Design-In Guide:
Certaflux DL-S 1000lm and 2000lm

A cost effective and integrated LED system for mainstream downlight applications with good quality of light.

PHILIPS

Product Overview

Certaflux DL-S module takes the final barriers out of LED downlight conversion. The innovative design with integrated heat sink and reflector makes OEM Design-In simple and allows for a fast and efficient development. The breakthrough system cost means that Certaflux DL-S fixtures get the edge over conventional competitors and demonstrate clear value over conventional down lighting solutions.

Applications – The Certaflux DL-S module would be integrated into a downlight fixture that can be used in a variety of indoor down lighting applications such as found commonly in hotel lobbies, schools, meeting rooms, restaurants and cafes, etc.

The product portfolio covers a lumen range of 1000 lm and 2000lm with color temperatures of 3000K, and 4000K.

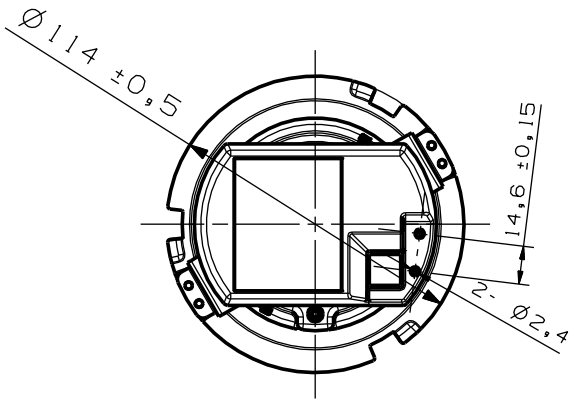
Lumen Output CCT	1000 lm 3000 K	1000 lm 4000 K	2000 lm 3000 K	2000 lm 4000 K
Philips 12NC Code	9290 008 80006	9290 008 80106	9290 008 80206	9290 008 80306
CRI	80			
Input Voltage (VAC)	220 - 240			
Frequency	50/60 Hz			
Wattage (@230V AC 50 Hz)	13	13	26	25
Beam Angle, FWHM	App. 98			
Lifetime, (B50L70)	25 k hours			
Size	4"	4"	6"	6"
Optimum Ambient Temp	25 C			
Ambient Temp, up to	40 C			
Tcase	70 C		75C	
Class Type	Class I			

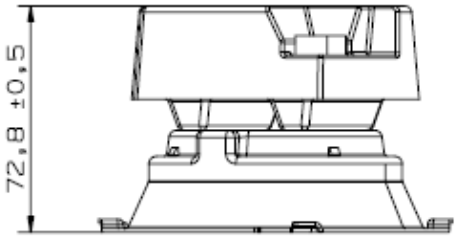
Wattage of a conventional downlight source	Lumen of a conventional downlight source	DL-S Recommended Equivalent
10	600	
13	780	
18	1080	DL-S 1000lm & 2000lm
26	1560	
2x13	1560	
2x18	2160	
2x26	3120	

From a lumen point of view, compared to a conventional downlight the Certaflux DL-S may be suitable to replace an 18W up to 2x18W light source. In addition to considering the light levels, please note that when recommending a suitable lighting solution the OEM should always also look at other factors such the regulated requirements for the application, the customers' requirements, safety considerations, installations factors, replaceability and others.

Dimensions of the Certaflux DL-S Module

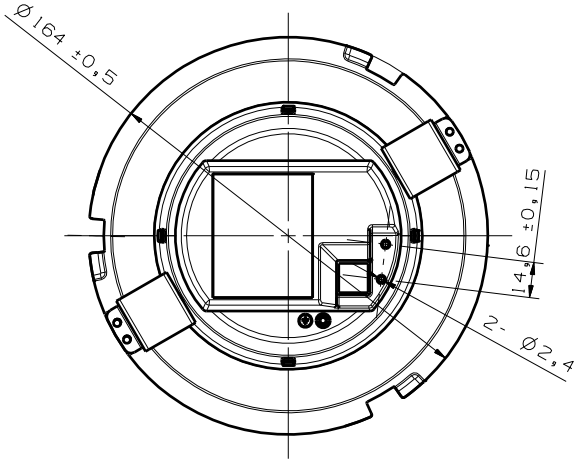
1000 lumens

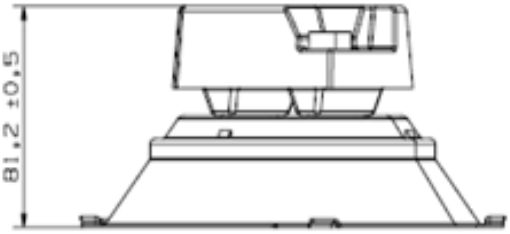




Dimension	Value			Unit
	Min.	Typ.	Max.	
Outer Diameter	113.5	114	114.5	mm
Height	72.3	72.8	73.3	mm

