



Department for
Business, Energy
& Industrial Strategy



Energy Technology List

Lighting

A guide to energy efficient equipment that is eligible for The Energy Technology List (ETL)





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Introduction



The ETL is a government register of energy saving products. When replacing equipment, businesses are often tempted to opt for equipment with the lowest capital cost. However, such immediate cost savings may prove to be a false economy. Considering higher energy efficient products, means that life cycle costs are reduced, improving cash flow in the longer term.

Businesses can also claim accelerated tax relief through the Annual Investment Allowance (AIA) for investments in plant and machinery equipment. The AIA has been temporarily increased to £1 million from January 2019.

In the case of lighting, three types of lighting are covered by the scheme:

White LED lighting modules for backlit illuminated signs – listed individually on the ETL product list:

https://etl.beis.gov.uk/engetl/fox/live/ETL_PUBLIC_PRODUCT_SEARCH

Efficient White Lighting Units – ‘Unlisted’ (see next page) products certified compliant by suppliers

Lighting Controls – ‘Unlisted’ (see next page) products certified compliant by suppliers

When you select ETL compliant products, you are choosing from amongst the most energy efficient products in the marketplace.

This leaflet illustrates the benefits of investing in lighting energy saving equipment which qualifies for the ETL.



Lighting technologies on the ETL



There are two different approaches for lighting products to qualify as compliant for the ETL.

White LED lighting modules for backlit illuminated signs, in common with many other technologies, are a 'listed' technology. For a product to be ETL compliant it must be specifically listed on the ETL product list:

https://etl.beis.gov.uk/engetl/fox/live/ETL_PUBLIC_PRODUCT_SEARCH/search

Manufacturers apply to have their products listed and applications are assessed for compliance with the ETL criteria by the scheme managers.

Efficient white lighting units and **Lighting controls** are 'unlisted' technologies. This is mainly because there are too many individual product combinations in the market, with rapidly changing product ranges, for product listing to be effective.

For unlisted technologies it is up to the supplier to provide the customer with confirmation that the product meets the current ETL criteria at the time of sale. Guidance on the information that should be provided can be found on the ETL website: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/723445/etl-efficient-white-lighting-units-checklist-statement.pdf

For more detailed guidance on how Lighting technologies are treated on the ETL, see the Lighting Guidance Note 10: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/721315/Guidance_Note_10_Lighting_Energy_Technology_List_June2018.pdf

Lighting manufacturers may wish to use the Manufacturers toolkit:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/694998/Manufacturers_Toolkit_March_2018.pdf



Setting the scene



Background: The need for efficient lighting

Lighting uses around 20% of the electricity generated in the UK. Given that many of the current lighting systems in use are reliant upon inefficient lighting sources, there are broad opportunities for savings. It is important that businesses are aware of the efficient lighting systems that are now available. Due to the pace of lighting technology developments, opting for more efficient luminaires such as Light Emitting Diodes (LEDs) need not be expensive nor disruptive for any organisation. Upgrading from conventional lighting to LED technology can deliver significant cost savings of up to 80% for a business.

Efficient lighting solutions

- There are a wide variety of highly efficient lighting options now available, including LEDs, and some modern fluorescent and high intensity discharge lamps. Selecting ETL compliant lighting can offer over three times as many lumens per watt as other non-ETL compliant lighting.
- LED lighting units are now the favoured option for many businesses wishing to reduce electricity consumption. LEDs have the highest efficacy and lamp life of all, are cost effective to run and are easy to control and maintain.
- The use of LED lighting can also work towards improving the quality of light that is provided. The high performance of LEDs ensures that colour rendering is high, a factor which enables natural colours to remain unaltered.
- The widespread application of LED lighting will also allow improved efficiency units to be installed across a variety of applications. A switch to LEDs across whole businesses will therefore represent significant cost and energy savings.



Setting the scene



Cost saving opportunities

- Use of appropriate lighting controls including: daylight linked photoelectric control, presence detection with occupancy sensors, time switching and flexible manual control can all help to avoid wasting energy.
- Controls should be selected that are appropriate to the type of space and whether it is day-lit or intermittently occupied. Savings of **30%-50%** are common for circumstances where automatic controls are used.
- Efficient, well designed lighting can boost a business's productivity and sales as well as saving energy. Low energy lighting is also one of the most visible ways that an organisation can demonstrate concern for the environment.

Lighting eligible for the ETL must meet defined energy efficiency levels. In this document, the baseline scenario below, has been used to calculate the potential financial (£), energy (kWh) and carbon savings (tonnes CO₂) unless otherwise indicated:

- Price for electricity 11.14p/kWh*
- Carbon emissions for electricity 0.35156 kgCO₂/kWh*
- There is an assumed loss of 20% from magnetic ballasts
- Operating hours are assumed to be 8,760 hours per annum unless stated otherwise

* BEIS 2017



Products on the ETL: Efficient white lighting units

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Efficient white lighting units (EWLUs) are covered by the ETL criteria.

