LIGHTPOINT.

An ETAP publication | 2014

US
softlight
with LEDs

US: Light up your office with LED softlights

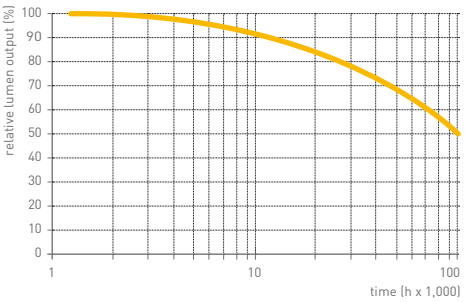
LED lighting: How much light is left after 5 years?

Experience lighting in our new Light pavilion

ETAP
EXCELLENT LIGHTING, SAVING ENERGY

How much light is left after 5 years?

A correctly calculated maintenance factor is critical to the accurate measuring of a lighting installation. A maintenance factor that does not take sufficient account of the specific properties of LEDs, leads to inaccurate lighting studies and calculations.



Depreciation of the luminous flux over time (typical values for cost-driven high power LEDs)

Why do we use a maintenance factor?

During the lifetime of a lighting installation, illuminance gradually decreases. The light output of the lamps decrease, lamps break and luminaires get soiled with dust and other dirt. The space itself also gets soiled and will not reflect light as well as before. That is why a maintenance factor is applied in the calculation of an installation that takes on board the decrease in luminous flux (see box). In this way you will rest assured that the installation will continue to satisfy the assumed lighting level after 5 or 10 years.

How to correctly calculate the maintenance factor

Contrary to fluorescent lighting there is no general consensus on LED lighting with respect to the calculation of the maintenance factor. Numerous factors are to be taken into account, starting with the choice of LEDs. Today there still is a major difference in quality between manufacturers and the type of LED – low or high power – is also decisive for the maintenance of luminous flux and service life. It furthermore involves a fairly recent technology that is developing at a rapid pace. Due to lack

The maintenance factor (MF) is calculated by means of four parameters:
MF = LLMF x LSF x LMF x RMF

Lamp Lumen Maintenance Factor (LLMF)		**Lamp Survival Factor** (LSF)		**Luminaire Maintenance Factor** (LMF)		**Room Maintenance Factor** (RMF)
	x		x		x	
This is the decrease in luminous flux of the light source.		Takes into account the lamp's service life without immediate replacement.		Decrease in the output of the luminaires due to pollution.		Soiling of the space.

of knowledge and information, today quite a few LED and lighting manufacturers apply a general LLMF of 70% after 50,000 hours. This implies that they assume that the LEDs will only achieve 70% of their initial light output after 50,000 burning hours, regardless of the quality of the LEDs.

Contrary to fluorescent lighting, luminaire design also plays a major role. The light output and service life of LEDs greatly depends on their operating temperature. The better they are cooled, the less depreciation and the longer they will last. Heat dissipation is therefore critical. The luminaire design, however, is seldom taken into account today when determining the maintenance factor. In practice each LED luminaire has its own maintenance factor, which makes it impossible to apply a generally valid figure.

Major impact on your installation

Inaccurate calculations may have major consequences in practice. When the maintenance factor is assessed too optimistically, the installation will no longer satisfy the desired lighting level after a few years. Conversely, a pessimistic maintenance factor will lead to an overdimensioned lighting installation, with too many luminaires and exaggerated installed power, which will drive up purchase price and energy consumption.

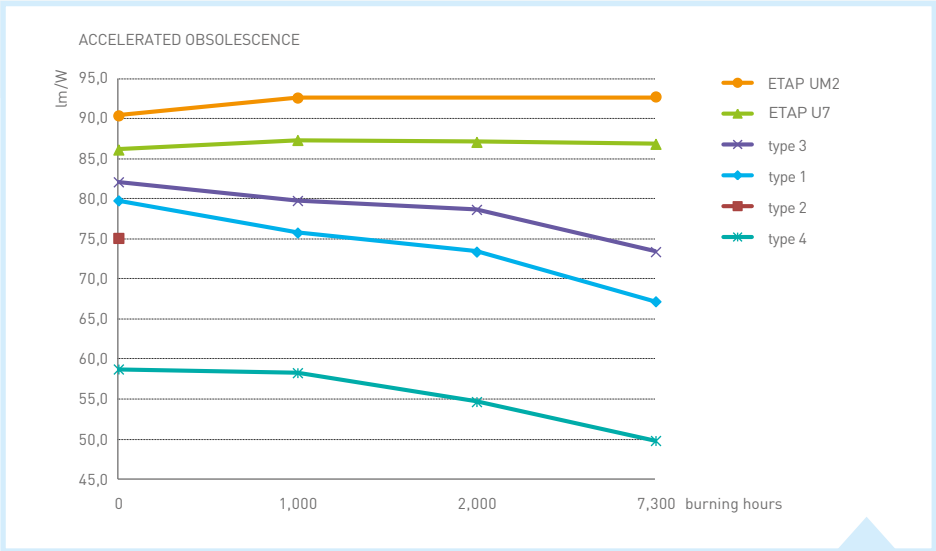
High maintenance factor with sophisticated design

