LED II

Environmental advantages

Extremely long working life (50.000 h)

Reduced maintenance costs
Growing efficiency

Instant switch-on mode

Dimming option with no colour temperature variations

Filter-free direct coloured light emission

Complete colour spectrum
Dynamic colour control mode (DMX, DALI)

Can be switched on also at low temperature rates (-35°C)
Low-voltage DC power supply

Unidirectional light emission (light is shed only upon the desired object or area)

Photobiological safety.

General advantages

Mercury-free

No IR or UV components can be found in the visible light spectrum

Reduced use of renewable and non-renewable energy sources

Environment enhancement

No light pollution

Less power

Less power installed in each lighting point

Design-related advantages

Wide choice of design solutions

Bright, saturated colours

Vibration resistant lights

Advantages for users

A wide range of different colours together with compact and flexible modules enable many creative and innovative design solutions.

Lower energy consumption, longer working life and reduced maintenance facilitate the creation of interesting applications.

Excellent reliability guarantees safety even in difficult operating conditions

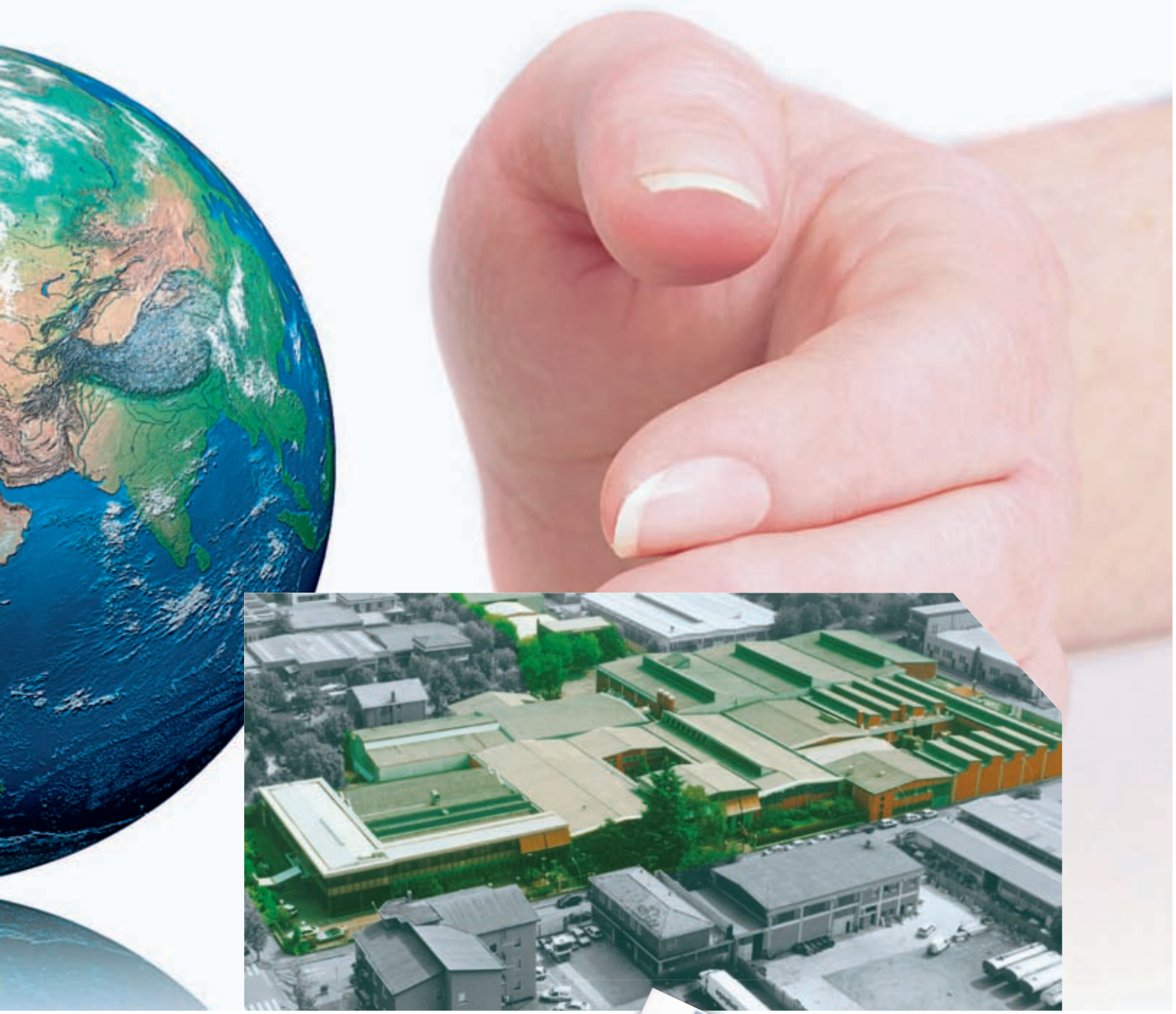
Fosnova S.r.l., located in Rozzano (Milan), boasts decade long expertise in architectural lighting design. Currently, Fosnova's production specializes mostly in fixtures utilising LED.
The Fosnova product range offers a variety of solutions to indoor lighting problems, including:

- Downlights and spotlights
- Interior floodlights
- Lamp stand, wall and ceiling mounted fixtures,
- Modular systems,
- Electrified tracks.

The Fosnova Group considers service to the market and continuity in relations with customers as key elements in company policy in which it has continuously invested in Italy and Europe.

Improvements in manufacturing technology, excellent innovation, rigorous controls throughout the entire corporate process system, high product quality control standards, as well as the development of advanced computer systems for lighting design calculations.

The photometric measurements certified by the CSQ mark are entirely conducted in our research laboratories, in compliance with the European Lighting Design Committee's guidelines.



For FOSNOVA, Quality System Certification (CSQ-IQNET) in compliance with UNI EN ISO 9001:2008 standard (production and sale of lighting fixtures and accessories) is an important step towards the improvement of company processes, aimed at achieving customer satisfaction. Please note that the purpose of the EC labelling is to indicate a product's compliance with all applicable standards and to guarantee the right of this product to be marketed directly in all member states of the European Community. The standards to be complied with by lighting fixtures are as follows: 2004/108/CE "electromagnetic compatibility" - 2006/95/CE "low voltage electrical materials". For more detailed information, please contact our lighting design support centrelighting assistance centre.

ITALY

The Group's manufacturing company is located in Dorno (Pavia), on a totally covered area, equipped with state-of-the-art, highly automated machinery. The company has high productive potential and manufactures products for the whole Group. Additionally, it relies on an entirely automated semi-finished product warehouse, covering a surface of approx. 12,000 sqm.

SPAIN

Spain-based ILUMINACION Fosnova s.a., established in 1992, is now located in new headquarters situated in Roda de Barà (Tarragona), and is responsible for distributing the Group's products in the Spanish territory. Additionally, Iluminación Fosnova has a productive area of approximately 11,850 sqm totally covered, equipped with advanced systems and highly automated. Iluminacion Fosnova's logistics operate on a fully automated area, with an overall capacity of 6360 pallets.

FRANCE

France-based Fosnova FRANCE s.a., established in 1993, equipped with a warehouse and customer support offices, is responsible for distributing the Group's products in the French territory.

Support tools

Fosnova offers designers, installers and distributors
a series of free services that are able to completely satisfy technical, lighting design and commercial needs.

OUR PROMOTERS

Promoters are present in every region and are at the complete disposal of wholesalers, installers and designers to immediately solve any technical, commercial or lighting design problem and to promote the Fosnova product nationwide. They also supply estimates and develop lighting design projects, ensuring continuous support.

CONSULTING CENTRE

From the Lighting Technology Consulting Centre, you can request any type of support for the correct use of light fixtures. In fact, Fosnova guarantees total flexibility in implementing projects using non standard fixtures.The Group's aim is to keep an open-door policy with its customers, and to be at their service at all times.

MARKETING

The Marketing Department has been set up to assist wholesalers by implementing marketing and promotional support actions at the point of sale, advertising their trademarks to make them become reference point for end users.

