7-TEC BY ECLATEC

7-Tec by Eclatec is a seven stage process ensuring that you; the designer, installer or stakeholder are getting an outdoor lighting product and solution of the highest quality.

1. MECHANICAL OPTIMISATION

Mechanical optimization is a comprehensive approach in engineering that aims to maximize the performance, reliability, and efficiency of mechanical systems.

One crucial aspect of mechanical optimization is designing systems for long-term reliability and maintainability. By considering factors such as component durability and ease of maintenance, engineers ensure that the systems can operate efficiently over an extended period.

Moreover, mechanical optimization focuses on achieving a long economic life for assets. By employing durable materials and robust designs, engineers ensure that the mechanical systems have a prolonged lifespan, reducing the need for frequent replacements and minimizing associated costs.

A modular approach is another key principle of mechanical optimization, aiming to maximize product circularity. By designing systems with interchangeable and reusable components, engineers enhance the system's flexibility, adaptability, and sustainability. This approach allows for efficient maintenance, upgrades, and recycling of components, reducing waste and resource consumption.

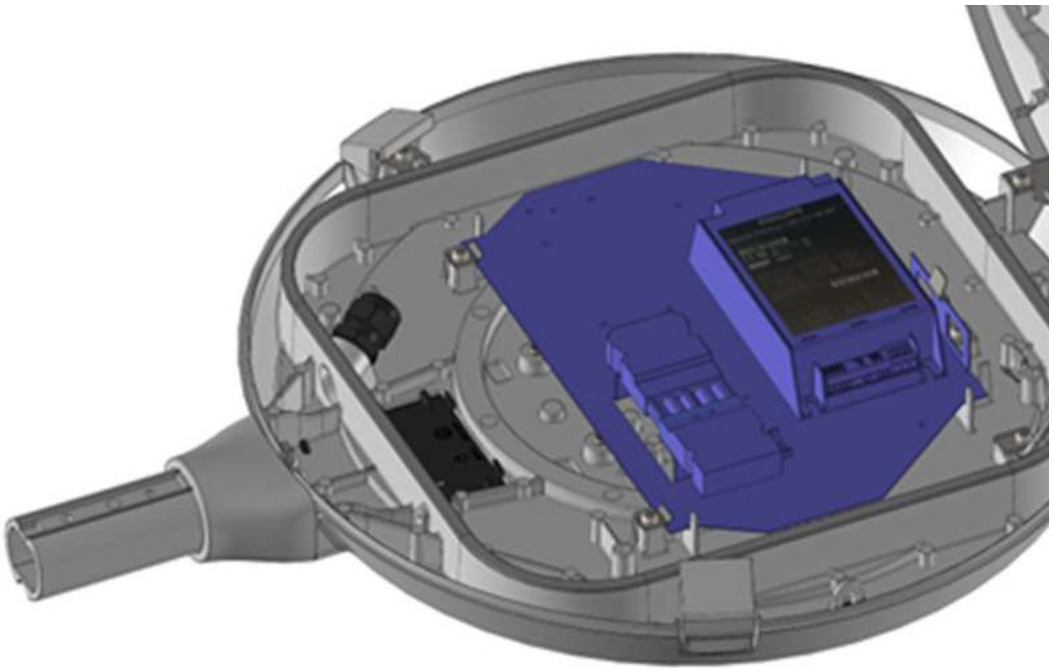
In the pursuit of thermal performance optimization, mechanical systems are designed with housings that never use cooling fins. This design feature ensures that the systems are not affected by the accumulation of dust or debris, maintaining consistent thermal performance over time.

To facilitate maintenance and repair, drivers are only fixed to removable gear-trays rather than the body casting. This design enables quick and easy replacement of faulty components without the need for extensive disassembly, minimizing downtime, shortening maintenance time, hence lifetime cost of ownership and increasing system availability.

An effective breathing system for the gear cavity is incorporated in the housing design, utilizing an activated carbon filter. This filtration mechanism helps to maintain clean and contaminant-free gear cavities, minimising dust buildup and ensuring ensuring optimal performance and prolonging the life of the electronic components by maximising heat dissipation and exchange.

Mechanical optimization also considers the need for a wide range of mechanical interfaces. By providing compatibility with various industry-standard interfaces, the systems can seamlessly integrate with other mechanical and electronic components and control systems, promoting interoperability and ease of use.

All fittings are carefully designed to meet the required European Standards, with IP66 ingress protection via extruded silicon gaskets kept sealed via tooless cantilever-type locking mechanisms being the norm across the majority of the Eclatec family of luminaires. Additionally, the mechanical optimization process takes into account the level of impact resistance required for different fitting types. The impact resistance rating, denoted as IK08, IK09, or IK10, ensures that the systems can withstand external forces and environmental conditions without compromising their functionality.



1. MECHANICAL OPTIMISATION

Summary:
Mechanical optimization encompasses various design principles and considerations to achieve enhanced performance, reliability, and efficiency of mechanical systems.

- long-term reliability,
- economic life,
- modular approaches,
- thermal performance,
- maintainability, and
- compatibility with mechanical interfaces.