The maintenance factors ETAP applies in its lighting studies are carefully determined in accordance with international standards. In practice we note that ETAP maintenance factors are for the most part much higher than the generally applied values. Since we pay attention to two specific aspects. Firstly, in our luminaires we always use LEDs from manufacturers that publish concrete and verifiable data about the light output and service life of their LEDs. In practice this takes place on the basis of LM80 and TM21 standards, which were validated by the Illuminating Engineering Society (IES), an international authority in the area.

Secondly, we pay a lot of attention to the thermal management of our LED luminaires and also take it into account. In our labs we have the right infrastructure to determine the junction temperature between PCB and LED. In that way we can more closely assess the operating temperature of the LED and the effective depreciation and life expectancy of the LEDs, which we factor into the calculation of the maintenance factor in our lighting studies.

After the correct calculation

On our website you will find a table with the correct maintenance factor for all ETAP LED luminaires, in function of the assumed environment and period of use. This enables us to provide a reliable lighting study, with the guarantee that an installation will also continue to satisfy the assumed lighting levels in the long term.



Accelerated obsolescence after 7,300 burning hours

U7 AND UM2 REMAIN AT HIGH LEVEL IN INDEPENDENT STUDY

A recent study by Laborelec, the independent research centre of GDF Suez, confirms that our attention for a quality and intelligent lighting design bears fruit. In a comparative study of LED lighting for offices Laborelec tested six luminaires from the major suppliers on the Belgian market, among which ETAP's U7 and UM2. Both recessed luminaires won over the panel with maximum efficiency and minimum obsolescence.

Obsolescence was determined according to two methods: Accelerated obsolescence in a climate-controlled room at 45° after 7,300 burning hours (UM2 and U7) and actual obsolescence at room temperature (UM2) after 2,000 burning hours. Both measuring methods confirm that whilst in the other participating luminaires the specific luminous flux drops considerably, the values remained absolutely stable for ETAP, even after respectively 2,000 burning and 7,300 burning hours.

**Would you like to have an LED solution developed for a building or space?
Contact your ETAP adviser for a lighting study.**

Softlights with LEDs

US: familiar look, advanced technology

WHAT ARE SOFTLIGHTS?

As their name suggests, so-called softlights provide soft, pleasant lighting. They feature a shielded light source, hence causing no glare – ideal for the care sector, among others. Light is diffused into the space directly through the primary or indirectly through the secondary optics. The result is uniform and comfortable lighting.

The fully dust- and insect-proof luminaire benefits both hygiene and aesthetics.

With US LED ETAP introduces a new generation of softlights with LEDs. The LEDs and sophisticated light technology guarantee energy efficiency and superior comfort in contemporary packaging.

