

ROBUS®



The ROBUS Guide: Fire Rated Downlights and Their Lifesaving Design





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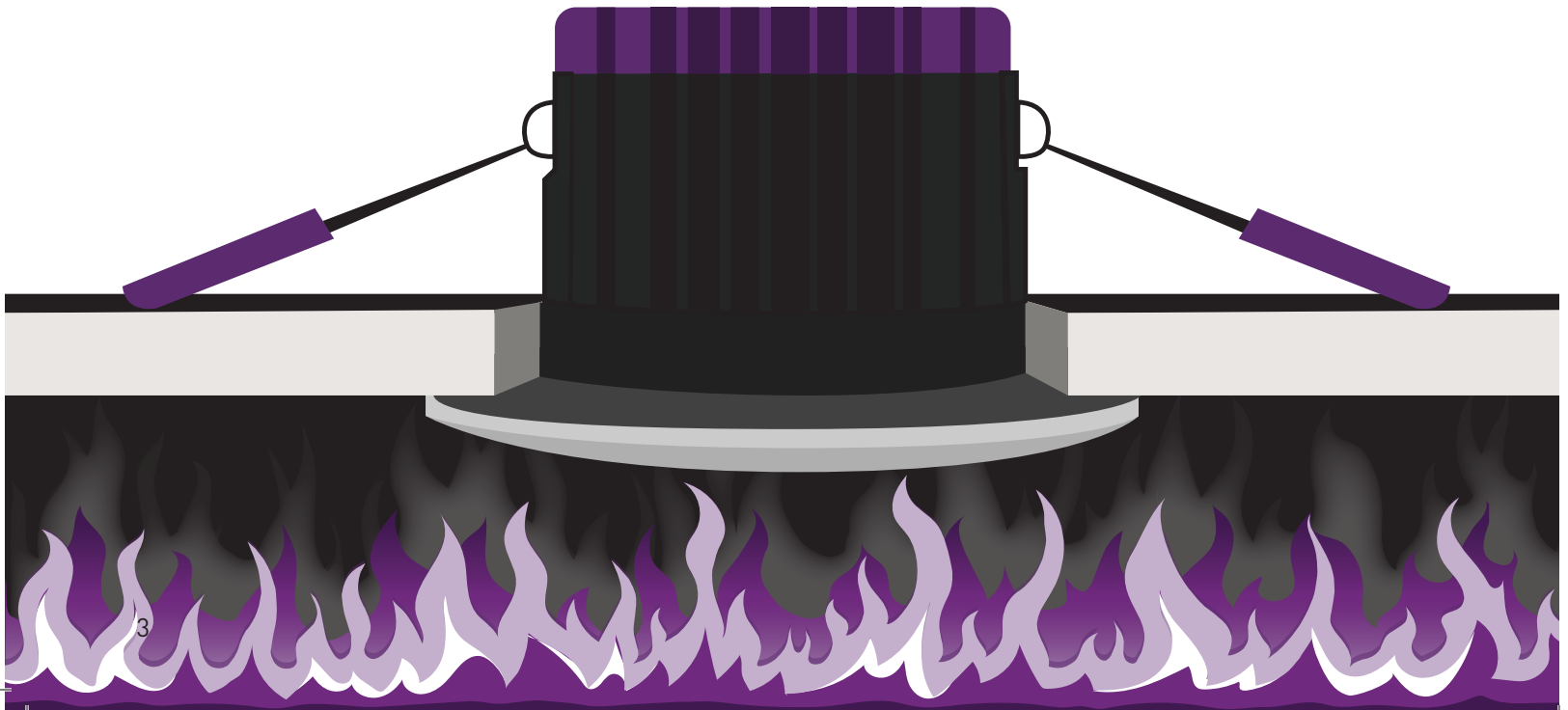
Downlights - a longstanding popular choice in décor. Also known as can lighting or recessed lighting, you've most likely had them requested by customers for a range of commercial and residential spaces due to their versatility and sleek design. But downlights have their challenges.

Primarily, the fact that if you want downlights in a ceiling what are you going to have to do first? Create an opening in that ceiling! This predicament underscores the very reason fire rated downlights were developed in the first place.

Why Would You Need Fire Rated Downlights?

Imagine a typical plasterboard ceiling, perhaps there is one above your head right now. That ceiling naturally helps to slow fires from spreading because it works as a barrier. In multistorey buildings where people reside on different levels, ceilings must be fire protective in all cases where people live above, in accordance with fire safety building regulations. As follows, in the case of basements, the ceiling must be fire protective.

