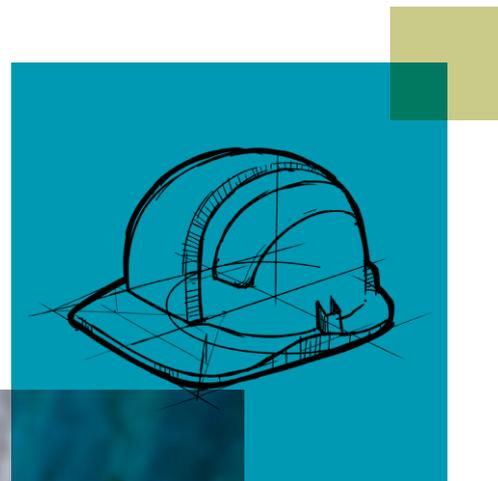


ROCKWOOL BEAMCLAD® SYSTEMS CONTRACTOR FIXING GUIDE

Fire protection solutions for structural steel & soffit protection

A comprehensive installation guide illustrating the various methods of fixing ROCKWOOL BEAMCLAD®

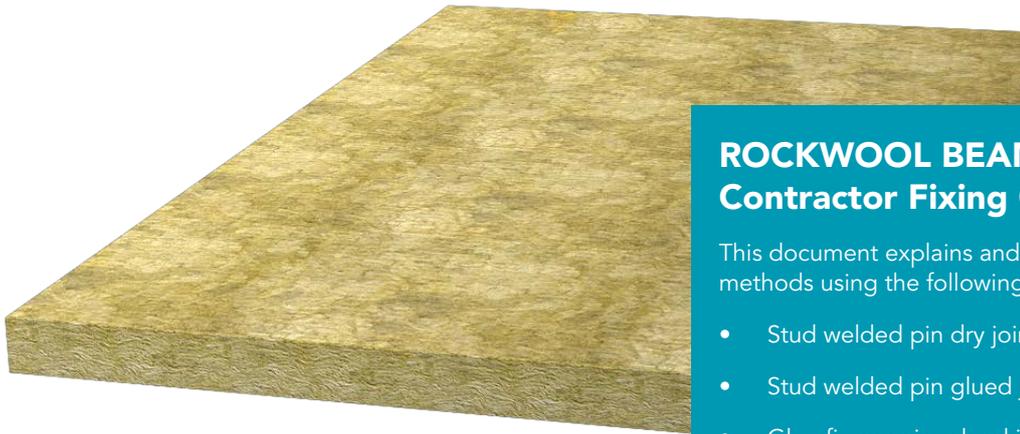




ROCKWOOL BEAMCLAD[®] SYSTEMS CONTRACTOR FIXING GUIDE

ROCKWOOL BEAMCLAD[®] Systems provide a 'tool-box' of options and have been assessed based on fire test data carried out to ENV 13381-4:2002 and EN 13381-4:2013 and in accordance with ASFP Yellow Book, Fire Protection for Structural Steel in Buildings, 5th Edition.

They offer contractors simple and economical fire protection solutions to the very real diversity of modern steel constructions.



ROCKWOOL BEAMCLAD® Systems Contractor Fixing Guide

This document explains and illustrates the installation methods using the following fixing options:

- Stud welded pin dry joint board system
- Stud welded pin glued jointed board system
- Glue fix noggin, glued jointed board system
- Tested and approved for solid and cellular sections

ROCKWOOL BEAMCLAD® boards

BEAMCLAD® boards are available with facings of glass tissue and reinforced aluminium foil as well as plain product. Size: 2000 x 1200mm. Standard thicknesses: 25, 30, 35, 40 and 50mm. Single board thicknesses up to 100mm are available.

Scope

Contractors are required to install materials as tested and detailed in this brochure. In situations not covered by this brochure, ROCKWOOL will either recommend a suitable detail or assist in obtaining an independent Design Appraisal.

Applications

This Fixing Guide provides details of all of the standard boxed applications. It covers fixing centres and details of available facings and joint details. Dry board joints for up to 3 hours and glued joints up to 4 hours protection.

Stud welded pin, dry joint board systems

Welded pin fixing solutions with dry joints are extremely quick to apply, reduce system installation costs and eliminate the need for glue.

Glued noggin fix and stud welded pin systems – glued joints

The glued joint ROCKWOOL BEAMCLAD® systems remain for the applications that require fire protection periods of up to 4 hours.



Benefits

- Fast to install, dry fix stud welded pin system
- Only dry joint stud welded pin solution
- Stud pin fixing centres at max. 320mm for top flange and bottom flange
- Up to 3 hours fire protection