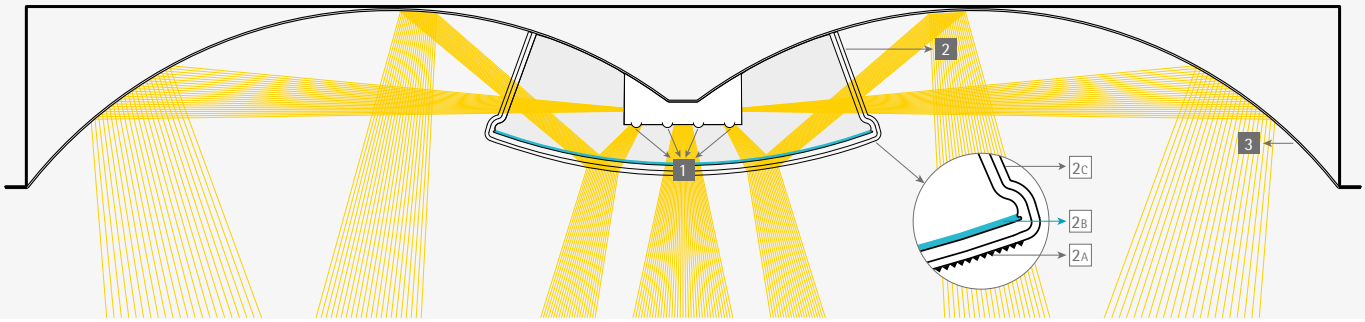
ETAP's softlight luminaires have been setting the tone for 25 years in the market and have amply earned their stripes. The switch to LEDs is the next, logical step in their development. US LEDs maintain the typical features of softlights and pair them with a new, more modern look.

ROI and comfort reconciled

US LED stands for superior comfort and ROI thanks to specially developed optics. The use of micro prisms and diffuser foil result in low glare (UGR < 19), which allows the US LED to be used as office lighting. There are versions available with higher luminous fluxes (up to 4,000 lm with UGR < 22),

US with LEDs is suitable for office lighting.

US with LED is fully dust- and insect-proof, a plus for environments in which hygiene is critical.



which allows you to limit the number of luminaires. The primary optics are evenly illuminated, without the LEDs being visible. The white lacquered side reflectors evenly diffuse the light into the space. The high luminaire efficiency (to 120 lm/W) and long service life of the LEDs make the US a highly efficient softlight luminaire. The series can furthermore be fitted with daylight and motion sensors, which further reduce energy consumption.

Updated design

The primary optics on the US LED consist of a single sealed, seamless unit, which results in the safe shielding of the LEDs with a sober, modern look. In addition, it allows for easy installation and provides full protection against dust and insects, another important asset for the care sector.

The US line is available in three mounting depths: 120 mm, 80 mm and 40 mm. Allowing for the luminaires to be installed in just about any type of ceiling. Furthermore, the three versions feature the same design, thus keeping continuity throughout the space or building. In terms of colour temperature you have the choice between 3,000 (warm white) or 4,000K (cold white).

1 *Light source: Medium-power LEDs*

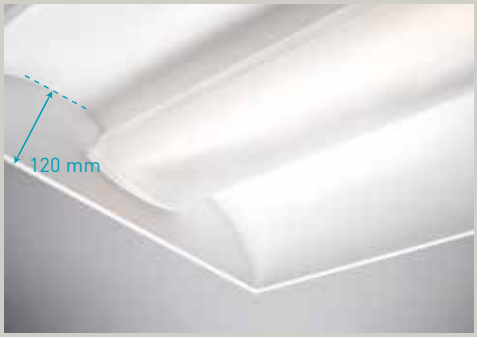
2 *Primary optics from polymethylmetacrylate (PMMA) or polycarbonate (PC), satisfy the glow wire test at 650°C (PMMA) or at 960°C (PC)*

2A *Micro prism structure for low glare (UGR < 19 of < 22)*

2B *Diffuser foil for pleasant illumination of optics, without the LEDs being visible*

2C *Translucent side with HaloOptics®*

3 *Secondary optics: side reflectors with highly reflective lacquer ensure even lighting*



US 01

US 21

US 11

Flexible mounting - the US line is available in three different mounting depths: 120 mm, 80 mm and 40 mm.

The difference between LED and fluorescent in figures

LED softlights: lower power consumption, greater comfort

Energy consumption drops by 40%

Suppose you wish to illuminate a space measuring 3.6 by 5.4 metres and have a choice between softlights with LEDs or fluorescent lamps. A lighting study (p. 7) shows that you need four softlights to achieve a lighting level of 500 lux on the work surface, regardless of the light source. If you use softlights with fluorescent lamps, the specific power is 2.1 W/m²/100 lx.

