Membrane Recommendation

Bituminous Felt | Asphalt | Single Ply

Application of the Roofing Membrane(s)

Adhesion

The application of the first layer of the roofing membrane should follow on immediately after every two completed rows of FOAMGLAS® have been applied. The membrane is applied in a full bed of hot bitumen. If the membrane to be used is not required to be fully bonded in bitumen to the FOAMGLAS® insulation, e.g. mastic asphalt roofing, it is required that the first layer only of the two waterproof building paper slip layers (e.g. kraft/polyethylene type according to BS1521) be fully bonded in a bitumen top coat to give additional protection from site foot traffic.

The second layer of paper should remain unbonded and be laid loose under the sheathing felt and mastic asphalt, which is laid to Code of Practice 144 Part 4. If the main roofing membrane is not compatible with bitumen (e.g. some PVCs), an appropriate separating layer must be used.

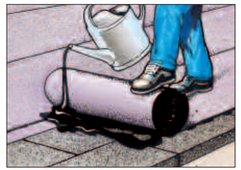
Work Stoppages

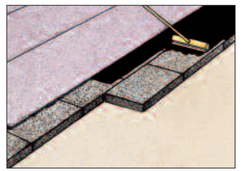
In order to avoid the retention of rainwater or dew in the open surface cells of the FOAMGLAS® slabs a bitumen mop coating should be applied to all areas of FOAMGLAS® not yet covered by the roofing membrane.

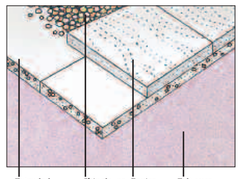
Membrane Protection

A 50mm layer of extruded polystyrene insulation should be laid over the weather-proof membrane, to provide protection from thermal shock, ultra-violet attack and excessive traffic. This layer contributes towards the overall design insulation value of the roof, although it could be classed as a semi-sacrificial layer, because its performance will deteriorate through ageing and the absorption of water vapour.

The FOAMGLAS® Compact Roof acts as the main insulation element, providing a long, maintenance-free life with no insulation deterioration; this ensures economical use of energy resources throughout the lifetime of the building. A layer of rounded shingle or concrete paviers should be laid (either direct or on supports) onto the extruded polystyrene to prevent wind-uplift and provide additional protection. Alternatively a combination tile could be used directly on the weather-proof membrane. Should the extruded polystyrene, the shingle, or even the membrane need replacement, this can usually be achieved without removing the FOAMGLAS®, thus providing great economies in future renovation costs.







FOAMGLAS

Specification Guide

Concrete Deck

– The FOAMGLAS® thermal insulation slabs of 600 x 450mm x ... mm are made of alumino silicated cellular glass composition. Type T4 WDS has a density of 115 kg/m³ and a thermal conductivity at 10ºC of k = 0.040 W/mK. Type T4 has a density of 120 kg/m³ and a thermal conductivity at 10ºC of k = 0.042 W/mK.

– The substrate shall be clean, dry and free of any irregularities in excess of 5mm over 2m. If required, an appropriate levelling screed shall be applied.

– On the dry and clean surface, a primer coat of bitumen emulsion type or cutback type shall be applied (coverage ± 0. 4 kg/m²).

– When the primer coat is completely dry, hot bitumen is applied to the substrate by the pouring can method and the slabs of cellular glass are pressed down and pushed diagonally into position.

– Bitumen shall be Type 95/25 or Type 115/15 dependent on conditions, care being taken to ensure that the hot bitumen is pressed well into the joints, to ensure a vapour-tight seal.

– The blocks are laid in parallel courses with staggered joints.

Profiled Metal Deck

– The FOAMGLAS® thermal insulation slabs of 600 x 450mm x ... mm are made of alumino silicated cellular glass composition. Type T4 WDS has a density of 115 kg/m³ and a thermal conductivity at 10ºC of k = 0.040 W/mK. Type T4 has a density of 120 kg/m³ and a thermal conductivity at 10ºC of k = 0.042 W/mK.

– On the dry and clean crowns, a primer coat of bitumen emulsion type or cutback type shall be applied (coverage: ± 0. 15 kg/m²).

– When the primer coat is completely dry the slabs of cellular glass shall be dipped into a tray of hot bitumen so that the lower face and two adjacent edges are covered completely with bitumen.

– The slabs are firmly pressed against the substrate and laid down in parallel courses with staggered joints, care being taken to ensure that the hot bitumen is pressed well into the joints to ensure a vapour-tight seal.

– Bitumen shall be Type 95/25 or Type 115/15 dependent on conditions.

– It is essential that no foot traffic is allowed on the FOAMGLAS® 5 to 10 minutes after laying, to ensure proper adhesion; this will result in the FOAMGLAS® providing an additional stiffening effect to the deck.

Built-up Felt Roofing

– The first layer of roofing membrane shall be ... (description of layer required) – and shall be fully bonded in hot bitumen Type 95/25 or Type 115/15 (or other adhesive approved by the manufacturer of the cellular glass), taking care not to entrap any moisture or air.