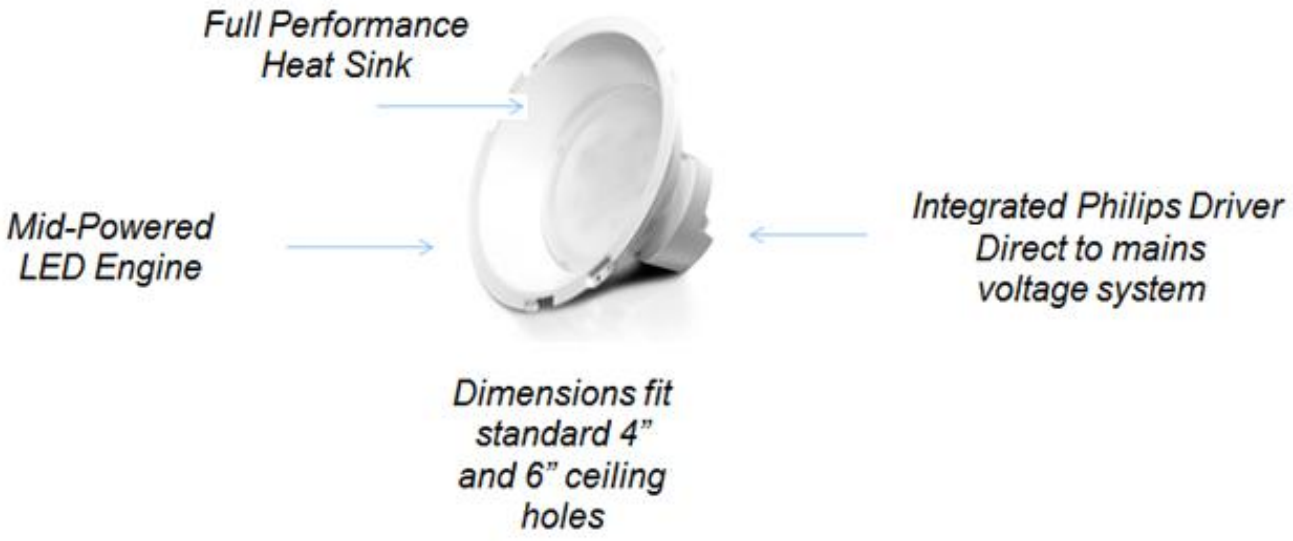
2000 lumens





Dimension	Value			Unit
	Min.	Typ.	Max.	
Outer Diameter	163.5	164	164.5	mm
Height	80.7	81.2	81.7	mm

Parts of the Certaflux DL-S Module



Operating Conditions

These factors are conditions that must be met for the performance of the Certaflux DL-S to be effective.

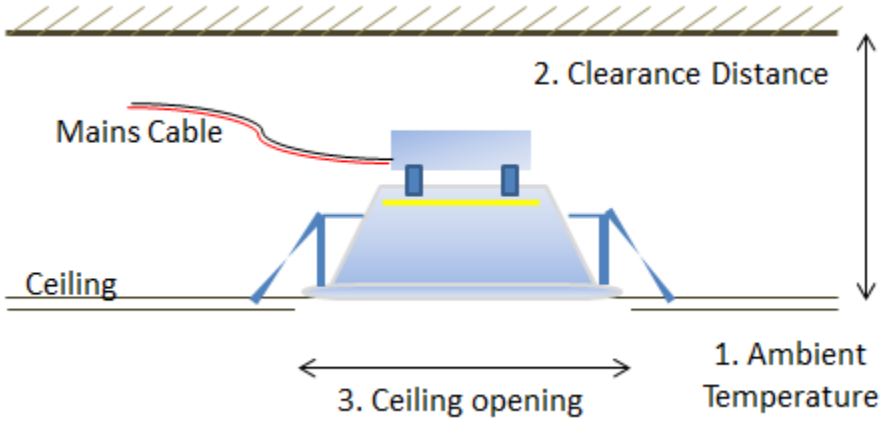
Environmental Parameters

Symbol	Parameter	Conditions	Value			Unit
			Min.	Typ.	Max.	
T_{amb}	Ambient temperature		-20	25	40	°C
V_{in}	Input voltage	RMS	198	220-240	264	V_{ac}
f	Mains frequency		47	50/60	63	Hz
H_{op}	Relative humidity	Non condensing	10		90	%