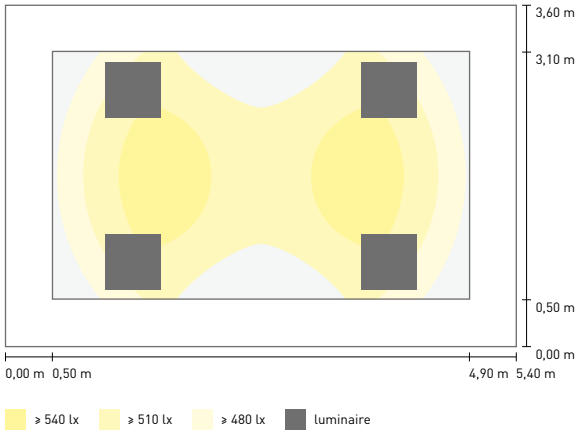
If you opt for the LED version, the specific power drops to 1.2 W/m²/100 lx. Representing energy savings of no less than 42%.

Also suitable for offices

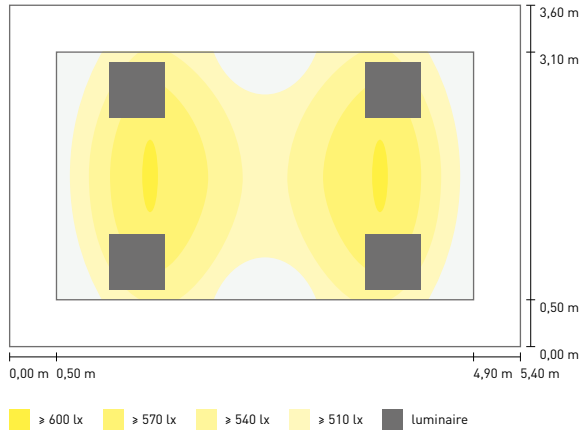
The LED version of the US softlight has an UGR < 19 (compared to UGR < 25 for the fluorescent version) making this lighting solution also suitable for offices.

US with LED stands for excellent energy-efficiency and an UGR < 19.

FLUORESCENT LAMPS **2,1 W/m²/100 lx**



LED **1,2 W/m²/100 lx**



In order to illuminate a space measuring 3.6 by 5.4 metres with softlights, you will need four luminaires. If you opt for the fluorescent lamp version, you will achieve an excellent specific power of 2.1 W/m²/100 lx. For the LED version this drops to 1.2 W/m²/100 lx, which amounts to a 42% energy saving.

	US 01 WITH FLUORESCENT LAMPS	US 01 WITH LEDS
LIGHTING LEVEL (lux)	522	552
UNIFORMITY	0,88	0,88
SPECIFIC POWER (W/m²/100 lux)	2,1	1,2
INSTALLED POWER (W)	216	132
GLARE RATING	UGR < 25	UGR < 19

[further information at www.etaplighting.com]
Brochure: downloads > brochures > softlights

E7: more efficient LEDs for large spaces

The E7 luminaires have passed the ball proof and are therefore also suited for sport halls.

LED EXCELLENT LIGHTING SAVING ENERGY

The updated E7 luminaires for large spaces are fitted with more efficient LEDs. Thanks to increased lumen output, you need fewer luminaires in order to get the same lighting result, which allows for a 10 to 30% investment cut.

The updated E7 luminaires, fitted with more efficient LEDs, achieve a luminous flux up to 10,000 lumen per metre.

Large spaces, high standards

The E7 was launched in early 2013 and provides an LED solution for the lighting of large spaces. The series is first and foremost suitable for large spaces where high lighting levels are required. Just think of your store spaces or production environments where precision and good visibility are critical. The E7 is also an ideal solution for sport halls, since the luminaires passed the ball test.

10 Up to 30% saving

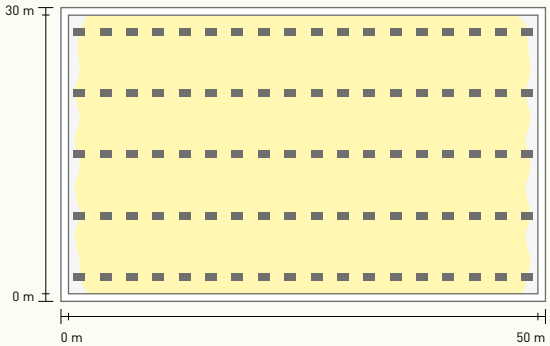
LEDs are still in full development and are becoming increasingly efficient. In other words, they deliver an ever increasing lumen output for the same consumption and price, which implies that manufacturers can upgrade their luminaire series as regularly as clockwork, which, in turn, benefits consumers.

