



June 2010

## Residential Refurbishment

### 3.6.4 Internal Floors



energy saving



warmth



quietness



fire protection



sustainability

# Residential Refurbishment

## Internal Floors Contents

### Introduction

Solution optimiser and pathfinder

Design considerations

find online

page

**306**

**307**

### Design Details

find online

page

Solid timber joists (glass mineral wool)

**If01**

**688**

Solid timber joists (rock mineral wool)

**If02**

**688**

Concrete beam and block floor

**If04**

**689**

# Internal floors

## Solution optimiser and pathfinder



Knauf Insulation offers a range of products for insulating internal floors within a dwelling that contribute towards the floor meeting the design and Building Regulation requirements in a cost effective manner.

Using these products can also improve the thermal insulation values of the floor allowing for thermal zoning within the dwelling.

### Internal floor design

The overwhelming concern of the designer when considering the internal floors of a dwelling is to ensure that the floor has the ability to support the dead and live loads that will be applied to it in the context of the whole structure of the building. Building Regulations determine the minimum standards for structure and fire resistance. Another important consideration is the spatial separation that the floors provide within a dwelling in both acoustic and thermal terms.

Quite reasonably the occupier of a dwelling can expect there to be satisfactory acoustic separation between the various storeys within a dwelling particularly as bedrooms are normally separated from living rooms by floors. The acoustic separation provided by a new internal floor in both new build extension and dwellings formed by a material change of use is formerly regulated in England and Wales by Building Regulations.

The thermal performance of internal elements is not covered by the current Building Regulations. However, the internal environment of individual zones can be more easily controlled when they are separated by insulated internal walls and floors.

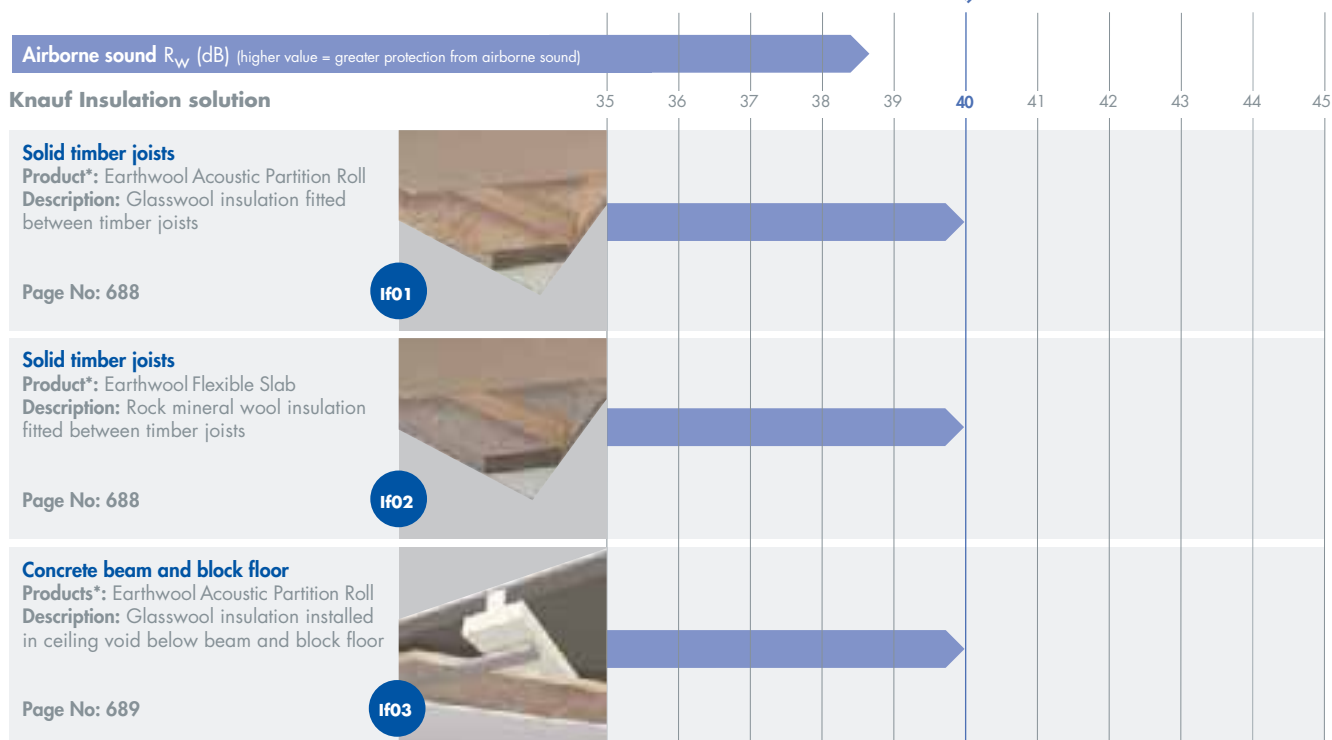
## Key

■ Sound insulation achievable by constructions within this document.

