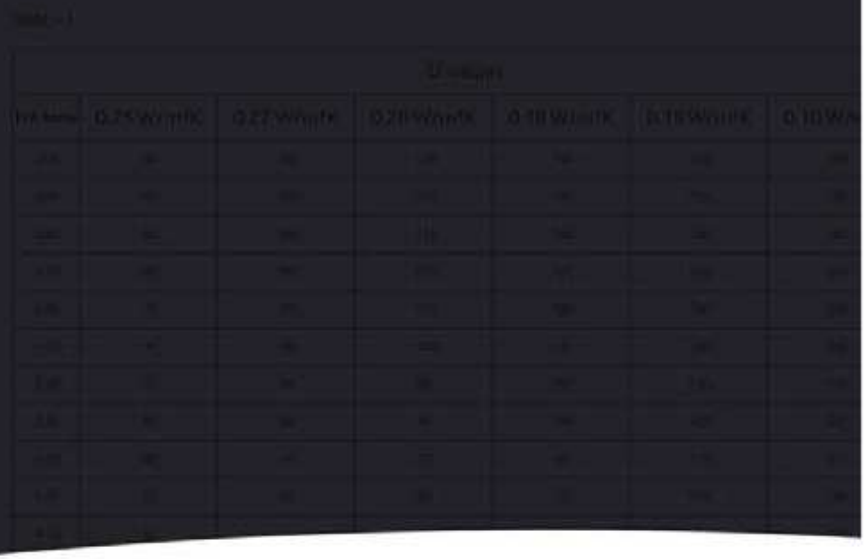
Floors | Walls | Roofs

Jablite Classic Board in a Cold Store Floor



jablite

APPLICATION:
Floor insulation – cold store floor

Product: Jablite board

Floors in chill and cold stores are usually subject to loadings well in excess of those found in normal domestic and commercial applications. Jablite board, in higher compressive-strength types, can be used to provide successively higher loadbearing capabilities combined with high levels of insulation to reduce thermal transfer from the surrounding sub-base. A concrete slab will normally be laid over the insulation to provide a suitable wearing surface.

Jablite board
The use of Jablite board will reduce the amount of heat entering the cold store from the surrounding sub-base. This helps to maintain the ambient ground temperature and to reduce the incidence of ground heave caused by freezing soils.

Easy to handle
Jablite board is manufactured from expanded polystyrene (EPS), which is lightweight and easy to handle.

Permanent
Jablite board is rot-proof and durable and will remain effective for the life of the building. It also has the added advantage of being flood-proof.

Rapid construction
No specialised trades or equipment are required.

Versatile
Jablite board is available in various grades allowing the optimum selection of wearing surface/slab and insulation to support distributed loads up to 100kPa.

Environment
Expanded polystyrene has been awarded an A+ rating by the BRE's Green Guide to Specification.

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Type
Jablite board is available as EPS 100, 150, 200, 250 as defined in BS EN 13163. Flame-retardant additive material is available to order.

Dimensions
Standard size: 2400 x1200mm.
Standard thicknesses: from 50-300mm.

Thermal conductivity
Jablite board has the following thermal conductivity, k-values:

EPS 100	0.036W/mK
EPS 150	0.035W/mK
EPS 200	0.034W/mK
EPS 250	0.034W/mK

Thermal insulation
Unlike a conventional flooring application, in the case of a coldstore floor, the insulation is intended to prevent heat transfer between the comparatively warm surrounding soil and the cold concrete floor. The rate of heat transfer will be directly dependent on the temperature difference between the two, and a suitable thickness of insulation should be selected to reduce this figure to an acceptable level within the constraints of the refrigeration plant. Jablite board suffers no loss of efficiency at normal cold-store temperatures.

Fire
Solid ground floors are not required to provide fire resistance. When properly installed, the EPS insulation is fully protected by the wearing surface and will have no adverse effect on the fire performance of the floor. Euroclass E, flame-retardant additive material is available to order.