Therefore, one and a half year after its launch, the E7 series comes with more efficient LEDs as standard. The updated luminaires achieve a luminous flux up to 10,000 lumen per metre, which implies that you need fewer luminaires to achieve the same lighting result, which has a positive impact on investment costs: depending on the situation and application you will save from 10 to 30%.

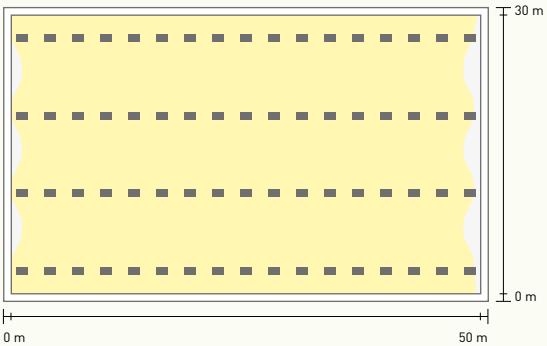
10 Worry-free years

In addition, the updated E7 series offers the traditional advantages of LED, with high energy-efficiency and long service life. Especially in spaces where replacement is difficult (high ceilings, 24/7 environments), the latter is a major advantage. The LEDs have a maintenance factor of 99% after 50,000 burning hours, which means that you can sleep soundly for ten years.

E7 - edition 2013



E7 - edition 2014



90 luminaires vs 68 luminaires
1.30 W/m²/100 lx vs 1. 27 W/m²/100 lx

In order to illuminate an industrial space measuring 30 by 50 metres, up to now 90 E7 luminaires were required (left), with a specific power of 1.30 W/m²/100 lx and with the new generation LEDs (right), 68 E7 luminaires suffice to illuminate that same space (1.27 W/m²/100 lx), resulting in your investment cost being 24% lower.

[further information at www.etaplighting.com]
Brochure: downloads > brochures > E7

Project developer MAF played pioneering role in sustainability

LEDs, a strong statement

ABOUT MAF

The Majid Al Futtaim (MAF) Group was founded in Dubai in 1992. The group specialises in the development and management of, among others, shopping centres, hypermarkets, hotels and cinemas in the Middle East, North Africa and Central Asia. The group is currently active in 12 countries and employs 26,000 staff drawn from more than 70 nationalities.

The real estate group Majid Al Futtaim (MAF) from the United Arab Emirates does not compromise when it comes to sustainability. With the renovation of its Dubai headquarters, the group aimed to make a strong statement. ETAP was selected as their lighting partner.

The real estate group MAF attaches a lot of importance to sustainability in all its activities. "Over the past decade environmental awareness has grown considerably in the United Arab Emirates," according to Glenn Dawson, Senior Manager Operational Procurement at MAF. "The government encourages businesses and consumers to use energy and water in a more sustainable manner. As one of the leading project developers in the region, we realise that we have a major responsibility in this narrative and aim to play a pioneering role."

A paragon of sustainability

MAF implements this commitment. "We strive for LEED Gold-certification for all our new projects and also invest heavily in the LEED certification for our existing buildings – where necessary we undertake renovation projects. In addition, we aim to save 15% energy and water in all our shopping centres over the next three years. Our commitment is for that matter not limited to projects we complete in the United Arab Emirates, but applies to all countries in which we are active."

Obviously the group raised the bar for the renovation of its own headquarters. "Our new headquarters had to become a model of sustainability, which immediately makes it clear to staff, customers, and business partners that we are serious about our commitment," states Glenn Dawson. No cost or effort was spared to create a sustainable, healthy and comfortable working environment in all areas – use of water and energy, ergonomics, use of material.

Maximum comfort: in the offices, R7 luminaires provide bright, even lighting.

PROJECT DATA

Client: Majid Al Futtaim (MAF)
Consultancy: Ramboll
Interior design: Al Reyami Interiors
Luminaires:
- 560 D4 downlights
- 850 Flare spots
- 320 R7 suspended luminaires (with integrated EXOR motion sensors)
- 120 U7 recessed luminaires

100% LED

It was obvious from the start that the group would opt for LED lighting. "LEDs are the sustainable choice par excellence for lighting due to their energy-efficiency and their long service life," Glenn Dawson adds. "We did not want to compromise in this area either: not only were the offices equipped with LED lighting, but also the sanitary facilities, the lifts, the corridors and the reception spaces. It also has the added benefit that mercury is no longer present anywhere in the building." The lighting comfort has improved as well: the LED luminaires provide bright, even lighting in all areas.

