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KNAUF INSULATION
it's time to save energy

June 2010

Residential New Build

2.8.3 Partition walls

energy saving
warmth
quietness
fire protection
sustainability

Residential New Build

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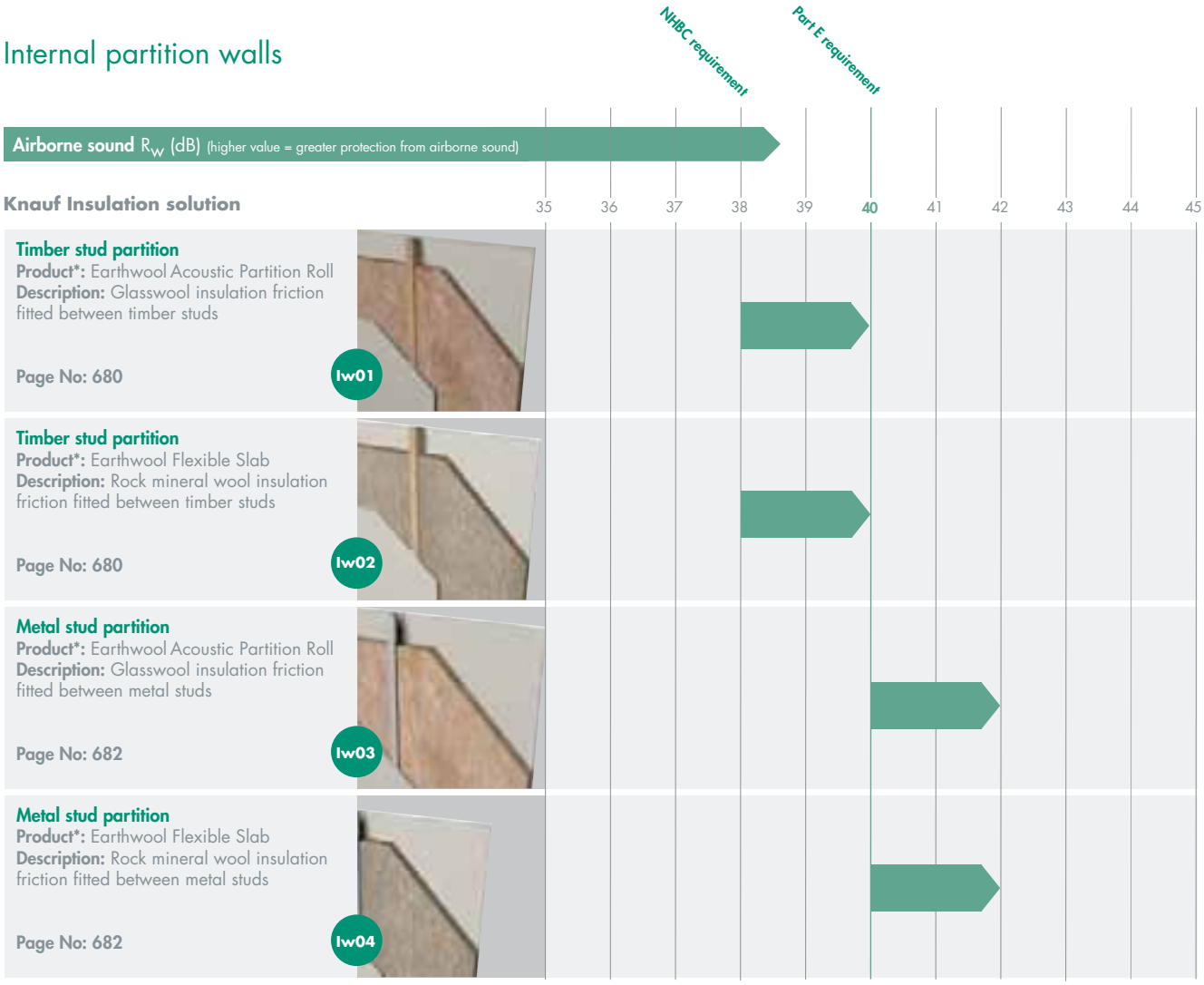
Partition walls

Solution optimiser and pathfinder

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

Using these products also improves the thermal insulation values of a partition allowing for thermal zoning within the dwelling.