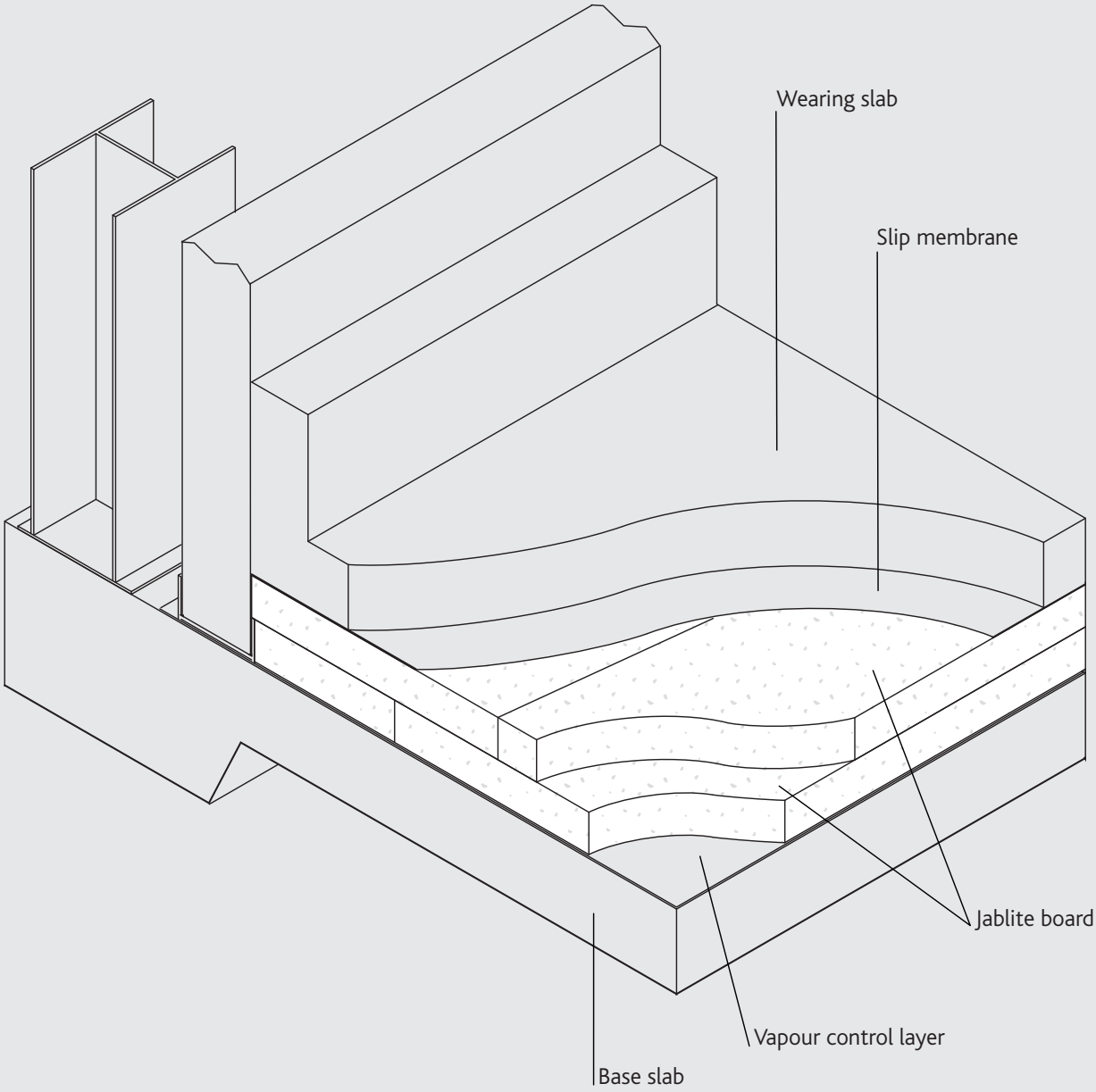
Mechanical properties
Compressive stress for 1% nominal strain, tested to BS 4370:Part 1 Method 3, Appendix A:

EPS 100	45kPa
EPS 150	70kPa
EPS 200	90kPa
EPS 250	100kPa

For technical information 0870 444 8769 technical@jablite.co.uk

Floor insulation – cold store floor

Figure 16.1



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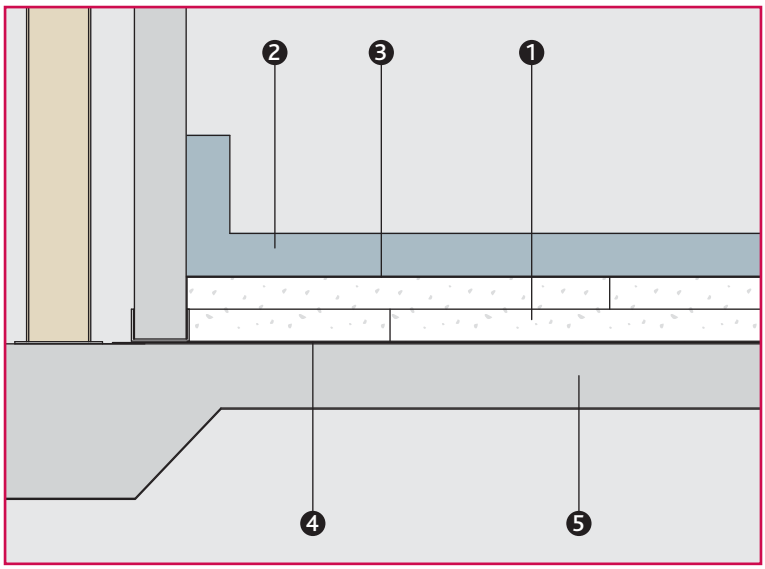
APPLICATION:
Floor insulation – cold store floor

INSTALLATION

Site preparation

The ground should be excavated to the required level, and compacted to ensure that the surface is firm and flat. The sub-base must be clean and free from contaminants, and placed in layers of sufficient thickness to allow adequate compaction of each layer. If necessary, the top layer should be blinded to receive a screed. The thickness of screed will depend on whether it acts simply as a blinding layer, or whether it is a carrier for heating cables intended to prevent ground heave in low temperature applications. In either case the top surface should be flat and even to receive a membrane and base slab. The base slab, which may include frost heave protection in lieu of that in the sub-base, should be laid to the required thickness.

Figure 16.2
Cold store floor insulation



1. Jablite board
2. Wearing slab
3. 2mm slip membrane
4. Vapour-control layer
5. Base slab

Vapour-control layer

Jablite board should not be regarded as a vapour-control layer and a suitable membrane, designed to suit the particular environmental conditions, must be laid over the base slab. The vapour-control layer must be tied in with other vapour sealing measures at all abutments and lapped and sealed as necessary.

Jablite board

In combination with the wearing surface, the correct grade of Jablite board should be selected to support the anticipated distributed floor loading with a nominal 1% compression; see 'Mechanical properties', above. In order to prevent possible cold bridging, the Jablite board should either be laid in two layers with staggered joints, or in a single layer with a suitable 'broken-joint' detail. It is advisable to start laying in one corner, and to use a half-board or off-cut to start the next layer. In any case, the joints in adjacent layers should not be closer than 300mm in any direction. A 2mm-thick slip membrane should be laid over the insulation prior to laying the wearing slab.

Wearing slab

The specified concrete slab should be laid over the Jablite board and suitably finished.

During these operations, the surface of the Jablite board or slip membrane should be protected from impact damage or excessive trafficking by the use of spreader boards.

References

BRE Report 262. Thermal insulation: avoiding risks – Third edition 2002.
BS EN ISO 13370 Thermal performance of buildings – Heat transfer via the ground – Calculation methods.
BS EN 13163 Thermal insulation products for buildings – Factory made products of expanded polystyrene (EPS) – Specification.