Figure 1
Stud welded pin, dry joint board system

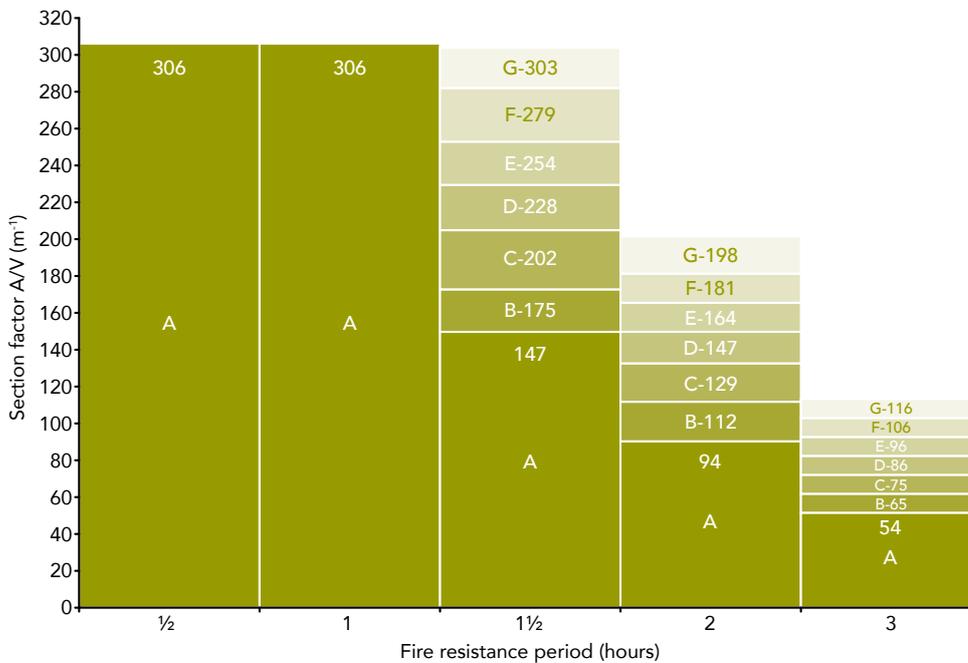
ROCKWOOL BEAMCLAD® stud welded pin dry joint board system

A traditional stud welded pin solution with dry joints. This dry fix pin solution can be used for 2, 3 and 4-sided beam protection for a period of up to 3 hours.

Installation sequence

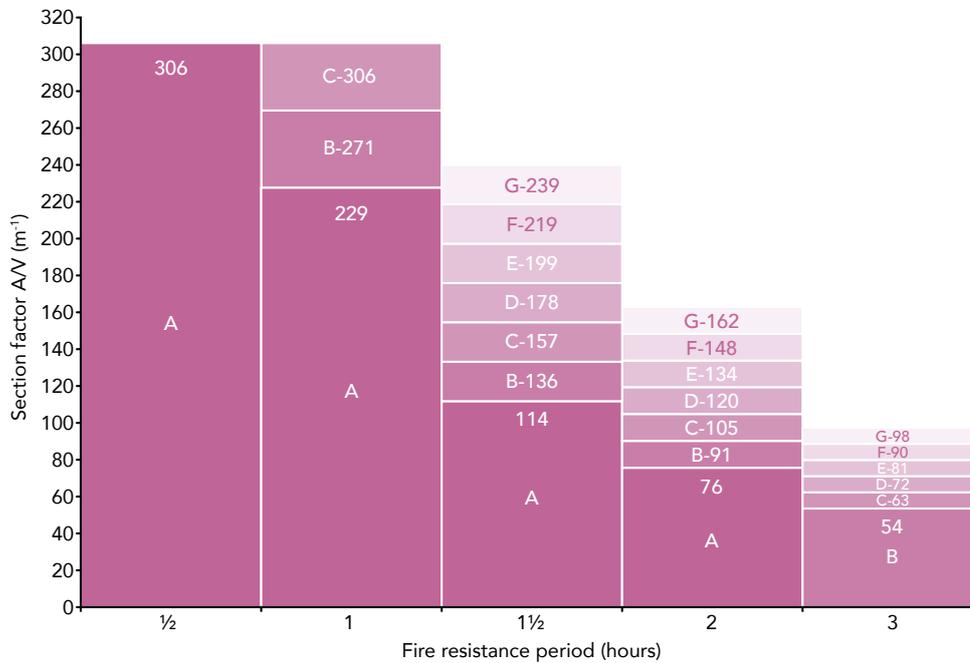
1. Clean the local area for pin welding and fix stud pin using arc or CD welds, ensuring a good contact has been achieved. Stud-welded pins are a minimum 2.7mm diameter. Test weld by bending pin.
2. Impale the ROCKWOOL BEAMCLAD® boards onto the stud welded pins using the deck soffit as a guide.
3. Push 28mm diameter sprung steel non-return washers onto the exposed pin until tight to the cover board face. Crop pins as necessary.
4. Tape joints using aluminium foil tape or scrim, if required.
5. In the case of beams, the pins are welded to the steel section along the flange tips and in two rows along the face of the bottom flange, nominally 50mm in from each edge.
6. Transverse joints in the boards fixed to the webs are offset with respect to those fixed to the flange by a minimum of 100mm.

Chart 1



ROCKWOOL BEAMCLAD® stud welded pin dry joint system:
Critical steel temperature 620°C, 3 sided protection for beams

Chart 2



ROCKWOOL BEAMCLAD® stud welded pin dry joint system:
Critical steel temperature 550°C, 4 sided protection for beams and columns

ROCKWOOL BEAMCLAD® thicknesses to be read with Chart 1 and 2.

The following key provides the required minimum thicknesses of ROCKWOOL BEAMCLAD® for the Section Factors given in the table.

