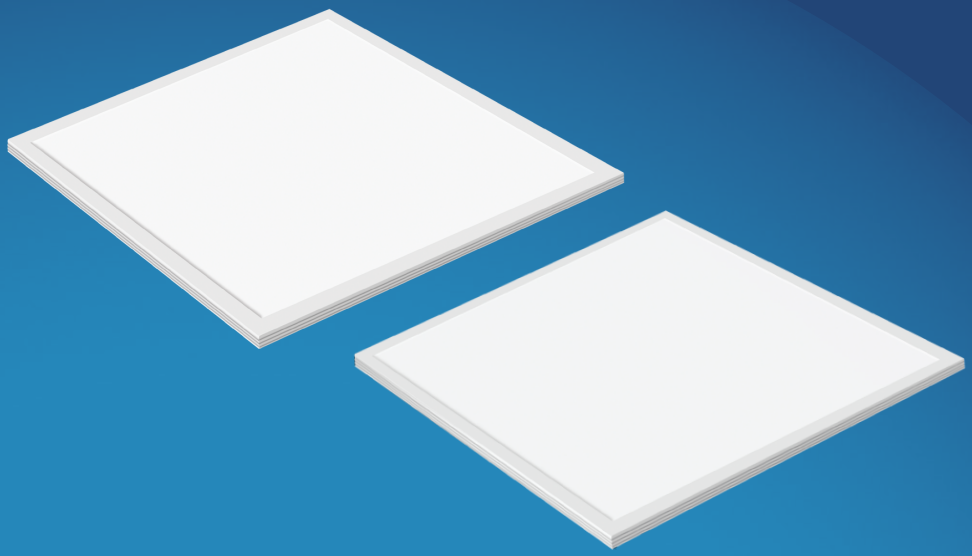
PHILIPS

CertaFlux

LED panel



Design-in Guide

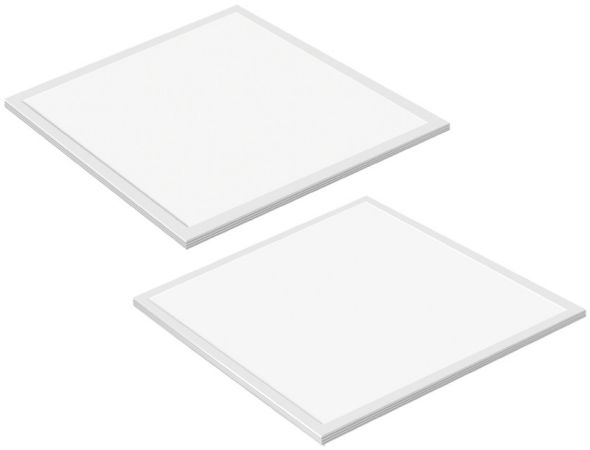
Philips CertaFlux LED panel

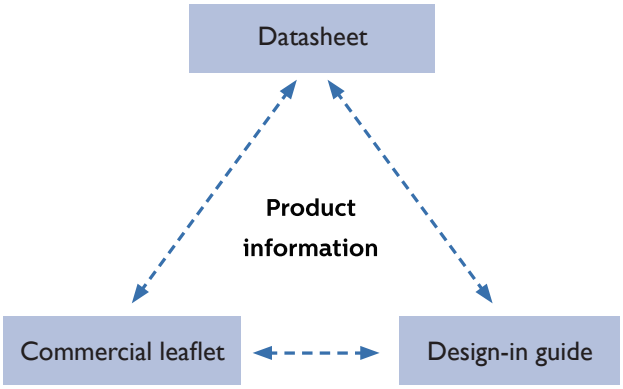
Design-in Guide

July 2017

Contents

Introduction to this guide





Thank you for choosing the Philips product. In this guide you will find the information required for the application.

Information and support

If you require any further information or support, please visit our website: http://www.lighting.philips.com.sg/oem-sg

Philips Design-in support is available, please consult to your sales representative.