Internal partition walls



Key

Sound insulation achievable by constructions within this document.

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

Pb01 Find online. Visit www.knaufinsulation.co.uk and key in construction code to find the most up to date information on your chosen solution.

Partition wall design

The use of framed lightweight partitions to subdivide a dwelling's space is a well established method. These partitions are generally required to provide acoustic insulation. A specific fire or impact resistance may also be required.

Lightweight partitions using dry construction methods enable housebuilders to speed up the construction process and improve profitability.

Performance requirements

In England and Wales, the 2003 edition of Approved Document E introduced a new requirement for the sound insulation of internal walls within houses and flats. The requirement is for all internal walls between a bedroom or room containing a WC and another room to have a minimum sound insulation of 40 R_W dB.

This applies to new walls built 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 and floors 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 requirement of partitions, it may be desirable in certain circumstances. For example, insulated partitions around rooms with high internal heat gains would help to avoid overheating in adjoining rooms in summer.

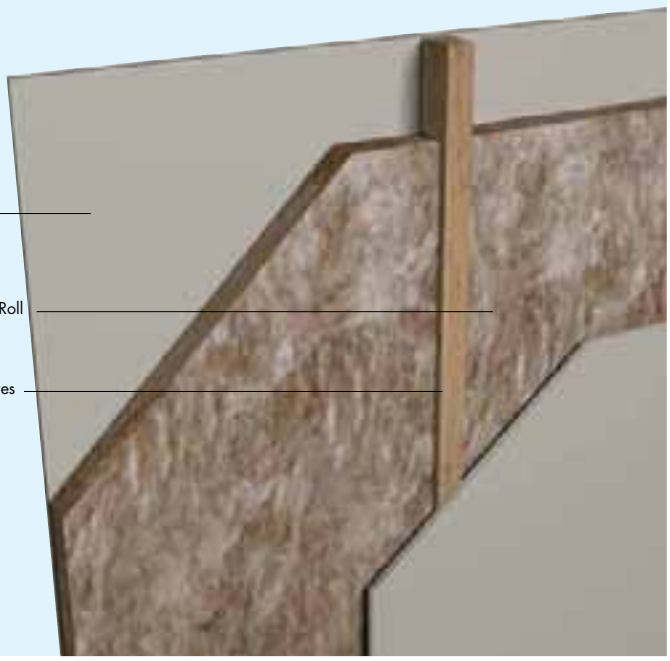
Partition walls

Timber stud

Iw01 Iw02

Advantages

- ✓ **Earthwool Acoustic Partition Roll and Earthwool Flexible Slab improve acoustic performance to 40 Rw dB, meeting Building Regulation requirements for dwellings in England and Wales**
- ✓ **Satisfies 40 Rw dB performance with a single layer of standard plasterboard each side**
- ✓ **Minimises partition width**
- ✓ **Prevents hollow sound that can occur in partitions with empty cavities**
- ✓ **The partition also provides a high degree of thermal insulation, enabling a greater degree of comfort control throughout the building**



Products

Earthwool Acoustic Partition Roll is a flexible, resilient glass mineral wool roll.

Earthwool Flexible Slab is a flexible rock mineral wool slab designed for friction fitting.

Typical construction

A timber stud partition (minimum 63x38mm studs) infilled with 50mm of Earthwool Acoustic Partition Roll or 50mm Earthwool Flexible Slab with 12.5mm standard plasterboard each side meets the requirements of the Building Regulations for a 40 Rw dB partition.

The partition should be sealed with an acoustic sealant at its perimeter and at all penetrations.