Efficient White Lighting Units

Efficient white lighting units are products that are specifically designed to provide efficient, high quality, illumination. Efficient White Lighting Units are a combination of a light fitting (or luminaire), one or more light sources, and associated control gear that have been assembled either into a single packaged unit or a luminaire with remote control gear. Neither light fitting, light sources nor control gear alone can be said to 'comply with the ETL'. Efficient White Lighting Units may also incorporate lighting control devices such as dimming and 'presence' controls. The luminaire could also include an optical system that reflects and/or focuses the product's light output onto the item(s) being illuminated. An Efficient White Lighting Unit may be equipped with any high efficiency light source, such that it meets the eligibility criteria. Types of lighting may include: LEDs, the most efficient fluorescent units, and some types of discharge lighting.

Category	Minimum luminaire efficacy
Amenity, accent and display lighting units	≥ 95
General interior lighting units using downlighting (DLOR/LOR≥0.9)	≥ 105
General interior lighting units using uplighting (DLOR/LOR<0.1)	≥ 125
General interior lighting units using combined up and down lighting (DLOR/LOR≥0.1 and<0.9)	≥ 125 – (20 x DLOR/LOR)
Exterior area lighting units	≥ 105
Exterior floodlighting units	≥ 105

Table 1: Minimum luminaire efficacies for efficient white lighting units eligible for the ETL.

- Efficacy (lumens per watt; lm/W): The ratio of light emitted by a lamp to the power consumed by it, that is, lumens per Watt.
- Efficacy tested after 100 hours of operation



Products on the ETL: Efficient white lighting units

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Information for manufacturers:
For further information about the eligibility requirements for both EWLUs and White LED Lighting Modules for Backlit Illuminated Signs, please refer to the [Energy Technology guidance note](#).



Efficient white lighting units (EWLUs) are covered by the ETL criteria.

Efficient White Lighting Units

EWLUs must be able to provide a light output (in lumens) after 6,000 hours of continuous operation that is not less than 90% of their initial light output.

The unit as a whole must also have a minimum luminous efficacy (lumens per watt) which is the total amount of light (emitted from the whole unit including any optical components; NOT just the LED chip itself) divided by the electrical power used by the whole unit including the control unit (driver).

Therefore units which fall short of the efficacy criteria in Table 1 are not eligible and would be considered less efficient than the market leading products. There are also criteria relating to colour quality, electrical quality (power factor) of the control unit (driver) and standby power consumption. In addition the fittings and control units (drivers) must be CE marked for safety. As there is not yet a single nationally or internationally agreed standard for measuring the performance characteristics of LED products, a number of test procedures are specified in the eligibility criteria.

The supplier of the unit should provide confirmation that the unit conforms to all the required standards and criteria (in the form of a statement and supporting technical information).

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/723445/etl-efficient-white-lighting-units-checklist-statement.pdf



Products on the ETL: Efficient white lighting units

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Efficient white lighting units (EWLUs) are covered by the ETL criteria.

Efficient White Lighting Units

- An LED solution can give a 70% energy saving compared to older fluorescent technology.
- LED luminaires also last significantly longer than fluorescent lamps, resulting in maintenance savings.
- Automatic lighting controls would give additional savings.



For the installation of 25 18W LEDs lighting to replace 25 existing 36W T8 fluorescent luminaires within a typical 100m² retail store operating sixteen hours per day seven days a week, the potential annual savings are calculated as:

- £440
- 3.9 MWh
- 1.3 tonnes CO₂
- 0.9 year payback

With a typical capital cost of £375, lifetime energy and AIA benefits could be around £4,460 at today's prices. With a potential AIA of £71 and energy savings of approximately £440 in year 1, the capital cost is recovered in less than 1 year.



Products on the ETL:

White LED lighting modules for backlit illuminated signs

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Energy Technology List

White LED lighting modules for backlit illuminated signs are covered by the ETL criteria.

As they are directional sources, LEDs can be particularly effective for back-lighting of display signage

White LED lighting modules for backlit illuminated signs

- This is a new sub-technology category added to the ETL in 2018 to cover products which provide white light by means of solid state lighting, including appropriate control gear, to illuminate signage.
- They were added to the ETL due to the substantial energy savings that can be achieved through using efficient lighting units, considering the longevity of illumination.
- White LED lighting modules must be integrated with electronic control gear to meet ETL criteria.
- They must include one or more LED light fittings.

For the installation of ten LED signs powered by 2x 22W LEDs to replace ten existing 2m x 1m sign with 2x 58W T8 fluorescent luminaires operating 24/7, the potential annual savings are calculated as:

- £990
- 8.8 MWh
- 3.1 tonnes CO₂

With a typical capital cost of £1,200 and lifetime energy and AIA benefits of around £10,100 at today's prices, the financial benefit of installing an ETL listed product is over 8 times the cost. Furthermore with a potential AIA of £228 in year 1 plus additional energy savings, the capital cost is recovered within the first year of purchase.

