



August 2008: Issue 1

Non - Residential New Build 4.6.3 Partition Walls



energy saving



warmth



quietness



fire protection



sustainability

Non-residential New Build

Partition Walls Contents

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Partition walls

Partition wall design

The use of framed lightweight partitions to subdivide a building'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 speed up the construction process.



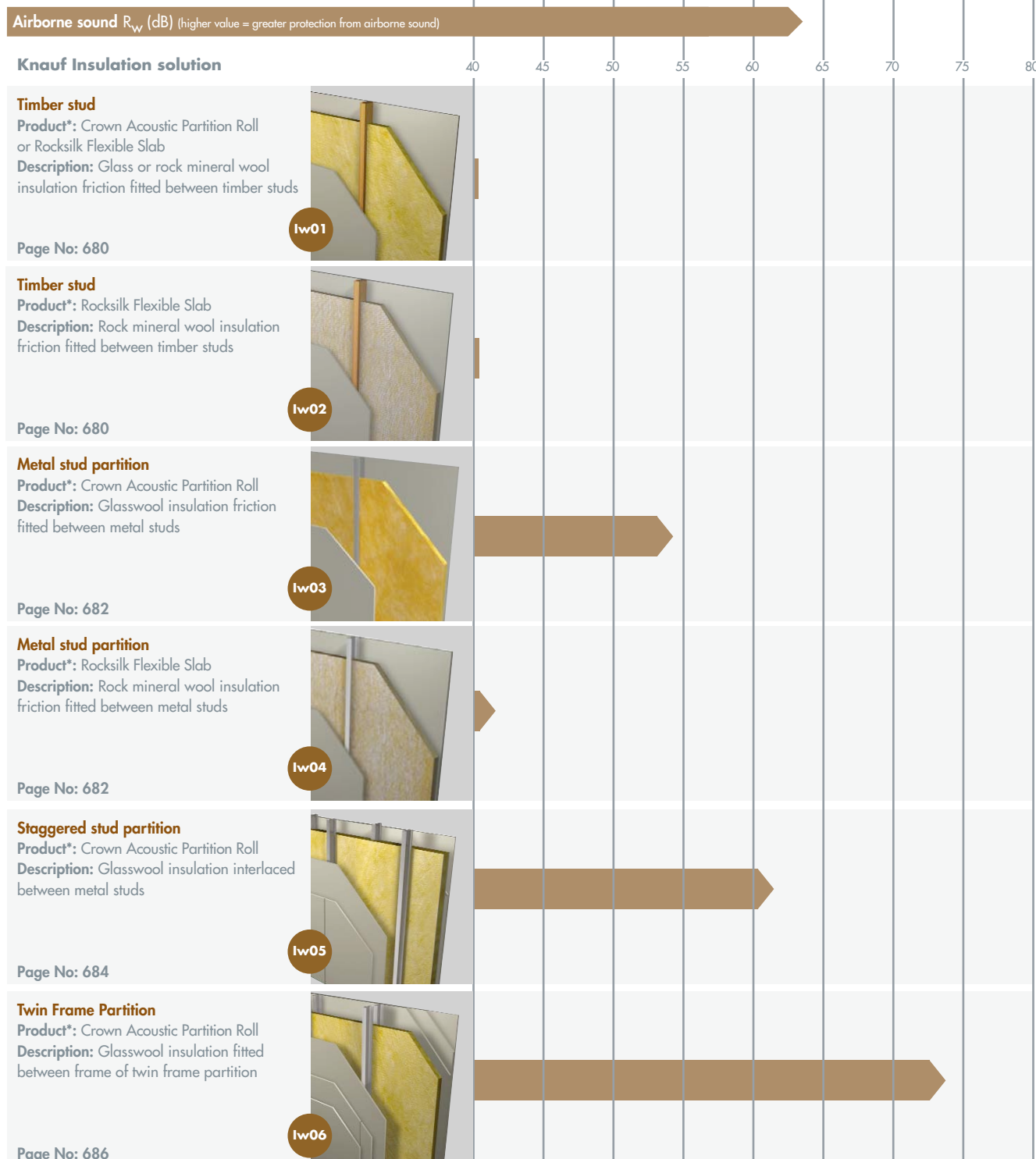
Partition walls

Solution optimiser and pathfinder

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 and key in construction code to find the most up to date information on your chosen solution.