Engineers strive to create systems that maximize functionality while minimizing waste and resource consumption.

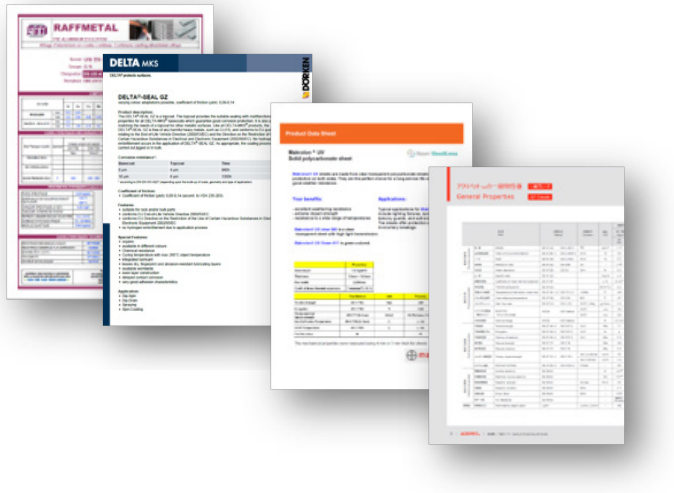
This holistic approach leads to improved system durability, reduced costs, and a more sustainable approach to mechanical engineering.

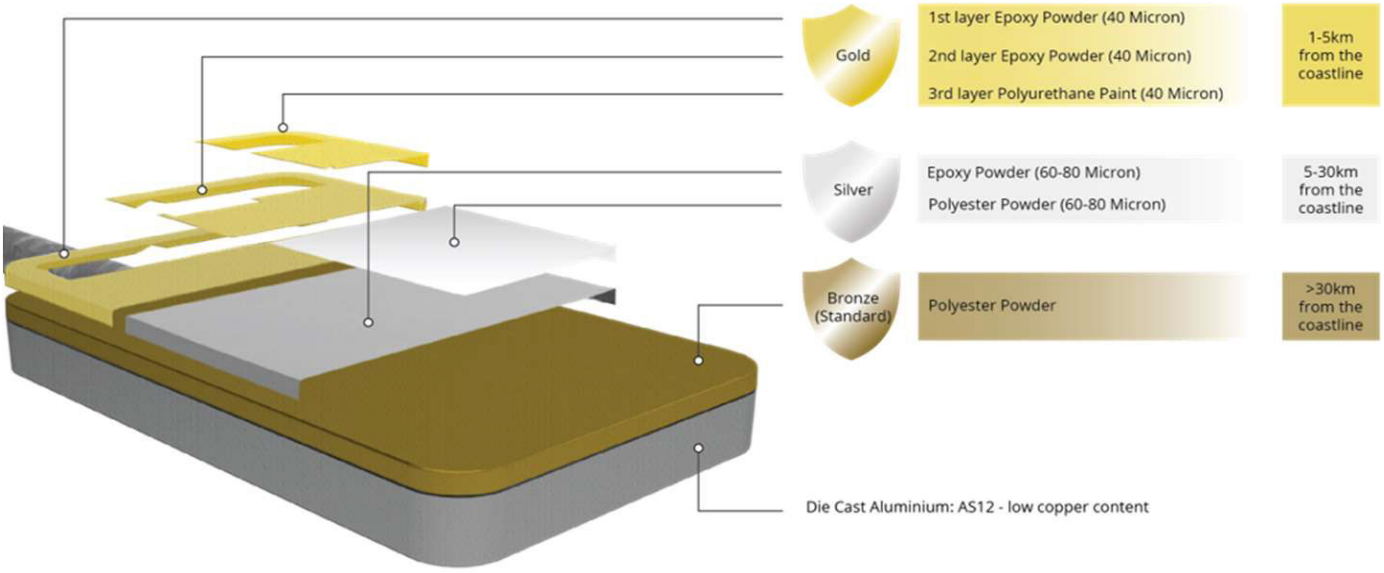
2. MATERIALS & TREATMENT

In the realm of materials and treatment, careful selection and application of various elements contribute to the overall quality and durability of luminaires.

When it comes to cast aluminum housings, low-copper AS12-grade alloys with a copper content of less than 0.08% are utilized. This choice of alloy ensures high corrosion resistance, protecting the housings from the detrimental effects of environmental factors and extending their lifespan.

To prevent galvanic bonding and further enhance corrosion resistance, all external screws undergo the DELTA sealing process. This treatment eliminates the risk of galvanic corrosion and ensures the integrity and accessibility for maintenance of the luminaire over time, ensuring the extended functional life of the fitting.



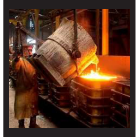


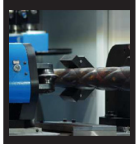
External optics are constructed from thermally-toughened glass or double-UV-stabilized polycarbonate, with the treatment applied to both sides. This provides excellent weathering resistance, ensuring that the optics can withstand harsh environmental conditions without compromising their functionality. In addition, the primary lenses used on individual LED packets are made from UV and temperature-stabilized PMMA, which enhances their durability and ability to maintain optical clarity under varying environmental conditions.

