



By
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Providing cover for the down lighter installer

Down lighters provide a very attractive modern and efficient form of lighting. They can illuminate or concentrate light into difficult areas, increase the feeling of space and mix well with other lighting elements to create a very pleasant ambience.

However, if during their installation, no consideration is given to fire and location protection, then a reduction in the fire rating of the structure will occur resulting in non compliance of Building Regulations. Also, in

some situations the down lighters themselves can introduce other fire hazards.

Building Regulations, Approved Document B (Fire) states "If a fire separating element is to be effective, then every joint, or imperfection of fit, or opening to allow services to pass through the element, should be adequately protected by sealing or fire-stopping so that the fire resistance of the element is not impaired". The technical standards of Scotland and those of Northern Ireland say the same.

This has been re-emphasised in the Department of Trade and Industry sponsored "Ensuring Best Practice for passive fire protection in buildings" that has just been published, which states: "Lighting fittings, and other penetrations through the ceiling, must also have the same demonstrated standard of fire resistance, and be appropriate for the type of ceiling."

Structural floors have three functions, the structural element, providing a passage for services and very importantly, the separating element as referred to in Building Regulations. The plasterboard ceiling lining has an important role to play in all these functions, particularly in the case of fire separation, where it provides a significant portion of the fire resistance time period.

This fire resistance or fire rating is broadly 30 minutes for houses and single occupancy units and 60 minutes for flats, apartments and multi occupancy units.

If the ceiling lining is then perforated to fit recessed down lighters and the down lighters fitted are not protected so that the specification of the lining is not totally reinstated, then a serious down grade in the fire resistance properties of that ceiling will occur.

The down grade in Fire Resistance can be considerable where modern I beam or metal lattice joists are used. These styles of joists have many constructional advantages plus the very economical use of wood. As a result, they do not have the sacrificial timber that traditionally provides the protective charcoal which allows timber structures to achieve their fire resistance. They may therefore be unable to withstand fire exposure for more than 5 to 10 minutes. In this case, the ceiling lining will now have to provide protection to the structure for 90% of the target rating duration.

It is unfortunately very often considered that the perforation of the ceiling will only result in a loss of integrity and that, if the floor



boarding is of reasonable thickness and well jointed, this will not result in a failure of the fire resistance because the floor will resist burn through.

This is particularly so in domestic housing where the rating is only 30 minute load bearing capacity. However, ceiling perforation puts this load bearing capacity at risk and if an unprotected installation of down lighters fails to keep fire out of the cavity for 20 minutes, then a premature collapse could occur.

This is a risk that should not be taken.

It is sometimes difficult to ascertain, after installation, whether the required protection has been fitted. Better then to remove the doubt and make down lighter protection the acceptable standard.

Also, as now being highlighted by Building Regulations E, this ceiling membrane has also a critical role to play in maintaining the acoustic rating of the structure.

Again, perforation of the ceiling will result in a down grade of its acoustic properties and any down lighter fitted or its protection must be capable of restoring that acoustic rating.

For domestic housing applications, protection is provided by the use of lighting covers or the fitting of down lighters where the fire and acoustic protection is built into the light unit itself.

Care needs to be taken in the selection of a lighting cover to ensure that it is right for the application. Some covers are only tested to BS 476 Part 23. This is a test for light fittings used in association with commercial suspended ceilings designed solely to protect steel beams in lieu of applying protection and therefore has no function in respect of floor tests to BS 476 Part 21 or 22.

As stated in "Ensuring Best Practice for passive fire protection in buildings" the demonstrated level of fire resistance must be appropriate for the type of ceiling.

A lighting cover with a one hour rating to BS476 Part 23 may only be able to protect a timber decked floor for 15 to 25 minutes because of the positive pressure used in Part 21 test.

It is also essential that the down lighter and fire cover are tested as a total component. In recent fire tests, down lighters of reasonable quality fell out of the ceiling within 6 minutes of the fire starting. In this situation, a cover would be ineffective against the pressure of the fire, giving the fire, fumes and smoke immediate access to the upper structure.

Some down lighters get very hot in use with temperatures at the rear of the fitting exceeding 200°C. Fire covers can protect the fitting from being in contact with flammable or insulating materials present in the void and being manufactured from intumescent fibre material have good acoustic properties.

Fire covers however, can cause overheating of the down lighter with a resultant significant reduction in lamp life and

if they are of the vented style to prevent this overheating, they then lose their acoustic performance.

The simplest, most economical and safest (the protection having been properly installed) solution is to select down lighters that have

protection built into them, have been tested in representative ceiling / floor structures to BS476 Parts 21 or 22, have had a full acoustic test, airborne and impact, and are capable of being in contact with materials in the void without creating a fire hazard or over heating problems.



Such a range has been developed and patented by FL Patents Limited and is being manufactured under licence and marketed by Electro-Technik Limited. This low voltage down lighter range is available in fire ratings up to 1.5 Hours, meets all the above test criteria, is extremely simple to install from below and is approved by Lantac, Zurich Building Guarantees and meets the requirements of the relevant parts of NHBC Standards.

It is important to remind the electrical contractor that all down lighter installations must be protected by either fitting an appropriately tested fire cover or by fitting down lighters with inbuilt protection. Any liability for consequential fire spread from an unprotected installation may rest with the installer.



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