Subsequent layer(s) to be... (description). Layer(s) to be fully bonded in hot bitumen as above, or torch-applied where applicable, Surface finish to be ... (reflective treatment/mineral surface/etc).

Mastic Asphalt Roofing

– The first layer only of the two waterproof building paper slip layers, meeting BS1521 class A1F (e.g. Sisalkraft Type 822 or similar kraft/polyethylene), shall be fully bonded in a bitumen top coat to give additional protection from site foot traffic.

– The second layer shall be loose laid beneath the sheathing felt and mastic asphalt, which will be laid to Code of Practice 144 Part 4.

Single Ply Membranes

– Bitumen-compatible SP membranes are to be fully bonded in mop-applied hot bitumen, with laps sealed all in accordance with the appropriate manufacturer's instructions.

– Non-compatible membranes will require a separating layer (e.g. polyester fleece) prior to loose-laying and heat or solvent-sealing of laps, to manufacturer's instructions. In this instance, extra ballast may be required to counter wind-uplift.

– The use of mechanical fastenings is not recommended by Pittsburgh Corning, because they jeopardise the inherent vapour-tightness of the Compact Roof System.

– (In each case) For all work stoppages or at the day's end, the cellular glass surfaces that have not yet received the first layer of the roofing membrane, should be given a coat of hot bitumen.

Membrane Protection

Once the chosen membrane(s) have been installed, protection shall be provided by either 50mm extruded polystyrene insulation boards plus an appropriate weight of rounded shingle or concrete paviers, or an integrated insulated roof tile comprising 50mm extruded polystyrene and 15 or 20mm cementitious wearing surface, (may need adhering to membrane). The total weight should be calculated to provide sufficient resistance to flotation and wind-uplift, in accordance with BS 6399: Part 2.

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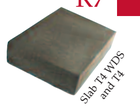
PITTSBURGH CORNING

R7.02.06

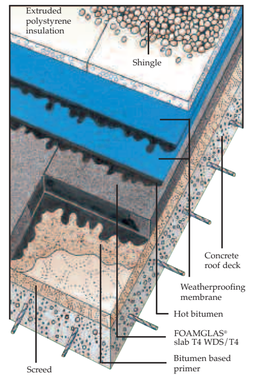
Designed and Produced by **SEL Ltd.** Birmingham.

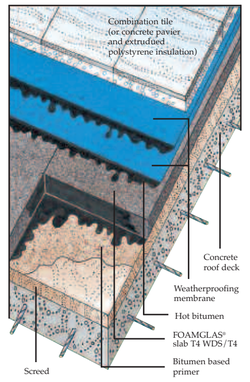
Insulation of Concrete and Metal Decks - New Build or Renovation

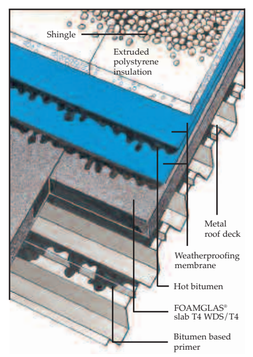


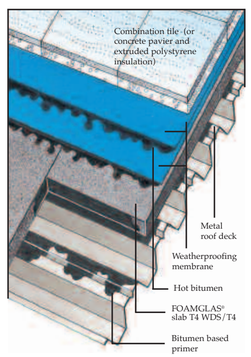
COMPACT DUO-ROOF has been developed by PITTSBURGH CORNING to provide the specifier with the ultimate in roof construction – long term weather-tightness and an insulation performance that does not deteriorate with age. It is a unique combination of the proven benefits of the FOAMGLAS® Compact Roof System and a Protected Membrane System (inverted roof).

The conventional inverted roof will not continue to perform thermally due to three factors:
(i) warm water run-off; (ii) escape of blowing agent; (iii) moisture/vapour absorption.
COMPACT DUO-ROOF minimises all these factors, thus providing long-term insulation performance and extended membrane life.









www.foamglas.co.uk

FOAMGLAS®
Cellular Glass Insulation

BUILDING REGULATIONS, Part L & J

All FOAMGLAS® systems meet the requirements of Building Regulations, with regard to air tightness of the building, the avoidance of cold bridging and sustainable construction. FOAMGLAS® systems will continue to fully perform for the lifetime of the building.

FOAMGLAS® COMPACT DUO-ROOF

USE OF FOAMGLAS®

The physical properties of FOAMGLAS® ensure that its insulation value does not deteriorate with age and make it the most cost-effective insulant when real performance in the medium to long term is required. Its impermeability to water and water-vapour eliminates the need for expensive and often inefficient vapour barriers. Breather felts and vents are also unnecessary. Remaining effective across an enormous temperature range of -273°C to +430°C, FOAMGLAS® also has a coefficient of linear expansion similar to concrete and steel, allowing the whole structure to behave as one during temperature variations. A high percentage of the insulation value in the roof build-up is provided by the FOAMGLAS® Compact Roof System. FOAMGLAS® is totally non-combustible and cannot contribute to a fire nor give off toxic fumes or smoke; it is also totally free from HCFC, HFA and pentane.