Furthermore, the primary lenses (those that are associated with the individual LED packets) are made from UV and temperature-stabilized PMMA, which enhances their durability and ability to maintain optical clarity under varying environmental conditions.

As was stated in the previous section, the choice of materials also provides high ingress protection and impact resistance, depending on the specific fitting type.

To ensure reliable ingress protection and weathering resistance, long-life extruded silicone gaskets are employed for luminaire housing seals. These gaskets provide effective sealing, safeguarding the internal components from moisture, dust, and other contaminants. With an ingress protection rating of IP66, the luminaire housings are well-equipped to withstand challenging environmental conditions while maintaining their integrity.





Summary:

ECLATEC offers three levels of coating protection for their fittings. All luminaire bodies are degreased, rinsed twice and dried at 120°C. Then there are three levels of protection that are applied to the body. These consist of;

BRONZE (Standard)
- Corona polyester powdercoat is applied
- Polymerisation at 200°C
- Protection and Packaging

SILVER
- Application of epoxy powder (60-80 microns)
- Jetification at 150°C
- Corona polyester powdercoat is applied
- Polymerisation at 200°C
- Protection and Packaging

GOLD
- First layer of epoxy powder (40 microns)
- Jetification at 150°C
- Second layer of epoxy powder (40 microns)
- Jetification at 150°C
- Third layer of polyurethane paint (40 microns)
- Fitting is left to dry
- Protection and Packaging

GOLD protection level allows ECLATEC fittings to be used close to seaside and coastal locations.

3. ELECTRONIC QUALITY

LED Selection

Electronic quality is paramount in achieving optimal performance and reliability in LED luminaires. The careful selection of LED chips from specific bins, considering factors such as forward voltage, flux, and colour temperature, allows for the optimization of operating points and efficacy.

Internal laboratory tests verify manufacturer's figures and conduct QC testing, covering a range of parameters, to ensure consistent quality during production. By prioritizing electronic quality, the luminaire can deliver the desired performance and reliability, meeting the expectations of the end-users.

ECLATEC utilise only the best brands for the LED chips. Among these are Osram, Philips Lumileds and Nichia.

OSRAM

PHILIPS
Xitanium
LED Driver

PHILIPS LUMILEDS OSRAM Opto Semiconductors NICHIA

PCB Design

PCB design is a critical aspect of ensuring optimal performance, stability, and reliability of electronic systems. In-house production and robotic pick-and-place methods ensure precise assembly.

Design considerations, such as PCB thickness, circuit printing, temperature gradient minimization, manufacturing tolerances, and surface quality, all contribute to the overall quality and performance of the PCBs. Additionally, focus on thermal performance without pastes/mastics and inclusion of an "over-temp" indicator further enhance the reliability and usability of the electronic systems.

By prioritizing these aspects in PCB design, the electronic systems can operate efficiently and reliably, meeting the expectations and requirements of the users.

Driver Selection

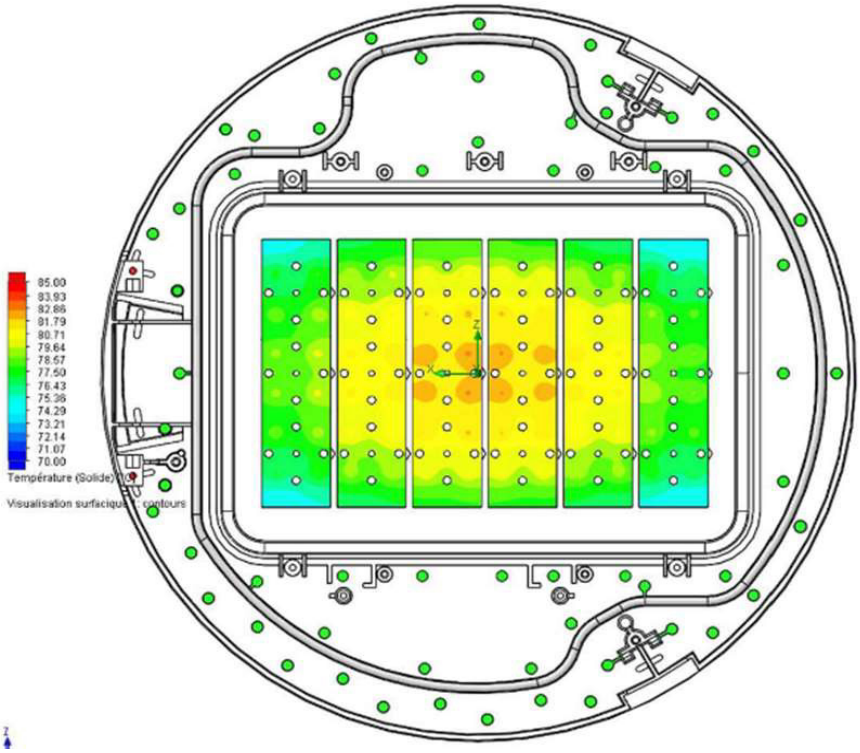
The selection of drivers by ECLATEC emphasizes quality, reliability, and compatibility.