Installation

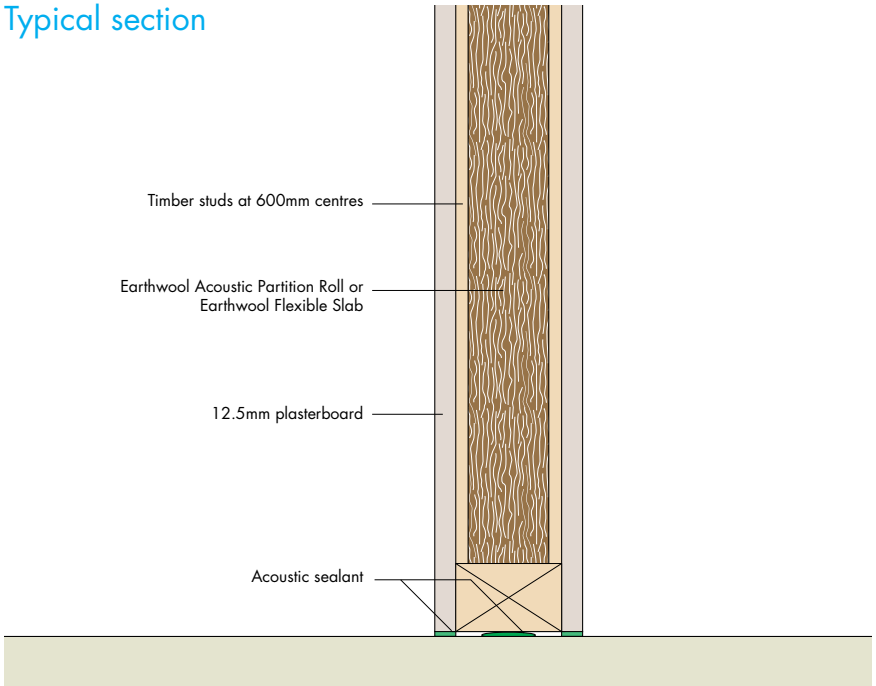
Construct the timber frame, applying a bead of acoustic sealant to each piece of timber that is fixed to the surrounding structure. Board out one side of the partition before inserting the insulation.

50mm Earthwool Acoustic Partition Roll and Earthwool Flexible Slab are designed to friction fit between timber studs at 600mm centres. 50mm Earthwool Acoustic Partition Roll and Earthwool Flexible Slab are sufficiently rigid not to need supporting at the head of the partition.

Alternatively, use 25mm Acoustic Partition Roll, friction fitted between timber studs at 600mm centres and supported at the head of the partition by means of a timber batten.

For maximum acoustic performance, fit all insulation tightly up against the stud sides. Seal all gaps around the perimeter of the plasterboard with acoustic sealant.

Typical section



Typical specification

Earthwool Acoustic Partition Roll, 50mm thick*/ Earthwool Flexible Slab 50mm thick*, fixed between vertical studs. Insulation to fit snugly between studs and at bottom of the structure to ensure that there are no air gaps.

Seal all gaps around the perimeter of the plasterboard with acoustic sealant.

(*Delete as appropriate)

Alternatively, consult the National Building Specifications (NBS) based on Standard Version K10/125. It contains a set of proprietary clauses, which are edited versions written by Knauf Insulation.

Performance

Acoustic performance

Table 93 shows typical sound reduction figures for a range of timber stud partitions.

Fire performance

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

Density

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

50mm Earthwool Acoustic Partition Roll has a density of 16 kg/m^3.

50mm Earthwool Flexible Slab has a density in excess of 10.00 kg/m^3.