- | | |
|----------|----------|
| A = 25mm | E = 45mm |
| B = 30mm | F = 50mm |
| C = 35mm | G = 55mm |
| D = 40mm | |

Typical details



Figure 2
3-sided box

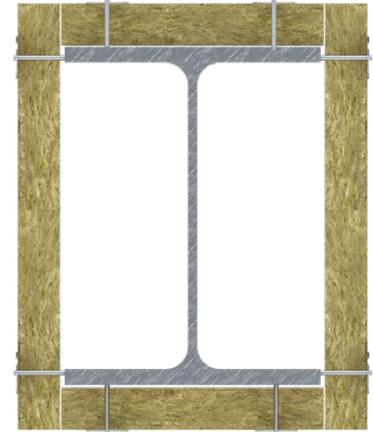


Figure 3
4-sided box

Fixing patterns

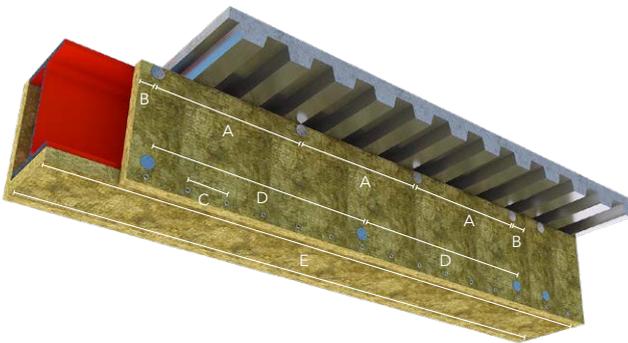


Figure 4
3-sided box with stud welded pins

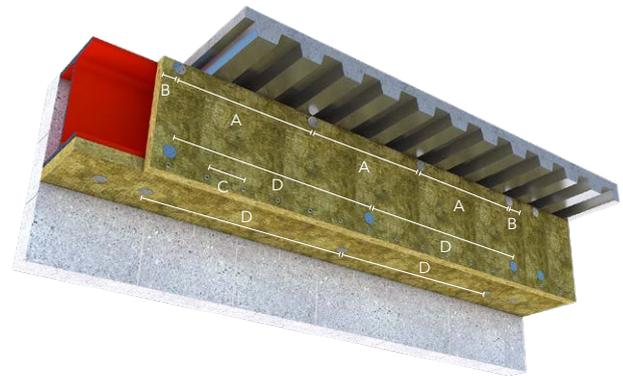


Figure 5
2-sided box with stud welded pins

Dimensions

- A = Stud welded pins at max. 320mm centres
- B = Stud welded pins, nominally 50mm in from edge of board
- C = Bottom flange stud welded pins at max. 320mm centres
- D = Transverse joints in the side boards are offset with respect to those fixed to the flange by a minimum 100mm
- E = $\leq 100\text{mm}$ Flange Width - 1 row of welded pins, $\geq 100\text{mm}$ Flange Width - 2 rows of pins required

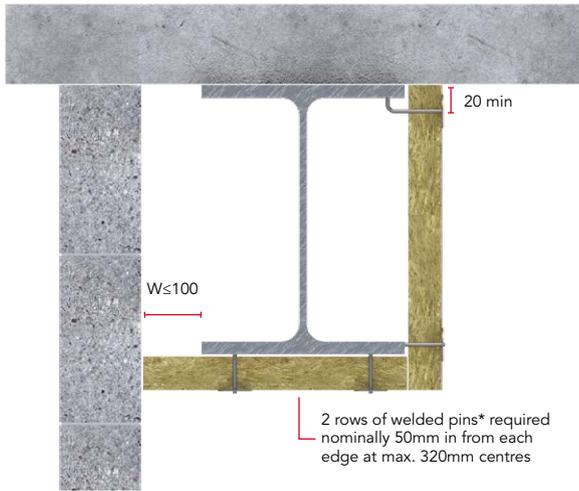


Figure 6
2-sided box

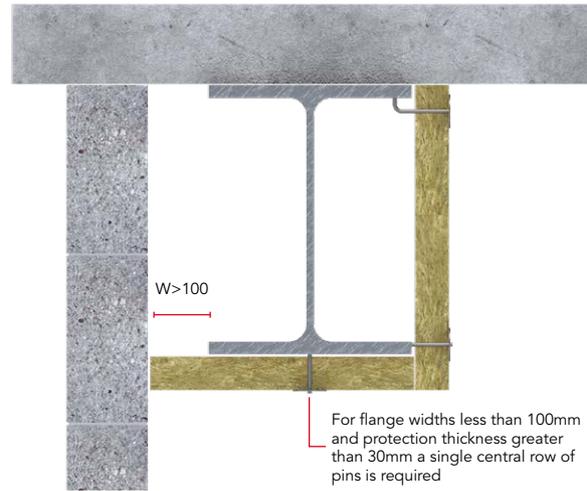


Figure 7
2-sided box - W limit is 100mm. Where $W > 100$ mm a shelf angle or similar should be fixed to the wall

* For flange widths greater than 100mm, 2 rows of pins are required, each row approx. 50mm from flange tips.



ROCKWOOL BEAMCLAD® glued joint systems

The following two systems are well established having been used for many years. The application of FIREPRO® Glue enhances the fire performance over the dry joint systems for 2, 3 and 4 hour periods. The glue joint systems are capable of providing up to 4 hours fire protection.

Fixing boards to noggins

Wherever three or four-sided protection is required, fixing to noggins is a practical option. No power supply is required.

Fixing boards with stud welded pins

Situations will always occur where noggins do not afford a practical choice, e.g. for two-sided box constructions or diverse perimeter bracketing.

Stud welded pins allow the installer a simple, tested alternative to noggins.