However, once an opening is made in the ceiling, this barrier is significantly compromised – think of water running down your bathtub's drain, but the water is actually fire! Fire rated downlights are designed to combat this issue with an intumescent seal.





CASE STUDY: ROBUS TRIUMPH ACTIVATE

Our **TRIUMPH ACTIVATE** fire rated downlight was the perfect fit for the elite function room at The Charleville Park Hotel in Cork, Ireland. In this retrofit project, our lighting design achieved the same light level using approximately 44% fewer fittings. With an efficacy of more than 80 luminaire Lm/CCT, the **TRIUMPH ACTIVATE** provides energy savings in excess of 90% and is compliant with Irish and UK fire safety regulations..

Read more by visiting our Case Studies at www.robust.com.

The Lifesaving Intumescent Seal

Intumescent material is a substance that does not burn immediately on exposure to heat but usually expands in volume while decreasing in density. Effectively, it fills the opening in the ceiling restoring its fire resistance. Intumescent seals can be made from a wide range of synthetic polymers and resin binders, such as silicone or epoxy.



Downlight without fire rating



Fire rated downlight

Visually, there are only slight differences between these downlights as everything from diameter, depth and even light output are all very similar. Nonetheless, the differences are crucial, as fire rated downlights have the potential to save lives.

Once swollen, the intumescent seal can block the spread of fire for a pre-determined period of time. This delay gives the building users enough time to escape to safety while also protecting the property. Fire rated downlights should be utilised whenever recessing a luminaire into a fire barrier.

Different Ceilings Have Different Levels of Fire Protection

It's crucial to recognise that fire rated downlights are not a one-size-fits-all solution. Fire rated downlights receive ratings based on two factors: how long they can resist fires (30, 60, or 90 minutes) and the specific type of ceiling they can be placed in (like solid timber joists, I-joists, and steel web joists).

To restore the integrity of the punctured ceiling, you must install a fire rated downlight that meets the fire protection requirements of that ceiling. It's also important to consider the spacing between lights.

Fire Resistance is Determined by the Size of the Dwelling

Basement Storey* including floor over		
1. Residential	Depth (m) of the lowest basement	
a) Blocks of Flats	More than 10m	Up to 10m
~ Without Sprinkler System	90 Minutes	60 Minutes
~ With Sprinkler System	90 Minutes	60 Minutes
b & c) Dwellinghouse	Not Applicable (4)	30 Minutes *†
2. Residential	Depth (m) of the lowest basement	
Institutional	90 Minutes	60 Minutes
Other Residential	90 Minutes	60 Minutes

The above table illustrates fire safety measures in residential dwellings, edited by ROBUS for educational purposes. Source: Approved Document B - Fire Safety (Volume 1) 2019 edition, with 2020 and 2022 amendments. Published by the UK government. URL: [link](#). For Irish regulations, please refer to Technical Guidance Document B Fire Safety available at [www.gov.ie](#).

- * For the floor over a basement or, if there is more than one basement, the floor over the topmost basement, the higher of the period for the basement storey and the period for the ground or upper storey applies.
- † For compartment walls that separate buildings, the period is increased to a minimum of 60 minutes.
- + Any floor that does not contribute to the support of the building within a flat of more than one storey, the period is reduced to 30 minutes.
- § For flat conversions, refer to paragraphs 6.5 to 6.7 regarding the acceptability of 30 minutes.
- (2) Blocks of flats with a top storey more than 11m above ground level (see Diagram D6) should be fitted with a sprinkler system in accordance with Appendix E.
- (4) Very large (with a top storey more than 18m above ground level or with a 10m deep basement) or unusual dwellinghouses are outside the scope of the guidance provided with regard to dwellinghouses.
- (5) A minimum of 30 minutes in the case of three storey dwellinghouses, increased to 60 minutes minimum for compartment walls separating buildings.

Fire Resistance is Determined by the Size of the Dwelling (Continued)

Ground or Upper Storey					
1. Residential	Height (m) of top floor above ground, in a building or separated part of a building				
a) Blocks of Flats	Up to 5m	Up to 11m	Up to 18m	Up to 30m	More than 30m
~ Without Sprinkler System	30 Minutes †	60 Minutes +§	Not Permitted (2)	Not Permitted (2)	Not Permitted (2)
~ With Sprinkler System	30 Minutes †	60 Minutes +§	60 Minutes +§	90 Minutes +	120 Minutes +
b & c) Dwellinghouse	30 Minutes †	60 Minutes (5)	60 Minutes (5)	Not Applicable (4)	Not Applicable (4)
2. Residential	Height (m) of top floor above ground, in a building or separated part of a building				
Institutional	30 Minutes †	60 Minutes	60 Minutes	90 Minutes	120 Minutes †
Other Residential	30 Minutes †	60 Minutes	60 Minutes	90 Minutes	120 Minutes †

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How to Identify the Different Types of Fire Protective Ceilings: 30, 60 or 90-Minute Rating?