Table 93: Sound insulation of timber stud partitions

	Stud Size (mm)	Facing	Infill	R_w dB
Iw01	63x38	12.5mm standard plasterboard each side	None	35
	63x38	12.5mm standard plasterboard each side	50mm Earthwool Acoustic Partition Roll	40
Iw02	Stud Size (mm)	Facing	Infill	R_w dB
	63x38	12.5mm standard plasterboard each side	50mm Earthwool Flexible Slab	40

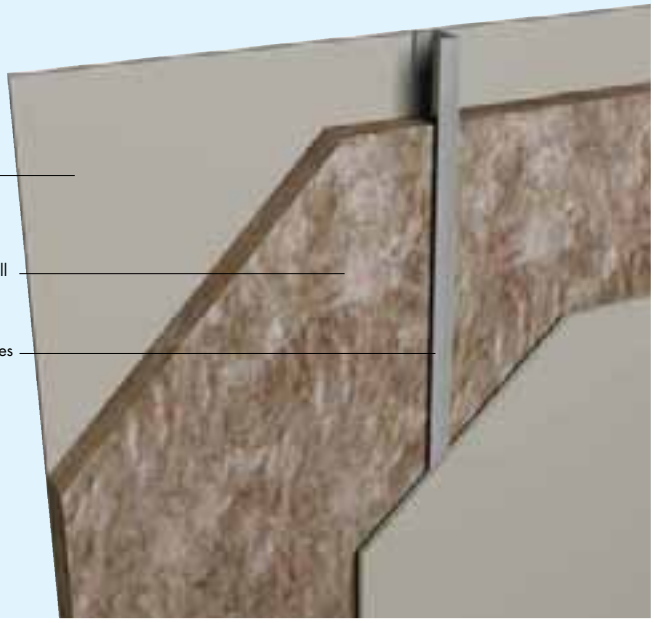
Partition walls

Standard metal C-stud partitions

Iw03 Iw04

Advantages

- ✓ **Robust products which provide a high levels of sound absorption**
- ✓ **Provides thermal insulation**
- ✓ **Improves sound insulation of partition**
- ✓ **Non-combustible products**



Products

Earthwool Acoustic Partition Roll is a flexible, resilient glass mineral wool roll.

Earthwool Flexible Slab is a flexible rock mineral wool slab designed for friction fitting.

Typical construction

A metal stud partition infilled with Earthwool Acoustic Partition Roll or Earthwool Flexible Slab and faced each side with plasterboard. The fire and sound performance of the partition depends on specification – see table 94.

The partition should be sealed with an acoustic sealant at its perimeter and at all service penetrations.

Installation

Construct the steel frame and apply a bead of acoustic sealant to the back of the steel studs that are fixed to the surrounding structure. Board out one side of the partition before inserting the insulation.

Earthwool Acoustic Partition Roll and Earthwool Flexible Slab are designed to friction fit between metal studs at 600mm centres. When installing 25mm of Earthwool Acoustic Partition Roll, support the roll at the head of the partition by means of a timber batten or light steel angle. 50mm Earthwool Acoustic Partition Roll is sufficiently rigid not to require supporting at the head of the partition. For maximum acoustic performance, hang the quilt in the centre of the partition void and fit snugly up against the studs on both sides.

Board out the second side and finish using standard drylining techniques.