The expected average operating time per year in a common downlight application is 4,000 per year. This is an average of 10-11 hours per day continuously throughout its lifetime. Furthermore the expected average switching cycles is 1 cycle per day, e.g where the module is turned on once and turned off once per day.

Average operating time per year	4000 hrs
Average number of on/off switching cycles over life time	1 cycle/day

Ceiling Use Conditions

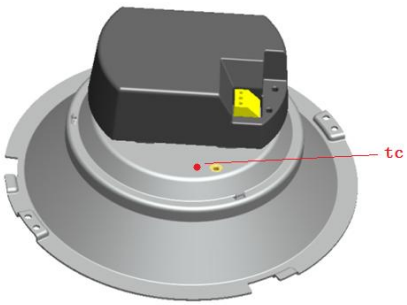


1. The optimum ambient temperature below the ceiling should be 25C
2. The clearance from the main ceiling to an upper surface should be 200mm or more
3. Hole in the bottom to let the light out (reflector opening) should match the size of the fixture.

Case Temperature (Tc) of the module

The maximum Tc of the 1000lm and 2000lm is 70’ and 75’ Celsius respectively.

It is measured at the predefined point (see illustration) using guidelines recommended by IEC 60598. For these modules a test box measuring 600 x 600 x 200 mm was used and the reading is taken after the temperature stabilizes.



Surface Temperature of the Module

The module has been designed & tested so that the surface temperature doesn't exceed the commonly accepted limits for touchable surfaces. However it is recommended that at all times the module and/or fixture is not touched whenever it is turned on. If it is necessary to touch the surface, for any reasons such as reinstallations or adjustments, please always turn it off for at least 5 minutes until the surface temperature cools down.

IEC 60598-1 guides that touchable surfaces that are made of metal parts are 60 degrees Celsius (and below) and for non-metal parts 75 degrees Celsius (and below).

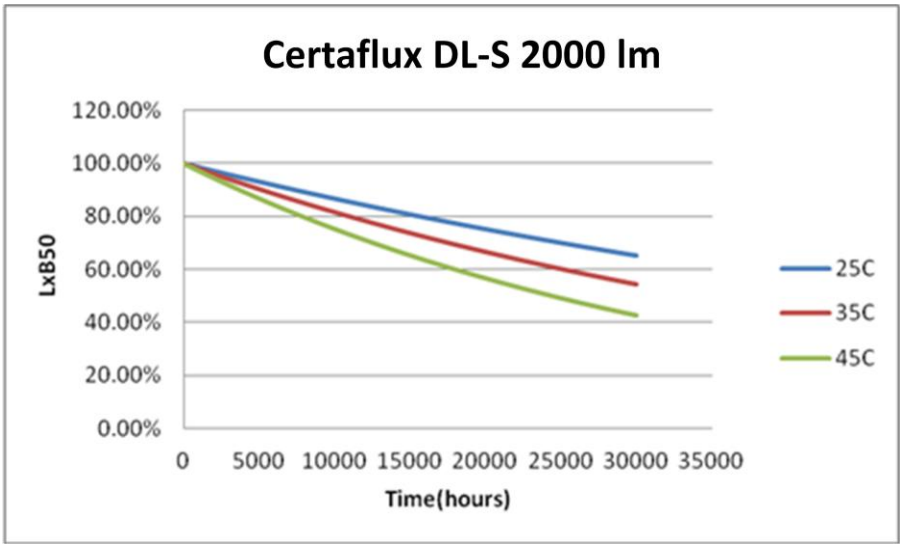
Touchable surfaces are generally described as any point on a surface where persons usually stand or move about to the limits which a person can reach with the hand, in any direction, without assistance. When the Certaflux DL-S module is assembled as a fixture and installed in the application area the touchable surface could mean the inner surface of the heat sink that faces down and the rim accessory.