Internal partition walls



Partition walls

Partition wall design

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 or the absorbent layer within the cavity
- there are coincident joints in the partition
- a partition stops at the underside of a suspended ceiling allowing sound transfer from one room to another via the ceiling void.



Performance requirements

Acoustic performance

In general performance requirements are set by client requirements, but in some purpose groups there are specific Building Regulation Requirements or Government Departmental Standards creating common standards.

Rooms for Residential Purposes

In England and Wales, the 2003 edition of Approved Document E introduced a new requirement for the sound insulation of internal walls within rooms for residential purposes. 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.

Schools

Specific performance standards are set for airborne sound insulation between spaces by Building Bulletin 93 'The Acoustic Design of Schools'. This classifies each room for the purpose of airborne sound insulation by its activity purpose in terms of activity noise as a source room and noise tolerance as a receiving room, and then sets the performance standard for sound insulation for each partition.

Hospitals

Similarly to Schools the Healthcare Technical Manuals HTM 2045 or HTM 56 set standards for Privacy according to room type and from this the specific performance requirement for any partition can be obtained.

Fire performance

Generally fire performance of partitions will be determined in line with the appropriate building regulations if the purpose of the partition is to provide compartmentation. In certain buildings there may be specific fire performance requirements for partitions separating specific room types, for example in Hospital where this is set by Firecode HTM 81 and Building Bulletin 100 Design for fire safety in schools.

The use of mineral wool helps to improve the fire rating of a partition by limiting the transfer of heat across the cavity.

For fire rated partitions, Knauf Drywall produce Fireshield plasterboard. This offers superior fire protection to standard plasterboard products.

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:

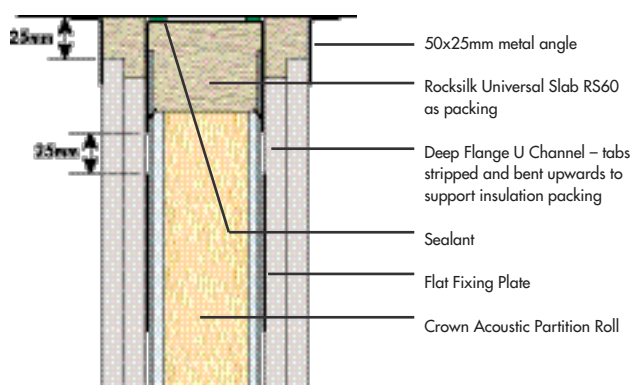
- Gaps or holes in the construction – even hairline cracks can seriously impair sound insulation – seal all potential gaps with a flexible sealant
- Gaps in the absorbent layer within the cavity

Thermal insulation

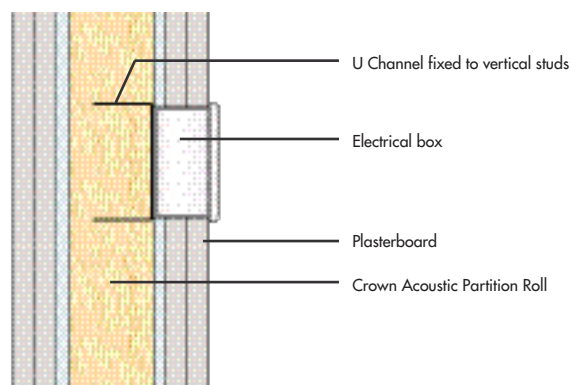
Whilst thermal insulation is not generally a requirement of partitions, it may be desirable in certain circumstances. For example, insulated partitions around rooms with high internal heat gains would help to avoid overheating in adjoining rooms in summer.