Performance

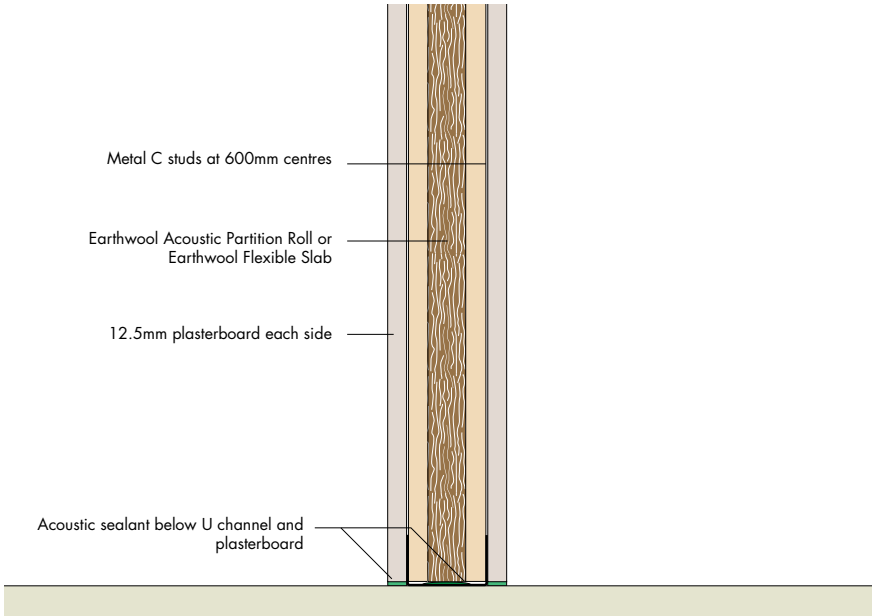
Acoustic performance

Table 94 shows typical sound reduction figures for a range of metal stud partitions.

Fire performance

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

Typical section



Typical specification

In all …… (steel stud) partitions install Earthwool Acoustic Partition Roll*/Earthwool Flexible Slab*, ……mm thick. •Secure 25mm Earthwool Acoustic Partition Roll at head of partition using timber batten or light steel angle. Insulation to fit snugly between studs and at bottom of the structure to ensure that there are no air gaps. Seal partition at perimeter and all service penetrations with an acoustic sealant.

(*Delete as appropriate)

(•only applicable to 25mm Earthwool Acoustic Partition Roll)

Alternatively, consult the National Building Specifications (NBS) based on Standard Version K10/125. It contains a set of proprietary clauses, which are edited versions written by Knauf Insulation.

Table 94: Sound insulation of metal stud partitions

Stud type	Stud spacing (mm)	Facing	Infill	Sound insulation (R_wdB)	Fire resistance (hours)
Iw03	**Earthwool Acoustic Partition Roll**				
50mm C stud	600 c/s	12.5mm plasterboard Wallboard each side	25mm Earthwool Acoustic Partition Roll	42	1/2
70mm C stud	600 c/s	15mm Knauf Drywall Fireshield each side	25mm Earthwool Acoustic Partition Roll	49	1
	600 c/s	2 layers of 12.5mm Knauf Drywall Soundshield each side	25mm Earthwool Acoustic Partition Roll	54	1
	600 c/s	2 layers of 12.5mm Knauf Drywall Fireshield each side	50mm Earthwool Acoustic Partition Roll	54	2
Stud type	Stud spacing (mm)	Facing	Infill	Sound insulation (R_wdB)	Fire resistance (hours)
Iw04	**Earthwool Flexible Slab**				
50mm C stud	600 c/s	12.5mm plasterboard Wallboard each side	50mm Earthwool Flexible Slab	42	1/2

Partition walls

Staggered metal I-stud partition

Iw05

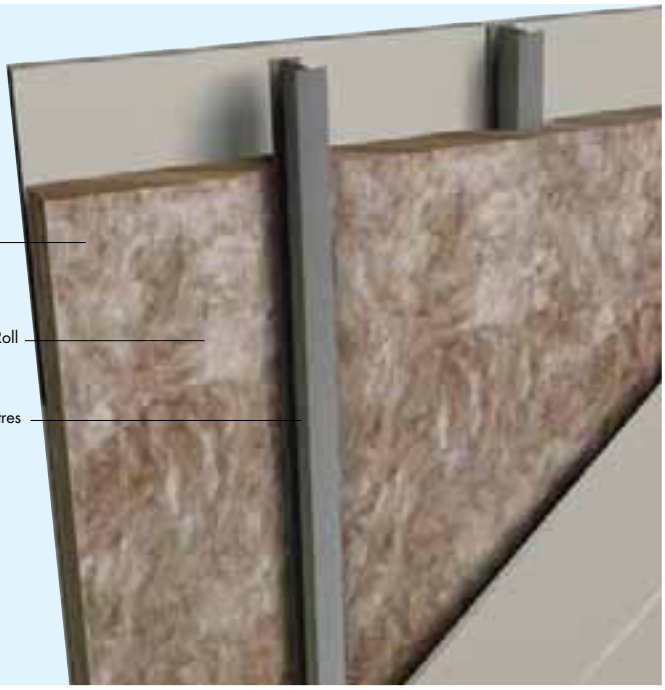
Advantages

Staggered stud partition

- ✓ **Achieves very high levels of sound insulation**
- ✓ **High acoustic performance within a relatively narrow width**
- ✓ **Both sides of partition isolated, reducing impact sound transmission**

Earthwool Acoustic Partition Roll

- ✓ **Robust product which provides a high level of sound absorption**
- ✓ **Provides thermal insulation**
- ✓ **Improves sound insulation of partition**



Products

Earthwool Acoustic Partition Roll is a flexible, resilient glass mineral wool roll.

