ICEL Technical Statement No. 4

Could The Selection Of ‘Equal And Approved’ Equipment Risk Lives?

There is nothing wrong with the literal interpretation of the phrase ‘Equal and approved’ as long as the selected equipment really is ‘equal’ to the equipment originally specified.

The concept of accepting alternative equipment to those products originally specified has been the subject of discussion for many years. Statements on the methods of assessing equal / approved status have been prepared by recognised expert organisations including the Lighting Industry Association, the Electrical Contractors Association, the Institute of Lighting Engineers, and the Society of Light and Lighting in an attempt to ensure that the integrity of design, product choice and installation meet with the original design parameters for a lighting installation.

It is essential that those responsible for procuring equipment for a lighting scheme ensure that any luminaire submitted as an alternative to a specified luminaire meets the same standards as the specified product, achieves the same results and meets all the criteria determined by members of the original design team.

After all, there are legal responsibilities associated with any alteration to the existing design.

However, when the alternative lighting equipment being proposed is a life safety product such as emergency lighting, then any changes to the original design may ultimately have a consequence influencing life or death.

The competent person / designer of the original emergency lighting scheme will have taken professional fees to carryout appropriate risk assessments and determine the required equipment to meet the legal requirements for the application. As professionals they will carry appropriate Legal Indemnity insurance to cover the worst case scenario should they get something wrong.

For an emergency lighting installation the constructional safety of the products is only a small part of the consideration, of even more importance is the performance, reliability and environmental suitability of the equipment in relation to the application.

Photometric Equality

The original designer of an emergency lighting installation will have assessed full photometric characteristics for the luminaires including all service factors for the performance during the initial stages of the emergency operation through to the performance achieved at the end of duration and end of life of the emergency lighting supply.

Emergency lighting luminaires of similar appearance and design can have significant variations in photometric performance. The way an emergency lighting luminaire provides installed illuminance will be determined by the type & position of light source, the material & design of the lens, the control gear electronics and the type & size of battery.

In commercial lighting, if an area has been designed to use a fixed number of specified 4 x 14Watt T5 luminaires and these are replaced by the same quantity of an alternative 4 x 14Watt T5 luminaire of similar appearance there may be aesthetic concerns, the alternative products may not be as reliable and due to the optical design the resultant working plane illuminance may differ from what was intended. However, any 'problems' will probably be relatively easy to assess and if the installation provides lower than required illuminance the result may be disappointing but not life threatening.

Whereas, if an escape route has been designed to use a fixed number of 3hour duration self-contained emergency lighting luminaires incorporating a high efficiency drive circuit powered from a 3.6Volt 4Ah battery providing 120luminaire lumens via a wide distribution fresnel lens and these are replaced with the same quantity of similar looking products that have poor quality electronics, driven from a 2.4Volt 4Ah battery providing 80 luminaire lumens via a poorly design diffuser; the result will be that the installation will fail to comply with the minimum illuminance and uniformity requirements specified in BS5266. This installation will therefore fail to comply with the legal requirements and may be dangerous.

Maintaining the design in service life

The need to maintain the original designer's scheme also applies when luminaires are replaced by service companies after a failure. Many systems that were appropriate when originally installed are put at risk by inadequate replacement luminaires or components.

Replacement batteries and lamps must be compatible with the original circuits any substitution should be checked by a competent engineer and identified in the site records. So any replacement luminaires or components should be checked for compatibility, quality, and life expectancy in this operational condition.

Reasons for introducing 'Equal and approved' equipment

Of course, there can be many reasons for proposing alternative equipment to the original specified products but increasingly the most common reason is price.

The reputable specialist emergency lighting equipment suppliers are very professional and generally manufacture their products to comply with EN and ICEL standards. By using the standards as a design benchmark, it is inevitable that the internal components from various suppliers have broadly similar construction and cost. So although products from different suppliers may differ in appearance there are generally bands of similar intrinsic costs for equipment aimed at specific applications. If a product is offered at a price significantly below the market value for the product group then it is very likely that it is not 'equal' to other products of that type.

How to identify 'Equal' emergency lighting equipment

First, it must be remembered that an emergency lighting scheme has been designed with the prime aim of ensuring safe escape during dangerous conditions and to achieve this aim, the products selected will have been chosen based on performance, reliability, design life and suitability for the environmental conditions.

Reputable suppliers specialising in the emergency lighting sector will be able to provide full photometric data and they will be able to state the service factors required to conduct an accurate lighting design. Emergency lighting specialist suppliers will also have a good understanding of the product and application standards and will ensure that their products have been designed and manufactured in accordance with the relevant safety and performance standards.

All ICEL member companies operate to these stringent ethics and therefore specifying that any ‘equal’ equipment should be supplied by an ICEL Member Company will be a good first step.

It is then essential that the photometric performance of the proposed ‘equal’ equipment is compared to the data provided for the specified equipment (only comparing the full photometric data will suffice – there is no ‘short cut’ or ‘rule of thumb’ when assessing if the required illuminance, uniformity and glare values are complying with the legal requirements).

Finally, ensure that the ‘equal’ products are supplied with a Declaration of Conformity listing the same safety and performance standards associated with the original specified equipment.