LIGHTING MAGAZINE

Has been made a regular information editorial about light. The latter aims to make the culture of light, targeted communication and continuous information to designers and architects, and describe their projects and thoughts.

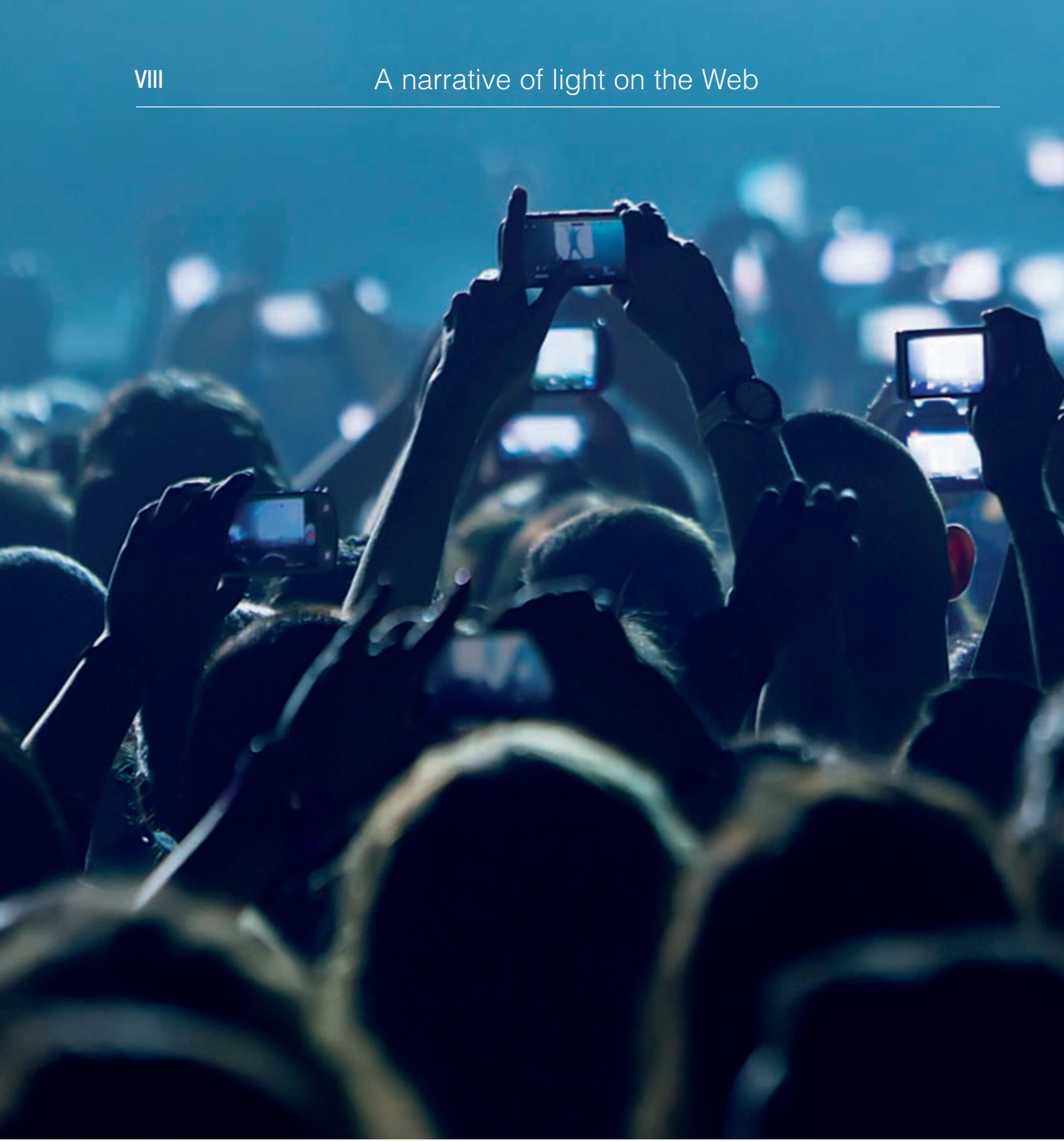
The Group has made significant investments in research and development, adopting advanced technologies (design software) to develop new fixtures and to improve those currently produced.