Typical construction

A metal stud partition formed from 'I' studs, staggered within wider floor and head U channels. The studs are spaced at 300mm offset centres, providing fixings at 600mm centres to each side of the partition. Two layers of Knauf Drywall Soundshield are usually fixed each side.

The fire and sound performance of the partition depends on specification – see Table 95.

The partition should be sealed with an acoustic sealant at its perimeter and at all service penetrations.

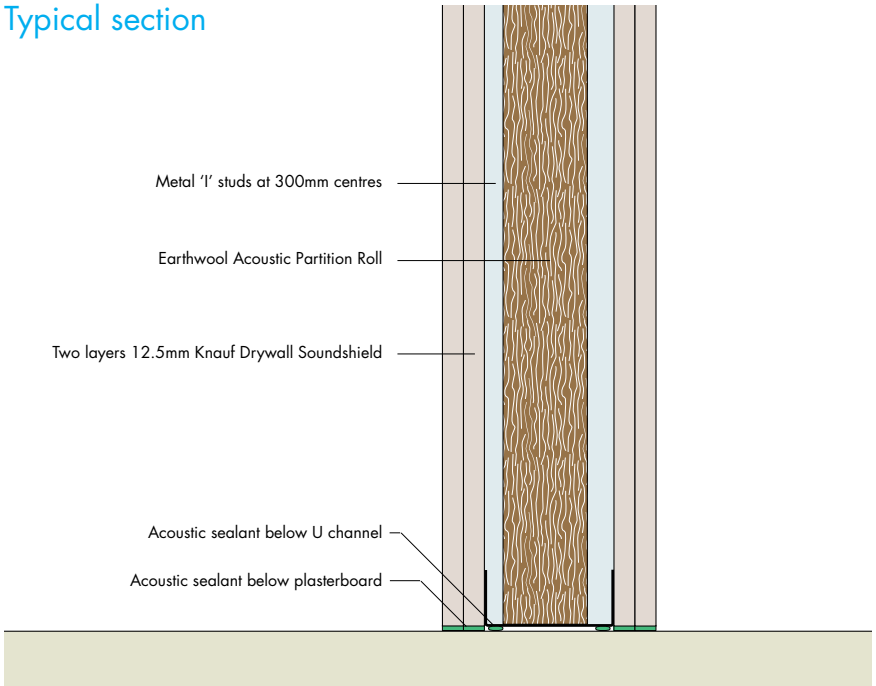
Installation

Construct the staggered stud steel frame and apply a bead of acoustic sealant to the steel studs that are fixed to the surrounding structure. Board out one side of the partition before inserting the insulation.

Earthwool Acoustic Partition Roll is wound through the studs horizontally. Ensure the insulation is fitted neatly, without gaps at abutments or joints between rolls.

Board out the second side and finish using standard drylining techniques.

Typical section



Typical specification

In all …… (steel stud) partitions install acoustic insulation of Earthwool Acoustic Partition Roll, ……mm thick.

Once the studs have been positioned and one side boarded out, the insulation to be wound through the studs horizontally. Ensure there are no gaps at abutments or between adjacent lengths of the insulation.

Seal partition at perimeter and all service penetrations with an acoustic sealant.

Alternatively, consult the National Building Specifications (NBS) based on Standard Version K10/125. It contains a set of proprietary clauses, which are edited versions written by Knauf Insulation.

Performance

Acoustic performance

Table 95 shows typical sound reduction figures for staggered stud partitions.

