everything we do

On the production floor

In order to ensure the high quality of LED luminaires and to prevent early life failures occurring in the market, when this is most critical, every LEDGINE product undergoes a series of tests:

- extensive burn-in test for every single LEDGINE board
- additional burn-in test for every single LEDGINE luminaire once it has been assembled to ensure that faulty LEDGINE boards are prevented from reaching the market



The Bathtub curve

Ready for all environments

It is crucial that LEDs are maintained at a constant temperature to prevent them from failing. This is why all the LEDGINE boards are equipped with thermal protection. The temperature sensor in the board measures the temperature continuously, and if it exceeds the permitted limit the driver will start to dim the LEDS in steps until they are brought down to an acceptable temperature. Once the temperature is below the limit, the system will return to the initial flux again. This is the best way to protect your luminaires against unusually high temperatures without compromising on safety.

Lifetime and lumen maintenance

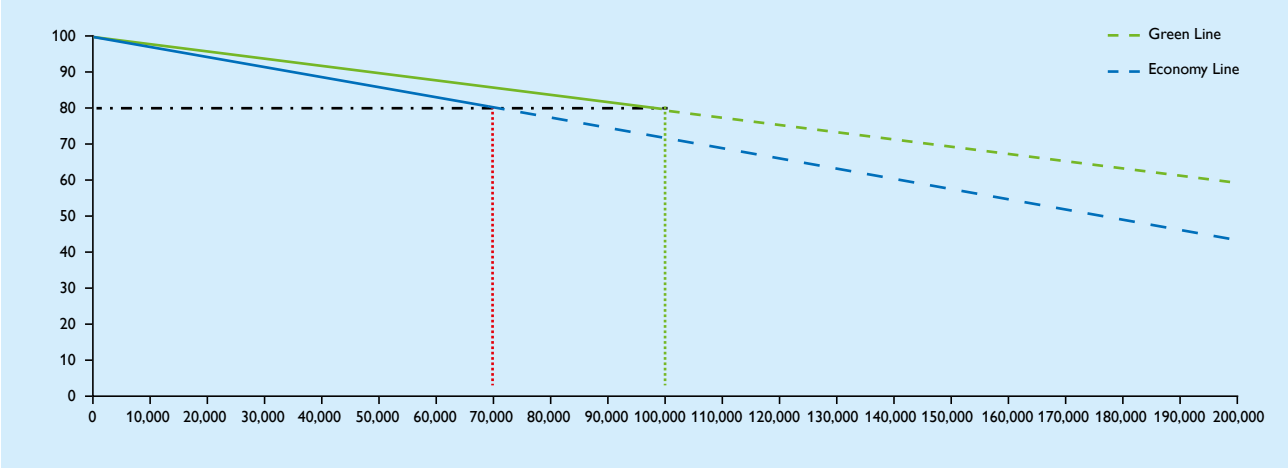
The lifetime of LEDGINE luminaires is defined by L80F10 (which combines lumen maintenance and failure rate).

The lifetime figure is different depending on your choice of strategy (GreenLine or EconomyLine).

- GreenLine : L80F10 = 100,000 hours
- EconomyLine : L80F10 = 70,000 hours

The lumen maintenance curve is also different depending on the strategy. The curve below shows the lumen maintenance taking into account 90% of the population of LEDGINE luminaires.

LyF10 curves



LEDGINE in luminaires

Source efficacy or LER?

It is not only the power consumption of the LEDs that matters, but also that of the overall system, including losses. After all, that is what the customer is paying for. It is for this particular reason that we state the LER (Luminaire Efficacy Rating). The LER is the efficacy of the overall luminaire, i.e. also taking into account the thermal losses.

	LEDs	Optics	Thermal	Luminaire
	Lumen package source, Power consumption, Source efficacy 100 lm/W			
	Depend on: Line Color temperature	**Optical losses**	**Thermal losses**	**LOR, LER Luminaire Efficacy Rating**
Example:	**130 lm/W** →	**117 lm/W** →	**105 lm/W** →	**94 lm/W**