Through extensive internal testing procedures, the best-in-class drivers are chosen Philips and Osram), meeting the stringent standards set for performance and durability. The drivers have a minimum lifetime of 100,000 hours, surge protection capabilities, and continuity of brand and model to facilitate long-term maintenance and spare parts compatibility. By prioritizing these factors, the luminaires can operate efficiently and reliably, minimizing failures, and ensuring optimal performance throughout their lifespan.

Interoperability and Controls

ECLATEC offers a range of solutions for Smart lighting, catering to various requirements and preferences. Stand-alone solutions (pre-programmed, field-adjustable, sensor or Bluetooth wireless), Local Networks (wired or Zigbee) or Cloud-based applications (Zigbee wireless) are some of the options available.

ECLATEC provides a comprehensive range of interfaces, detectors, sensors (PIR and radar) and video through cameras. These components are located within the luminaire housing thus not detracting from the fitting's appearance. NEMA, Zhaga or ZD4i sockets can also be fitted to make the luminaire Smart Lighting ready.



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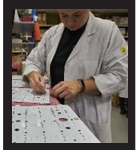
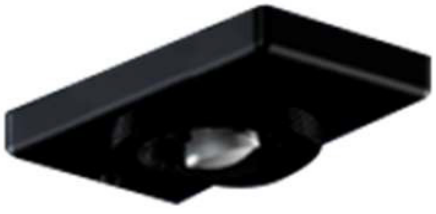


ZHAGA Socket

ZD4i Smart-Ready



Camera

Presence Sensor

Summary:

LED Selection:
Binning, determined by factors such as:

- forward voltage,
- flux, and
- colour temperature, allows for the optimization of operating points and efficacy.
- Internal laboratory verification ensures consistent quality during production.

PCB Design:

- Ensures optimal performance, stability, and reliability of electronic systems, robotic pick-and-place methods ensure precise assembly.
- Design considerations, such as PCB thickness, circuit printing, temperature gradient minimization, manufacturing tolerances, and surface quality, all contribute to the overall quality and performance of the PCBs.
- The focus on thermal performance without pastes/mastics and the inclusion of an “over-temp” indicator further enhance the reliability and usability of the electronic systems.

Driver Selection:

- Emphasizes quality, reliability, and compatibility.
- Extensive internal testing identifies best-in-class drivers meeting the stringent standards set for performance and durability.
- Selected drivers have a minimum lifetime of 100,000 hours, surge protection capabilities, and continuity of brand and model to facilitate long-term maintenance and spare parts compatibility.
- By prioritizing these factors, the luminaires can operate efficiently and reliably, minimizing failures, and ensuring optimal performance throughout their lifespan.

linteroperability and Controls:

- Smart lighting solutions achieve these outcomes through the adoption of D4i and Zhaga hardware, ensuring compatibility across different vendors and components.
- Eclatec provides a comprehensive range of solutions, encompassing stand-alone, local network, and cloud-based applications.
- The availability of diverse interfaces, detectors, and sensors further enhances the versatility and adaptability of the lighting systems.
- Through these efforts, Eclatec aims to deliver seamless integration, flexible control options, and innovative sensing capabilities in their smart lighting solutions.

4. MAINTENANCE OPTIMISATION

Sustainability Goals
The focus on maintenance optimization is an integral part of the design and functionality of ECLATEC lighting systems, it has become increasingly relevant as clients have begun to introduce sustainability as a critical design requirement. Several features are implemented to simplify and streamline the maintenance process while maximizing circularity and minimizing the need for tools and associated down-time.

Circular Economy
A modular design approach is employed to promote circularity and facilitate maintenance. This design philosophy allows for easy disassembly and replacement of individual components, should they fail, reducing waste and promoting sustainability. In line with this, tool-free maintenance is prioritized to enhance convenience and efficiency.

Maintenance Simplification
To ensure easy and hassle-free maintenance, toolless gear-tray fixing and plug-and-play electrical connections are incorporated into the luminaire. This enables simple replacement of drivers, eliminating the need for complex installation procedures with its attendant risk of error as well as reducing downtime. Similarly, LED PCBs are mechanically fixed to castings, eliminating the use of pastes or adhesives. This design feature simplifies the replacement of LED modules, making it a straightforward process.

Simplified Mechanical Closure
To further facilitate maintenance, the luminaires are equipped with a hinged body. This design allows for a secure enclosure while enabling easy access to the gear cavity for maintenance tasks. The hinged body design strikes a balance between security and convenience, ensuring that maintenance operations can be carried out efficiently.

