

Fire rating - where 30 + 60 don't = 90

Here at JCC we don't just talk about the building regulations, we understand them. That's why Fireguard is not just "suited" to 30 and 60 minute ceilings, it is TESTED for 30, 60 and 90 minute ceilings.

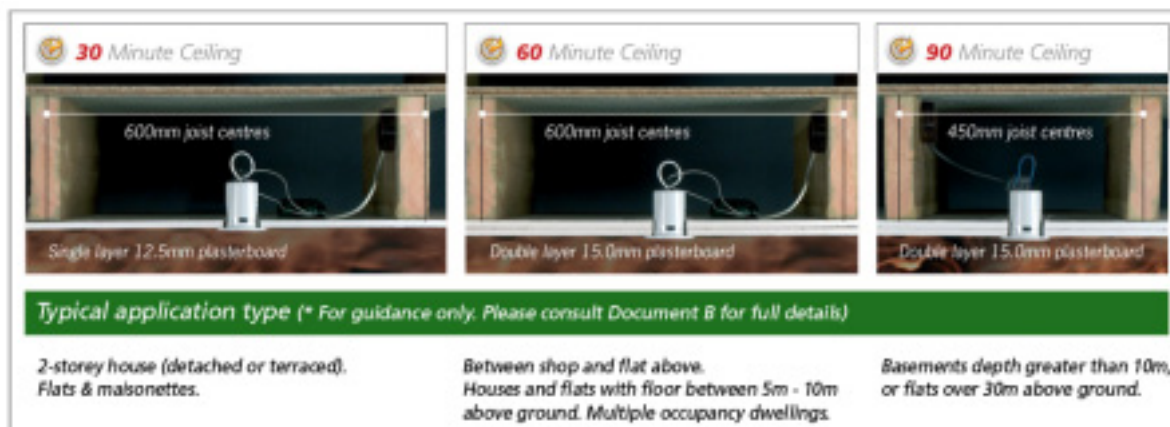
It is estimated that around 70% of UK build installations feature 30 minute ceiling types. However some lighting manufacturers are producing and promoting downlights that have only been tested at 90 minutes, while claiming that they are fully compliant with 30, 60 and 90 minute ceiling constructions. Each ceiling is rated separately for a reason, and in fact, the test for 30 minutes is what you should really be looking out for in most domestic installations.

There is still a lot of confusion within the UK building industry over the building regulations. Often the problem of deciding which lights should be fitted in order to comply with Part B ends up with the contractor at the point of installation, whereas that decision should only be made during the design process in respect of the type of ceiling involved.

In some cases, it has *almost* become the norm to fit a downlight tested for a 90 minute ceiling in a 30 or 60 minute ceiling. But here lies the risk.

What do the ceiling ratings mean?

Ceilings have to be constructed to provide protection to the floors above and also to adjacent buildings for a duration that is specified in Part B, which is a standard put in place to ensure that a building's structure provides adequate protection to personnel in the event of a fire and during emergency evacuation.



Different types of building require a specific method of ceiling construction as can be seen in this image. Each ceiling construction uses different materials and has joists spaced at different widths. At 90 minutes the joist widths are at 450mm and utilise two layers of 15mm gypsum board impregnated with strengthening fibres. The ceiling will fail under duress when the moisture is evaporated by the heat of the fire and the board collapses under its own weight (and that of the downlight). At 600mm joist spacings used in 60 minute ceilings the weight is supported over a greater distance and thus will collapse at an earlier stage. Couple to this the fact that the 60 minute gypsum board is not impregnated with fibres to hold it together and it is easy to understand the differences and associated risks.

The level of resistance is proportional to the risk involved and the location of adjacent dwellings. 90 minute fire-rated floors are generally only required in extreme construction, such as tall buildings or towers. 60 minute fire-rated floors are used in between shops and flats, and multiple occupancy buildings, while 30 minute fire-rated floors are the most common, used in 2-storey houses (detached or terraced), flats and maisonettes.