Example of performances in luminaires

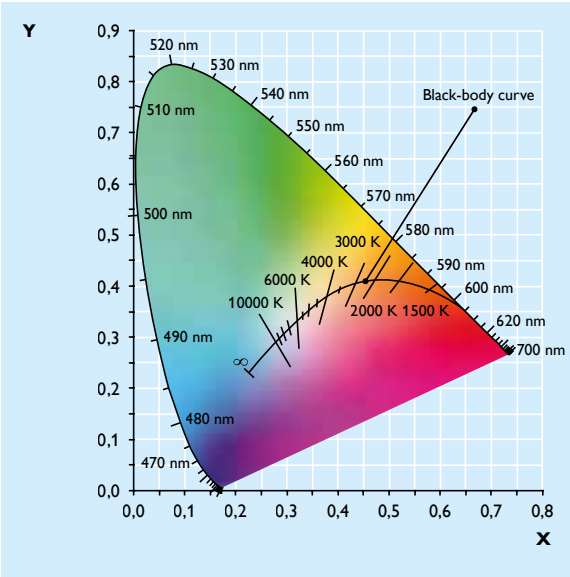
LEDGINE luminaires are built in such a way that the overall system is optimized, thus minimizing the impact of any losses and maximizing the efficiency and system performance.

Luminaire	Optic	Color temp.	System lumen output	Power	LER	CRI
CitySoul	DC	Warm white - 3000 K	2,240 lm	24 W	93 lm/W	84
CitySoul	DN	Neutral white - 4000 K	5,030 lm	52 W	97 lm/W	76
Iridium²	DM	Neutral white - 4000 K	6,050 lm	60 W	101 lm/W	76
Iridium²	DK	Neutral white - 4000 K	11,350 lm	116 W	98 lm/W	76
SpeedStar	A	Neutral white - 4000 K	15,210 lm	150 W	102 lm/W	76
SpeedStar	DW	Neutral white - 4000 K	22,263 lm	252 W	89 lm/W	76

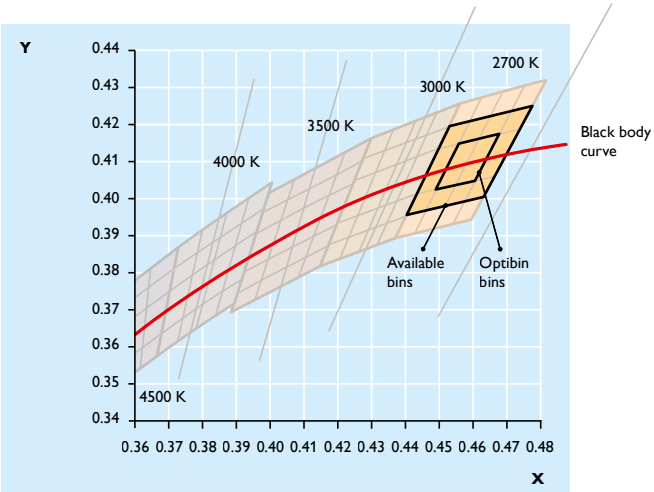
Extremely selective in LED choice: Optibin®

The variation in chromaticity can be readily discerned even when the CCT value is the same. Therefore Philips has devised an algorithm, called Optibin®, to keep a tight control on color variations.

Optibin® is a proprietary binning optimization process developed by Philips Color Kinetics. Optibin® uses an advanced bin selection formula that exceeds industry standards for chromaticity to guarantee uniformity and consistency of hue and color temperature for LEDGINE luminaires. Consequently, all LEDGINE color points are within a 7-step MacAdam ellipse within their respective ANSI bin.



The black-body curve defines the range of color temperature, from warm (reddish) to cool (bluish), within the CIE 1931 color space.