The Fosnova catalogue is intended to offer detailed information on all the fixtures that are included in our current production range. Together with a thorough description of the structural and functional features of our fixtures
And systems, you will find all the details required to develop lighting design projects. Photometric measurements were performed in our research laboratories, in compliance with the requirements of the european committee for lighting design. These measurements will be shown as diagrams as well as tables.

Laboratories, identical to the ones available to the Italian Body for Quality Marking (IMQ), perform:

- Heat and mechanical resistance tests
- Glow wire test electromagnetic compatibility test
- chemical tests on paint quality.
- protection IP tests for stated fixtures

A narrative of light on the Web



Fosnova has created an innovative website, periodically updated, which provides detailed data and information about the company, its products, representative projects, designs, new products.

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Want to browse Fosnova and Fosnova catalogues easily and quickly, view technical specifications at a glance or retrieve design information with just a few clicks? Now you can thanks to our application for **iPad** and **iPhone** available in four languages (Italian, English, French and Spanish)! A close-up of a Fosnova product against a dark background and the words 'Turn On': this is the homepage that users see when they log into our virtual world. May the journey begin!

Users can choose the different sections from a navigation bar:

Technique displays the catalogues and technical specifications of all the data necessary to develop a lighting design project; three separate catalogues are used to present Fosnova, Fosnova and Led products in order to make product reference easier.

Trend is dedicated to research, development and the manufacturing of highquality lighting products and their applications;

in **Culture** users will find every issue of Fosnova Lighting Magazine, the magazine about the latest lighting design projects implemented by Fosnova in the world.

A slide show displays the most impressive projects: a story in images, a narrative of light and emotions.
Each product is supported by detailed information to meet all the lighting demands in both interior and exterior applications.

Luminous flux and power

The luminous flux levels for each fixture are generally measured based on minimum, nominal, maximum or output values.
The measures indicated by Fosnova in its catalogues are “output” values (HOT LUMEN: lumen output for all fixtures except LED modules)
(except for some cases: ask our customer service for details).

LED and traditional lamps

LEDs have a nominal light output of 150 Lumens and can bring remarkable energy savings compared to conventional sources: Discharge lamps with high colour rendering (Ra>60). They can save up to 30-40% in energy costs. When comparing a LED lighting system with a conventional system we need to take into account the fixture’s actual Lm/W ratio rather than the source’s initial lumens. The Lm/W ratio of any lighting fixture depends on different factors, such as power loss or power variations due to temperature. In discharge lamps these variations cut by half the initial luminous efficiency (expressed in lumen per watt) of sodium or metal halide sources. The products designed by Fosnova, instead, minimize losses and operate efficiency even with traditional technology.ù The wavelength of light (colour) is adjusted using semiconductor materials and different production processes. Unlike lamps emitting a continuous spectrum, **LED lights emit monochromatic light of one particular colour to guarantee the emission.**

Light sources (colour temperature)	**K**
Blue sky	12-20.000
Summer daylight (sunshine and sky)	6500
“Daylight” fluorescent tube	6300
White light LEDs	**5600**
Sunlight (midday, summer, mid-latitude)	5400
“Cool white” fluorescent tube	3400
“Warm white” LED	**3250**
100W halogen lamp	3000
“Warm white” fluorescent tube	2950
Sodium lamp	2100
Sunlight (dawn, dusk)	2000
Candle light	1850-1900
Light sources (colour rendering)	CRI
Sodium lamp	0-25
“Warm white” fluorescent tube	55-73
“Cool white” fluorescent tube	65-86
LED	**80**
Metal halide lamps	85-93
100W incandescent lamp	100

As for wattage, Fosnova indicates the nominal wattage declared by the LED manufacturer, while the relevant **W** column indicates the input power absorbed by the system, i.e.

LED source + power supplier

(except for some cases: ask our customer service for details).