Installation sequence (noggin fix)

Fixing noggins

Cut 120mm wide noggins to suit web depth, using same thickness material as the cover protection. For web depths of 500mm and up to (C)600/(B)604mm* use either solid noggins or 'T' shaped noggins. For stability purposes, it is recommended that the face of the 'T' noggin is made from the same thickness as the cover board but the thickness of the return into the web should be at least 50mm. These are then glued into position at 1000mm centres.

Fixing boards

Apply FIREPRO® Glue liberally to face of noggins. Quickly apply vertical boards and secure with nails/pigtail screws long enough to pierce full thickness of noggins before FIREPRO® glue forms a hardened surface.

Apply glue continuously and liberally to all board interfaces. Tightly butt to adjoining boards and nail/pigtail screw through edge joints with same length nails/pigtail screws as for noggins, at 400mm maximum centres.

* (C) denotes Column

* (B) denotes Beam

Installation sequence (stud welded pin fix)

1. Fit stud welded pins (2.7mm diameter).
2. A selection of pins should be mechanically tested by bending from the vertical and returning it to the original position.
3. 28mm sprung steel non-return washers to secure boards.
4. Apply FIREPRO® Glue to all board-to-board joints.
5. Offer up flange boards and nail/pigtail screw through glued corner joints at 400mm maximum centres.
6. If using faced boards, apply foil or scrim tape over joints for uniformity of appearance.

For A/V charts, see Charts 1 and 2 (Stud Welded).

Typical details

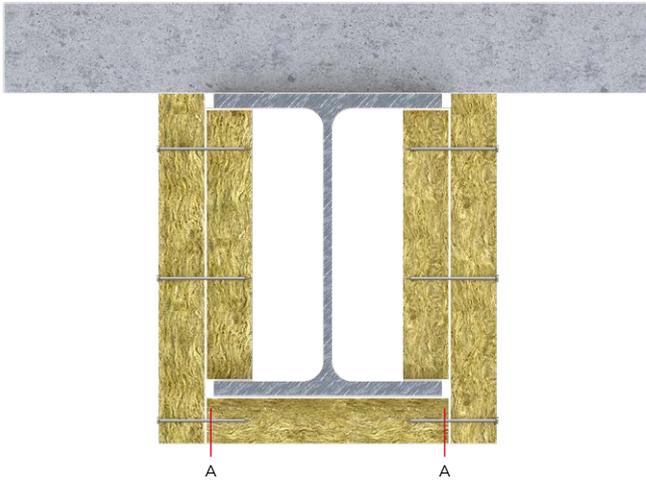


Figure 8
3-sided box, noggins to project slightly beyond flange

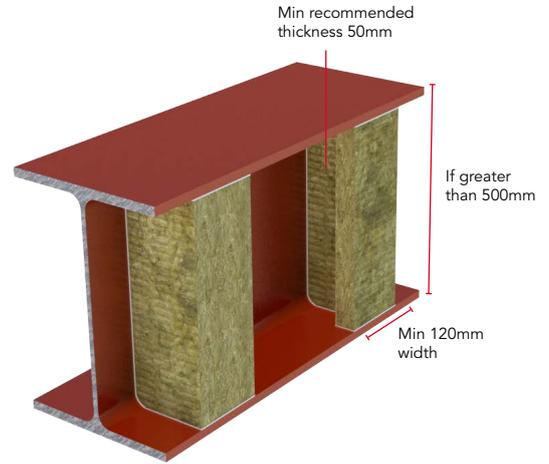


Figure 9
Full depth noggin or 'T' noggin for web depths greater than 500mm, up to 604mm for beams and 600mm for columns

Fixing patterns

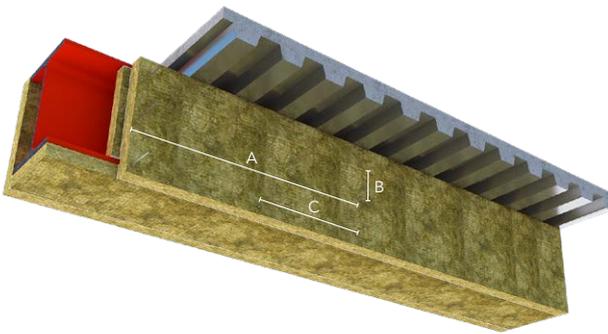


Figure 10
Fixing method using glued noggins, nails/pigtail screws and glued board-to-board joints

Dimensions

- A = Noggins at max. 1000mm centres
- B = Nails/pigtail screws at max. 150mm centres
- C = Nails/pigtail screws at max. 400mm centres (max. 50mm from edge of board joint)

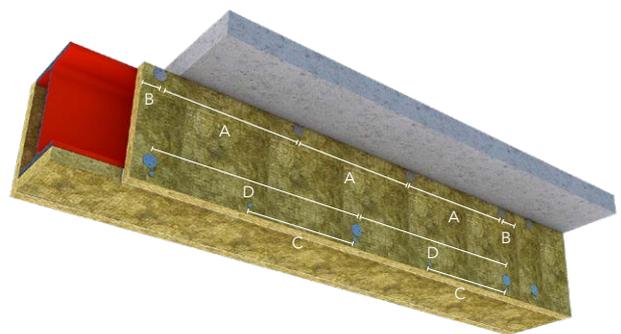


Figure 11 - Stud welded pin fixing arrangement
3-sided box with stud welded pins

Dimensions

- A = Stud welded pins at 320mm centres
- B = Stud welded pins at max. 50mm from edge of board
- C = Nails at max. 400mm centres
- D = Stud welded pins at 320mm centres