Determine which documents contain what information

In order to provide information in the best possible way, Philips' philosophy on product documentation is the following.

Commercial leaflet contains product family information & system combinations (compatible Philips driver information)
Datasheet contains LED panel specification
Design-In Guide describes how to design-in the products
Easy Design-in Tool In order to offer more solution quickly for OEM customer to find their way through the growing maze of complexity of LED systems and the different specifications.

All these documents can be found on the download page of the OEM website

For Asia :
http://www.lighting.philips.com.sg/prof/electronic-control-gear#pfpath=0-GE01_GR

For America's :
https://www.na.mytechnologyportal.lighting.philips.com/public-dashboard/download-center-public.html?folderUUID=5619e2f0-14fe-485c-9ce8-348844cd769c

If you require any further information or support, please consult your local Philips office.

Warnings and instructions

Warnings:

- The drivers combined with LED panel must be SELV driver in Asia Pacific region
- LED panel should not be exposed to UV light

Safety warnings and installation instructions

To be taken into account during design-in and manufacturing.

Design-in phase

- It is mandatory to use a UL class 2 / IEC compliant SELV driver in combination with the LED panel LV products.
- The general IEC and UL recommendations for luminaire design and legal safety regulations (ENEC, CE, ANSI, etc.) are also applicable to Philips LED Linear systems. Luminaire manufacturers are advised to conform to the international standards for luminaire design (e.g. UL1598, IEC 60598-Luminaires).
- The LED Panel is not suited for Explosion-Risk application, such as gasoline stations.
- The LED Panel is suited for indoor applications.
- Do not apply mains power to the LED panel directly.
- Connect the LED panel and drivers before switching on mains.
- Avoid contamination (direct or indirect) from any incompatible chemicals reacting with the LED. A list of incompatible chemicals is provided in the chapter for Compliance and Approval.
- The general IEC recommendations for luminaire design and legal safety regulations are also applicable to Philips LED panel.

Manufacturing phase

- The LED panel should always be replaced by an OEM-qualified installer.
- Do not use damaged or defective LED panel.
- Do not drop the LED panel or let any object fall onto it because this may damage the diffuser. If the LED panel has been dropped or an object has fallen onto it, do not use it, even if there are no visible defects or signs of damage.
- Connect all electrical components first before switching on mains.

Introduction to LED panel

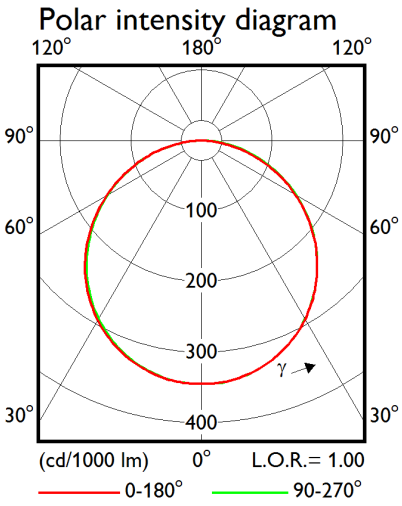
Applications and luminaire classification

Certaflux LED Panel is to provide a good LED solution in general lighting. Please refer to the datasheet for details about each SKU. For system combinations, please check Commercial leaflet and Easy design-in tool.

In this design-in guide

In this design-in guide you will find all necessary guidelines to configure the LED panel to your needs.

Optical design-in



Light distribution

LED panel is suitable for indoor application. Optical files can be downloaded from http://www.lighting.philips.com.sg/oem-sg

Color consistency

Color consistency refers to the spread in color points between LED panel. It is specified in SDCM (Standard Deviation of Color Matching) or MacAdam ellipses, which are identical.