Typical fire-rated partition details

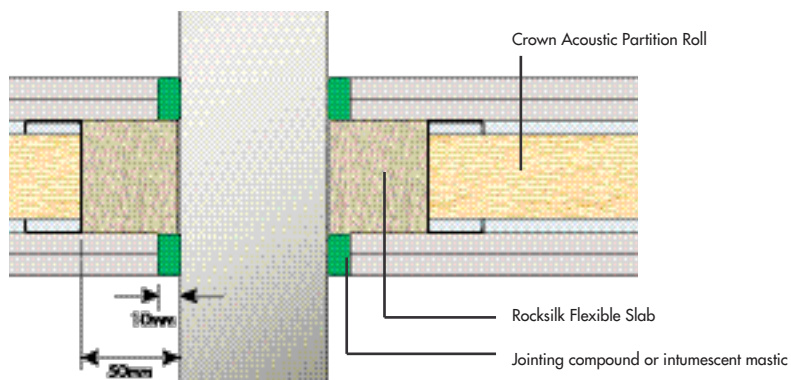
Deflection head – 2 hour fire resistance



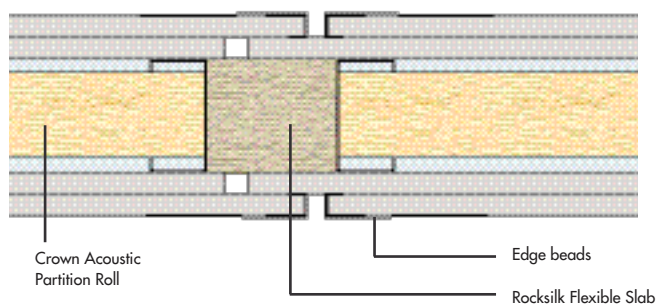
Socket detail



Duct penetration



Expansion joint



design detail finder

Knauf Insulation solutions for these types of construction can be found on pages 680-687.

Partition walls

Timber stud

Iw01

Iw02

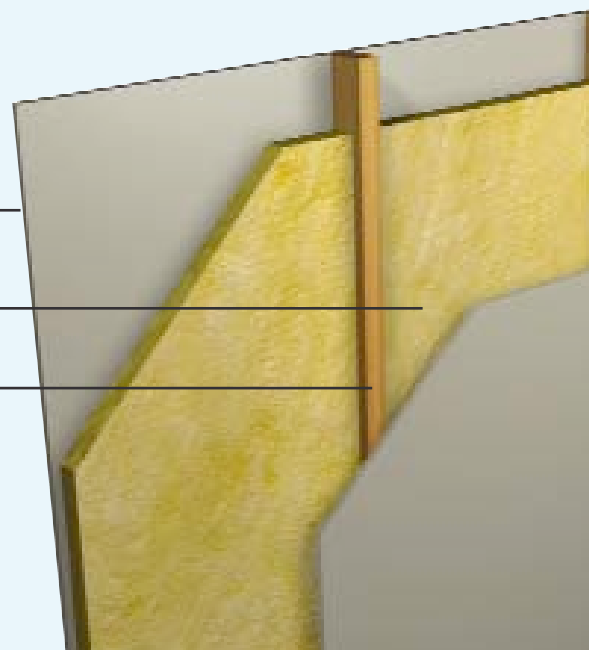
Advantages

- ✓ Crown Acoustic Partition Roll and Rocksilk 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

12.5mm plasterboard

Crown Acoustic Partition Roll
or Rocksilk Flexible Slab

Timber studs at 600mm centres



Products

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

Rocksilk 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 Crown Acoustic Partition Roll or 50mm Rocksilk 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