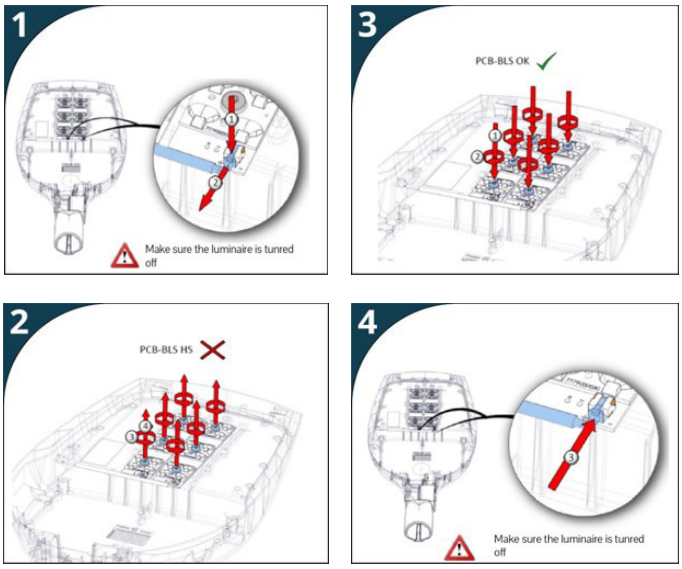
Push-fit gaskets
Extruded silicone gaskets play a vital role in maintaining the integrity of the lighting system. These gaskets are designed to be “push-fit” over sealing ridges, eliminating the need for adhesives or glues. This feature simplifies the installation and replacement of gaskets, reducing the time and effort required for maintenance activities.

Toolless gear-tray fixing and plug-and-play electrical connections
– **simple driver replacement**

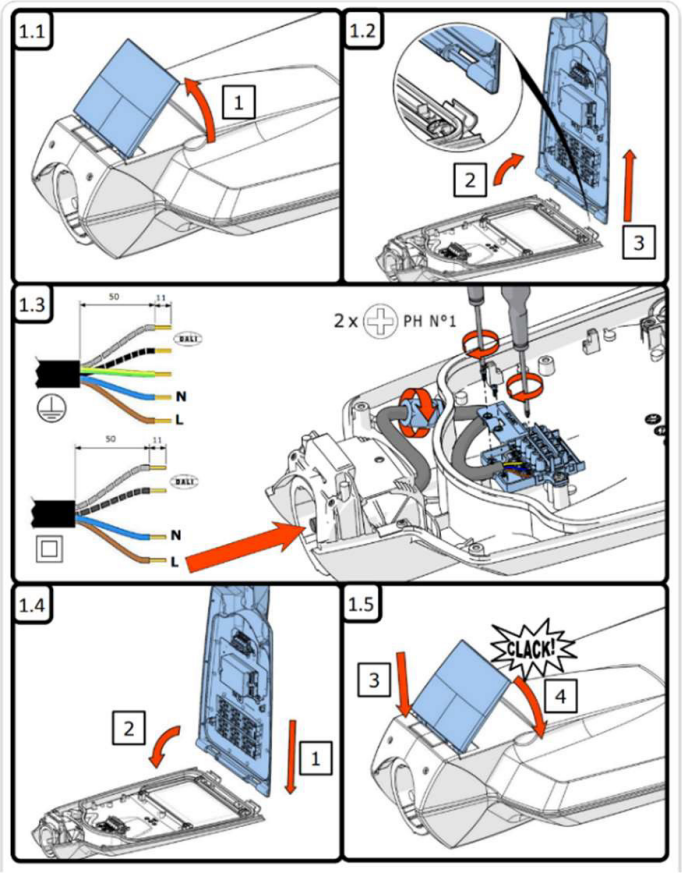
LED PCBs mechanically fixed to castings (no pastes/adhesives)
– **simple LED module replacement**

Hinged body
– **secure, but easy access to gear cavity**

Extruded silicone gaskets ‘push-fit’ over sealing ridges
– **gaskets are never glued.**



BLS mount/dismount with Back Light Shield (strong)



Summary:

- Maintenance Optimization is a key consideration in the design of ECLATEC luminaires.
- The modular design with a tool-free maintenance approach, incorpurating plug-and-play connections simplify the replacement of components.

- Easy and hassle-free maintenance is effected via toolless gear-tray fixing and plug-and-play electrical connections incorporated into the luminaire.
- This enables simple replacement of drivers, reducing downtime.
- Similarly, LED PCBs are mechanically fixed to castings, eliminating the use of pastes or adhesives, which again simplifies and expidites replacement.

- The use of extruded silicone gaskets that are “push-fit” over sealing ridges eliminates the need for adhesives.
- By incorporating these features, the lighting systems are designed to
- maximize circularity,
- minimize maintenance efforts,
- and promote sustainability.