The unique design of ETAP's LED+LENS™ luminaires emphasises the lighting's innovative and sustainable nature. "Everyone who enters the building, immediately sees that this is no traditional lighting system. This connotation is very important if you want to make a statement," says Michael Nuyttens, CEO for ETAP UAE. "The use of motion sensors throughout the building also highlights the energy-efficient aspect."

Reliable partner

"We consciously chose ETAP as a partner in this project," Glenn Dawson stresses. "ETAP not only produces a full range of LED lighting for all possible applications, but just like us they also attach a lot of importance to sustainability. Furthermore they were able to submit the right references and underpin their claims with the necessary figures and technical specifications. Lastly, extensive support and flexible service were decisive factors."

The use of motion sensors throughout the building results in extra energy savings.

Dubai's renovated headquarters are a showcase of sustainability for staff, customers and business partners.

Daylight sensors to illuminate great heights

The new ELS was specifically developed for great heights such as sport halls, warehouses or workspaces.

ETAP's daylight-dependent light control (ELS) is now also available in a version for high spaces. The adjusted sensor guarantees correct lighting levels for heights up to 20 m, for an average 25% energy-saving.

The demand for daylight-dependent light control is on the increase. Logical, since it allows to save quite a lot of energy: the sensors constantly measure the lighting level on the work surface and determine – depending on incident light – to what degree they can dim artificial light. Especially in high spaces with large skylights and a lot of incident light, the savings potential is huge.

That is why ETAP now also markets a daylight sensor that is specifically suitable for use in high warehouses, workspaces and sports halls. In order to measure the correct lighting level at greater heights, we adjusted the sensor's measuring range, among others.

In LED luminaires (example E7) the daylight sensor is integrated in the housing. In fluorescent lighting the sensor is fixed to the lamp using a clip.

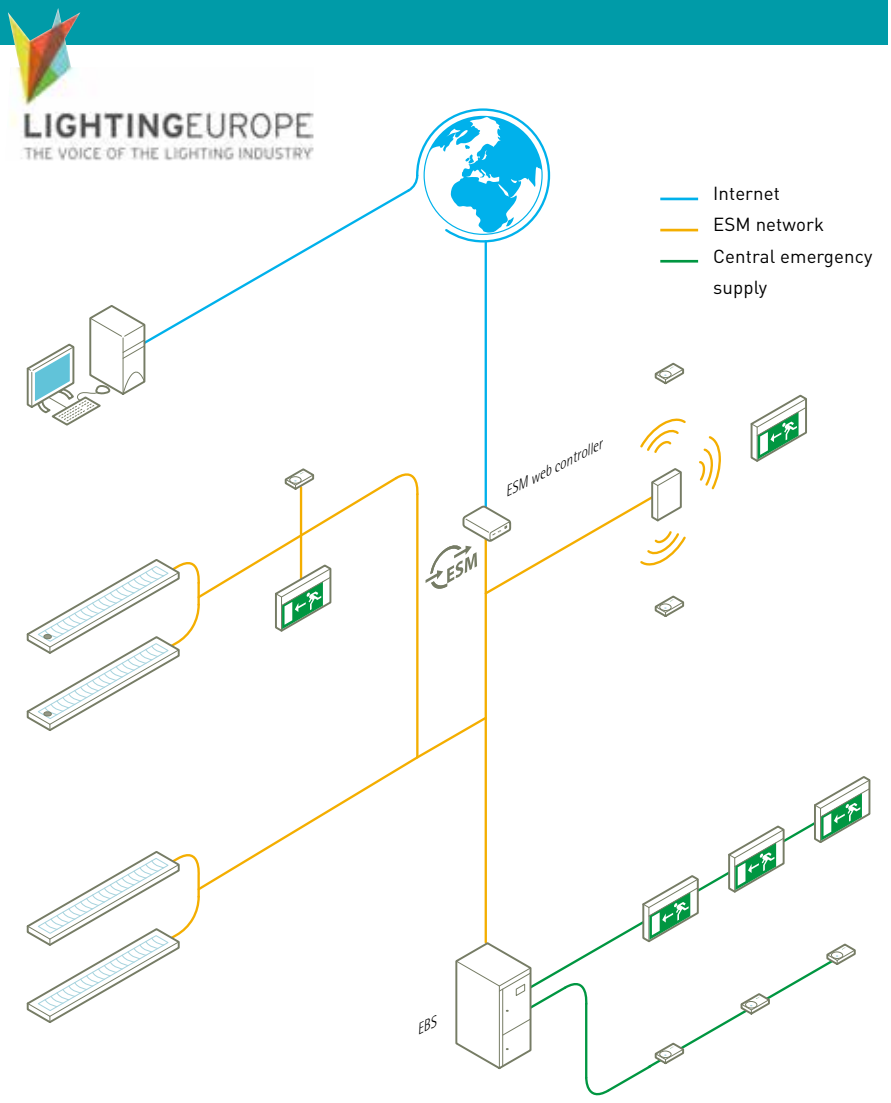
Thanks to the remote control you can easily do adjustments, without having to bring in costly access equipment.