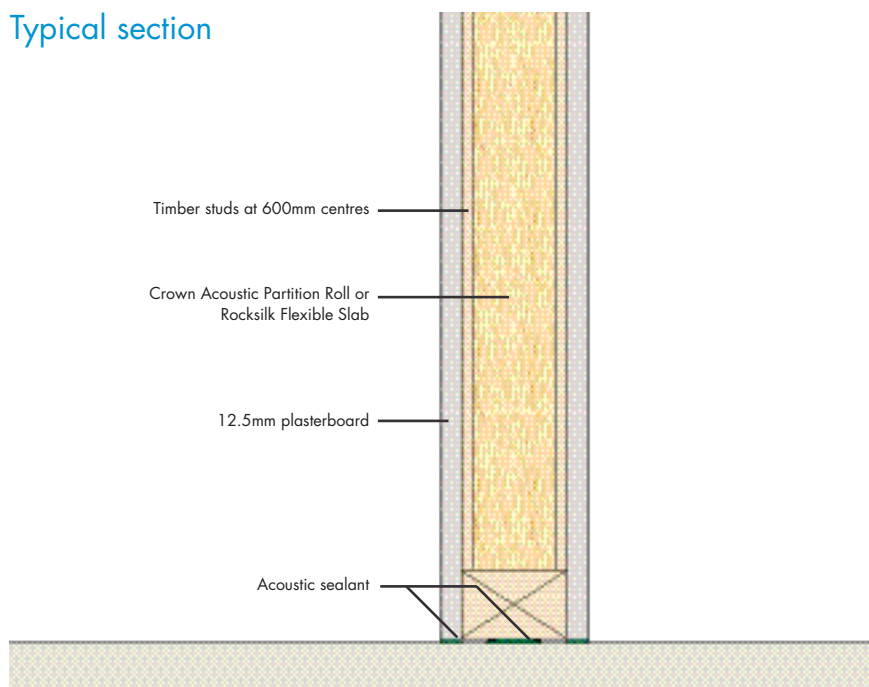
Construct the timber frame, applying a bead of acoustic sealant to each piece of timber that is fixed to the surrounding structure. Board out one side of the partition before inserting the insulation.

50mm Crown Acoustic Partition Roll and Rocksilk Flexible Slab are designed to friction fit between timber studs at 600mm centres. 50mm Crown Acoustic Partition Roll and Rocksilk 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

Crown Acoustic Partition Roll, 50mm thick* / Rocksilk 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)

NBSPlus

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

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

Density

25mm Crown Acoustic Partition Roll has a density of 19.5 kg/m³.

50mm Crown Acoustic Partition Roll has a density of 16 kg/m³.

50mm Rocksilk Flexible Slab has a density in excess of 10.00 kg/m³.

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
		12.5mm standard plasterboard each side	50mm Crown Acoustic Partition Roll	40
Iw02	63x38	12.5mm standard plasterboard each side	50mm Rocksilk Flexible Slab	40