Life expectancy

Firstly, it should be noted that LEDs, unlike traditional sources, will not turn off suddenly when their working life ends, but will slowly fade their initial luminous flux until they turn off completely. In fact, LEDs do not break (except for manufacturing damages) but decay gradually and constantly.

The decrease of LED flux, normally after 50,000 hrs, is defined by the working life and is represented by the L80 mark (see charts), which means that the flux is kept up to 80% after 50,000 hrs.

The “B” letter followed by a number ranging between 10 and 50 indicates the quality of the fixture and defines the LED percentage that doesn’t keep the declared characteristics when it reaches 50,000 working hours.

EXAMPLE: LED declared L80/B10 = 50,000 hrs

This means that when the LED reaches 50,000 hours of operation, 90% (B10) of the LED will have a luminous flux corresponding to 80% of the initial flux (L80)

The influence of heat

Excessive temperature affects the correct functioning of LED lights and reduces their working life. The values concerning lamp life are regarded as reliable after determining the effect of heat on LED sources. In fact, overheated LEDs are more likely to be affected by malfunction and have a shorter life cycle. Therefore, for LEDs to operate properly, guarantee long life (e.g. 50,000 hrs) and a natural degradation of the luminous flux (e.g. L70), they must be designed to evenly dissipate the heat they produce. The nominal performance of LEDs is respected only if their working temperature is not exceeded (Tj). **Fosnova is a competent and responsible company that takes these factors into account and measures real values.**

Thermal Resistance (C°/W): it indicates the difficulty of LED lights to expel heat, which causes the light sources to deteriorate. TR should be very low to guarantee energy efficiency and durability (LM70). A range of products characterized by even lower values will be launched shortly to guarantee improved light levels and longer working life (at present, a minimum of 50,000 hours in certain conditions).

Power supply

Based on the type of LED, they can be powered: - with a 24V power supply- signalling/semi-power/power LED - with a 1050mA power supply – power LED

- The latter can be powered with a higher current to increase its luminous flux and power. In this case it is fundamental to ensure that LEDs have excellent air circulation and a good heat sink to dissipate heat. - the LED power supply has the purpose to maintain and control the exact current circuiting through the circuit; excessive current would damage the LEDs in a few seconds while a weak current would impair performance. -To guarantee constant current, all LEDs of a circuit must be connected in series; if they are connected in parallel (like the one usually used for halogen bulbs) this will deteriorate LEDs very quickly. Power supplies have an isolated output and the maximum input voltage never reaches dangerous levels.

1 - 10V

DALI

LED regulation

Our products are equipped with an automatic temperature control device. In the event of an unexpected temperature rise caused by anomalous weather conditions, the system will reduce the drive current or turn off the system as the LED gets warmer, guaranteeing proper operation.

Moreover they are equipped with an overvoltage protection device as required by EN 61547.

In short:

- fixtures that are powered at up to 530mA have a smart current limiting device;
- fixtures that are powered at 700mA have an On/Off device.

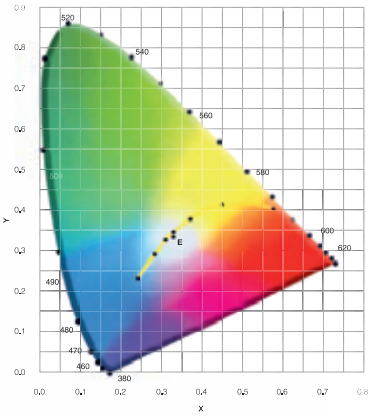
The Colour Rendering Index (**CRI**) indicates how truthfully the artificial light source is able to reproduce the colours of objects.
It varies from a range of **0 to 100**, where **0 represents the minimum** and 1**00 is the maximum**.
Daylight is the best source of light from a physiological point of view because it contains the full colour spectrum.

Therefore, a lamp with a high colour rendering index is very important to ensure the wellbeing and comfort of the occupants of a room and it is absolutely necessary in rooms where good visibility is required.