Performance & Reliability

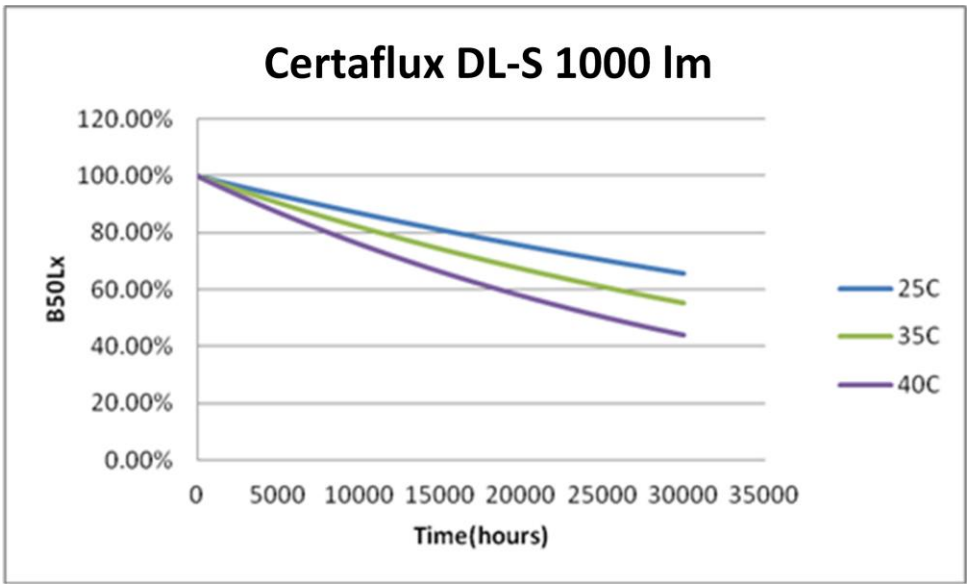
The Certaflux DL-S module has a lifetime of 25k hours (L70B50) when the operating and environmental parameters in this guide are met.

Please refer to the plots for detailed information.

Simulated prediction of operation hours and lumen maintenance for the Certaflux DL-S 2000lm:



Simulated prediction of operation hours and lumen maintenance for the DL-S 1000lm:



Light Performance

Beam Angle

The typical beam angle of the Certaflux DL-S module is 98 degrees. This is measured by a goniometer. If a secondary diffuser and/or reflector extender is added to the module, the beam angle could change. It is advised that measurements are calculated again.

Unified Glare Rating (UGR)

The rounded average UGR is 26. If the application requires a lower UGR a possible solution would be to add a reflector extender. For example, using a reflector extender that extends the 1000lm Certaflux DL-S from a 4" opening to a 6" may reduce the UGR from 26 to around 20.

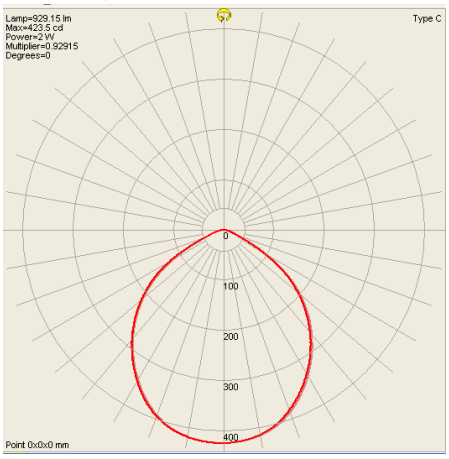
Color Rendering Index (CRI) & SDCM

The normal CRI is 80 for all the Certaflux DL-S covered in this document. The SDCM is 5.

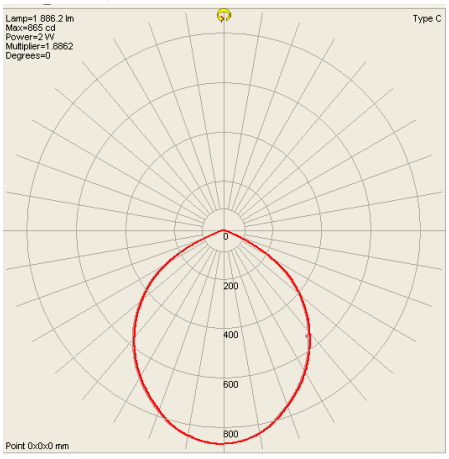
Light Distribution of the modules

Tested by goniometer. IES files are available from our website.