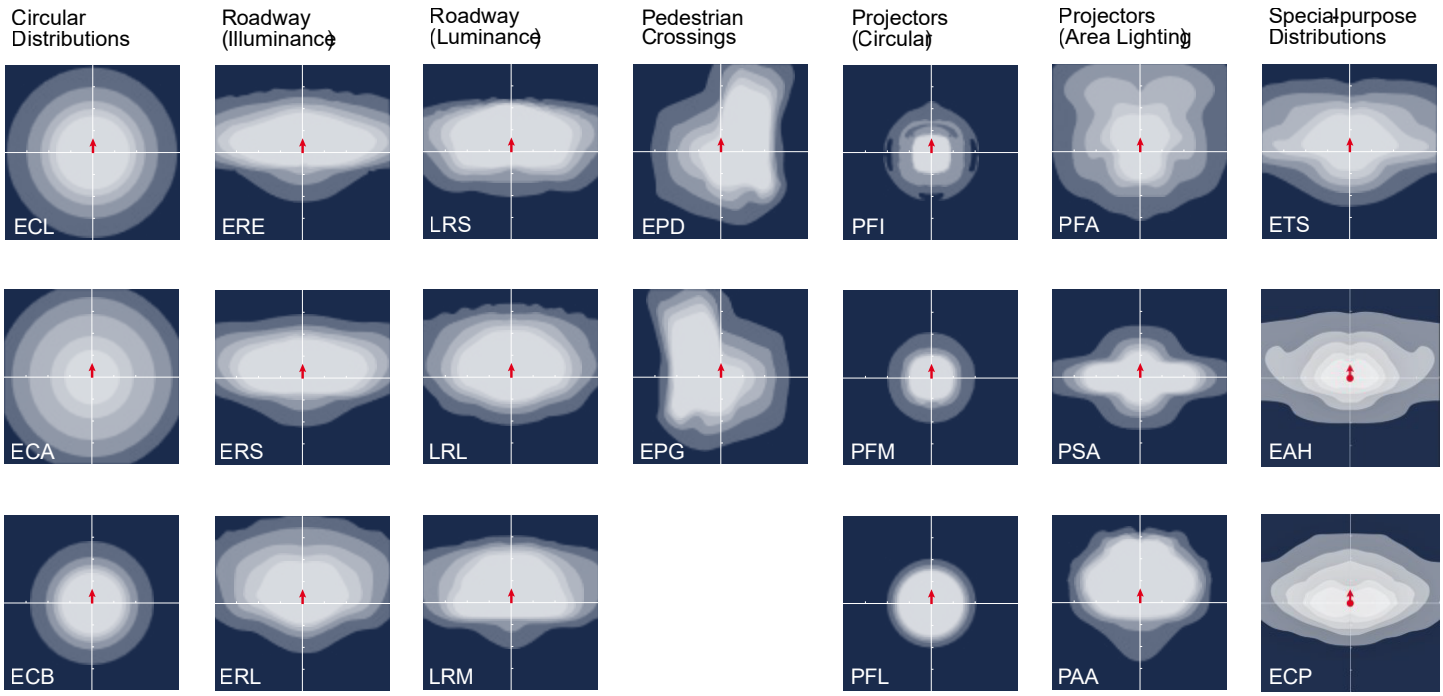
- The modular design approach promotes circularity and facilitates maintenance.
- This design philosophy allows for easy disassembly and replacement of individual components, reducing waste and promoting sustainability.

4. MAINTENANCE OPTIMISATION

5. OPTICAL DISTRIBUTION

The optical distribution of luminaires plays a crucial role in achieving desired lighting outcomes and meeting specific application requirements as well as meeting the needs of specifiers. At Eclatec, the Optics Engineering team takes the lead in designing optics in-house, ensuring a comprehensive understanding of the optical characteristics and performance of the individual lighting solutions

In addition to the standard distributions, Eclatec offers the possibility of hybrid distributions and CCT (Correlated Colour Temperature) arrangements with the integration of Backlight Shield modules. This flexibility allows for the creation of tailored lighting solutions that can adapt to specific project requirements and desired lighting effects.

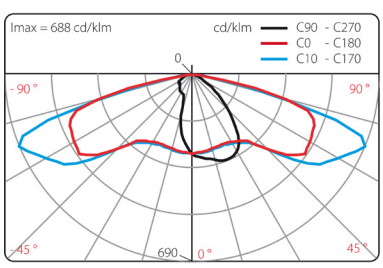


The distributions of the optics are optimized for a variety of applications, catering to different lighting needs. Whether it is roadways, pathways, areas, or accent illumination, the optics are carefully designed to provide the desired light distribution and coverage for each specific application while limiting the creation of excess illumination in line with Dark Sky requirements.

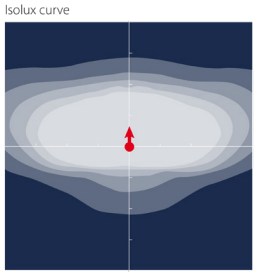
To limit light spill and enhance visual comfort, Eclatec has developed unique Backlight Shields. These shields are specifically designed to control and redirect light, ensuring that the illumination is focused precisely where it is intended, minimizing glare and light pollution. The Backlight Shields are available in different options, compatible with BLS and ORALED PCB's and can be easily installed either at the factory or in the field using a clip-on mechanism. The shields are available in white (medium) and black (strong) variants, allowing for flexibility in light control based on the specific requirements of the application.

Eclatec maintains an extensive database of customized distributions to suit specific applications worldwide. This database serves as a valuable resource, ensuring that lighting solutions can be tailored to meet the unique needs and regulations of different regions and projects. This level of customization enables optimal lighting performance and compliance with local lighting standards.