Right now there are products on the market which only comply in a 90 minute ceiling, which is rarely required, but this is no guarantee that they are suitable for 30 and 60 minute ceilings as these are a less robust construction.



Developments in building materials also mean that it is imperative to use fully tested downlights. Timber I-joint systems are becoming increasingly popular as an alternative to solid beam ceiling constructions. As they are manufactured from laminating layers of wood together, they are lighter and easier to manoeuvre, together with the benefit of being able to span greater widths without undue flex in the floor system. However, as these joists are thinner, they are less resistant to the passage of fire. This again means that any downlights installed must also be tested for I-joists as well as solid beam constructions.

Firehoods

The issues with fire-rated downlights go beyond that of rigorous testing. Most lamp sources need to disperse heat and require a certain amount of ventilation, which can therefore compromise the ceiling. The construction of the downlight needs to ensure that there is enough ventilation to keep the lamp cool, while having the ability to seal the fitting against fire.

The subject of fire-rated downlights and hoods is a complicated one. As heat is always going to be present with any lamp source, fire safety and liability are of obvious concern. Providing the fire-rated downlight is acquired from a reputable manufacturer and has been fitted correctly should be reassurance enough that the fixture is doing its job correctly.

However, it is difficult to see whether a firehood has been fitted correctly, as any disruption to the hood could compromise the safety it is claiming to offer.

Building regulations place a considerable amount of restraint on modern developments and while a limited amount of downlights meet all the required regulations including Part C, which requires special seals to inhibit the flow of air and moisture, and Part L relating to energy efficiency, firehoods don't provide a seal. This means that when used with a standard downlight, it doesn't meet the regulations and wouldn't offer any protection in the upper floors of modern houses. This type of fitting would only be useful when installed on the ground floor of a property.

As house building and developments becomes more technical it will become increasingly difficult to ensure total fire safety. The use of hoods will be limited due to space restrictions, and testing will be paramount to ensure protection against fire.



Lamps

With so many different lamp types available now, lamp replacement can also be an issue as this is where problems can occur if people use the wrong lamp type. As far as fire-rated products are concerned, the issue of aluminium and dichroic lamps can be a concern, as some people don't know the difference. Due to issues with backward heat dissipation in dichroic lamps, aluminium reflector lamps are essential for use in fire-rated products as they send the majority of the heat forwards through the front of the fitting. However, as lamp manufacturers are reducing the number of dichroic lamps produced while increasing the production of aluminium lamps, this risk is gradually reducing.

Low energy lamps are becoming ever more popular, particularly as there are lamps available now that comply with building regulations and provide significant savings on energy bills. For example, compact fluorescent lamps (CFLs) reduce power consumption and will last on average 8 to 15 times longer than incandescent variants. Relative new comers to the low energy market also include GLS halogen retro-fit lamps with up to 30% lower energy consumption than their standard GLS equivalents.

High intensity discharge lamps (HIDs) produce a greater amount of light per watt than incandescent lamps and can last up to five times longer. Metal halide lamps have the ability to produce a natural white light ideal for applications where true colour rendering is vital, such as retail displays.

Light emitting diodes (LEDs) are really starting to make their way into all aspects of lighting. They are becoming more powerful and starting to rival existing lamp types. Not only are they an excellent energy efficient light source, but they can have a working lifetime of anywhere between 50,000 and 100,000 hours, and will reach full brightness instantly.

The lighting industry is starting to provide the solution by producing dedicated lamp bases so that the wrong type of lamp cannot be fitted, therefore reducing any risk of using a dichroic lamp. In line with the latest legislation a variety of dedicated lamp holders are now evolving that will only accept specific low energy lamps, and eventually these will replace the traditional lamp base. It is still possible, however, to install an incandescent or CFL into an existing BC or ES lamp base, but in order to fully comply with Part L specifications, the new standard calls for a dedicated low energy lamp and socket combination.

What next for fire rated solutions?

Getting the testing message across to house builders, developers and contractors isn't always easy. Although some of the national house building companies are concerned about fire safety, many see it as an issue for the building contractor. Even architects' plans don't necessarily go as far as specifying a particular downlight fitting. This means the building contractor doesn't have any guidelines to follow when matching fire-rated products to ceiling types.