\* Recommended Knauf Insulation product(s). Other products may be applicable.

Find online. Visit [www.knaufinsulation.co.uk](http://www.knaufinsulation.co.uk) and key in construction code to find the most up to date information on your chosen solution.

## Internal floors



## Performance requirements

In England and Wales, the 2003 edition of Approved Document E introduced a new requirement for the sound insulation of internal floors within houses, flats and rooms for residential purposes. The requirement is for all internal floors to have a minimum sound insulation performance value of 40  $R_w$  dB. This applies to new floors both in dwellings formed by a material change of use and new build extensions of existing dwellings. Elsewhere in the UK, the NHBC have similar requirements for internal walls, but the minimum sound resistance is 38  $R_w$  dB.

## Quality of detailing

A construction can only achieve its expected sound performance if it and the surrounding walls have no inherent faults in their detailing or workmanship. Performance will be impaired if there are:

- Gaps or holes in the construction - even hairline cracks can seriously impair sound insulation - seal all potential gaps with a flexible sealant
- Gaps in the absorbent layer within the cavity

## Thermal insulation

Whilst thermal insulation is not generally a regulatory requirement of floors, it may be desirable in certain circumstances. For example, insulated floors above and below rooms with high internal heat gains would help to avoid overheating in adjoining rooms in summer.

# Internal floors

## Insulation of internal timber floor

### Advantages

- ✓ Earthwool Acoustic Joist Roll/ Earthwool Flexible Slab provides improved acoustic performance with no increase in floor depth
- ✓ Minimal increase in weight of floor
- ✓ Earthwool Acoustic Joist Roll/ Earthwool Flexible Slab friction fits between joists
- ✓ Floor system offers a high level of thermal insulation stopping heat flow between storeys

If01

If02



Timber deck with minimum mass of 15kg/m<sup>2</sup>

Timber or steel joists

100mm Earthwool Acoustic Joist Roll or 100mm Earthwool Flexible Slab

12.5mm plasterboard

### Products

**Earthwool Acoustic Joist Roll** is made from glass mineral wool and formed into rolls which are lightweight, flexible, resilient and non-combustible.

**Earthwool Flexible Slab** is a semi-rigid non-combustible rock mineral wool slab.

### Typical construction

Timber or metal joisted floor with 12.5mm plasterboard ceiling and 100mm Earthwool Acoustic Joist Roll or 100mm Earthwool Flexible Slab between the joists. Floor deck to be timber or wood based board with a minimum mass of 15 kg/m<sup>2</sup>, e.g. 22mm chipboard.

### Performance

#### Acoustic performance

The construction complies with internal floor type C in Approved Document E2.

#### Fire performance

Earthwool Acoustic Joist Roll and Earthwool Flexible Slab are classified as Euroclass A1 to BS EN ISO 13501-1.

#### Density

Earthwool Acoustic Joist Roll has a density of 10 kg/m<sup>3</sup>. Earthwool Flexible Slab has a density in excess of 10 kg/m<sup>3</sup>.

### Typical specification

Earthwool Acoustic Joist Roll\*/Earthwool Flexible Slab\*, 100mm thick, to be placed between the floor joists.

(\*Delete as appropriate)

The ceiling and floor deck to be as specified by the designer.