Application example Sodium lamps vs LEDGINE

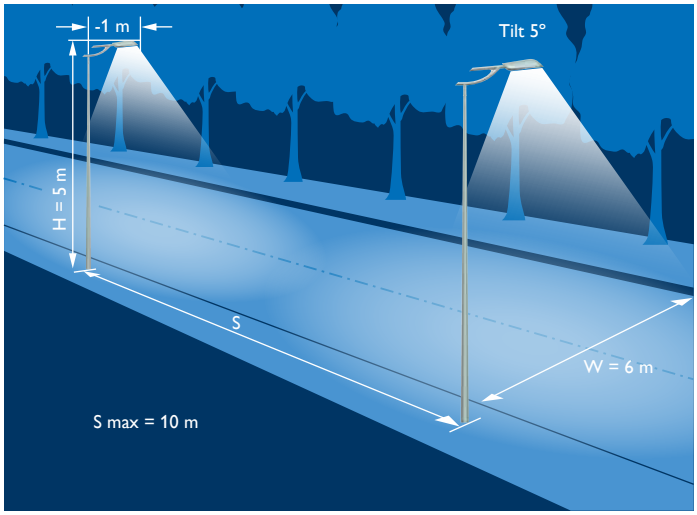
Sodium lamp

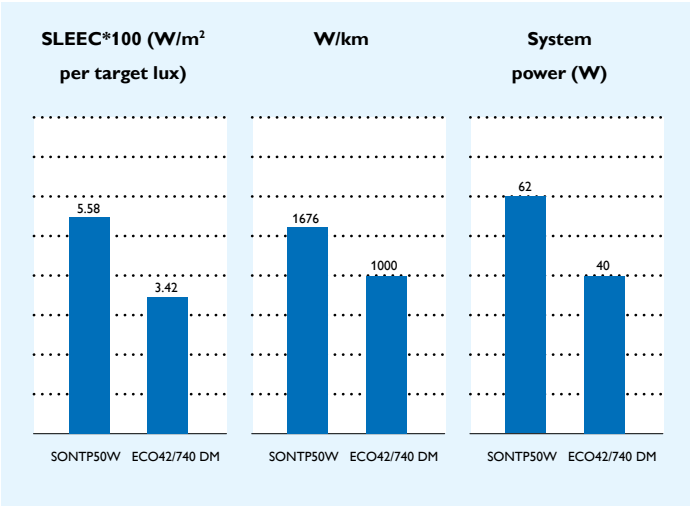
Installation with Sodium lamp, Bristol, UK

LEDGINE SpeedStar

Installation with LEDGINE luminaire, Bristol, UK

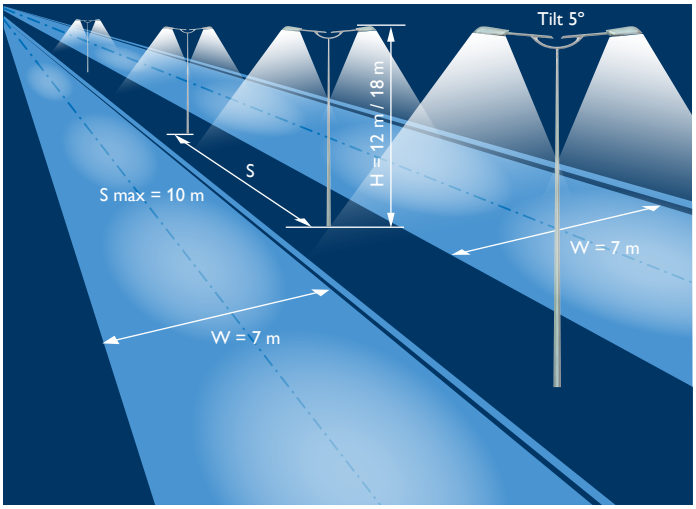
Street width (2 x 2 lanes (S4 class C5 lux average, 1 lux min))

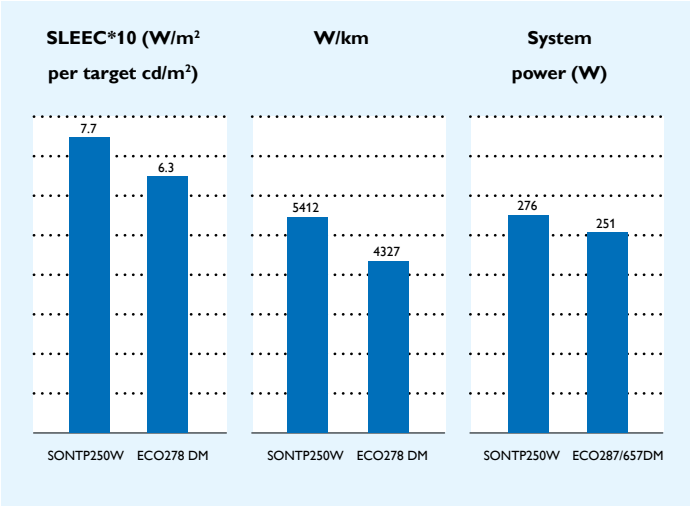




35% energy saving with LEDGINE comparing to sodium lamp and 8% better spacing

Street width (2 x 2 lanes and large central reserve (ME3a class))





9% energy saving with LEDGINE comparing to sodium lamp and 14% better spacing

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