

## Installing Downlighters Safely by John Ware

Following these steps should ensure a downlighter will not pose a risk of fire due to overheating

1. Only use downlighters that conform to BS EN 60598, the British Standard for Luminaires and ensure the requirements of BS 7671 are met
2. Follow the Manufacturer's instructions
3. Ensure the requirements of the Building Regulations (England and Wales) are met
4. Provide space around the downlighter
5. Fit the correct lamp

**1. EN 60598.** International Standard EN 60598 specifies general requirements for luminaires incorporating electric light sources for operation from supply voltages up to 1 000 V. The requirements and related tests of this standard cover all aspects of safety including electrical, thermal and mechanical in the areas of classification, marking, mechanical

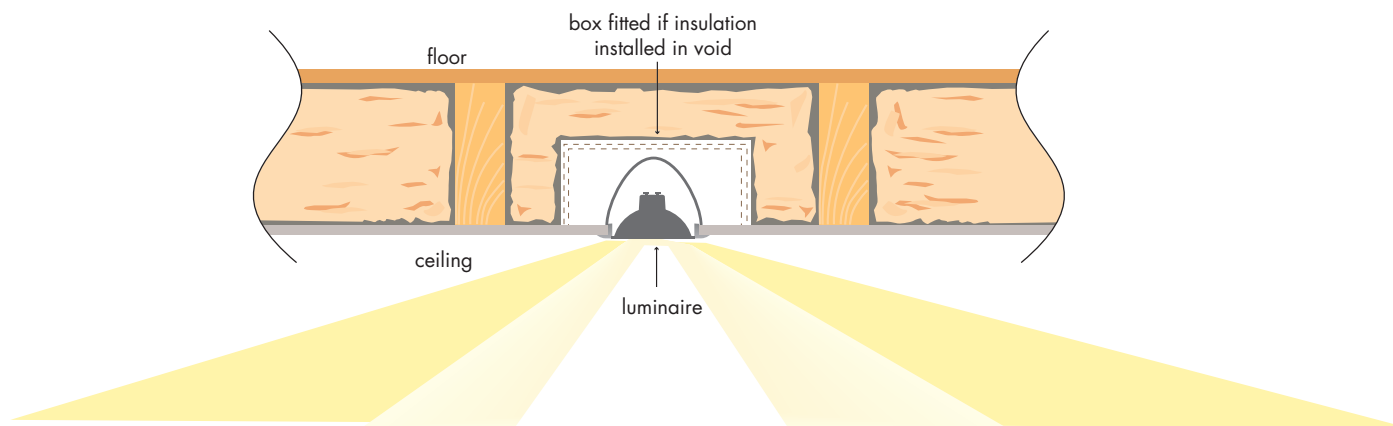
construction and electrical construction.

BS 7671 Requirements for Electrical Installations requires, in Regulation 511, that electrical equipment, which includes luminaires, conforms to an applicable Standard. Section 422 of BS 7671 gives requirements for protection against fire and harmful thermal effects and Regulation 422-01-02 applies to fixed electrical equipment such as a downlighter that, in normal operation, has a surface temperature sufficient to cause a risk of fire or harmful effects to adjacent materials. The Regulation gives three methods of preventing danger which are (i) mounting within a suitable enclosure, (ii) screening or (iii) provision of sufficient distance from adjacent material. Refer to the Regulation for full details.