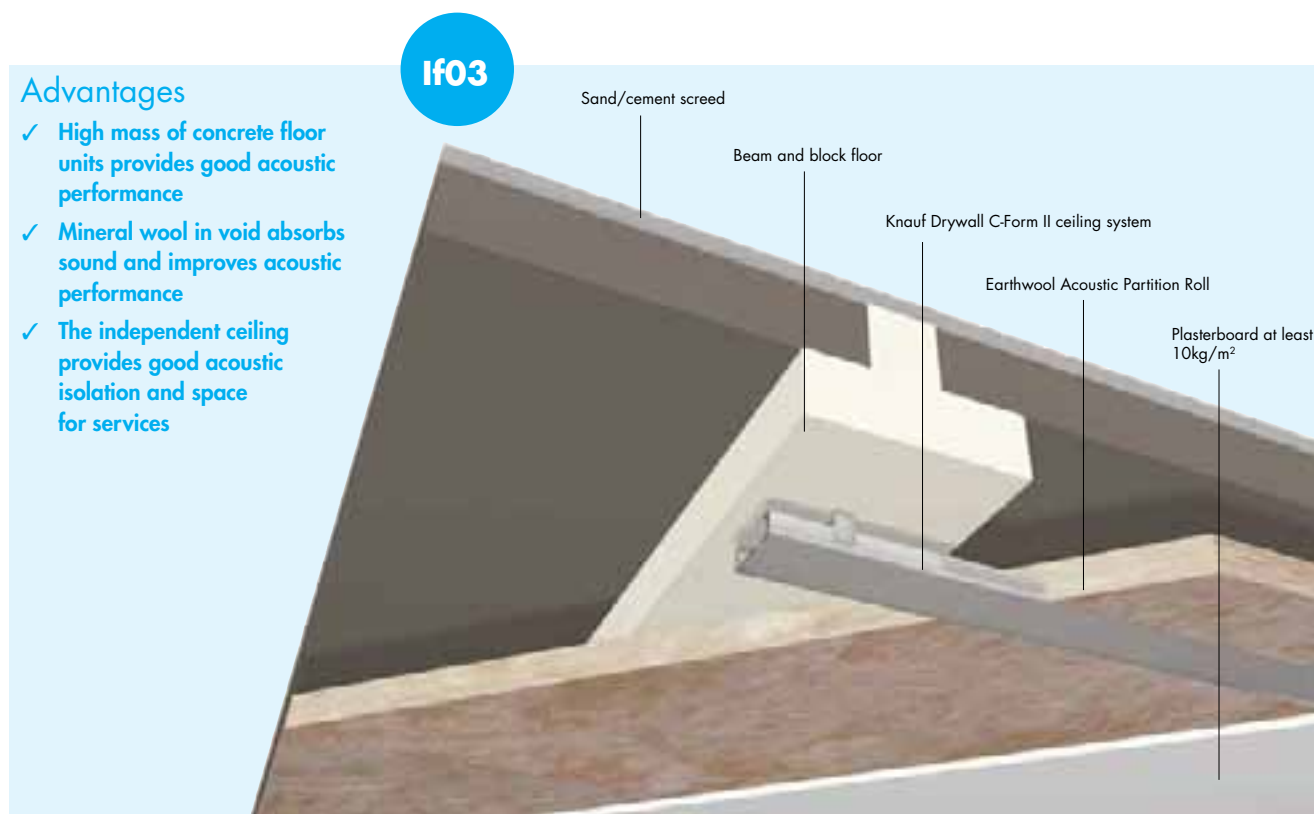
Alternatively, consult the National Building Specifications (NBS) based on Standard Version P10/240. It contains a set of proprietary clauses, which are edited versions written by Knauf Insulation.

If02

If02 is an alternative solution to If01. It replaces Earthwool Acoustic Joist Roll with Earthwool Flexible Slab.

# Internal floors

## Concrete beam and block floor



### Advantages

- ✓ High mass of concrete floor units provides good acoustic performance
- ✓ Mineral wool in void absorbs sound and improves acoustic performance
- ✓ The independent ceiling provides good acoustic isolation and space for services

### Products

**Earthwool Acoustic Partition Roll** is made from glass mineral wool and formed into rolls which are lightweight, flexible, resilient and non-combustible.

#### Typical construction

Concrete beam and block floor with a minimum mass per unit area of 220kg/m<sup>2</sup> finished with a bonded 40mm sand/cement screed.

Plasterboard ceiling with a minimum mass of 10kg/m<sup>2</sup> fixed to the Knauf Drywall C-Form II ceiling system with Earthwool Acoustic Partition Roll filling the ceiling void.

Contact the manufacturer of the beam and block floor system to determine the correct method of mechanically fixing channels to the beams.

### Performance

#### Acoustic performance

The construction complies with Internal floor type B in Approved Document E2 and employs a metal framed ceiling system with 10 kg/m<sup>2</sup> plasterboard with Earthwool Acoustic Partition Roll in the cavity void. The density of the insulation is required to be a minimum of 10kg/m<sup>3</sup>.

#### Fire performance

Earthwool Acoustic Partition Roll is classified as Euroclass A1 to BS EN ISO 13501-1.

#### Density

25mm Earthwool Acoustic Partition Roll has a density of 19.5 kg/m<sup>3</sup>.

### Typical specification

Earthwool Acoustic Partition Roll, 25mm thick, to be supported by the horizontal members of the Knauf Drywall C-Form II ceiling system.

The plasterboard ceiling to be as specified by the designer.



Alternatively, consult the National Building Specifications (NBS) based on Standard Version. It contains a set of proprietary clauses, which are edited versions written by Knauf Insulation.

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*it's time to save energy*



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Ref: KB143010

June 2010

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