

Cavity-Wall Insulation: Partial-Fill

Jabwall

Jabwall is a partial-fill cavity-wall insulation system designed to be incorporated into new masonry walls during construction to satisfy the Building Regulations' U-value requirements.

The insulation is retained against the required leaf by clips on the wall ties.

- **Low thermal transmittance**

Depending primarily on the block chosen for the construction of the inner leaf, 75mm thickness of Jabwall will typically improve the U-value of a cavity wall to 0.35W/m²K.

- **Maintains the cavity**

The use of Jabwall ensures that an air gap is maintained in the cavity-wall construction. This means, subject to compliance with its British Board of Agrément Certificate, that the boards can be used in walls in exposed situations.

- **Permanent**

Jabwall is rot-proof and durable and will remain effective for the life of the building; the recommended fixing methods will retain the boards permanently in position.

- **Rapid, economical construction**

The boards are available in sizes to suit block coursing and tie centres, and are simply clipped into position as construction of the wall proceeds.

- **Easy to cut and fit**

If required, boards can be easily cut to length using a sharp trowel or knife. No specialised trades or equipment are required.

- **Easy to handle**

Jabwall is manufactured from expanded polystyrene (EPS), and is lightweight and easy to handle.

Table 12. Maximum allowable total exposure factors

Construction	Maximum allowable exposure factor, E, calculated in accordance with BS 5618
All external masonry walls protected by rendering to BS 5262; tile or slate hanging; timber, plastic or metal weatherboarding or cladding	no restriction
One or more masonry walls constructed from clay facing bricks or natural stone, with a porosity exceeding 20% by volume. Mortar joints must be flush-pointed or weatherstruck.	100
One or more masonry walls constructed from calcium-silicate bricks, concrete blocks, or natural or reconstituted stone, with a porosity not exceeding 20% by volume, or any material with raked mortar joints.	88
Any buildings above 12m high, and not exceeding 25m: a maintained cavity of 50mm is required. The exposure factor E must not exceed 120.	

APPROVALS

Jabwall has been assessed and approved by the British Board of Agrément for use in cavity walls to a maximum height of 25m with a 50mm cavity, and 12m with a 25mm cavity; Certificate number 89/2179.

Jabwall has been approved for this application since 1979, and was the first partial-fill insulation product to gain BBA approval.

TYPE

Jabwall is supplied as EPS 70 as defined in BS EN 13163. Flame retardant additive material is available to order.

DIMENSIONS

Standard size, 1200 x 450mm. Thickness, 40, 50, 60 and 75mm; other thicknesses available to order.

U-VALUES

Table 13 describes a selection of common cavity-wall constructions using a range of materials for both