Partition walls

Standard metal C-stud partitions

Advantages

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

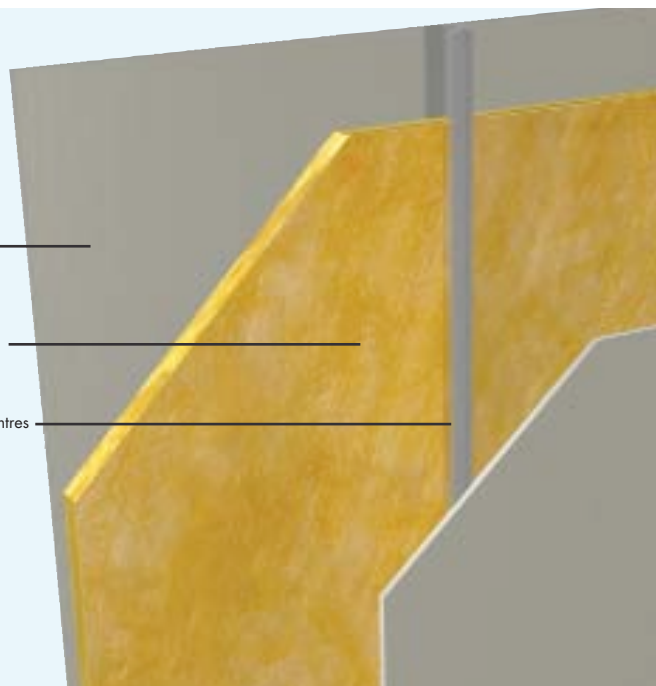
Iw03

Iw04

12.5mm plasterboard

Crown Acoustic Partition Roll

Metal 'C studs at 600mm centres



Products

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

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

Typical construction

A metal stud partition infilled with Crown Acoustic Partition Roll or Rocksilk 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.

Crown Acoustic Partition Roll and Rocksilk Flexible Slab are designed to friction fit between metal studs at 600mm centres. When installing 25mm of Crown Acoustic Partition Roll, support the roll at the head of the partition by means of a timber batten or light steel angle. 50mm Crown 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

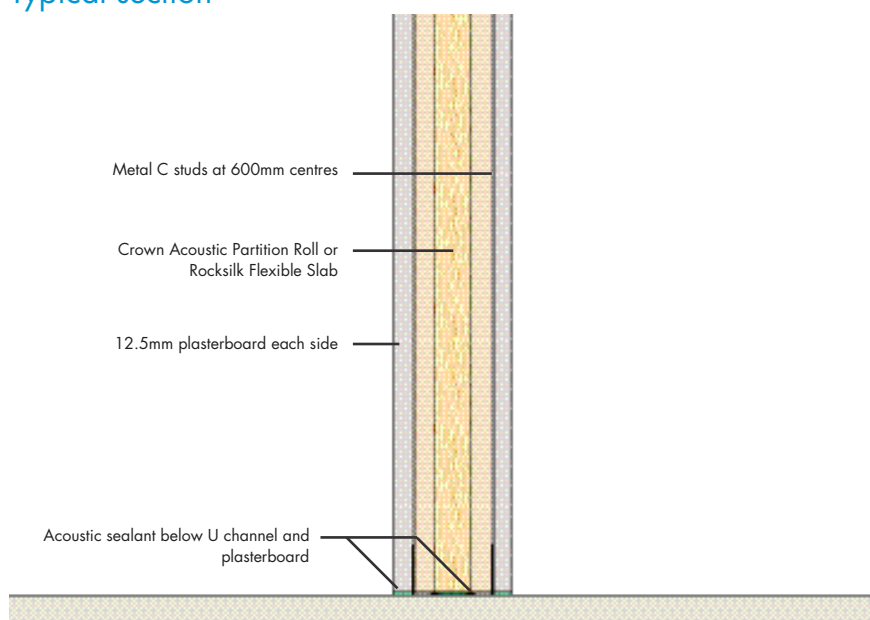
Acoustic performance

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

Fire performance

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

Typical section



Typical specification

In all (steel stud) partitions install Crown Acoustic Partition Roll*/RocksilK Flexible Slab*,mm thick. *Secure 25mm Crown 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 Crown 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 _w dB)	Fire resistance (hours)
Crown Acoustic Partition Roll					
Iw03					
50mm C stud	600 c/s	12.5mm plasterboard Wallboard each side	25mm Crown Acoustic Partition Roll	42	1/2
70mm C stud	600 c/s	15mm Knauf Drywall Fireshield each side	25mm Crown Acoustic Partition Roll	49	1
	600 c/s	2 layers of 12.5mm Knauf Drywall Soundshield each side	25mm Crown Acoustic Partition Roll	54	1
	600 c/s	2 layers of 12.5mm Knauf Drywall Fireshield each side	50mm Crown Acoustic Partition Roll	54	2
RocksilK Flexible Slab					
Iw04					
50mm C stud	600 c/s	12.5mm Knauf Drywall Wallboard each side	50mm RocksilK 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