Fire performance

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

Density

50mm Earthwool Acoustic Partition Roll has a density of 16 kg/m^3.

Table 95: Sound insulation of staggered metal stud partition

Stud type	Channel size	Facing	Thickness of insulation (mm)	Sound insulation (R_wdB)	Fire resistance (hours)
60mm 'I' stud	72mm	2 layers of 12.5mm Knauf Drywall Soundshield each side	50mm Earthool Acoustic Partition Roll	57	1
92mm 'I' stud	148mm	2 layers of 15mm Knauf Drywall Soundshield each side	50mm Earthwool Acoustic Partition Roll	62	1½

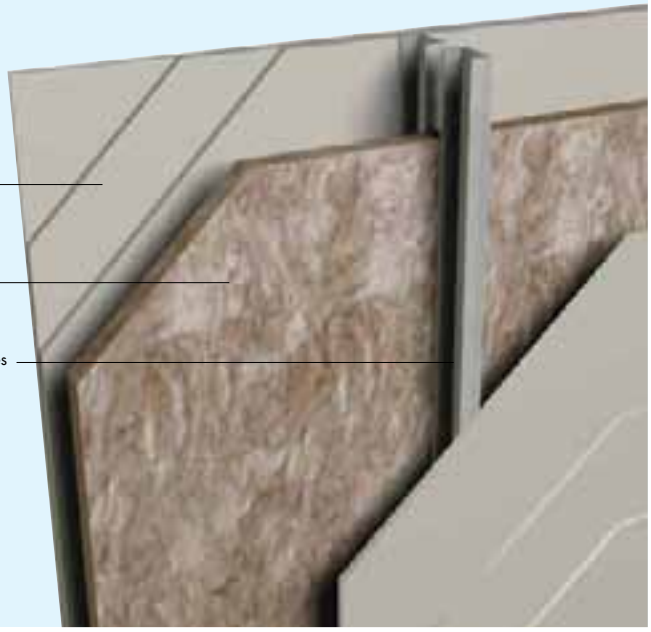
Partition walls

High performance twin frame metal stud partition

Iw06

Advantages

- ✓ **Twin frame system with a glass mineral wool acoustic absorption layer providing very high levels of sound insulation**
- ✓ **Mineral wool in void absorbs sound and improves acoustic performance**
- ✓ **Provides thermal separation between adjoining rooms**



Products

Earthwool Acoustic Partition Roll is a flexible, resilient glass mineral wool roll.

Typical construction

Twin steel frame construction with facing of three layers of plasterboard on each side. 100mm Earthwool Acoustic Partition Roll between the frames.

The perimeter of the steel frames are bedded on acoustic sealant and the perimeter of the plasterboard facings are sealed with acoustic sealant.

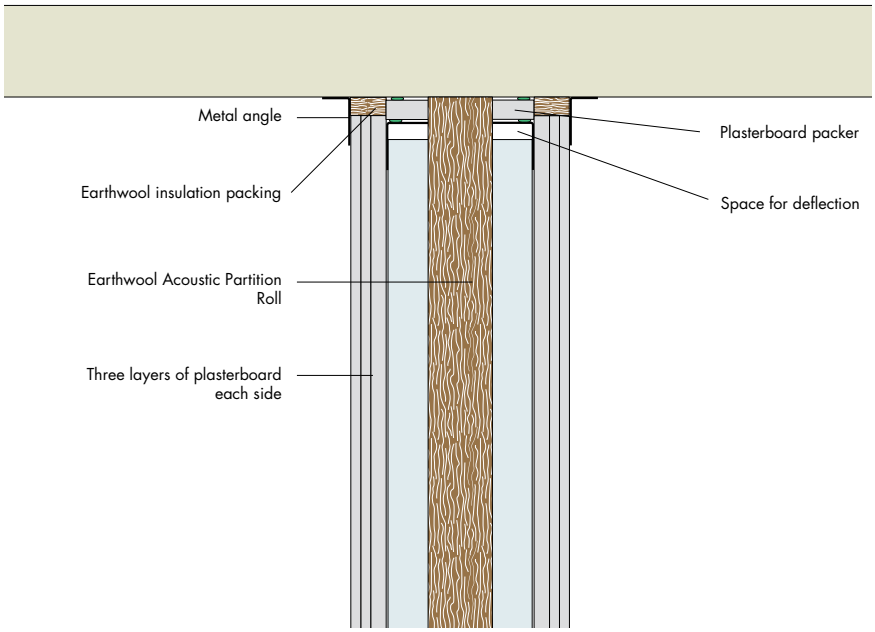
The isolation between the steel frames, the acoustic absorption of the mineral wool and the heavyweight plasterboard all contribute to achieving a high level of acoustic performance.