ERS



Isolux curve



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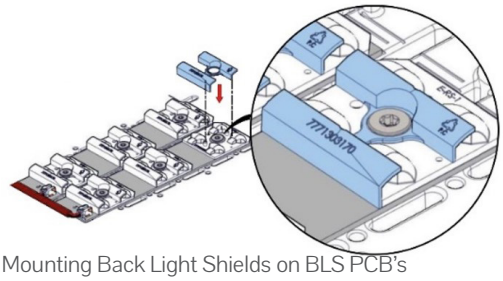
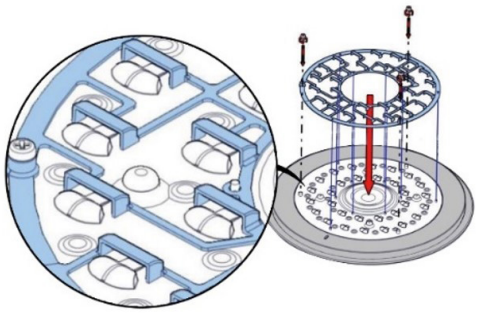
Standard lens (STD)

'Medium' shield (CFM)

'Strong' shield (CFF)



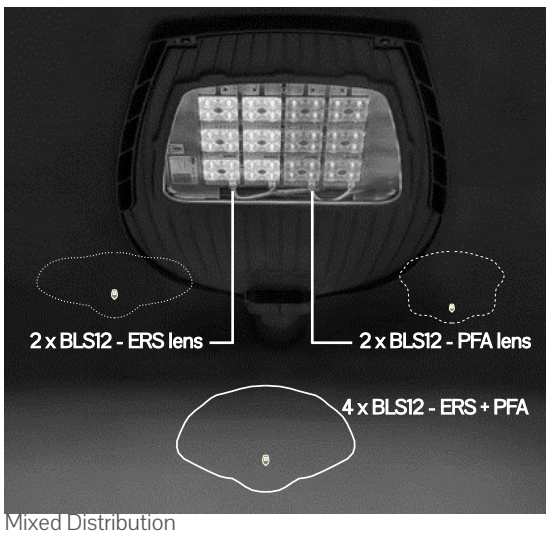
Mounting Back Light Shields on BLS PCB's



Mounting Back Light Shields on ORALENS PCB's

Summary:

- Optical distribution of Eclatec's lighting systems is designed in-house by their Optics Engineering team.
- Carefully designed optics for roadways, pathways, areas, or accent illumination, ensures desired light distribution and coverage for each application while meeting Dark Sky requirements.
- Unique Backlight Shields control light spill and glare, enhancing visual comfort, and directing light precisely where intended, minimizing light pollution. The Shields are available in different options, compatible with BLS and ORALED PCB's, easy to install at the factory or in the field using a clip-on mechanism.
- Shields come in white (medium) and black (strong) variants for flexible light control based on application requirements.
- Customized distributions, flexible hybrid distributions, and CCT arrangements offer tailored lighting solutions for specific project needs.
- Eclatec strives to deliver lighting systems worldwide that optimize light distribution, visual comfort, and efficiency for various applications.



Mixed Distribution

Tunable White

6. TRACEABILITY

Traceability is achieved through comprehensive labelling practices. Traceability is a critical aspect of ensuring transparency and accountability in the production and distribution of lighting systems. To facilitate easy identification and communication, comprehensive labeling is employed throughout the manufacturing and supply chain processes.

The labels include essential information such as the

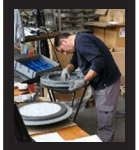
- order code,
- product description,
- program description,
- driver description, and
- gear tray description.

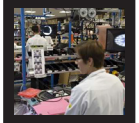
This detailed labeling system allows for accurate identification and tracking of each lighting system, ensuring that the right products are selected and used in the appropriate applications.

Additionally, the program description indicates the specific program or software associated with the lighting system, enabling efficient programming and customization. The driver description provides important information about the driver component, including its compatibility and functionality. Similarly, the gear tray description offers details about the gear tray, aiding in maintenance and replacement activities.

Furthermore, QR codes are incorporated into the labeling system, providing a convenient means of communication between distributors, customers, and the factory. These QR codes can be scanned using smartphones or other devices, enabling efficient and direct communication with relevant stakeholders. This feature promotes effective collaboration, allowing for quick access to product information, technical support, and any necessary follow-up or troubleshooting.

By implementing a robust labeling system that includes order codes, product descriptions, program descriptions, driver descriptions, gear tray descriptions, and QR codes, traceability is enhanced throughout the entire lifecycle of the lighting systems. This level of traceability ensures that accurate information is readily available, promoting efficient inventory management, streamlined communication, and effective customer support.

