White LED Lighting Modules for Backlit Illuminated Signs

Date added to ETL 2018.

1. Definition of Technology

White light emitting diode (LED) lighting modules for backlit illuminated signs are products which provide white light by means of solid state lighting to illuminate signage.

The technology is used to internally illuminated box signs and built up letters using white LEDs and modules, in combination with appropriate control gear, in both internal and external applications.

2. Technology Description

The internally illuminated box signage and built up letters that, for example, spell out company names, logos or other messages and pictures, have been included in the Enhanced Capital Allowance (ECA) scheme because they offer substantial energy and carbon savings, considering their usual long hours of operation. These products are designed to provide a more efficient solution to back-lit illuminated signs, which have traditionally been using fluorescent batten fixtures or cold cathode systems.

These products are a form of Display Lighting, i.e. lighting used to highlight displays of exhibits, signs associated with the business function, merchandise, and display case lighting used predominantly in the services and the retail industries either indoors (e.g. shop vitrines) or outdoors (e.g. hotels and restaurant facades).

The ETL criteria are only applicable for situations where the white LED lighting modules are integrated with the electronic control gear. Neither the individual white LED lighting module or electronic control gear alone can be said to ‘comply with the ETL’.

The internally illuminated signs with white LEDs may also incorporate lighting control devices such as dimming and presence controls.

Investments in backlit illuminated signs using white LED modules can only qualify for Enhanced Capital Allowances if the products meet the eligibility criteria set out below and are listed on the Energy Technology List (ETL).

3. Eligibility Criteria

To be eligible, white LED lighting modules for backlit illuminated signs shall:

- Be used exclusively to back light illuminated signage;
- Not be used as road traffic signs, safety signs or fire safety signs, trackside railway signs or airside airport signs.
- Include one or more LEDs, driven by suitable electronic control gear;
- Not be designed to incorporate or be supplied with LED based ‘lamps’ that retrofit to traditional light sources;
- Include only CE marked components;
integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps”;

- Only include components that are compliant with the Ecodesign requirements and energy labelling regulations in force, where applicable. At the finalisation of this ETL criteria, the relevant regulations were:

In addition, lamps and control gear shall comply with the following EU safety directives and British/European standards:

- BS EN 50107-3. Product standard covering luminous signs with discharge lamps and/or LED (light emitting diodes) and/or EL (electroluminescent) light sources with a nominal voltage not exceeding 1000 V, with the exclusion of general lighting, traffic- or emergency purposes

Performance criteria

Eligible white LED lighting modules for backlit illuminated signs shall:

- Have a lighting efficacy that is greater than, or equal to, 93 lumens per circuit watt\(^1\), when tested after 100 hours of continuous operation. If the product incorporates dimming control it shall be tested at its highest light output level.
- Have a power factor that is greater than, or equal to, 0.9 at \(\geq 75\%\) of designed driver load at highest light output level.
- Be able to provide a light output (in lumens) after 6000 hours of continuous operation that is not less than 90\% of their initial light output (in lumens).

In addition:

- The electrical power consumed (in circuit watts) is defined as the total power consumed by the whole unit from main circuit connection point to the LED light source, including losses in the control gear.
- Individual control gear shall have a standby power not exceeding 0.5 Watts when the lighting unit incorporates an electronically addressed dimming or switching circuit. If the product is not fitted with an automatic switching or dimming circuit, the product shall not consume power when it is switched off.

\(^1\) Lumens of light output emitted by the module per circuit watt of electrical power consumed.
Required test procedures

All products shall be tested in accordance with the procedures laid down in one of the following standards:

- IESNA LM-79-08, “Electrical and Photometric Measurements of Solid-State Lighting Products”.

For the avoidance of doubt test data should be presented to zero decimal places by rounding down. As an example, an efficacy of 92.9 lumens per circuit Watt for backlit illuminated signs would be expressed as 92 lm/W and deemed to be a fail.

4. Representative Testing

Where applications are being made for a range of two or more products that are variants of the same basic design, test data may be submitted for a representative selection of models, provided that all variants conform to the following condition:

1. Parameters such as size, shape, power rating and constructional design do not reduce product energy efficiency performance or basic functionality.

The representative models shall be selected by dividing the range of products into groups of models with similar design characteristics, and testing a model in the lowest quartile of predicted performance in each group. The performance of each model in the group shall be predicted using a validated mathematical model.

It should be noted that:

- If a manufacturer voluntarily removes the representative model from the Energy Technology Product List (ETPL) then other products linked with that representative model may or may not be permitted to remain on the ETPL.
- If any product submitted under these representative model rules is later found not to meet the performance criteria when independently tested, then all products based on the same representative model will be removed from the ETPL.

5. Scope of Claim

Expenditure on the provision of plant and machinery can include not only the actual costs of buying the equipment, but other direct costs such as the transport of the equipment to site, and some of the direct costs of installation. Clarity on the eligibility of direct costs is available from HMRC.

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