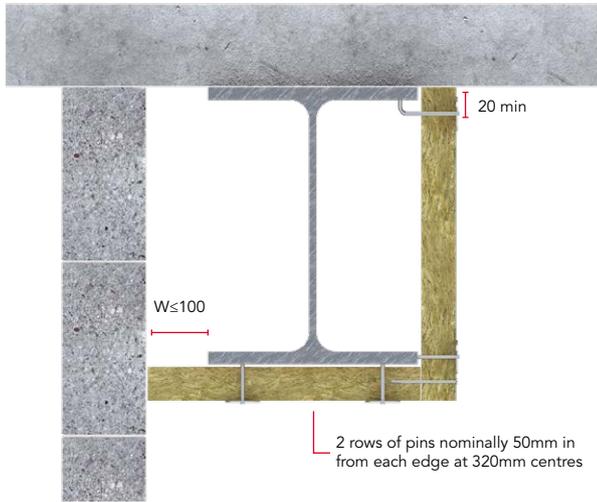


Figure 12
2-sided box

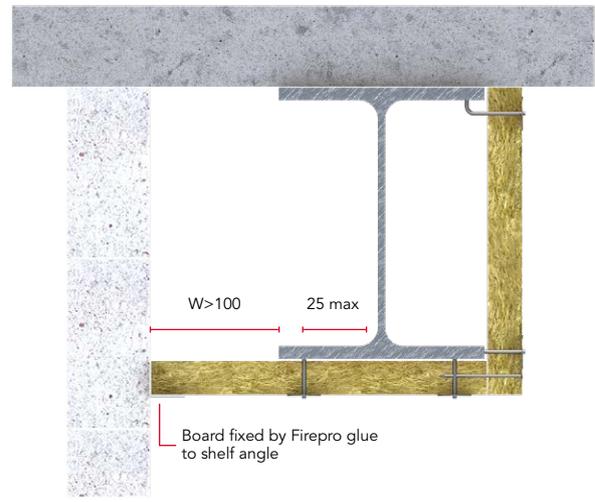
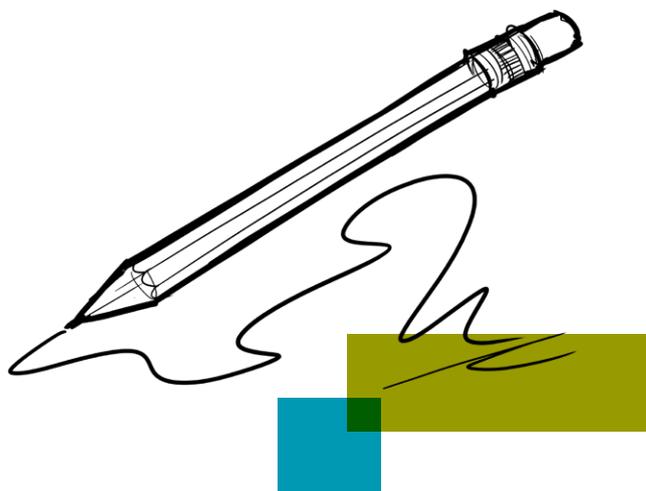


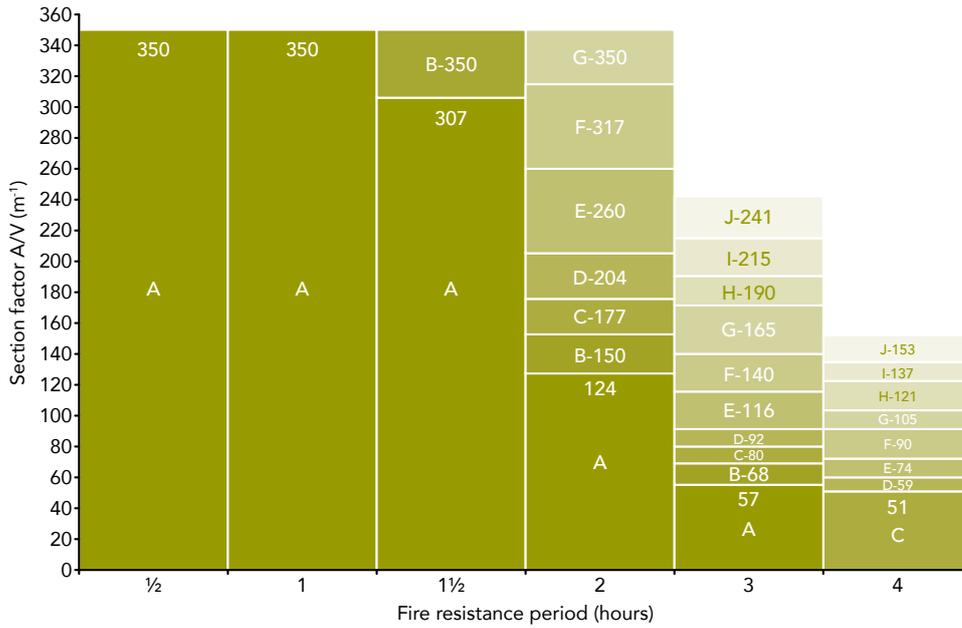
Figure 13
2-sided box - W. Limit is 100mm. For $W > 100\text{mm}$, a shelf angle or similar should be fixed to the wall

* For flange widths greater than 100mm, 2 rows of pins are required, each row approx. 50mm from flange tips.