Remote control

The new ELS is fitted with an infrared receiver, which allows to easily adjust the settings on the sensor through the remote control. These adjustments can be made easily and quickly, without having to bring in a costly access equipment. No superfluous luxury in modern, flexible warehouses, where spaces and racks are often rearranged.

Always rely on your emergency lighting

How can you be sure that your emergency lighting will work when it really matters? Automatic testing systems such as ETAP Safety Manager (ESM) help you to guarantee the safety in your building in a cost-efficient way.



With ETAP Safety Manager (ESM) it is possible to centrally monitor your complete emergency lighting installation, including central battery systems.

A recent position paper by LightingEurope, the association representing leading European lighting manufacturers, once again stressed the importance of regular tests for emergency lighting systems. No one will notice defective emergency lighting... until it's too late.

Legal obligation

The testing of emergency lighting is mandatory by law. Depending on the country the tests are to be conducted daily, weekly, monthly or yearly. There are short tests for the operation of the emergency lighting as well as endurance tests that check whether the lamps and batteries still achieve their assumed autonomy – generally 1 hour. In addition, all tests and interventions are to be recorded in a logbook.

Rapid ROI

In practice the testing of emergency lighting is not always obvious. It disrupts daily operations in the building and is time-consuming. Central monitoring systems such as ETAP Safety Manager (ESM) provide a solution. The system continuously monitors the operation of each emergency luminaire and immediately reports any failures, including type of defect and location of the defective luminaire. The online system can be easily consulted from any PC at any time.

With ESM any emergency lighting installation can be monitored, including central battery systems – such as EBS or EBS Compact. ESM can also be hooked up to an existing building management system. According to LightingEurope calculations, the investment in such a system can even be recovered in two to four years.

For further information on your legal obligations go to www.lightingeurope.org
For further information on ETAP Safety Manager go to www.etaplighting.com

Renovation and expansion of Light pavilion successfully completed

Experience and choose the correct LED lighting

ETAP's new buildings were officially inaugurated earlier this year in the presence of the then Flemish Minister-President Kris Peeters.

LED or fluorescent? Reflector or diffusor? 500 or 1,000 lux? Each and every one important questions when choosing a lighting solution. In our Malle Light pavilion all of your questions will be answered. Several light sources, technologies and systems can be experienced and compared under realistic conditions.

The renovated Light pavilion in ETAP's headquarters in Malle was officially opened earlier this year. The spectacularly designed showroom was described in the previous issue of Lightpoint. But the Light pavilion has a lot more to offer.

Insight into technology and lighting techniques

While you become familiar with our various product ranges in our showroom, you can also visit the demo rooms for further insight into technology and lighting techniques. You will discover the properties and operation of various light sources, technologies, optics and light distribution. Since how does the blue light on an LED actually turn white? How is binning applied in LEDs? And what is the impact of diffusers and foils on lighting efficiency and comfort? Several educational panels and displays will make it immediately clear. In addition, a number of 'specials' can be admired, lighting solutions custom made by ETAP for customers.

Lighting = experience

Lighting has a major impact on how one experiences a space. That is why ETAP set up three true-to-life application spaces, where the differences between the various light sources, technologies and systems can be experienced in person. For example, you can experience the difference between LED and fluorescent lighting in an office environment. In the fully fitted class room, we illustrate how adjusted lighting can ensure maximum support for various course scenarios. In the shop space we show what influence lighting has on the store experience and can highlight the appeal of the products. Not only experience, but also efficiency is important. That is why we installed lux and wattage meters in every space. On displays you can at all times read the actual lighting level and installed power of the various lighting solutions.