Color targets

The color target points of LED panel can be found in the respective datasheets on http://www.lighting.philips.com.sg/oem-sg

Spectral light distribution

The spectral light distribution of LED panel can be found in the respective datasheets on http://www.lighting.philips.com.sg/oem-sg

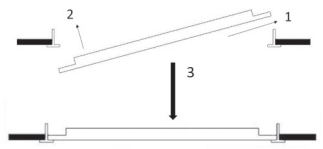
UGR

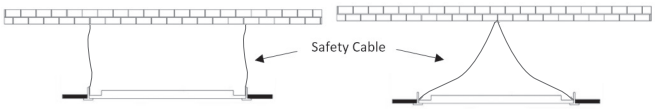
The maximum LED Panel current to comply with UGR requirements for offices, contact your Philips representative.

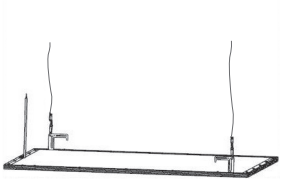
Note:
Component and process tolerances can result in imperfectly symmetrical light distributions. Maximum acceptable tolerances will have minimal impact on optical distributions and optical performance in the final application for a variety of reasons.

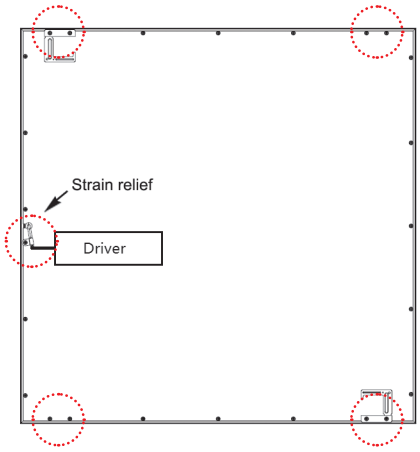
All polar intensity diagram illustrations are just an indication of the beam shape. We suggest making use of the IES files available on OEM product website.

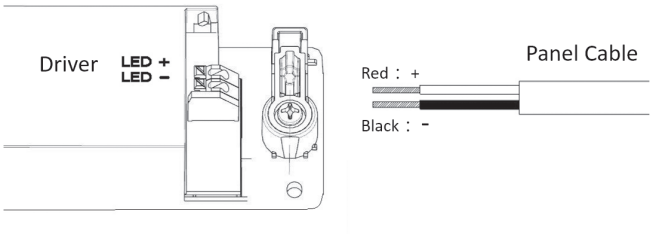
Mechanical design-in











LED panel dimensions

3D CAD files can be downloaded from our website http://www.lighting.philips.com.sg/oem-sg

Basic dimensions for each LED panel can also be found in the datasheets which are also available at the afore mentioned website.

Wiring

Wire parameter and polarity please refer to the datasheet.

Installation instructions

The installation should be in accordance with local regulations. The drivers should also be connected with strain relief according to IEC.

- LED panel is designed for installation on a T-bar ceiling system only.
- Adjust the LED panel position to fit ceiling well by following the steps 1, 2, and 3 in the figure on the left.
- For safety purposes, it is recommend to attach a safety cable to the two hooks at the rear side of the LED panel. Two situations for applying such a safety cable are sketched in the figure on the left.
- Driver is recommended to be put on the panel and near the panel cable, as indicated in the figure on the left. Please refer to the driver DIG for specific instructions regarding the connection of the driver.
- The LED panel input wires should be poked into the terminals of the driver and must be attached with strain relief protection.
- In any case, insulation matting or other similar materials cannot cover LED panel.
- The place to be grounded is recommended on left. The screw is long type, M3x4.8mm.

Thermal design-in

The critical thermal management points for the LED panel are set out in this chapter in order to facilitate the design-in of LED panel. If these thermal points are taken into account, this will help to ensure optimum performance and lifetime of the LED system.

Optimum performance

The main thermal specification that needs to be taken into account when designing in LED panel according to the claimed T-case lifetime. Please refer to the product datasheet for further details.