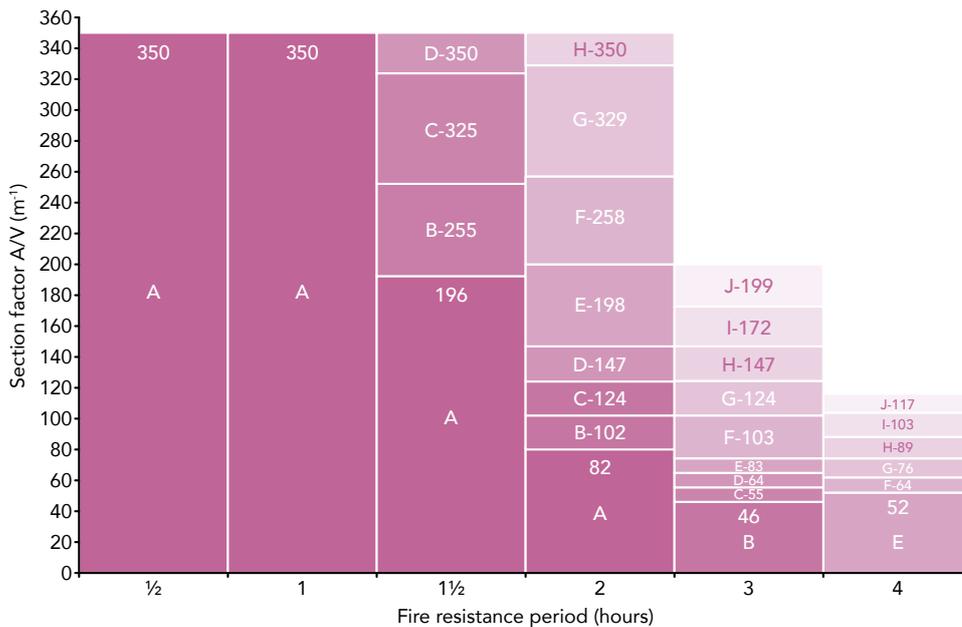
Selecting the thickness of ROCKWOOL BEAMCLAD® board for glued systems

Chart 3



Steel beam sections ROCKWOOL BEAMCLAD® glued joint systems: Critical steel temperature 620°C

Chart 4



Steel beam/column sections ROCKWOOL BEAMCLAD® glued joint systems: Critical steel temperature 550°C

ROCKWOOL BEAMCLAD® thicknesses to be read with Charts 3 and 4.

The following key provides the required minimum thicknesses of ROCKWOOL BEAMCLAD® for the Section Factors given in the tables.

- | | | |
|----------|----------|-----------|
| A = 25mm | E = 50mm | I = 90mm |
| B = 30mm | F = 60mm | J = 100mm |
| C = 35mm | G = 70mm | |
| D = 40mm | H = 80mm | |

Column applications

The fixing system for columns is the same as for beams except that only a single row of pins are required down then centre of the web where the web width is less than 120mm and the protection thickness is 30mm or greater.

Where stud weld pins are used, the boards across the web should be fixed to the noggins using nails/pigtail screws.

General notes

Board jointing

Butted corner joints

Butted corner joints are made with square edge boards and depending on the system employed, use either a dry joint with stud welded pins at 320mm centres, or FIREPRO® Glue and nails/pigtail screws at 400mm centres.

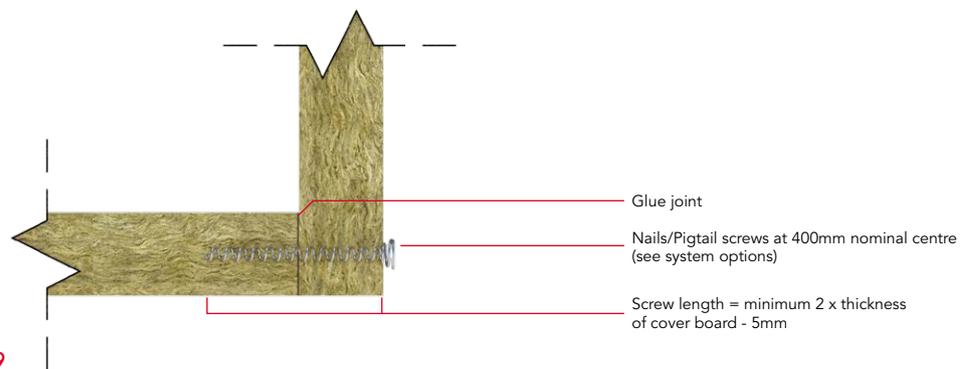


Figure 29

Axial joints

All axial joints are made with square butt edges, without nails. Glue is only required for glued board systems. Joints must be tightly butted.

For foil faced products, joints can be finished with Class 'O' foil tape.