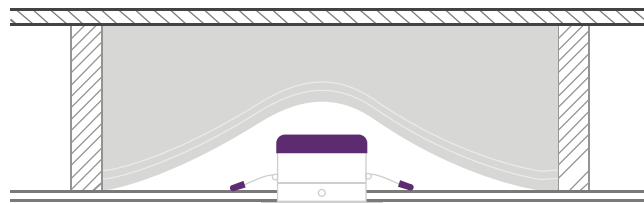
One way to identify different fire protective ceilings would be to measure their thickness:

- 30 minutes would be a 1x 12.5mm plasterboard (a single skin).
- 60 minutes would be 2x 12.5mm plasterboards (a double skin).
- 90 minutes would be 3x 12.5mm plasterboards (a triple skin).



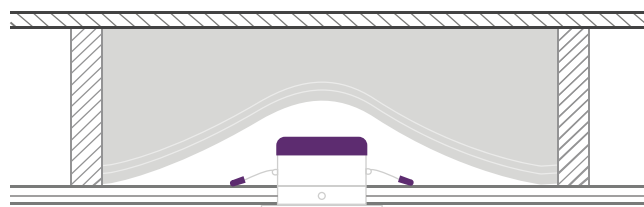
Downlights being installed on the top floor of a dwelling with no living space above, technically do not require a fire rating. However, to stop the spread of fire through the attic space from one property to another, it is recommended that a fire rated product be installed.

30
mins



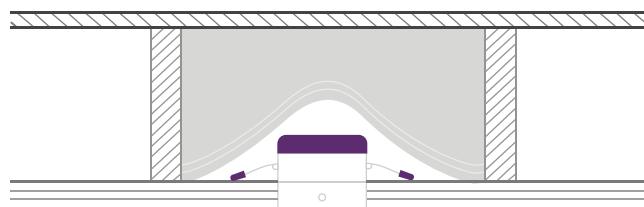
1 x 12.5mm Plasterboard (a single skin)

60
mins



2 x 12.5mm Plasterboard (a double skin)

90
mins



3 x 12.5mm Plasterboard (a triple skin)

I-joist Rated Downlights

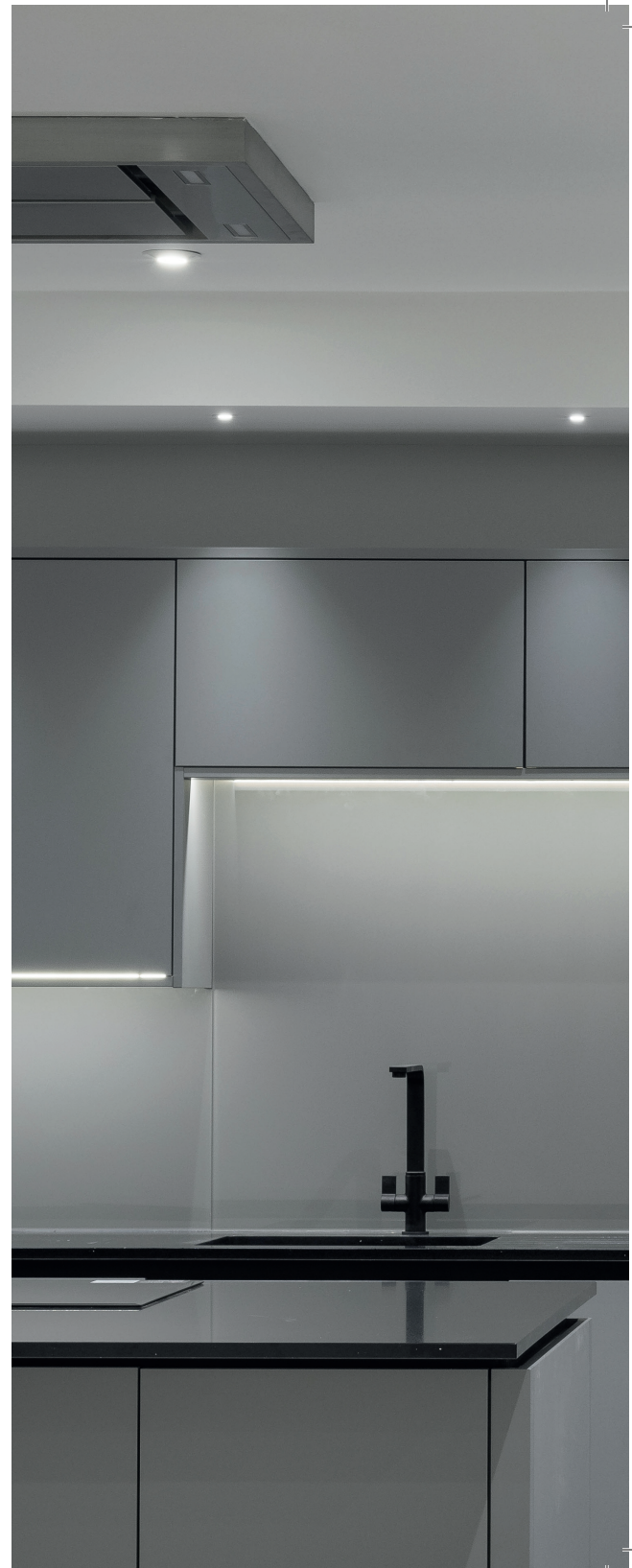
In the world of ceiling design, the I-joist offers an advanced structural alternative to the traditional solid timber approach. With its array of constructional benefits, this innovation has gained ground (or gained ceiling you might say!).