Colour quality

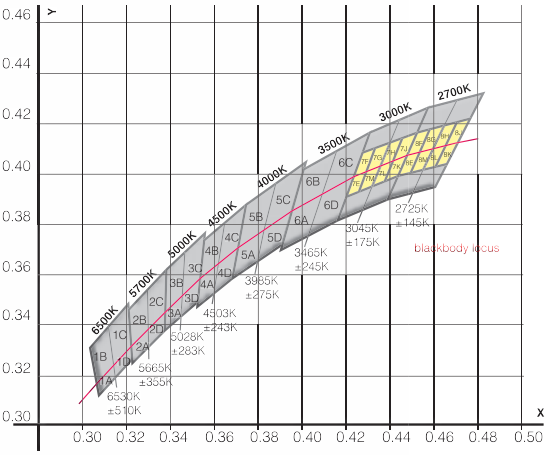
MacAdam Ellipses

Refer to the area on a chromaticity diagram that contains all the colours which are indistinguishable, to the average human eye, from the colour at the centre of an ellipse. The contour of the ellipse represents the just-noticeable difference of chromaticity.
MacAdam shows the difference between two light sources through ellipses, which are described as having 'steps' that indicate the standard deviation of colour. In applications where light sources are visible, this phenomenon should be taken into account because a 3-step ellipse has a lower colour variation than a 5-step.



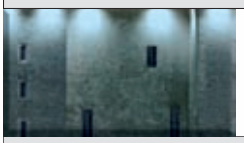
White LED

Several distinctions are made during the production process of the LED lights selected. The chromatic areas called 'bin' are horizontal contours along the BBL line. **Colour uniformity depends on the manufacturer's know-how and quality standards.** A larger selection means higher quality, but also higher costs.



Graphic representation of BINNING: choice of LEDs to use in relation to their colour temperature. Source: Lumileds, 2011.

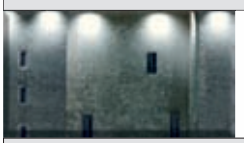
Cold white



5000 ÷ 7000K
CRI 70

Typical colour temperature: 5600K
Outdoor applications (e.g., parks, gardens)

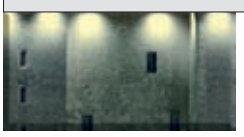
Natural white



3700 ÷4300K
CRI 75

Typical colour temperature: 4100K
Combinations with existing light sources (e.g., shopping centres)

Warm white



2800 ÷ 3400K
CRI 80

Typical colour temperature: 3200K
For indoor applications, to enhance colours

Coloured LEDs

The CIE chromatic diagram is based on the physiological peculiarity of the human eye to assess colours by breaking them down into three fundamental chromatic components (three-colour process): red, blue and green, positioned at the top of the diagram curve. The CIE chromatic diagram can be obtained by calculating x and y for each pure colour.
The spectrum colours (or pure colours) can be found on the contour curve, while the colours inside the diagram are real colours. It should be noted that the colour white (and other colours in the central area - achromatic colours or shades of grey) are not pure colours, and can not be associated to a specific wavelength.

LED FULLCOLOR

Power supply:
Local control (ex. Master + Slave system with remote control)
Remote control (DMX systems)
The range of FULLCOLOR products is operated by a DMX signal and a special interface, which converts the DMX signals into PWN
The DMX signal is generated by a special electronic control, supplied by the customer or by Fosnova.

Direct, emotion-stirring contact with art and culture requires quality lighting.
Light should be able to enhance a work of art in its entirety, along with the aesthetic and architectural qualities of history-laden places.
Hence, Fosnova created a range of luminaires that join top technical performance with versatility, presenting designers with the opportunity to obtain the best possible lighting solutions to enhance the works and places hosting them.

The range of Fosnova lighting fixtures can be seen in prestigious museums and places hosting works of art.
They were also used for important exhibitions and cultural events.
In recent years, Fosnova and art have come closer, thanks to constant product upgrading.
The luminaires are now equipped with state-of-the-art light sources, optics and control systems. Research and quality products serve art and culture.

Today, selling is becoming increasingly synonymous with arousing sensations.
Commercial and display areas should be arranged both as eye-catching and amazing paths. Furthermore, space should be constantly renovated, by enhancing some of the products displayed according to the seasons and the latest arrivals.