APPLICATIONS AND PRELIMINARY CONDITIONS

Access or limited access roofs subjected to foot traffic only, where the supporting element is either a reinforced concrete slab or a profiled metal deck.
All roofing membranes complying with relevant Codes of Practice and Building Regulations can be used with FOAMGLAS®.
Concrete substrates should comply with usual Codes of Practice. Expansion joints should be continued through the structure.
Profiled metal roof decking should be of a minimum thickness of galvanised steel of 0.7mm. The maximum deflection of the metal decking should not exceed 1/240 span under the maximum designated loading. The additional stiffening effect obtained from the FOAMGLAS® being firmly bonded in hot bitumen to the metal deck must be ignored for design purposes. (If the trough depth exceeds 90mm, or the trough width exceeds 140mm, please contact PITTSBURGH CORNING (UK) LIMITED).
FOAMGLAS® should be applied to a clean and dry substrate and this should preferably take place when the ambient air temperature and temperature of the substrate are above 5°C.

PREPARATION OF THE SUBSTRATE

Irregularities of concrete decks should not exceed 5mm over 2m. If uneven, an appropriate levelling screed should be applied to meet these requirements. Profiled metal roof decking should be installed following the manufacturer's instructions and in both cases the requirements of the structural engineer must be adhered to.

PRIMER COAT

The concrete or crowns of metal decking should receive a bitumen primer coat, applied by brush, roller or spray and allowed to dry.
Coverage: metal ± 0. 15 kg/m²
concrete ± 0.4 kg/m²

Ecologically FOAMGLAS® cellular glass meets the most stringent demands for an environmentally sound material. In manufacturing, 66% post-consumer waste glass is utilised, combined with a manufacturing process which minimises energy. The result is an insulation material which provides high performance throughout the lifetime of the building, through to its eventual disposal as an inert material or its re-use. FOAMGLAS® is totally free from HCFC, HFA and pentane, exceeds the requirements of the Building Regulations and has Agrément Certification.

THICKNESS OF FOAMGLAS® TYPE T4 WDS OR T4

The dew point temperature should be situated in the cellular glass, in order to avoid condensation, either interstitial or surface.
Design criteria:
- temperature below deck ≤ 20°C
- internal relative humidity ≤ 55%
- external temperature ≥ -10°C.
- no false ceiling, or a ventilated false ceiling.
- the build-up allows for heat losses due to water run-off and for the inevitable ageing and gradual moisture uptake of the extruded polystyrene layer.

CONCRETE DECK (100MM MIN) OR PROFILED METAL DECK 0.7MM

Roof build-up as follows:
Ballast (rounded stone or paviers)
Extruded polystyrene 50mm
High performance bitumen membrane or mastic asphalt
FOAMGLAS® T4 WDS/T4
Deck (concrete or metal)

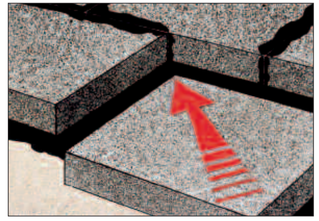
Table shows thickness of FOAMGLAS® T4 WDS or T4 required to meet Part L and J of UK Building Regulations dependent upon building usage.

W/mK	Concrete deck 100mm	Metal deck 0.7mm
0.25	90mm	100mm

Major Compact Duo-Roof Project.

FOAMGLAS® APPLICATION ON CONCRETE DECKS

The slabs of FOAMGLAS® are laid in parallel courses with staggered joints, into hot bitumen (Type 95/25 or Type 115/15) with a coverage of at least 4kg/m².
The hot bitumen is poured onto the substrate in sufficient quantity and the slabs are pressed down and pushed in a diagonal direction, until the bitumen squeezed up into the joints shows on top, indicating that the joints are well butted together and fully adhered.
Cutting and detail work can be done using a rigid saw or craft knife.



FOAMGLAS® APPLICATION ON METAL DECKS

Of the various methods that can be used to apply FOAMGLAS® slabs, we recommend the following:
1) Bitumen Tray
The tray is placed directly onto the metal deck. Using a pair of tongs, proceed to dip the lower face and two adjacent edges of each FOAMGLAS® slab into the hot bitumen, before installing onto the substrate.
2) Mobile Bitumen Boiler
Equipped with a heating device and also a platform to store a number of FOAMGLAS® slabs, this equipment speeds up application.

FOAMGLAS® is laid in parallel courses with staggered joints, with the long sides of the slabs laid parallel to the troughs of the decking.
Once dipped in bitumen, the slabs should be pressed firmly into place. All joints to be well butted together and completely filled with bitumen.