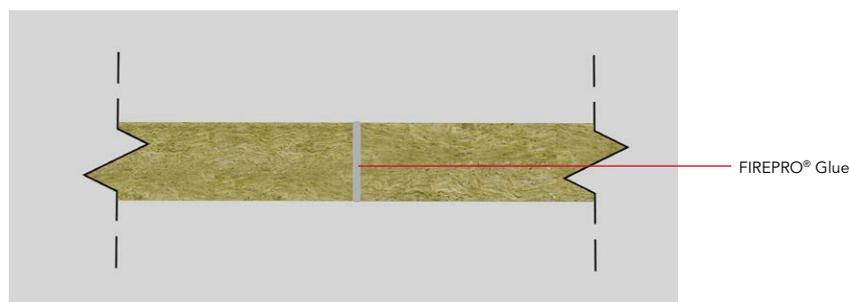


Figure 30

Noggins

ROCKWOOL BEAMCLAD® boards can be fixed to noggins, cut from ROCKWOOL BEAMCLAD® offcuts.

The edges of the noggins are glued where they contact the steelwork. Once the noggins have set firmly, the cover boards are fixed in position with FIREPRO® Glue and nails/pigtail screws. The thickness of the noggin is to be the same as that of the cover board used.

Welded steel pins

Boards are secured to 2.7mm diameter stud welded pins with 28mm diameter non-return washers.

Glue

FIREPRO® Glue is required between all board-to-board and board-to-noggin joints for glued systems.

Applying FIREPRO® Glue on the external face of joints is bad practice.

Whatever noggin system is employed, the glue between noggin and steel must be allowed to set hard before cover boards are applied to the noggins. This will normally take about 4 hours at 20°C ambient temperature.

FIREPRO® Glue is supplied pre-mixed in 17kg tubs and 300ml cartridges.

Coverage rate will depend on the linear length of the joints, width of joint (board thickness) and joint depth. Assuming total, effective useage of the glue on site, the following table provides an approximate weight (kg) of glue per linear metre of joint, based on a glue depth of 1mm.

Table 1

ROCKWOOL BEAMCLAD® thickness (mm)	Square butt joint
25	0.09
30	0.11
35	0.13
40	0.15
50	0.19
60	0.22

In practice, a degree of wastage would be expected and as such, it would be prudent to make an allowance for this when placing an order. As a very approximate guide, the coverage rate of a 17kg tub of FIREPRO® Glue would be 35m² of applied board.

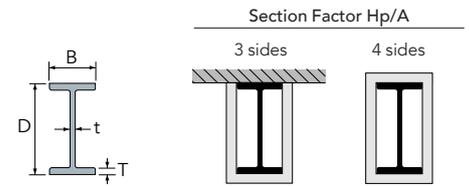


Table 2 - Universal beams A/V table (as per 2006)

Designation serial size	Mass per metre (kg)	Depth per section D (mm)	Width per section B (mm)	Thickness web t (mm)	Flange T (mm)	Area of section (cm ²)	m ⁻¹	m ¹
914x419	388	921.0	420.5	21.5	36.6	494.5	45	55
	343	911.4	418.5	19.4	32.0	437.5	50	60
914x305	289	926.6	307.8	19.6	32.0	368.8	60	65
	253	918.5	305.5	17.3	27.9	322.8	65	75
	224	910.3	304.1	15.9	23.9	285.3	75	85
	201	903.0	303.0	15.2	20.2	256.4	80	95
838x292	226	850.9	293.8	16.1	26.8	288.7	70	80
	194	840.7	292.4	14.7	21.7	247.2	80	90
	176	834.9	291.6	14.0	18.8	224.1	90	100
762x267	197	769.6	268.0	15.6	25.4	250.8	70	85
	173	762.0	266.7	14.3	21.6	220.5	80	95
	147	753.9	265.3	12.9	17.5	188.1	95	110
686x254	170	692.9	255.8	14.5	23.7	216.6	75	90
	152	687.6	254.5	13.2	21.0	193.8	85	95
	140	683.5	253.7	12.4	19.0	178.6	90	105
	125	677.9	253.0	11.7	16.2	159.6	100	115
610x305	238	633.0	311.5	18.6	31.4	303.8	50	60
	179	617.5	307.0	14.1	23.6	227.9	70	80
	149	609.6	304.8	11.9	19.7	190.1	80	95
533x210	122	544.6	211.9	12.8	21.3	155.8	85	95
	109	539.5	210.7	11.6	18.8	138.6	95	110
	101	536.7	210.1	10.9	17.4	129.3	100	115
	92	533.1	209.3	10.2	15.6	117.8	110	125
	82	528.3	208.7	9.6	13.2	104.4	120	140
457x191	98	467.4	192.8	11.4	19.6	125.3	90	105
	89	463.6	192.0	10.6	17.7	113.9	100	115
	82	460.2	191.3	9.9	16.0	104.4	105	125
	74	457.2	190.5	9.1	14.5	95.0	115	135
	67	453.6	189.9	8.5	12.7	85.4	130	150
457x152	82	465.1	153.5	10.7	18.9	104.5	105	120
	74	461.3	152.7	9.9	17.0	95.0	115	130
	67	457.2	151.9	9.1	15.0	85.4	125	145
	60	454.7	152.9	8.0	13.3	75.9	140	160
	52	449.8	152.4	7.6	10.9	66.5	160	180
406x178	74	412.8	179.7	9.7	16.0	95.0	105	125
	67	409.4	178.8	8.8	14.3	85.5	115	140
	60	406.4	177.8	7.8	12.8	76.0	130	155
	54	402.6	177.6	7.6	10.9	68.4	145	170
406x140	46	402.3	142.4	6.9	11.2	59.0	160	185
	39	397.3	141.8	6.3	8.6	49.4	190	215
356x171	67	364.0	173.2	9.1	15.7	85.4	105	125
	57	358.6	172.1	8.0	13.0	72.2	120	145
	51	355.6	171.5	7.3	11.5	64.6	135	160
	45	352.0	171.0	6.9	9.7	57.0	150	180
356x127	39	352.8	126.0	6.5	10.7	49.4	165	195
	33	348.5	125.4	5.9	8.5	41.8	195	225
305x165	54	310.9	166.8	7.7	13.7	68.4	115	140
	46	307.1	165.7	6.7	11.8	58.9	135	160
	40	303.8	165.1	6.1	10.2	51.5	150	185
305x127	48	312.7	102.4	6.6	10.8	41.8	175	200
	42	308.9	101.9	6.1	8.9	36.3	200	230
	37	304.8	101.6	5.8	6.8	31.4	225	255
254x146	43	259.6	147.3	7.3	12.7	55.1	120	150
	37	256.0	146.4	6.4	10.9	47.5	140	170
	31	215.5	146.1	6.1	8.6	40.0	165	200
254x102	28	260.4	102.1	6.4	10.0	36.2	175	200
	25	257.0	101.9	6.1	8.4	32.2	190	225
	22	254.0	101.6	5.8	6.8	28.4	220	255
203x133	30	206.8	133.8	6.3	9.6	38.0	145	180
	25	203.2	133.4	5.8	7.8	32.3	170	210