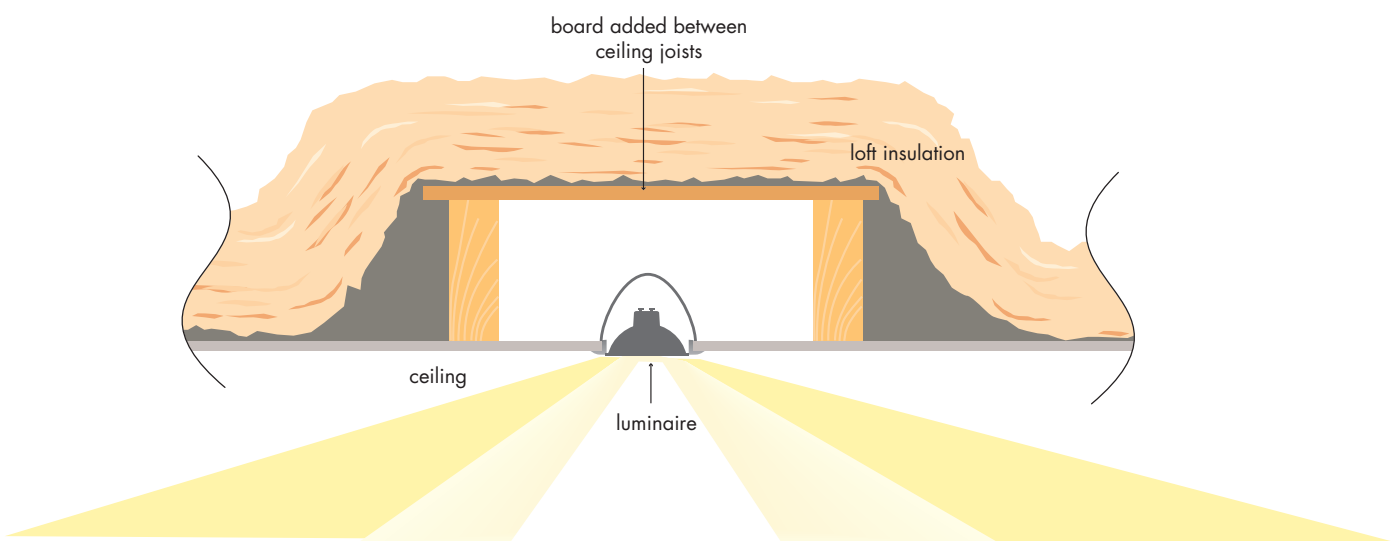
**2. Manufacturer's instructions.** The manufacturer's instructions supplied with the downlighter must be followed. The Manufacturer may require a

certain amount of space be left around the back of the downlighter or that the downlighter must not be covered with loft insulation, or only lamps of a particular type and maximum wattage be fitted or that a fire hood or intumescent hood be installed.

**3. Building Regulations (England and Wales).** The installer must be aware of the requirements of the Building Regulations in England and Wales before installing a downlighter. For example, before cutting a hole in the fabric of the building the installer must ensure that the structural integrity, fire resistance or other aspects of the structure are not compromised. Approved Document B gives guidance on the precautions to be taken to inhibit the spread of fire within a building. Approved Document A deals with structure and the basic requirement is that persons installing electrical equipment must not cut, drill, chase, penetrate or in any way interfere with the structure so as to



**Figure 1:** Installing a downlighter  in the void between a ceiling and an upstairs floor



**Figure 2:** Installing a downlighter  in a ceiling with a loft space above

cause significant reduction in its load bearing capacity.

Regulation 4(2) states that, on completion of electrical installation work, the building (and parts of the electrical installations in the building that were not the subject of work) should be no worse in terms of the level of compliance with the other applicable Parts of Schedule 1 to the Building Regulations than before the work was undertaken.


For example, one or more perforations of a ceiling lining beneath a floor – made to accommodate recessed lighting or similar fittings – may have an adverse

effect on that floor's performance in terms of its resistance to fire and sound penetration. Due regard should therefore be paid to the guidance in Approved Documents B and E on the performance of compartment floors.

Regulation 4(2) also means that, when extending or altering an installation, only the new work must meet current requirements and there is no obligation to upgrade the existing installation unless the new work would adversely affect the safety of the existing installation, or the state of the existing installation was such that the new work could not be

operated safely, or where there is a requirement to upgrade imposed by the energy efficiency requirements of the Building Regulations.

**4. Provide space around the downlighter.** A downlighter can develop significant heat and sufficient space must be provided around it.

