

# JJI-JOIST TECHNICAL BULLETIN

SUBJECT: **Installation Guidelines for  
Downlighters in Intermediate Floors**  
Sheet 1 of 3

Bulletin Number:  
**15 Revision A**

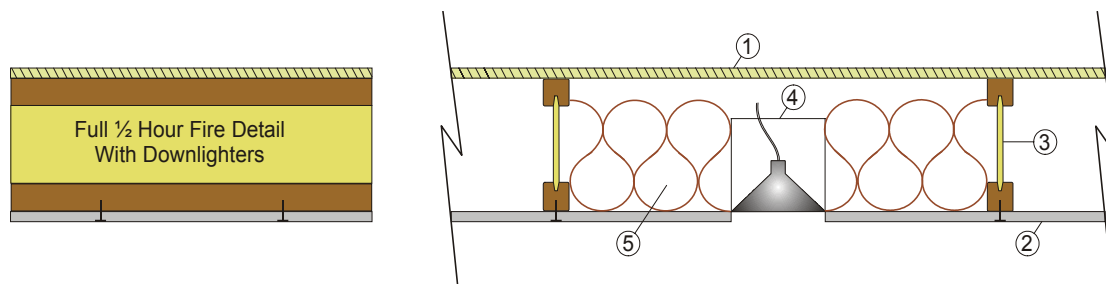
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## Introduction

Floors of domestic houses require to have a half hour fire resistance. Chiltern International Fire Ltd has evaluated the fire resistance performance of JJI-Joists with a variety of ceiling linings and floor decking materials in terms of BS476: Part 21: 1987 to meet the required fire resistance. Successful testing was also carried out with two different sizes of downlighters constructed on a fire test laboratory floor. This Technical Bulletin provides guidelines for the installation of downlighters when using JJI-Joists and the alternative materials which may be substituted for the test specification as suggested by Chiltern International Fire Ltd in keeping with their assessment of the JJI-Joist system for a full 30 minutes fire resistance performance.

For further information on the testing carried out a request can be made to view the document ref. No. FEA/F99142A Revision A.

## Full 30 Minutes Fire Resistance with Downlighters



**Figure 1. Full 30 minutes fire resistance**

### Materials used in full 1/2 hour Fire Test:

1. **Floor deck** – 22mm T & G flooring grade chipboard sheets fixed across the joists in a staggered pattern, screwed at 290mm centres
2. **Plasterboard** – British Gypsum, 15mm thick fixed at 230mm centres with 44mm long drywall screws across the soffits of the joists with the joints parallel to the joists staggered on adjacent boards. All the joints in the plasterboard were taped and filled using British Gypsum jointing compound and jointing tape.
3. **Structural member** – JJI-Joists installed @ 600mm centres to support the loads from above.
4. **Downlighters** – Two sizes of downlighter were used, 125mm diameter and 77mm diameter fitted at 500mm centres and 100mm from the plasterboard edges. The downlighters were standard units constructed with steel bodies and plastic socket fittings, clip in type. All downlighters were fitted with bulbs.
5. **Insulation** – No insulation was used in the test case.

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### Construction Options

#### 1. Floor Deck

1. Minimum 22mm thick T & G flooring grade chipboard (for maximum joist centres of 600mm) – edge joints backed by joists or noggings. †Fixings should be screws or nails not more than 300mm centres along continuously supported edges and at intermediate supports. Fixings should be at least 9mm from board edges.
2. Minimum 18mm thick T & G flooring grade chipboard (for maximum joist centres of 450mm) – edge joints backed by joists or noggings. †Fixings should be screws or nails not more than 300mm centres along continuously supported edges and at intermediate supports. Fixings should be at least 9mm from board edges.
3. Minimum 21mm thick T & G softwood floor boarding – edge joints backed by joists or noggings. †For boards not greater than 175mm wide, two nails should be used at each support, fixed at 15-20mm from board edges. For boards wider than 175mm at least three nails should be used.
4. Minimum 18mm thick oriented strand board (OSB) – T & G or square edged with joints backed by joists or noggings. †Fixings should be screws or nails not more than 300mm centres along continuously supported edges and at intermediate supports. Fixings should be at least 9mm from board edges.
5. Minimum 18mm thick flooring grade plywood - T & G or square edged with joints backed by joists or noggings. †Fixings should be screws or nails at 150mm maximum centres along board edges and at 300mm maximum centres along intermediate supports. Fixings should be at least 10mm from board edges.

All sheets of flooring must be fixed across the joists in a staggered pattern.

#### 2. Plasterboard

When selecting one of the plasterboards listed in Table 1 on Sheet 3, the following notes must be adhered to:

- the plasterboard should be fixed directly to the underside of the joists
- the fixings should not be inserted closer than 13mm from the edge or ends and 10mm to papered edges or ends
- \*Fixing:  
Nailing to ceilings – approximately 150mm centres (8 per linear metre)  
Screwing to ceilings – approximately 230mm centres (5 per linear metre) screw length 2.5 times board thickness
- care should be taken to avoid the plasterboard core being damaged by the nail or screw heads penetrating the paper liner.
- boards must be tightly butted together with end joints located centrally over the joist. The plasterboard sheets may be square or tapered edge but joints should be taped and filled with a gypsum based jointing compound.

†Extracts from **The Building Regulations 1991. Timber Intermediate Floors for Dwellings (excluding compartment floors)**

\*Extracts from **NHBC Standards chapter 8.2.**

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OPTION	THICKNESS (mm)	PRODUCT DESCRIPTION	NOGGINGS	PRODUCT STANDARD
1.	15	Plasterboard	None	BS1230: Part 1: 1985 Type 1
2.	12.5	Plasterboard with 3mm plaster skim	All joints	BS1230: Part 1: 1985 Type 1
3.	12.5	Fireline (British Gypsum), Diamond Fireshield (Knauf) or Firecheck (Lafarge)	All joints	BS1230: Part 1: 1985 Type 5
4.	15	Fireline (British Gypsum), Diamond Fireshield (Knauf) or Firecheck (Lafarge)	None	BS1230: Part 1: 1985 Type 5

**Table 1. Plasterboard Options**

### **3. Structural Member**

The range of JJI-Joists available for selection range from 195mm deep to 450mm deep and flange sizes vary from 45mm x 45mm up to 45mm x 97mm.

JJI-Joists may be spaced at a maximum of 600mm centres. This spacing may be reduced provided that the plasterboard end joints coincide with the JJI-Joist positions.

### **4. Downlighters**

The downlighters should be standard units of steel construction clip in type, up to a maximum of 130mm in diameter at a minimum spacing of 500mm.

### **5. Insulation (optional)**

A low-density (up to 33 kg/m<sup>3</sup>) glass or rock fibre insulation fitted in the JJI-Joist cavity laid on the back of the plasterboard.

### **Applicability**

Chiltern International Fire Ltd have assessed all the materials mentioned in this Technical Bulletin in conjunction with the JJI-Joist series and have deemed that any of the JJI-Joist series (apart from 145mm deep JJI-Joist) when incorporated with any of the materials listed and tested in accordance with BS 476: Part 21: 1987, will achieve a minimum of 30 minutes fire resistance for load bearing capacity, integrity and insulation performance so long as the loading does not exceed that recommended by James Jones & Sons Ltd.

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