Lighting should comply with specific requirements according to different product sectors, enhancing for instance the colour of the products displayed, or creating the right context where to display the most different items of clothing as well as the most exclusive objects.
Fosnova is able to meet all such requirements through offering practical, efficient and modern solutions.

Pictographs

NEW PRODUCT

PERFORMANCE
Techniques - Lighting - Photometric

In the FOSNOVA catalogue, there are some items, generally the more recent ones, that have two numbers (a subcode) at the end of the classical 6-digit code. These subcodes indicate the product type of wiring. Therefore, it is very important when making an order to write the complete FOSNOVA code, including the subcode, which carries the following meaning:


Fixture built with recyclable materials (excluding lamps and batteries).


Energy saving fixtures.

Electronic power supply.

Lighting fixtures wired with dimming electronic power supply.

Lighting fixtures equipped with digital dimmable electronic power supply.

Lighting fixtures equipped with electronic power supply and emergency kit (SA).

UV-stabilised coating, anti-yellowing. Fixture built with stabilised materials.

Maximum track lead 32A load

Maximum track lead 16A load


Aiming on horizontal axis at 0°


Aiming on vertical axis at 0°

UV rays filter installation possibility.

UV rays filter installation possibility.


Colouared or specific filter installation possibility.

LED

LED FULLCOLOR


baffle film protection


With conveyor


Size of round hole for recessed installation


Size of hole for recessed installation

Mains voltage 230V operated with transformer.


Extra wide beam


Wide beam


Medium beam


Narrow beam


Asymmetric beam


Both direct and indirect light


Fixtures to be installed to the wall or ceiling only with a base.


Fixtures to be installed on track to the wall, ceiling or suspension.


Fixtures to be installed to the wall, ceiling or suspension.

S	The unit is supplied with lampholder only
CLD CELL	Electronic power supply with 230/240V - 50/60Hz + LED
CLD CEL-F	Electronic power supply with 230/240V - 50/60Hz + fuse
CLD CEL-E	Electronic power supply with 230/240V - 50/60Hz+ emergency kit
CLD CELL-F	Electronic power supply with 230/240V - 50/60Hz + LED + fuse
CLD CELF-E	Electronic power supply with 230/240V - 50/60Hz + fuse + emergency kit
CLD CELLF-E	Electronic power supply with 230/240V - 50/60Hz + LED + fuse + emergency kit
CLD CELD-DIG	Electronic digital dimmable power supply with 230/240V - 50/60Hz (DALI)
CLD CELD-DIG-E	Electronic digital dimmable power supply with 230/240V - 50/60Hz (DALI) + emergency lighting
CLD CELLD-DIG	Electronic digital dimmable power supply with 230/240V - 50/60Hz (DALI) + LED
CELFD-DIG	Electronic digital dimmable power supply with 230/240V - 50/60Hz (DALI) + fuse
CELLFD DIG	Electronic digital dimmable power supply with 230/240V - 50/60Hz (DALI) + LED and fuse

Technical specifications
RG0: the lighting source is exempt from photobiological risks in compliance with EN62471 Standard.
RG1 (low risk): the lighting source does not pose hazards during normal operating circumstances.
RG2 (moderate risk): the lighting source does not pose hazards because of our aversion response to very bright light sources, or due to the fact that we would experience thermal discomfort.

WATERPROOF FIXTURES
Polycarbonate fixtures are IP66 water-resistant if installed at temperatures not exceeding 45°C. Direct exposure to sunlight can easily cause the temperature to exceed 45°C, which affects the degree of protection. However, it is recommended that these fixtures are used properly without altering their mechanical and protection properties (IP65/66); **they should not be installed on surfaces subject to strong vibrations, outdoors on ropes or stakes**; whenever this is necessary, waterproof steel fixtures should be used.