Jablite

Expanded Polystyrene (EPS) Technical Information

Jablite EPS is a lightweight cellular plastic material suitable for a wide range of building-insulation applications. It is an excellent insulating medium which exhibits consistent thermal performance over the range of temperatures normally encountered in buildings.

The material is versatile, light in weight, clean and easy to handle, and provides a cost-effective means of including permanent insulation in floors, walls and roofs to meet, and exceed, the standards laid down in the Building Regulations.

Technical Description

Composition

Jablite insulation products are manufactured from EPS. The material comprises expandable beads of polystyrene pre-foamed and fused together in a steam-heated mould under pressure. This produces a block of material, up to 7314mm long, which is then cut to and/or shape. After cutting to size, the material may be faced or laminated with other materials to suit its application. Alternatively, the beads may be moulded into a finished, shaped section which requires no further processing.

Material Type

The following types of material are available, as defined in BS EN 13163: EPS 70, EPS 100, EPS 150, EPS 200, EPS 250.

In addition, each type is available as either Euroclass F, or Euroclass E containing a flame-retardant additive.

Additional types are also available for specific applications; for example, types with compressive-stress values, at 10%, of 400 and 500kPa.

Shape and size

After moulding, the 'block' material is cut to size, thickness and taper, if required, according to the intended end use; see individual product and application data.

Typical properties of Jablite

Jablite Type	EPS 70	EPS 100	EPS 150	EPS 200	EPS 250
Mechanical Properties					
Compressive strength @ 10% compression (kPa)	70	100	150	200	250
Compressive strength @ 1% nominal strain (kPa)	20	45	70	90	100
Bending strength (kPa)	115	150	200	250	350
Moisture Properties					
Water vapour diffusion resistance factor μ	20-40	30-70	30-70	40-100	40-100
Water vapour permeability δ mg/(Pa.h.m)	0.018-0.036	0.010-0.024	0.010-0.024	0.007-0.018	0.007-0.018
Vapour resistivity (MNs/gm)	145	200	238	238	238
Thermal Properties					
Thermal conductivity (W/mK, at 10°C)	0.038	0.036	0.035	0.034	0.034
Thermal resistivity (mK/W)	26.32	27.78	28.57	29.41	29.41

Technical Description *(continued)*

Tolerances

In accordance with BS EN 13163 tolerances on the cut dimensions are defined as follows:

Length: ± 3mm or ± 0.6% whichever is greater (L1)

Width: ± 3mm or ± 0.6% whichever is greater (W1)

Thickness: ± 2mm (T1)

Squareness: ± 5mm per 1000mm (S1)

Alternative tolerances can be provided for specific applications.

Dimensional stability

In accordance with BS EN 13163 = DS(N)5 ± 0.5% under constant laboratory conditions.

Density

The density range is 15-35kg/m³ for EPS types shown below.

Nominal Densities

EPS 70	15kg/m³
EPS 100	20kg/m³
EPS 150	25kg/m³
EPS 200	30kg/m³
EPS 250	35kg/m³

Standards

Where relevant, Jablite products are produced to the requirements of BS EN 13163 'Thermal insulation products for buildings – Factory made products of expanded polystyrene (EPS) – specification'.

Vencel Resil Limited has been assessed and approved to BS EN ISO 9001:2000 'Quality systems; for quality assurance in production, installation and servicing'.

Properties & Performance

(Please refer to the table on the previous page)

Mechanical properties

Jablite EPS has a high strength to weight ratio.

Tensile strength

Ranges from 20-400kPa, according to type and product.

Compressive strength

Ranges from 70-250kPa, according to type and product; method of test, BS EN 826.

Bending strength

Ranges from 115-350kPa, according to grade and product; method of test BS 4370:Part 1, method 4.

Design load

Ranges from 20-100kPa for 1% nominal strain, according to type and product; method of test EN 826.