Installation

Two separate steel frame walls are constructed. Rolls of Earthwool Acoustic Partition Roll are slotted into the cavity between the two steel frames and butt jointed. There should be no gaps between the edges of the insulation rolls.

A layer of 19mm Knauf Plank is screwed horizontally to each side of the steel frame, all joints staggered. Two layers of 12.5mm plasterboard are screwed to each side of the steel frame. Seal all joints in outer leaf with joint tape or caulk with acoustic sealant.

Typical section



Typical specification

In all twin stud steel partitions install acoustic insulation of Earthwool Acoustic Partition Roll, 100mm thick. The insulation to be slotted into the cavity between the two steel frames and butt jointed. Ensure there are no gaps in the insulation. Face both sides of partition with plasterboard, as specified, and seal partition at perimeter and all service penetrations with an acoustic sealant.

Alternatively, consult the National Building Specifications (NBS) based on Standard Version K10/125. It contains a set of proprietary clauses, which are edited versions written by Knauf Insulation.

Performance

Acoustic performance

The use of twin studs separated by a layer of mineral wool provides a high degree of acoustic insulation. The use of three layers of plasterboard adds mass to the partition and further improves its acoustic performance.

Table 96 shows typical sound reduction figures for twin frame partitions.

Fire performance

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

Density

100mm Earthwool Acoustic Partition Roll has a density of 16 kg/m^3.

Table 96: Sound insulation of twin metal stud partitions

Stud type	Facing	Thickness of insulation (mm)	Sound insulation (R_wdB)	Fire resistance (hours)
92mm C stud	19mm Knauf Plank and two layers of 12.5mm wallboard each side	100mm Earthool Acoustic Partition Roll	69	2
146mm C stud	19mm Knauf Plank and two layers of 12.5mm wallboard each side	100mm Earthwool Acoustic Partition Roll	74	2

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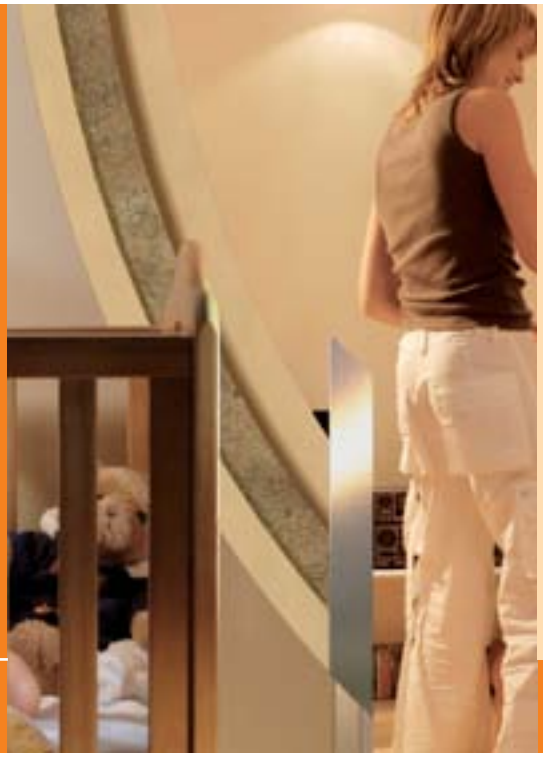

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