In the near future, fire-rated products will become the benchmark luminaire for all domestic dwellings. There are likely to be additional luminaires based around the functionality of the design but with aesthetic enhancements to fit in with modern and evolving designs such as different shapes, dropped glass and an increased range of finishes.

Manufacturers will be increasingly challenged to meet all building regulations and testing procedures to ensure maximum fire safety. Contractors need to fully understand the risks and have an understanding of the building regulations and the testing process, and use this knowledge in all domestic and commercial applications to minimise risks. It will also be increasingly important for the house owner to have an understanding of the requirements, to ensure they are fully compliant with their existing fittings and to protect their home from fire risks.

Don't run the Risk

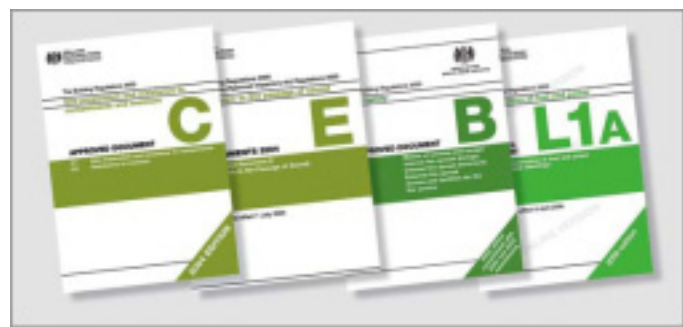
Fire safety is a concern for everyone in the industry, but the best way to tackle it is to get a clear message to the whole marketplace about the thorough testing of fire-rated downlights.

Lighting manufacturers have a major role to play in providing information and clarifying their claims of compliance. If manufacturers can't give out the right information, what chance is there of the house builder, the building inspector and the building contractor getting it right?

At JCC we believe the message needs to be clear - when you are fitting downlights you must ensure they are tested for the ceiling construction. Otherwise you run the risk of potential ceiling collapse in the unfortunate event of a fire (ceiling collapse can be more of a threat than the actual fire itself).

In addition, downlights need to look good, and there are now a wide range of downlights, from tiltable, dropped glass, eyeball, recessed or standard from a number of responsible manufacturers. But good looks should not overrule safety at any point.

Why risk it? Fit the relevant fully tested fire-rated downlights or you may end up liable should the worst happen. Make sure you demand a copy of the testing certificate for the downlights that you fit. And remember, if it's not fire-rated for each ceiling construction you are working on, don't fit it.



Building regulations –what do they mean?

In addition to Part B (Fire safety) there are a number of regulations that contractors should be aware of when installing downlights into a fire ceiling.

Part B: Fire Safety

The purpose of Part B is to ensure that building structures provide adequate safety protection to personnel in the event of an emergency evacuation of the structure/complex. The regulation has been a legal requirement since 1987.

Part C: Moisture protection

New building materials and associated construction methods are altering the way in which new properties are manufactured. The amount of moisture that can enter a cold roof void must be controlled, so anything that punctures the seal between the cold roof area and dwelling area, such as a downlight, must be considered. The requirements of Part C are demanding, therefore any downlights installed must be designed to inhibit the flow of air and moisture. This has been widely enforced since July 2005.

Part E: Acoustic standard

There is a general increase in the levels of background noise within a domestic environment compared with previous years, due to evolving technologies in sound systems, televisions and transport. Changes to the building regulations have been implemented to ensure that only a reasonable level of noise can be expected between partition walls and ceilings, both between separate dwellings and within an individual residential area. This means the design of the downlight must ensure that noise is limited, for example, by the use of seals or gaskets.

Part L: Energy conservation

The 2006 revision to Part L has a far more defined requirement for energy conservation, with the need for 1 in 4 downlights to be energy efficient. This becomes a challenge where downlights are used in abundance. Options include using low energy downlights, or to have secondary energy compliant wall lights that can be switched separately from the main lights – once the CFL lamps are up to full brightness, the main lights can be switched off.