Operating temperature

Definitions

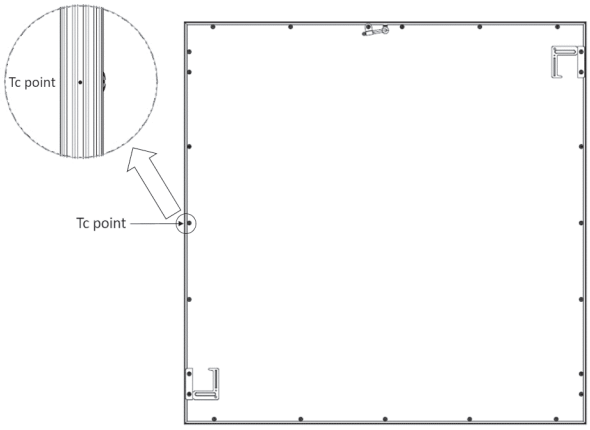
LED panel temperature: temperature measured at the specified Tcase point (at the base).
Driver temperature: temperature measured at the specified Tcase point on the driver.
Ambient temperature: temperature of the air surrounding the luminaire in the test environment or application.
Ambient temperature in a lab environment: air temperature in a testing area, in a controlled environment free from drafts.
Average ambient temperature: monthly average temperature based on at least 2 measurements per day, with at least 8-hour intervals between measurements.

LED panel temperature

To achieve typical product lifetime characteristics, it is crucial to ensure that the product is operating within the specified temperature limits. These limits are determined not only by the product and the application, but also by the luminaire design and ambient environment.

Warnings:

- Maximum T_{case} should never exceed specified T_{case} max
- Please refer to the specific datasheet for the maximum T_{case} Value
- Thermal design should ensure that driver T_{case} <max specified driver T_{case}
- Thermal design must ensure maximum $\triangle T$ (T_{case} - T_{amb}) ≤ 50 °C



Tc point location

Thermal measurements

The maximum ambient temperature at which the luminaire will operate constitutes the initial key criterion for defining the correct temperature limit and validating the thermal luminaire design.

In order to get an accurate ambient temperature, tests must be done in a quiet, draught free area.

Critical temperature point (Tcase)

For LEDs, the junction temperature is the critical factor for operation. Since there is a direct relation between the case temperature and the LED junction temperature, it is sufficient to measure the aluminum casing of LED panel at its critical temperature point, Please refer to figure (Tc point on LED panel). If the case temperature at the Tcase point exceeds the recommended Tcase lifetime, this will have an adverse effect on the performance of LED panel in terms of light output, lifetime and lumen maintenance.

Measurement of critical temperature point

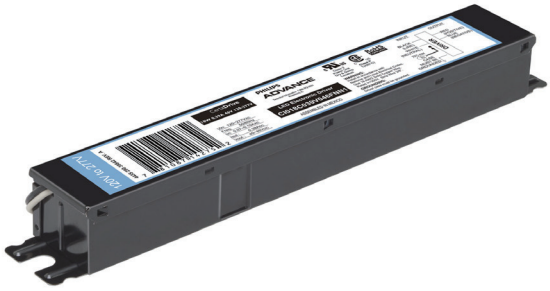
The Tcase (Tc) point is located in the middle of the body's side as indicated on the figure on the left. Note that the LEDs are located only on two sides of the panel. The Tcase point must be used for all temperature measurements. The temperature must be stable before any reliable data can be obtained (depending on the size and material of the luminaire, this will take between 30 and 180 minutes).

Note:

Don't use thermal interface materials for Tcase measurements.

In order to ensure accurate Tcase test results, the case temperature should not vary by more than 1°C for a period of at least 30 minutes.

Electrical design-in and flexibility



Connection to the mains supply

The mains supply must be connected to the LED driver.