Would you also like to experience our lighting? Contact your ETAP advisor for a personalised tour.

[left page]

Top: In our demo spaces several technologies and lighting techniques can be empirically compared.

Middle: Discover the operation of our light control and emergency lighting systems by means of building mock-ups and practical examples (© Timon Jacob Photographer/ MMEK').

Bottom: The chosen lighting levels can have a major impact on the store experience.

GREENLIGHT

NEW GREENLIGHT PARTNERS

In the past few months 6 ETAP customers have been awarded a GreenLight certificate, in recognition for their efforts with respect to energy-efficient lighting.
- CAPI, l'Isle d'Abeau (France),
- Casino, Villefranche (France),
- Commune D'Aureilhan (France),
- Mairie de Rodez (France),
- Maire de Sathonay-Camp (France),
- YKK Portugal, Lda (Portugal).

[further information at www.etaplighting.com]
Brochure: downloads > brochures > GreenLight

LED READING

The modular Kardó light line system has been expanded several times in the past few years: After Kardó 90, Kardó 60 and several LED versions followed. You will discover the full range in a new brochure, with in it, in addition to product information, numerous attractive, large application images. And under the motto 'First comes theory, then comes practice', we also recently published a new brochure on light control, which is in keeping with the light control report published in 2013 and guides you through our range of daylight sensors, multidetectors and management systems. Lastly, you will discover the latest novelties in terms of LED technology in the fifth issue of our LED dossier.

LEDs, love at first sight

It is in Aquitaine, a region in south-west France, that the head office of HSA, *Habitat Sud Atlantique, Office Public de l'habitat de Bayonne,* is located. Recently, the building's interior has been refurbished for energy and cosmetic reasons. Where the new lighting was concerned, the aim was to achieve an innovative solution, which was also energy-efficient and pleasing to the eye. Three criteria that led to a 100% LED solution by ETAP.

The idea of a thorough renovation was conceived in 2012. The building, which dates back to the 1970s, had not only become an energy hog, but it also lacked comfort and a welcoming ambiance. As suggested by the architectural firm AADI and the research consultancy Ingetudes, HSA decided to carry out the renovation relying on noble products, which were also high-tech, innovative and energy-efficient.

In terms of lighting, ETAP was requested to develop a 100% LED solution. After a few initial studies, a favourite emerged with the presentation of the U7/R7 range. Thanks to the innovative LED+LENS™ technology, the luminaires feature great visual comfort and high performance, which allows to limit the number of luminaires to be installed. What is more, they allow to integrate air extraction, as well as motion sensors (EMD) to increase comfort and achieve further savings. In short, the solution ticked all the boxes.

Today the renovation has been completed. The new lighting delights all users and project managers. Given the achieved savings, HSA is now a candidate for the GreenLight label.

ABOUT HSA

HSA - *Bayonne Public Housing Office* – is the number 1 social housing player in the Aquitaine region. Its role is to acquire plots of land to build council houses and to subsequently maintain and manage them. At this time, HSA has built more than 6,500 accommodations and employs 147 staff.

PROJECT DATA:

Owner: HSA

Consultancy: INGETUDES

Architect: AADI

Lighting 100% LED:
- Recessed U7 luminaires with air extraction and motion sensors integrated into the offices
- D13 downlights in traffic areas
- D4 downlights and R7 suspended luminaires in the reception area.

ETAP
EXCELLENT LIGHTING, SAVING ENERGY

ETAP Lighting
Progress Business Centre, Whittle Park Way, Slough, Berkshire SL1 6DQ, U.K.
Tel. +44 (0)1628559650
Fax +44 (0)1628559012
enquiries@etaplighting.com
www.etaplighting.com

ETAP Export Department
Antwerpsesteenweg 130
B-2390 Malle - BELGIUM
Tel. +32 (0)3 310 02 11
Fax +32 (0)3 311 61 42
export@etaplighting.com
www.etaplighting.com

ETAP U.A.E.
Dubai International Academic City, Block 3
Office 114, 1st floor, PO BOX 345014 Dubai, UAE
Tel. +971 (0)4 434 7364
Fax +971 (0)4 437 0378
export@etaplighting.com
www.etaplighting.com

8028757-16E/26