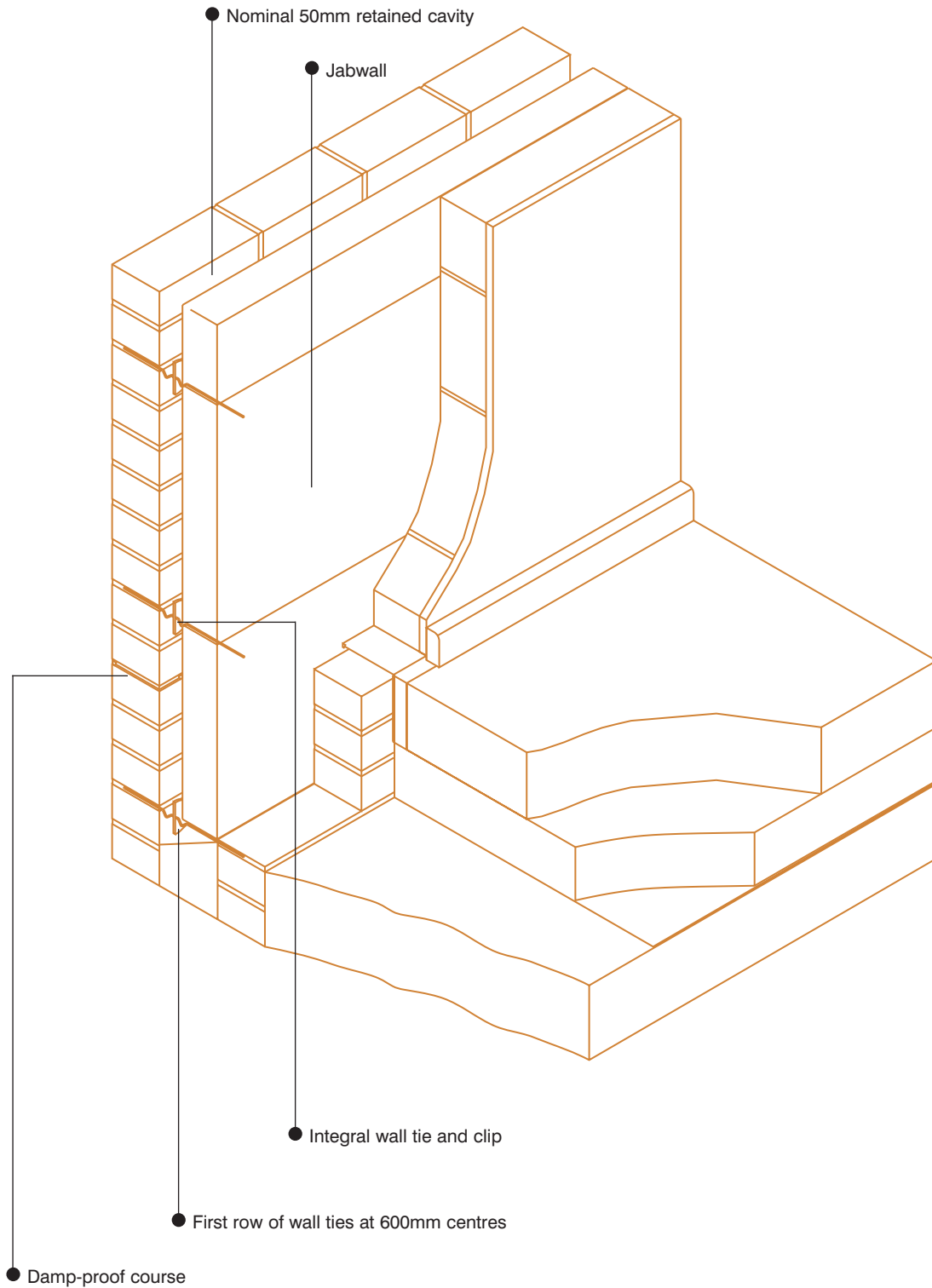
the inner and outer leaf, and gives the thickness of Jabwall required to achieve a U-value of 0.35W/m²K. Their calculation complies with the calculation procedures contained in the 'Conventions for U-value calculations' document accompanying the Building Regulations. This takes into account, mortar joints, air gap connections, wall ties and linings as necessary.

The values given are based on a k-value of 0.038W/mK for the insulation.

In most cases, the actual thickness of Jablite required according to this calculation will not correspond with the nominal thicknesses available. The next thickest nominal size should be used which will provide a performance which better the required U-value.

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Figure 53.



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THERMAL RESISTANCE

The thermal resistance, R-value, of Jabwall for each thickness is as follows:

40mm	1.05m ² K/W
50mm	1.30m ² K/W
60mm	1.55m ² K/W
75mm	1.95m ² K/W

These figures can be used for calculating U-values for constructions not described in Table 13.

WATER PENETRATION

Water penetration should not occur in external walls where a cavity of 50mm or more is maintained, and this allows Jabwall to be incorporated into walls in any exposure zone. A nominal 50mm cavity also satisfies the requirements of the NHBC.