00 = basic article
07 = article supplied with Emergency group
08 = article supplied with Electronic gear
09 = article supplied with Electronic+Emergency gear
12 = article with DIMM wiring
1241 = article supplied DIMMable DIGital DALI
0072 = special version for continuous line

71 = article with blue LED
72 = article with red LED
73 = article with yellow LED
74 = article with green LED
94 = DIMMable+Emergency gear
9441= Emergency DIMMable DIGital DALI gear
0092 = articles with the incorporated multi-sensor
0049 = article with wide ring

HEALTHCARE ENVIRONMENTS:
nursing rooms, operating rooms, clinics, first aids, wards, aseptic rooms UNI EN 12464

SCHOOLS:
classrooms, lecture rooms, laboratories, meeting rooms UNI EN 12464

OPEN SPACES:
Offices, large areas, public areas, waiting rooms UNI EN 12464

ART AND CULTURE: Cinemas, theatres, museums, galleries, churches, libraries, auditoriums, monuments **UNI EN 12464**

COMMON AREAS:
corridors, stairs, llifts UNI EN 12464

COMMERCIAL CENTRES:
Shops, show rooms, shop windows, supermarkets, airports. UNI EN 12464

MALLS: General shops, goods displays, shop windows, supermarkets, airports, shop facades **UNI EN 12464**

GENERAL ROOMS:
Home, hotels, sleeping rooms, bars, restaurants, canteens **UNI EN 12464**

LARGE-SCALE DISTRIBUTION: Shopping centres, supermarkets, hypermarkets

SPORT HALLS, GYMNASIUMS

RELIGIOUS PLACES

BOATS, YACHT and BOAT BUSINESS

HOTEL

SWIMMING POOLS

OFFICES
single office, meeting rooms, telephone exchange rooms, offices with VDU terminals (time spent in front of the screen: less than 3 hours totally) Optics + UNI EN 12464

OFFICES WITH VDU TERMINALS
Drafting and designing rooms, meeting rooms, banks, offices with VDU terminals (time spent in front of the screen: 3 to 6 hours) - Optics + UNI EN 12464

OFFICES WITH VDU TERMINALS
Time spent in front of the screen: more than 6 hours continually - Optics + UNI EN 12464

International Protection
The IP prefix followed by two figures indicates the level of resistance of the fixture to penetration by solids and liquids. Protection rating (published in EN60529)
1ªfigure: penetration by solid particles and contact with live parts
2ªfigure: penetration by liquids
3ªfigure: mechanical resist IK.

IP20	Protection against solid bodies Ø >12 mm only
IP23	Protection against solid bodies and rain
IP40	Protection against solid bodies Ø > 1 mm only
IP43	Protection against solid bodies Ø > 1 mm and rain
IP44	Protection against solid bodies Ø > 1 mm and water sprays
IP54	Protection against dust and water sprays
IP55	Protection against dust and water jets
IP65	Dust and water tight
IP67	Dust and waterwave tight

MAIN CONTROL SYSTEM — On request, fixtures are available with self-diagnosis with sub-code -0066.

Class III fixture (insulation class III).

Standard protective fuse

ENEC European Certificate of Conformity:
PENDING APPROVAL

CSQ/IQNET marking is valid all over the world.
It shows that the company has obtained the Company's Quality System certification as regards the design, production and marketing of lighting fixtures and accessories.
The reference standard is UNI EN ISO 90001/IQNET and UNI EN ISO 9002/ IQNET.

Indicates that a product can freely circulate within the European Coméquipé ty. It certifies that the product complies with essential safety regulations. All Fosnova products comply with the EC89/336/EEC "electromagnetic compatibility" and with the EC73/23/ EEC "low-voltage" standards. Therefore they comply with EMC regulations (electronic compatibility).

03 — The product has been granted the ENEC European certificate of conformity which replaces all national **regulations in the EEC**, according to EN60598 European standards

I.M.Q. approval for wired fixture. All fixtures comply with **CEI Italian** safety standards corresponding to EN60598 European standards.

Class II fixture (double insulation). No grounding needed.

Class II fixture (double insulation). No grounding needed.

V.. — V0: the test piece extinguishes within 5 sec. without dropping V2: the test piece extinguishes within 25 sec. (dropping allowed)