Philips Indoor driver

LED panel are combined with Philips Xitanium single current point driver, Certadrive linear panel driver and Certadrive point driver. This allows for an easier design-in for luminaire design.
More information about these driver families can be found in the Indoor driver design in guide and commercial leaflet. These documents can be downloaded via
http://www.lighting.philips.com.sg/oem-sg
http://www.usa.lighting.philips.com/products/oem-components

The driver datasheets can also be downloaded on this website. Full system overviews can be obtained using the Easy Design-in tool at www.easydesignintool.philips.com.

Compatible Drivers

A list of compatible drivers, specific to your choice of LED panel and operating point can be obtained from the Easy Design-in Tool that can be found at www.easydesignintool.com
In case of queries, please contact your Philips representative.

Note:
It's not allowed to put LED Panels in serie or parallel on one driver.

Reliability

Lumen maintenance

The quality of Philips portfolio by the Philips' claim of for example B50L70 @ >25,000 hours. This means that at >25,000 hours of operation at least 50% of LED panel population will emit 70% of its original amount of lumens.
Please refer to the product datasheet for further details.

Compliance and approval

Safety

IEC/EN 62031	LED panel for general lighting – safety specifications
IEC 62471/62778	Photo biological safety of lamps and lamp systems

Approval

• CB/CE/CQC

Compliance and approbation

LED panel bear the CE mark indicating that they comply with the appropriate European EU directives. The relevant standards are summarized below.
To ensure luminaire approval, the conditions of acceptance need to be fulfilled. Details can be requested from your local sales representative. All luminaire manufacturers are advised to conform to the international (luminaire standards IEC 60598-1) and national standards of luminaire design.

Environmental compliance

The product is compliant with European Directive 2011/65/EC on Restriction of the Use of Certain Hazardous Substances in electrical and electronic equipment (RoHS2).

Blue Light Hazard

The photobiological safety standard IEC TR 62778 ('Photobiological safety of lamps and lamp systems') gives guidance on how to evaluate the photobiological safety of lamps and lamp systems including luminaires. This standard specifies the exposure limits, reference measurement technique and classification scheme for the evaluation and control of photobiological hazards from all electrically powered incoherent broadband sources of optical radiation including LEDs in the wavelength range from 200 nm through 3000 nm. Measured results of emission limits for Philips LED panel using the non-GLS (20 cm) method are listed in the datasheets that can be found at http://www.lighting.philips.com.sg/oem-sg

From the nature of most LEDs applying blue light, emphasis has been put on the hazard in terms of Photo Biological Safety (PBS). Evaluation by the European lighting industry (ELC, Celma) has concluded LED light sources are safe for customers when used as intended. A photobiological safety report is available at http://www.lighting.philips.com.sg/oem-sg

Nevertheless luminaire makers have to comply with luminaire standards including PBS. To avoid extensive retesting, it is preferred to build on the test conclusions of LED panel suppliers; however this should be discussed and agreed upon with the used certification body. The testing conclusion then will be expressed in Risk Groups (RG), where RG0 and RG1 are considered safe and/or do not require specific action for the luminaire makers (as compared to RG2 and 3).

Chemical Name	Normally used as
Acetic acid	Acid
Hydrochloric acid	Acid
Nitric acid	Acid
Sulfuric acid	Acid
Ammonia	Alkali
Potassium hydroxide	Alkali
Sodium hydroxide	Alkali
Acetone	Solvent
Benzene	Solvent
Dichloromethane	Solvent
Gasoline	Solvent
MEK (Methyl Ethly Ketone)	Solvent
MIBK (Methyl Isobutyl Ketone)	Solvent
Mineral spirits (turpentine)	Solvent
Tetracholorometane	Solvent
Toluene	Solvent
Xylene	Solvent
Castor oil	Oil
Lard	Oil
Linseed oil	Oil
Petroleum	Oil
Silicone oil	Oil
Halogenated hydrocarbons	
(containing F,Cl,Br elements)	Misc
Rosin flux	Solder flux
Acrylic tape	Adhesive
Cyanoacrylate	Adhesive