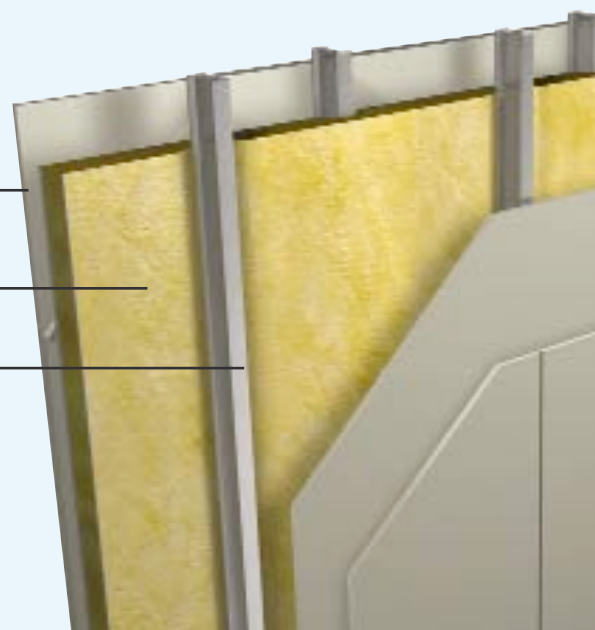
Crown Acoustic Partition Roll

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

Two layers 12.5mm
Knauf Drywall Soundshield

Crown Acoustic Partition Roll

Metal 'I' studs at 300mm centres



Products

Crown 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.

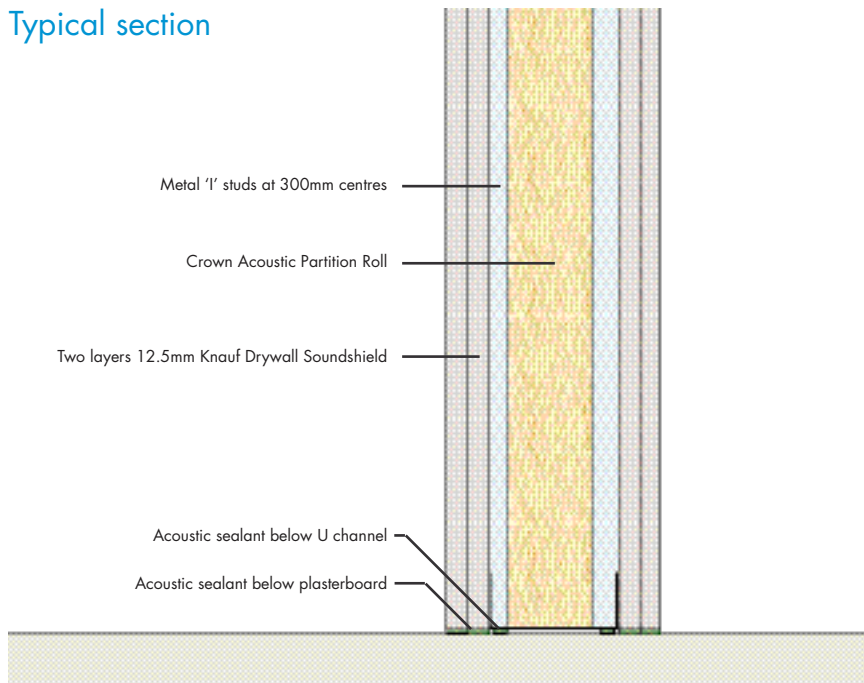
Installation

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.

Crown 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 Crown 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.

NBSPlus

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

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

Density

50mm Crown Acoustic Partition Roll has a density of 16 kg/m³.