However, it is important to note that greater fire safety precautions are required compared to those for solid timber. Even if a downlight conforms to the original fire endurance standards of 30, 60, or 90 minutes, this doesn't necessarily imply its adherence to I-joist compatibility for your specific project.

Choosing a Fire Rated Downlight

To provide a little background on how downlights earn their fire-rating – it is literally trial by fire! When testing downlights, the process involves an actual ceiling subjected to fire that swiftly exceeds 600 degrees Celsius (some of you may recall the TV show Brainiac: Science Abuse at this point).

This test will fail if the roof caves in before the time period expected for the downlight. If, during a 30-minute test, the ceiling collapses in forty minutes, the fixture will pass the test. However, if it crumbles in 20 minutes, it's a failure. It's worth noting that it cannot be assumed that should a luminaire have a 90-minute rating, it will also pass a 30- and 60-minute test.





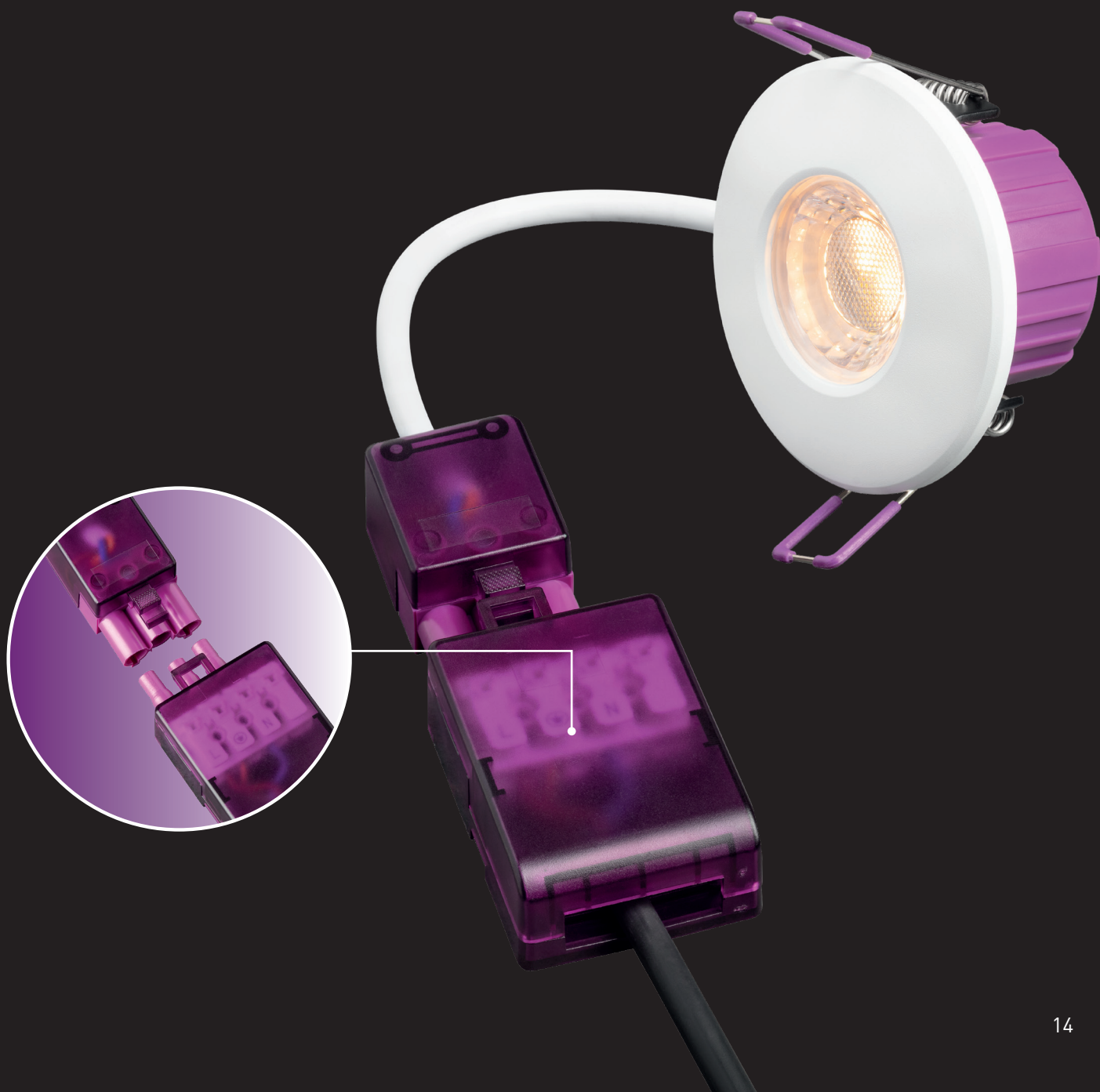
NEW PRODUCT 2023: TRIUMPH SLIM 2 PART CONNECTOR

