

The importance of optics in street lighting

Zaragoza (Spain) 24/06/2020 – Cities have become the focal point of choice for today's urban society. With an increasingly greater concentration of people living in urban environments (by 2050, 70% of the world's population is estimated to live in cities), they are now the setting for major physical and technological changes.

One of the major challenges facing cities in order to be sustainable and innovative is the need to be designed to adapt to the requirements of their inhabitants and visitors, taking into account their diversity. This is where **lighting** takes on a fundamental role, not only to maintain the balance between personal security and comfort, but also to achieve the long-desired energy efficiency, in addition to becoming a communications highway to serve society.



A well-illuminated city improves its level of habitability and this has a positive impact on the health of those who live in it. It is necessary to be aware of the importance that an appropriate, functional and ambient **street lighting** can have for the image, environment and economy of the city.

In this regard, many factors influence the right sort of street lighting, including the availability of a good portfolio of **optics** that help achieve a light quality that is in keeping with the type of road being illuminated.

Optics are essential for the efficiency of the lighting fixtures. They improve the control of the beam of light towards the desired place, increasing the performance of the lighting fixture and avoiding, among other things, direct glare towards users in unwanted directions.

There is no 'perfect' optic for street lighting. In the words of Justiniano Aporta, an expert on the subject and Full Professor in the field of Optics at the Department of

Applied Physics at the Universidad de Zaragoza “urban environments are very varied as regards morphometrics and functionalities. Roadways, pavements, squares, pedestrian streets and every other urban space, have very varied dimensions and uses and as such, need different types of lighting. All this, together with the demands of optimal integration into urban as well as tree-covered environments, make it necessary to incorporate different optics into the roadway lighting fixtures, which also need to be positioned at different heights and distances from each other”.

OPTIC DESIGN

When the time comes to design an optic, different functional aspects must be considered, as established by current legislation for the different spaces and type of light distribution, scope and aperture requested.

“Other aspects exist such the dimensions and the materials, imposed by the design of the lighting fixture and the productive processes used, which also have to be considered before addressing the optimisation of the optical components” continues Aporta.



Individual lenses are used for street lighting, as they are highly efficient, made of plastic and in some cases protected by means of a flat glass. They offer asymmetric roadway photometry that directs the light to specific areas to avoid light loss.

OPTIC LIFETIME

The ageing and time the lenses last largely depends on the materials used, the treatments applied, the type of lighting fixture and environmental conditions of the spaces in which they are located.

Most optical elements for lighting are made of optical grade polycarbonate or acrylic to maximise light transmission. There are also other optics that are made of polystyrene that have a lower optical efficiency and which deteriorate more over time, however, are cheaper to produce.

LIGHTING FIXTURES FROM ELT: MULTIPLE PHOTOMETRIC DISTRIBUTIONS AVAILABLE

The optical components in LED lighting play a crucial role for the overall success of the lighting fixture. This is because the luminaire itself is responsible for controlling and distributing the light emitted.

Aware of this fact, the lighting and R&D+i teams at ELT have been working alongside each other in the selection and validation of an **extensive range of optics and photometric distributions** to respond to any type of roadway and specific outdoor application.

In this regard, our EXEYA, ELODIA and EROSIA lighting fixtures are supplied ready to be installed with lenses such as PX, a special asymmetric optic for zebra crossings; ME, which offers an asymmetrical beam with excellent longitudinal luminance uniformity, which is ideal for motorways; and the SCL distribution, which is specifically designed for footpaths and residential areas. Every photometry from ELT is endorsed by an external, ENAC-accredited laboratory.

The [ELT](#) road luminaires, [EXEYA](#), [ELODIA](#) and [EROSIA](#) have a **design adapted to the most demanding needs** and are equipped with high performance and robust LED modules and drivers which offers a wide range of dimming modes and control features.

About us:

ELT - Especialidades Luminotécnicas S.A.U. is a Spanish business group specialised in the design, manufacture and marketing of lighting solutions and which, over its more than 40 years, has achieved a leading position in the market.

With a clear focus on quality and technology supported by innovation and the development of new products and tools, ELT dedicates considerable resources to bringing advanced technological solutions to the market covering connectivity, smart street lighting management, customised engineering projects and system interoperability and luminaires.

For more information about our products and technologies, please contact:

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