£120 cost per LED luminaire



Products on the ETL: Lighting controls

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Lighting controls are covered by the ETL criteria.

Lighting controls

The ETL aims to encourage the purchase of lighting controls that realise energy savings by automatically switching or dimming lighting. Five different categories of lighting control are covered by the ETL criteria:

1. Time controllers to automatically switch off lighting at predetermined times.
2. Presence detectors with associated switching controllers that monitor occupancy and automatically switch off or dim lighting when not required.
3. Daylight detectors with associated switching controllers that monitor daylight and automatically switch off lighting when daylight is sufficient.
4. Daylight detectors with associated dimming controllers that monitor daylight availability and automatically dim lighting to the level needed.
5. Central control units that manage the operation of electric lighting installations including some or all of the categories of lighting controls above.



Products on the ETL: Lighting controls

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Lighting controls are covered by the ETL criteria.

Lighting controls

The five control categories may be installed either individually or in combination. There are various requirements that controls must meet in order to be eligible for the ETL. For example, controls are not eligible for support in installations where individual users can change the settings of the control to undermine its energy saving operation.

A lighting controls supplier will be able to advise on whether the particular controller meets the criteria for support and can provide confirmation of compliance with the supplied products.

Presence Detection: The most common form of occupancy detector is based on passive infrared (PIR) sensors. Microwave based switching is effective in larger spaces. The less common ultrasonic sensors are more sensitive and can detect movement in spaces with part-height partitions such as changing rooms.

Usually, lighting is switched off after the sensor fails to detect movement, but in areas where safety is very important, some controls can dim the lighting to a safe lower level instead. Occupancy switching using presence detection can give substantial energy savings in intermittently occupied spaces such as warehouses and some display areas.

Absence detection, where switching on is carried out manually but switching off happens automatically, is effective in spaces with good daylight.

Products on the ETL: lighting controls

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Lighting controls are covered by the ETL criteria.

Daylight Detection: For daylight detection or photoelectric control, the lighting is switched or dimmed in response to incoming daylight. Switching control usually incorporates some form of time delay, or a gap between the illuminances at which lamps are switched on and off to prevent over-frequent switching.

Dimming generally saves additional energy and will be less obtrusive to the occupants when compared to simple on-off switching. Photoelectric control should ideally be used in conjunction with another form of control to allow the lighting to be switched off outside of occupied hours. Different areas of the building will benefit to a greater or lesser extent.

Lamps can be switched or dimmed as individual luminaires or in groups, depending on daylight penetration in the space. For example, the row of lamps nearest a windowed wall would normally be controlled separately from the remainder of the lighting.

Time Controls: Time controls are appropriate in places with fixed operating hours. For example, a time switch can be used to switch off the lighting in a shop or restaurant outside opening hours.

They can also be used in conjunction with other controls such as daylight or presence detection.

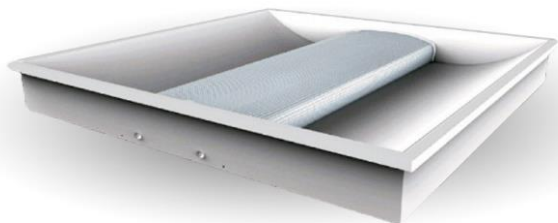


Products on the ETL: lighting controls

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Lighting controls are covered by the ETL criteria.



Example: For the installation of occupancy sensors for 4.8kW of fluorescent lighting illuminated storage racks within a 400 m² warehouse operating where previously the lights were left on 10 hours per day, 5 days a week, the predicted 70% energy savings result in potential annual savings of:

- £930
- 8.3 MWh
- 2.9 tonnes CO₂
- 1.1 year payback

With a typical capital cost of £1,000 and lifetime energy and AIA benefits of around £9,500 at today's prices, the financial benefit of installing an ETL listed product is over 9 times the purchase cost. Furthermore with a potential AIA of £190 in year 1 plus additional energy savings, the extra capital cost is recovered within the first year of purchase.

10x sensors at £100 per sensor. Assume that lighting load is reduced by 2/3rds.
Also assume the 4.8kW includes losses from ballasts.



Where can I find more information?



Energy Technology List



For information about the ETL please visit: <https://www.gov.uk/guidance/energy-technology-list> and see our [Information for Purchasers](#) factsheet. Or contact the ETL Help Line on 0300 330 0657; email ETLQuestions@carbontrust.com



For more information on the ETL:

To search for a product on the ETL please visit:

https://etl.beis.gov.uk/engetl/fox/live/ETL_PUBLIC_PRODUCT_SEARCH



https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/721315/Guidance_Note_10_Lighting_Energy_Technology_List_June2018.pdf

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