The conditions of the BBA Certificate (number 89/2179) state that if the maintained cavity is 50mm or more, then Jabwall can be used in buildings up to 25m high in any exposure zone. If the cavity is less than 50mm but not less than 25mm, the height restriction is reduced to 12m where the Exposure Factor is within the limits set out in Table 12.

In order to minimise the risk of water penetration, in all situations it is particularly important to ensure that the following procedures are carried out:

- Jabwall should be installed to the highest level on each wall, or the top edge of the wall should be protected by a cavity tray with appropriate weep holes in the mortar joints.
- Wall ties and fixings must be correctly installed, sloping towards the external leaf and free from mortar droppings or other debris.
- Excess mortar should be cleaned from the cavity face of the inner leaf, and any debris removed from the cavity.
- Mortar droppings should be cleaned from the exposed edges of the Jabwall boards as installation proceeds.

Water-vapour transmission

Jabwall should not be regarded as a damp-proof membrane (DPM) or vapour-control layer.

FIRE

When properly installed, Jabwall is fully protected by the masonry and will have no adverse effect on the fire resistance of the wall. Although Jabwall is a combustible material, it is unlikely that there will be sufficient air present in the cavity to support combustion.

Where the cavity exceeds 100mm in width, cavity barriers should be incorporated into the construction as required by the Building Regulations.

In all cases, the cavity should be 'closed'.

Euroclass E, flame-retardant additive material, is available to order.

INSTALLATION

Figure 54 gives a typical installation of Jabwall, showing how the insulation should be extended below the damp-proof course (DPC) level to provide floor-edge insulation. The figure also shows the correct use of insulation-retaining clips on the wall ties.

The clips, which should be of a BBA-approved design, should be placed so as to secure the boards at the top and bottom edges, ensuring that the minimum cavity dimension is maintained. It is important to use the correct length of wall tie in relation to the thickness of the insulation and the width of the cavity wall. Further information can be obtained by consulting the wall-tie manufacturer's literature.

Damp-proof membrane

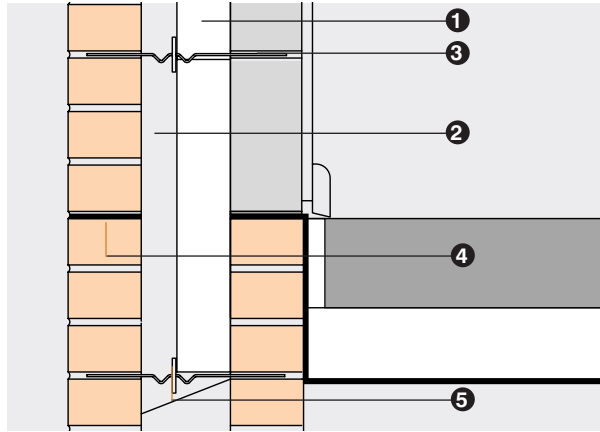
Jabwall should not be regarded as a DPM and both vertical and horizontal DPCs should be installed as required in accordance with normal good practice.

For buildings where the floor structure penetrates the external-wall cavity, for example at balcony positions, a horizontal damp-proof tray should be installed immediately above the upper limit of the insulation in order to avoid the transfer of moisture to the inner leaf.

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Figure 54.
Wall/floor junction detail



1. Jabwall
2. Nominal 50mm retained cavity
3. Integral wall tie and clip
4. Damp-proof course
5. First row of wall ties at 600mm centre

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Construction procedure

The walls are constructed in the normal way but the inner leaf should be advanced to sufficient height to allow the insulation boards to be installed and fixed before continuing the construction of the outer leaf.

The first row of insulation-retaining ties should be positioned at the base of the lowest insulation board but not directly on the DPC; the ties should be located at 600mm horizontal centres. Subsequent ties should be placed at 450mm centres vertically, and 600mm horizontally to suit the vertical coursing configuration and the insulation board retention requirements.

When the first row of boards needs trimming to height to meet course requirements, this must be carried out on the bottom edge of the boards. The clips are fitted onto the ties so as to restrain the top and bottom edges of the boards as the work proceeds.