Chemical Compatibility

The LED contains a silicone overcoat to protect the LED chip and extract the maximum amount of light. As with most silicones used in LED optics, care must be taken to prevent any incompatible chemicals from directly or indirectly reacting with the silicone.
The silicone overcoat used in the LED is gas sensitive. Consequently, oxygen and volatile organic compound (VOC) gas molecules can diffuse into it. VOCs may originate from adhesives, solder fluxes, conformal coating materials, potting materials and even some of the inks that are used to print the PCBs.
A list of commonly used chemicals, that should be avoided as they may react with the silicone material, is provided on the left. Note that Philips does not warrant that this list is exhaustive since it is impossible to determine all chemicals that may affect LED performance. These chemicals may not be directly used in the final products but some of them may be used in intermediate manufacturing steps (e.g. cleaning agents). Consequently, trace amounts of these chemicals may remain on (sub) components, such as heat sinks. It is recommended to take precautions when designing your application.

Cautions

During operation

Philips shall not be held responsible or liable for any damage, costs or expenses to the user, resulting from an accident or any other cause during operation if the system is used without due observance of the absolute maximum ratings and other instructions provided by Philips.

Contact details

Philips
Please contact your local Philips sales representative.

Disclaimer

Philips will perform the testing of the LED systems to high standards of workmanship. The tests are carried out with reference to the EN/IEC standards, if any, which are regarded by Philips as being of major importance for the application of the lamp gear and the lamp within the fixture for horticultural applications.

The design-in guide, regarding the testing and design in of the LED system provided by Philips, is not an official testing certificate, and cannot be regarded as a document for official release of the fixture. The OEM is liable for the official testing by a certified test body and all markings, such as CE and ENEC marks, on the fixture assembly.

The design-in guide is for information purposes only and may contain recommendations for detecting weak points in the design of the system (lamp – lamp gear – fixture), if any.

Specifically mentioned materials and/or tools from third parties are only indicative: other equivalent equipment may be used but it is recommended that you contact Philips for verification.

Philips will not be liable for unforeseen interactions of the proposed solutions when applied in the fixtures or applications using these fixtures. Philips has not investigated whether the recommendations are or will in the future be in conflict with existing patents or any other intellectual property right. Philips does not warrant that its recommendations are technically or commercially the best options.

Since the tests are only performed on one particular fixture provided by the customer, it will be treated as a prototype. This means that there is no statistical evidence regarding later production quality and performance of the lamp – lamp gear – fixture system.

As Philips does not have control over manufacturing of the fixtures, Philips cannot be held liable for the fixture assembly.

Philips will not accept claims for any damage caused by implementing the recommendations.

No warranty whatsoever may be claimed by the OEM with regard to the content and/or quality of the design-in guide or any other advice, or the conclusions and/or recommendations in the design-in guide or any other document, either express or implied, and Philips expressly disclaims any implied warranties of any kind, including without limitation any warranties of satisfactory quality, fitness for a particular purpose or non-infringement and any warranties regarding the design-in guide or any other advice or the use of the results of any activity performed while testing the fixture with respect to its correctness, quality, accuracy, completeness, reliability, performance or otherwise.

The OEM expressly agrees that test design-in guides are provided by Philips on an ‘as is’ basis and an ‘as available’ basis at customer’s sole risk and expense. Philips shall not be liable for any lost profits or lost savings, indirect, incidental, punitive, special, or consequential damages whether or not such damages are based on tort, warranty, contract, or any other legal theory – even if Philips has been advised, or is aware, of the possibility of such damages.

The OEM must bring any claim for damages within ninety (90) days of the day of the event giving rise to any such claim, and all lawsuits relative to any such claim.

14 July 2017
Data subject to change

http://www.lighting.philips.com.sg/oem-sg