TRIUMPH AFTER TRIUMPH, THE UNSTOPPABLE FIRE-RATED DOWNLIGHT


Introducing a refined design to meet the demands of the modern electrician's workspace. The Triumph Slim 2 Part Connector facilitates safe and convenient on-site testing after installation. How? The newly enhanced connector now has 2 essential parts: part 1 links to the fitting, part 2 securely holds the cable in the terminal.

The result? You don't stop until you're ready.

Explore our downlights at **www.robus.com**.







Therefore, when choosing a fire rated downlight, be sure to check the technical specifications to ensure it is designed to meet the fire protection required in the specific space you are installing the luminaire.

For example, at ROBUS we would describe a fire rated downlight in the technical specifications as being “Designed and tested to retain the integrity of 30, 60 and 90-minute fire rated ceilings – compliant with Building Regulations Parts B, C and E” and that it is “Tested for use with I-joists & Metal Web Joists” In the case of I-joist and metal web joists, we test for the industry standard of 30 minutes.

Warning: Never assume that a product labelled as ‘fire rated’ will meet the specific specifications you need. While a supplier might offer a test report to confirm the product’s fire rating, it could be rated for only 30 minutes. If, for instance, you require a 60-minute rating, the product’s current rating would not be in accordance with building fire safety regulations.

What are the Building Regulations for Downlights?

When it comes to fire safety in buildings, Part B of the Building Regulations is the go-to. This section covers a variety of topics such as installation rules, building code compliance, and regular inspection and care. It's important to have qualified electricians install fire rated downlights in accordance with manufacturer guidelines and fire safety regulations outlined in Fire Safety Approved Document B.

These regulations require specific flame-retardant standards, ranging from 30 to 120 minutes. It's essential to use approved models for your specific location. Regular checks and upkeep are necessary to maintaining fire safety. For more detailed information, you can refer to the Approved Document B available at www.gov.uk. For Irish regulations, please refer to Technical Guidance Document B Fire Safety available at www.gov.ie.

It's worth noting that changing lamps can be done as a DIY project, and surface-mounted downlights do not specifically require a fire rating as they are not mounted into the ceiling and therefore do not form part of the ceiling structure.



The Brave Little Downlight

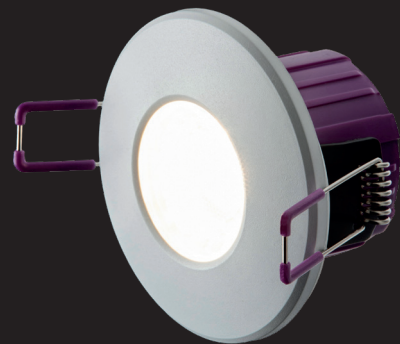
Fire rated downlights gracefully bridge the gap between aesthetics and safety, catering to various ceiling types and fire resistance needs. While adhering to regulations is essential, they're more than just regulatory compliance; they're a testament to smart design meeting life-saving functionality.

However, if the installation is done by inexperienced individuals, it doesn't matter how clever the design is as it simply won't be able to do its job. That's why it's so important for professional electricians to take the time to get thoroughly familiar with this impressive little luminaire!

Explore our downlights online at **www.robust.com** today.

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