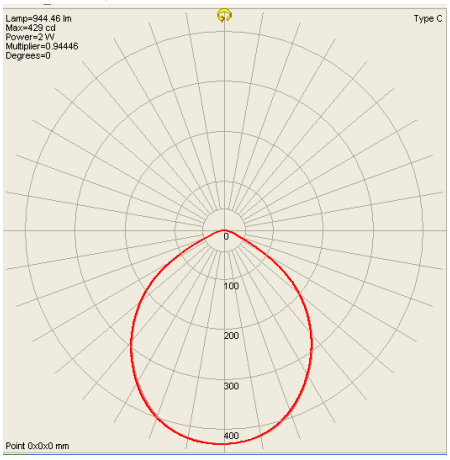
1000 Lm, 3000K



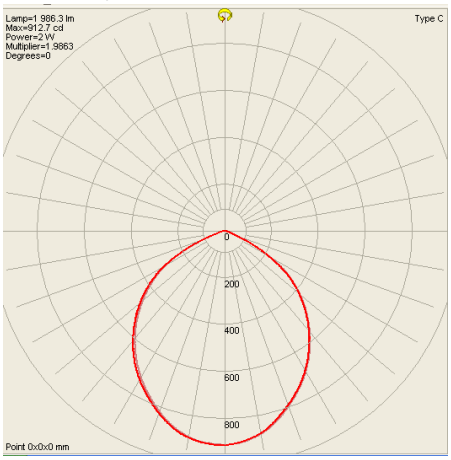
2000 Lm, 3000K



1000 Lm, 4000K



2000 Lm, 4000K



Inrush current

The current that flows during the very first few milliseconds after a luminaire or an entire lighting installation has been switched on is called the inrush current. This current plays a very important role in the choice of switch gear and fusing, e.g. circuit breakers, miniature circuit breakers (MCB). The inrush current is determined in part by the circuitry in use and in part by the properties of the mains supply, i.e. the mains supply impedance and the supply-cable resistance. The moment of switching in relation to the sine wave of the supply voltage also helps to determine the value of the inrush current. The highest inrush current occurs when the driver is connected to the mains at the peak of the mains voltage.

Type	Maximum LED drivers on MCB type B16	Inrush current peak	Inrush current width
Certaflux DL-S 1000lm	40	4.06	0.046
Certaflux DL-S 2000lm	40	3.54	0.053

Conversion table for max. quantities of modules on other types of MCB

MCB type	Rating	Relative number of Certaflux DL-S modules
B	16A	100% (see table)
B	10 A	63%
C	16A	170%
C	10 A	104%
L, I	16A	108%
L, I	10 A	65%
G, U, II	16A	212%
G, U, II	10 A	127%
K, III	16A	254%
K, III	10 A	154%

Notes on inrush currents and circuit breakers

1. Data is based on a mains supply with an impedance of 400 mΩ (equal to 15 m cable of 2.5 mm² and a further 20 m to the middle of the power distribution) under worst-case conditions. If the mains have an impedance of 800 mΩ, the number of modules can be increased by 10%.
2. Measurements will be verified in real installations; data is therefore subject to change.
3. In some cases the maximum number of modules is not determined by the MCB but by the maximum electrical load of the installation.
4. Note that the maximum number of modules is given when these are all switched on at the same time, for example by a wall switch. Measurements were carried out on single-pole MCBs. For multiple MCBs it is advisable to reduce the number of modules by 20%.
5. A maximum of 30 modules can be connected to one Residential Current Detector of 30 mA.