The boards should be installed in such a way that the edges are tightly butted together.

If the construction sequence requires the external leaf to be raised before the inner, then the insulation should be installed against the outer leaf in the same way as described above. This form of construction also has BBA approval.

After raising each section of the inner leaf, excess mortar should be removed and any mortar droppings cleaned from the top edges of the insulation boards. The use of a cavity board is recommended to protect the edges of the insulation during construction and to facilitate cleaning. Similarly, a cavity batten will protect the installed boards and help to keep the cavity clean as the following section of wall is constructed.

BS 5628: Part 3 gives further information on the protection of work in progress.

Cutting

The insulation boards can be cut with a craft knife or a fine-tooth saw to fit around apertures in the brick or blockwork. For general cutting to length, a sharp-edged trowel gives a good line of cleavage.

REFERENCES

BS 5262 Code of practice for external renderings.

BS 5628 Code of practice for use of masonry: Part 3, materials and components, design and workmanship.

BS EN 13163 Thermal insulation products for buildings - Factory made products of expanded polystyrene (EPS) - Specification.

Table 13. Thickness of Jabwall required to achieve U-value of 0.35W/m²K

	150mm		102.5mm brickwork stone		100mm dense concrete block		100mm lightweight concrete block		100mm AAC block		100mm SAAC block	
	fair-faced	render	fair-faced	render	fair-faced	render	fair-faced	render	fair-faced	render	fair-faced	render
102.5mm brick												
fair-faced	90	85	90	85	90	85	85	85	75	75	75	75
13mm dense plaster	90	85	90	85	90	85	85	85	75	75	75	75
13mm lightweight plaster	85	85	85	85	85	85	85	85	75	75	75	60
12.5mm plasterboard on dabs	85	85	85	85	85	85	85	85	75	75	60	60
12.5mm plasterboard on studs	85	75	85	75	85	85	75	75	75	75	60	60
100mm dense concrete block												
fair-faced	95	90	90	85	90	90	90	85	75	75	75	75
13mm dense plaster	90	85	90	85	90	90	90	85	75	75	75	75
13mm lightweight plaster	90	85	90	85	90	85	85	85	75	75	75	60
12.5mm plasterboard on dabs	85	85	90	85	90	85	85	85	75	75	60	60
12.5mm plasterboard on studs	85	85	85	85	85	85	85	75	75	75	60	60
100mm lightweight concrete block												
fair-faced	90	85	90	85	90	85	85	85	75	75	75	75
13mm dense plaster	85	85	90	85	90	85	85	85	75	75	75	75
13mm lightweight plaster	85	85	85	85	85	85	85	85	75	75	75	60
12.5mm plasterboard on dabs	85	85	85	85	85	85	75	75	75	75	60	60
12.5mm plasterboard on studs	85	75	85	75	85	75	75	75	75	60	60	50
100mm aerated block												
fair-faced	75	75	75	75	75	75	75	75	60	60	60	50
13mm dense plaster	75	75	75	75	75	75	75	75	60	60	60	50
13mm lightweight plaster	75	75	75	75	75	75	75	75	60	60	60	50
12.5mm plasterboard on dabs	75	75	75	75	75	75	75	75	60	60	50	50
12.5mm plasterboard on studs	75	75	75	75	75	75	75	60	60	50	50	40
100mm super-aerated block												
fair-faced	75	75	75	75	75	75	75	75	60	60	50	50
13mm dense plaster	75	75	75	60	75	75	75	60	50	50	50	40
13mm lightweight plaster	75	75	75	60	75	75	60	60	50	50	50	40
12.5mm plasterboard on dabs	60	60	60	60	60	60	60	60	50	50	40	40
12.5mm plasterboard on studs	60	60	60	60	60	60	60	60	50	50	40	40

Key

Standard thicknesses of Jabwall	95mm	90mm	85mm	75mm	60mm	50mm	40mm
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SJLW

Walls