Table 95: Sound insulation of staggered metal stud partition

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

Partition walls

High performance twin frame metal stud partition

Iw06

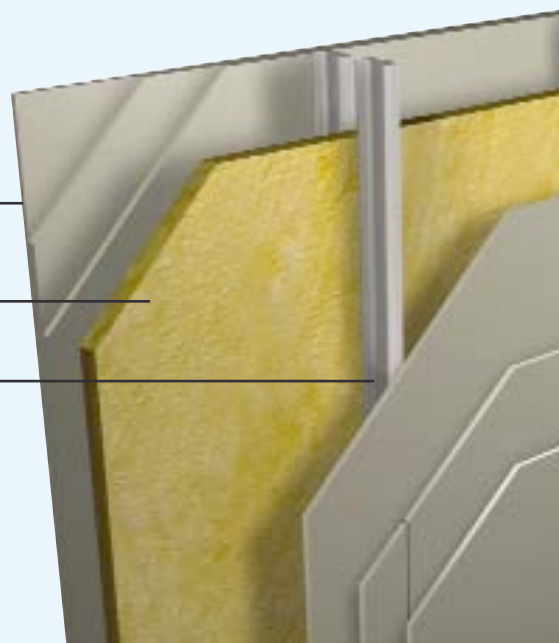
Advantages

- ✓ 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

19mm Knauf Plank and two layers of 12.5mm plasterboard

100mm Crown Acoustic Partition Roll between frames

Metal 'I' studs at 300mm centres



Products

Crown 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 Crown 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.

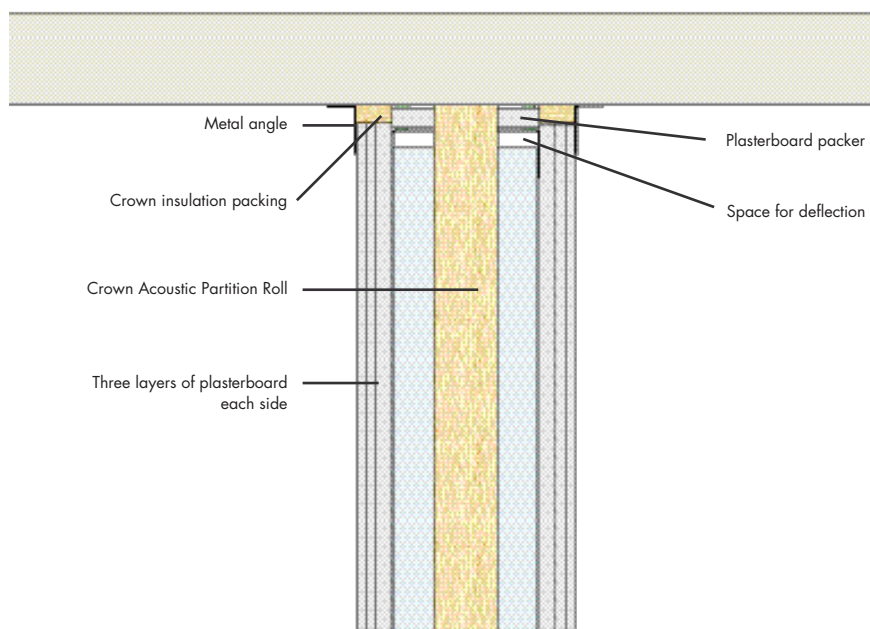
The isolation between the steel frames, the acoustic absorption of the mineral wool and the heavyweight plasterboard all contribute to achieving a high level of acoustic performance.

Installation

Two separate steel frame walls are constructed. Rolls of Crown 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 Crown 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.

NBSPlus

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

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

Density

100mm Crown Acoustic Partition Roll has a density of 16 kg/m³.

Table 96: Sound insulation of twin metal stud partitions

Stud size	Facing	Thickness of insulation (mm)	Sound insulation (R _w dB)	Fire resistance (hours)
92mm C stud	19mm Knauf Plank and two layers of 12.5mm wallboard each side	100 Crown Acoustic Partition Roll	69	2
146mm C stud	19mm Knauf Plank and two layers of 12.5mm wallboard each side	100 Crown Acoustic Partition Roll	74	2

KNAUFINSULATION



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