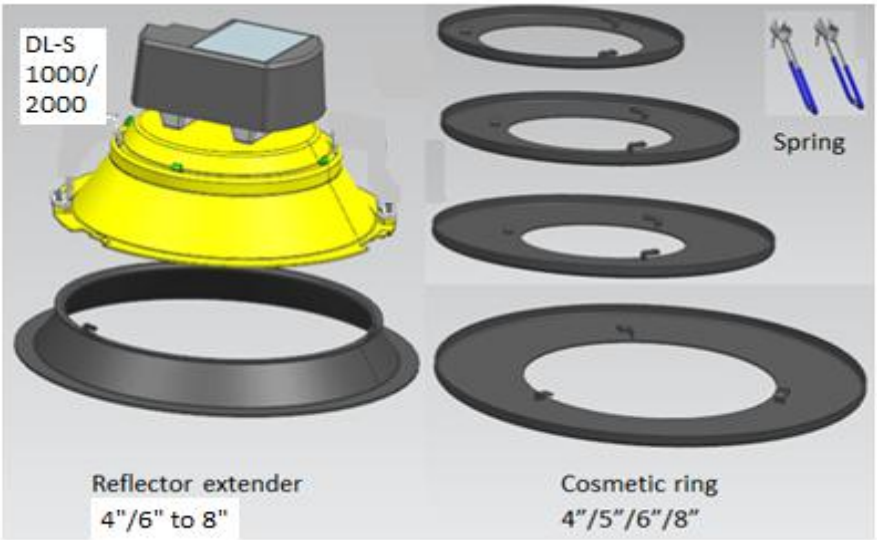
Installation & Safety

For detailed instructions on how to build a fixture using the Certaflux DL-S module and instructions on installed the completed fixture into the application area (ceiling) please refer to the Quick Installation Guide.

To build a proper fixture using the DL-S module several parts are needed, including:

1. A Certaflux DL-S Module
2. Springs
3. Cosmetic ring
4. Cables (not in picture)
5. Screws (not in picture)
6. Driver connector cover (not in picture)
7. Reflector extender

Please check your application requirements and local regulations which may require additional parts or steps to make a proper and safe fixture.



Depending on the cosmetic ring and/or reflector extender option selected, the fixture could fit into the following cut out ceiling sizes:

Product	Ring size	Cut-out	
		Range	Recommended
Certaflux DL-S 1000	4 inch	Ø120mm~ Ø125mm	Ø120mm
	5 inch	Ø135mm~ Ø155mm	Ø135mm
	6 inch	Ø150mm~ Ø175mm	Ø150mm
Certaflux DL-S 2000	6 inch	Ø170mm~ Ø175mm	Ø170mm
	8 inch	Ø200mm~ Ø230mm	Ø200mm

Maintenance & Handling

The Certaflux DL-S module does not require special maintenance and handling. As part of the application area's general maintenance the fixture can be clean using regular dry or damp cloth. Please always ensure that the fixture is turned-off before proceeding.

During the assembly of the module into the fixture, it will be necessary to perform a twist action to connect the rim accessory onto the modules rim. In doing so the driver box may be held to rotate the accessory into place. For reference, please see the guideline below.

Item	Value	Item	Value
Driver Enclosure Torque	>5N-m	Driver Enclosure Fixation	Pull off Force>100N
Max force on Bracket	N.A	Screw hole size for strain relief	Dia:ϕ2.4mm Depth:7mm
IP Rating	20		

Packaging & Storage Environment, Disposal

Symbol	Parameter	Conditions	Min.	Typ.	Max	Unit
T_{st}	Storage temperature		-40		65	°C
P_{op}	Operating pressure		290			kPa
H_{st}	Relative humidity	Non condensing	5		95	%

The Certaflux DL-S module is categorized as an electronic product. As such please consult the local regulation with regards to how electronic components and parts are handled.

Approbations, Certifications, Standards, Others

The Certaflux DL-S meets the European standard and has completed relevant CB tests.

In addition, the following are some of the relevant compliance that the product meets.

EMC:

Conducted and Radiated Emissions of Lighting Equipment CISPR 15 ed 7.2 2007

Harmonic Current Emission IEC 61000-3-2 :2006 +A1+A2

Voltage fluctuations and flicker IEC 61000-3-3 :2008

Lighting Immunity IEC 61547 :2009

Environmental: ROSH

Safety:

LED modules for general lighting, safety specifications IEC 62031
Photobiological safety of lamps and lamp systems IEC 62471
Lamp control gear - 2.13 d.c. or a.c. supplied electronic control gear for LED modules EN/IEC 61347-2-13
DC or AC supplied electronic control gear for LED modules - Performance requirements EN/IEC 62384

Cosmetics & Construction:

Internal guidelines that cover tolerances on mechanical and visual defects on the reflector and driver cover.

For more information on these and other topics please contact the local Philips sales organization.

Contact details

For specific questions on our products, please contact our regional team:

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**Contact your local Philips representative as the first line of support.*

***Names above may change without notice.*

Certaflux

OEM-related information: www.philips.com/oem

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