Moisture Properties

Although Jablite has significant resistance to the passage of water vapour, it should not be regarded as a damp-proof membrane or vapour-control layer, and will not provide a barrier against damp penetration.

A suitable damp-proof membrane or vapour-control layer will be required in most forms of construction: see individual product and application data.

Fire Properties

In common with all organic materials, EPS is combustible. However, provided it is specified and installed correctly and in accordance with the manufacturer's instructions and BS 6203, it will not present any undue fire hazard.
The standard recommends that for all applications, the material should be protected by either a laminated facing layer, or should be protected by being fully enclosed by the form of construction.
Euroclass E 'flame-retardant' additive material is available for most applications: this reduces the rate of flame spread but should not be considered as offering enhanced fire performance.

Combustion

EPS is 'combustible' as defined in BS 476:Part 4.

When burning, EPS behaves like other hydrocarbons such as wood and paper. For Euroclass F material, the products of uncontrolled combustion are carbon monoxide, carbon dioxide, styrene, and water vapour; the decomposing styrene will give off a certain amount of dense black soot. Euroclass E material also emits hydrogen bromide when burning.

Ignition temperature

Flash ignition temperature is between 350 and 490°C depending on the application and the exact circumstances of use.

Under certain circumstances the material can be readily ignited by a naked flame but providing it is correctly installed, this does not present any disadvantage in use.

Calorific value

40MJ/kg.

Specific heat capacity

1.13kJ/kg°C.

Surface spread of flame

Unfaced material, regardless of type, should not be exposed when installed in habitable areas.

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Jablite

Expanded Polystyrene (EPS) Technical Information

Biological Properties

EPS will not sustain mould growth, and has no nutrient value to insects or vermin.

The material is non-biodegradable and care should be taken to dispose of waste and offcuts at a licensed waste site.

Thermal Properties

Thermal movement

Coefficient of linear expansion, 0.6 x 10-6/°C.

The material is sufficiently resilient and flexible that no allowance need be made for thermal expansion in the method of installation.

Jablite EPS is suitable for meeting, and in many cases exceeding, the thermal insulation requirements set out in the Building Regulations Approved Documents:

L1A
Conservation of fuel and power in new dwellings.

L1B
Conservation of fuel and power in existing dwellings.

L2A
Conservation of fuel and power in new buildings other than dwellings.

L2B
Conservation of fuel and power in existing buildings other than dwellings.

Reference can be made to individual products sections to obtain specific details on meeting thermal values with Jablite products.

Working temperature range

EPS can be used within the temperature range -150°C to +80°C.

Jablite EPS is unaffected by the normal range of climatic temperatures and can be safely used in cold stores and similar applications.

During installation, and in service, contact with hot-water pipes or other surfaces where the temperature is likely to exceed 80°C for continuous periods should be avoided.
A minimum 12mm air gap should be maintained between the insulation and hot-water pipes, or they should be lagged.

In roofing applications, care should be taken that hot bitumen is not allowed to 'pool' under the insulation during installation since this can result in burning of the underside.

Compatibility with other materials

EPS is soluble in aromatic, halogenated solvents and ketones; it should be protected from contact with hydrocarbons and strong solvents using a suitable membrane.
The material is unaffected by contact with solvent-free bitumen providing that, where necessary, the precautions set out above regarding temperature are observed.
EPS should not be permitted to come into contact with PVC-sheathed electrical cables since this will lead to migration of plasticiser from the PVC resulting in embrittlement of the cable sheath. Cables should be protected by the use of a physical barrier, for example by being enclosed in a conduit or by an air gap.

Service Life

Providing it is correctly installed and protected, Jablite will remain effective for the life of the building.

Storage

Store Jablite boards under cover, protected from high winds and out and out of direct sunlight. Care should be taken in storage not to bring the boards into contact with highly flammable materials such as paint, solvent or petroleum products. Smoking should be prohibited in the storage area and the products must not be exposed to flame or other ignition source.

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