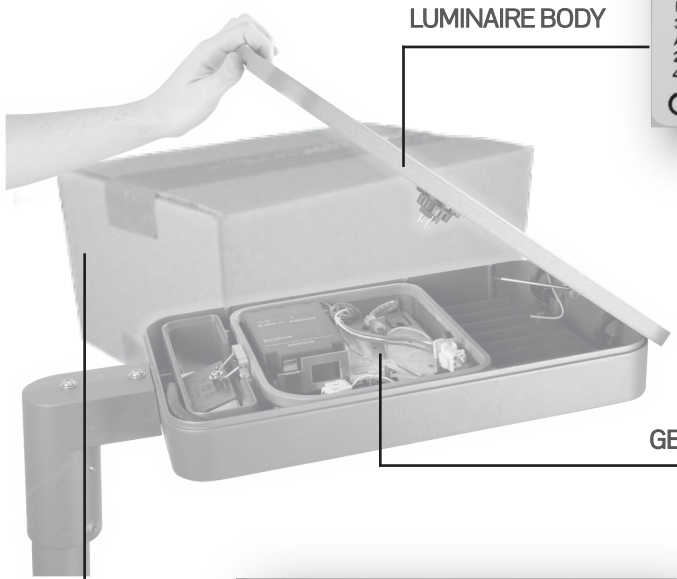




Summary:
Traceability is a function of comprehensive labeling that is implimented from the inception of assembly (robotisized picking) right through to final packaging.

Labelling includes:

- Order Code
- Product description (Componentry)
- Program Description (Software Compatibility)
- Driver Description
- Gear Tray Description
- QR Codes for communications with distributor and factory



7. RELIABILITY

Eclatec's dedication to reliability is further bolstered by their extensive experience in outdoor luminaire design and manufacturing since 1927. With a track record spanning millions of luminaires, their expertise and continuous improvement over the years have led to the development of highly reliable lighting solutions.

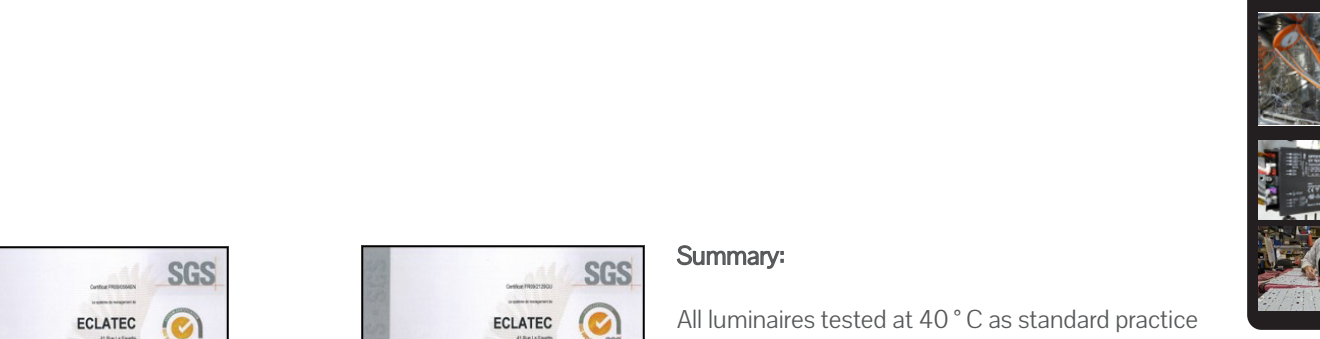
Reliability is a fundamental aspect when it comes to quality lighting systems, and Eclatec takes great pride in ensuring the longevity and durability of their luminaires. Rigorous testing and a long-standing track record contribute to ensuring reliability of not only their products but also the testing methodologies employed at every step of the manufacturing cycle of their products.

As a standard practice, all luminaires undergo testing at 40°C to ensure their performance under elevated temperatures, mimicking real-world conditions. This testing procedure guarantees that the luminaires can operate optimally even in demanding environments such as Dubai.

To demonstrate their commitment to reliability, Eclatec offers generous warranties on their luminaires. The mechanical warranty covers a period of 12 years, providing peace of mind regarding the robustness and longevity of the luminaire's construction. The driver warranty extends up to 10 years, highlighting the reliability and durability of the electronic components.

In addition, the LED modules are backed by a warranty that ensures L80 (B10) performance for 100,000 hours. This warranty guarantees that the LED modules will maintain at least 80% of their initial light output while minimizing the chances of early failures.

Through meticulous testing, extended warranties, and a long history of developing successful luminaires, Eclatec demonstrates their commitment to providing reliable lighting solutions. Customers can rely on their luminaires to perform consistently and withstand the test of time, ensuring long-lasting and dependable illumination.



Summary:

All luminaires tested at 40 ° C as standard practice

- Mechanical warranty: 12 years
- Driver warranty: Up to 10 years
- LED modules warranty: L80 (B10) @ 100,000 hrs

Outdoor luminaire design and manufacturing since 1927 – track record spans millions of luminaires

CERTIFIED ISO 50001 COMPANY

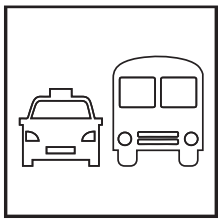
Certified System™
Quality
ISO 9001
SAI GLOBAL
BRISBANE

CERTIFIED ISO 26000 COMPANY

CERTIFIED ISO 14001:2015 COMPANY

CERTIFIED ISO 9001:2015 COMPANY

STANDARD WARRANTY	ECLATEC +	ECLATEC ++
5 YEARS	7 YEARS	10 YEARS



FOS lighting

info@foslighting.com.au
foslighting.com.au
1300 241 087

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