When installing the downlighter in the void between the ground floor ceiling and the upstairs floor, there should be sufficient space around the downlighter as illustrated in Figure 1. The downlighter used must be marked with symbol: . Building debris and other flammable material must be removed from the void. Cables must be

<b>Dichroic:</b>	<b>Light away from luminaire Heat back to luminaire</b>	<b>GZ10 holder</b>
<b>Aluminised:</b>	<b>Light and heat away from luminaire</b>	<b>GU10 holder</b>
<b>GZ10 holder:</b>	<b>Accepts GZ10 &amp; GU10 lamps</b>	
<b>GU10 holder:</b>	<b>Only accepts GU10 lamps</b>	

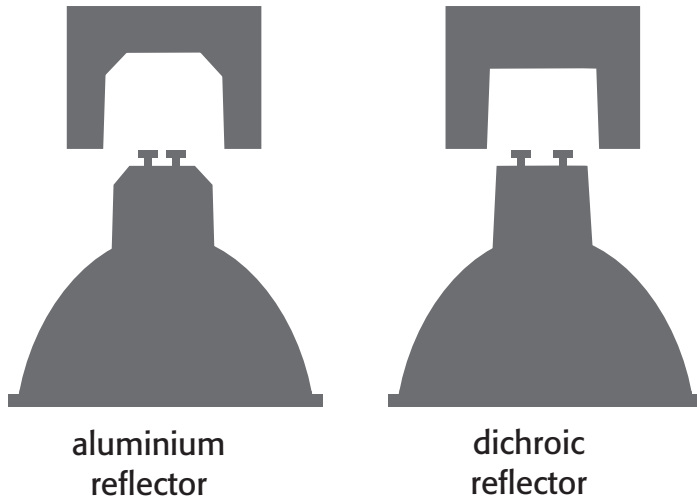


Figure 3: GU10 and GZ10 bases

secured such that they do not come into contact with the hot surfaces of the downlighter.

When installing a downlighter in a ceiling with a loft space above, precautions must be taken to ensure that loft insulation or other material does not surround or come into contact with the downlighter. Installing a board between two joists as shown in Figure 2 will, and running the loft insulation over the top of the board will, in most cases, ensure

sufficient air space around the downlighter. Once again the downlighter used must be marked with the symbol:

**5. Fit the right lamp.** Many downlighters are designed either for use with 230 V dichroic lamps fitted with GZ10 caps or aluminised lamps fitted with GU10 caps. (See above).

As can be seen in Figure 3 a GZ10 holder will accept lamps having a GZ10 cap and lamps having GU10 cap. A

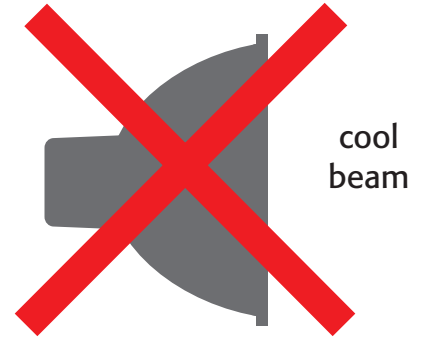


Figure 4: Cool beam or dichroic lamps forbidden

GU10 holder will only accept lamps with a GU10 cap due to the chamfer.

A luminaire employing a dichroic lamp will run hotter than an equivalent luminaire fitted with an aluminized lamp.

However, lamps that can be purchased are GZ10 - dichroic and aluminised and GU10 - dichroic and aluminised. Use of dichroic lamps in a luminaire designed for use with aluminised lamps could create excessive heat within the luminaire leading to an unsafe situation and risk of fire.

The European standard EN 60598 presently caters for this situation by application, on the luminaire, of a symbol warning against the use of cool beam lamps (dichroic) (see Figure 4).

It is recognized that many people will not know what the above symbol means nor will they know the difference between dichroic lamps and aluminised lamps. To avoid the occurrence of unsafe situations the Lighting Association advises its members to supply only luminaires suitable for both applications i.e. even if fitted with a GU10 holder the luminaire design should accommodate the additional heat produced by the possible use of a dichroic lamp. ■



A serious fire occurred in a listed building when a new lamp was fitted in a downlighter that had not been working for years.

In the attic above, an old oily coat had been thrown down and was partially covering the non-working downlighter. The heat generated by the new lamp set fire to the coat and destroyed the upstairs and roof of the property.