Determining protection thickness

The table opposite indicates the effect on A/V for three and four sided schemes. Determine A/V factor from the table or by calculating for other exposure situations, ensuring the correct mass per metre is used.

Establish the period of fire protection required.

For A/V factors in excess of 300, contact ROCKWOOL for advice on both thicknesses and fixing methods preferred.

Bracing members: These do not generally require protection. If required as an essential element to the fire resistance, use A/V not greater than 200 m-1.

Where steel beams are fixed to composite steel and concrete decks, the profiled re-entrant void may not need additional protection if allowances for board thickness or steelwork section factor are made.

See the ASFP Yellow Book A.3.5 for current independent guidance.

Profiled re-entrant voids above steel beams will need to be infilled-

- Where steel beams are positioned to form a continuation of a compartment wall
- Where non-composite beams support a trapezoidal steel deck

FIREPRO® Linear and Trapezoidal Firestop systems have been developed to provide up to 4 hours fire stopping at the junctions of compartment walls and floors and can be manufactured to suit the trapezoidal/dovetail profile.

General notes for systems

Ensure steel is free from grease, dust or loose particles where noggins are to be glued or pins welded.

Dry off steelwork where large water droplets are present. Steel damp to the touch is acceptable.

Ensure that all noggins have the correct friction fit. Avoid excessive interference that may cause noggins to bend.

Fix additional noggins (if required) at beam ends, beam-to-beam joints and large penetrations. For stud welded pin systems it may be necessary to introduce soldier noggins into webs behind board to board joints to increase stability of the system on steelwork with large web depths (up to 603mm).

For glued system options ensure that all noggin-to-beam, noggin to-board and board-to-board surfaces are glued, and that the required setting time is allowed.

Remove any excess glue for neatness.

Any localised board shaping to be made at the point of installation should be carried out with a sharp knife or fine-toothed saw.

Avoid 'nuisance dust' from cutting operations lying on boards prior to installation. Always use sharp-edged cutting tools.

The length of all nails used should be at least twice the thickness of the board being fixed.

Pigtail screw length should be twice the thickness of the board being fixed, less 5mm.

All board to board joints must be tightly butted.

Vapour barriers

Glass-reinforced aluminium foil-faced ROCKWOOL BEAMCLAD® A/F provides an excellent vapour seal. For integrity of the foil, all edges should be taped (with a minimum 75mm wide) plain foil tape. Idenden T 303 tape is recommended as being suitable. Taped joints also prevent damage to foil edges during construction.

Board joints (glued)

No glue is required where boards meet wall or soffit surfaces, except in cases where a temporary fix to flange faces may be advantageous to the work sequence. Close contact between boards at joints is always essential.

Painted steel

Painting of structural steelwork is not always essential for corrosion protection. BS 8202: Part 1: 1995 permits the use of unpainted steel which is both interior to the building and in an area which will be constantly heated.

ROCKWOOL BEAMCLAD® thickness

In selecting ROCKWOOL BEAMCLAD® thicknesses, due consideration must be given to the required period of fire resistance and the A/V value of the steel sections concerned.

Supply

ROCKWOOL BEAMCLAD® slabs are supplied on pallets, shrink-wrapped in polyethylene. Pigtail screws are available from ROCKWOOL stockists. Welded pins and sprung steel non-return washers are available from external suppliers.

References

ROCKWOOL BEAMCLAD® systems are part of the ROCKWOOL FIREPRO® range of fire stopping and fire protection range. A range of building solutions to prevent fire spread and protect the structural integrity of the building.

The ROCKWOOL Trademark

ROCKWOOL® - our trademark

The ROCKWOOL trademark was initially registered in Denmark as a logo mark back in 1936. In 1937, it was accompanied with a word mark registration; a registration which is now extended to more than 60 countries around the world.

The ROCKWOOL trademark is one of the largest assets in the ROCKWOOL Group, and thus well protected and defended by us throughout the world.

If you require permission to use the ROCKWOOL logo for your business, advertising or promotion. You must apply for a Trade Mark Usage Agreement. To apply, write to:
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Notes

Notes

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