



Building Solutions



Dow Building Solutions



Top ten reasons to specify
STYROFOAM-A XPS in inverted roofing

By Richard Powell, Roofing Manager,
Dow Building Solutions



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The inverted roof system was invented by Dow over 50 years ago, using STYROFOAM™ extruded polystyrene (XPS) as the insulation layer. Since then, it has built a strong reputation because:

- » placing ROOFMATE™ SL-A thermal insulation above the waterproof layer helps to maintain the temperature of the waterproofing close to that of the building's interior, protects the waterproofing from UV radiation and avoids mechanical damage;
- » covering a waterproofing layer with effective, durable and moisture resistant insulation gives protection from the wide temperature fluctuations experienced on a flat roof, including repeated freeze/thaw cycles;
- » installing insulation above the waterproofing means insulation can be added without disturbing the waterproof layer and is more easily lifted and replaced if the building is altered; a key advantage in this era of refurbishment, renovation and improvement of existing building stock.

There are good reasons why STYROFOAM-A material ROOFMATE SL-A has earned its reputation as a reliable and durable insulation material for an inverted roof system.



Extrusion of foamed polystyrene results in a material that has uniformly small, closed cells and a smooth surface 'skin'.

This produces a set of properties which is not commonly found in one package.



ROOFMATE SL-A supports a green roof design on the Giant's Causeway Visitors' Centre designed by [heneghan.peng.architects](#)

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Here are the top ten reasons why I recommend STYROFOAM to building designers and roofers:

1. NEW thermal conductivity across the STYROFOAM-A product range

Thermal conductivity values were lowered by 0.002 W/mK across the STYROFOAM-A range including ROOFMATE SL-A at the end of 2011, allowing users to achieve even lower U-values from previously required insulation thicknesses and making STYROFOAM-A one of the best XPS performers in the UK market.

2. Single extruded thicknesses up to 200mm

Designers are increasingly required to achieve more stringent energy efficiency targets in order to meet demands set by the Code for Sustainable Homes and BREEAM, for example, increasing the need for thicker insulation. Understanding that offering thicker insulation - enabling single layers - promotes more efficient installation on site, Dow Building Solutions offers ROOFMATE SL-A in single extruded thicknesses up to 200mm to help meet that need.

3. Excellent resistance to water absorption

STYROFOAM's closed cell structure makes it highly resistant to water, whether as rain, snow, frost or water vapour, giving it an excellent performance in terms of moisture resistance and freeze/thaw performance, a vitally important attribute in exposed rooftop conditions. Nevertheless, the special nature of the inverted roof application means that the insulation needs to be assessed for any effects of water absorption by diffusion and by freeze/thaw cycles. One of the reasons STYROFOAM is ideal for use in inverted roof applications is its moisture resistance: tests have shown that even after 300 cycles of freezing and thawing, water pickup by this mechanism is less than 1% by volume*.

4. High compressive strength

STYROFOAM's structure gives the foam great rigidity and, in load-bearing applications, makes it highly resistant to compression. Dow Building Solutions offers materials with compressive strengths from 300 to 700 kN/m², giving a range of options when it comes to supporting building services equipment on rooftops whilst maintaining durability and lifetime thermal efficiency.

5. Good long term mechanical performance

Inverted roof insulation must withstand constant loadings from ballast material, for example, without suffering substantial alterations to thickness which could affect thermal performance.

Declaring the design load of insulation products allows specification against the long term requirements of a building by offering an indication of a material's mechanical strength over a building's expected lifetime. STYROFOAM's closed cell structure gives ROOFMATE SL-A excellent mechanical strength and a design load - the load which will give maximum deflection of 2% over 50 years - of 130kN/m².

6. Long term protection of waterproofing layers

When properly installed, STYROFOAM boards have a service life comparable with that of the building or structure, meaning they help protect waterproofing layers from thermal shock, UV damage and maintenance during the expected lifetime of a building.

7. Rot resistance, making it ideal for green roofs

STYROFOAM boards have low susceptibility to rot, meaning mould or fungal growth is minimised. The material also provides support for drainage layers and growth mediums on green roofs thanks to its good compressive strength sustaining high design loads, and can also help to protect the waterproofing layer against root penetration.

* All STYROFOAM products are manufactured in accordance with BS EN 13164.

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8. ROOFMATE SL-A boards have shiplapped edges

Shiplapped edges offer a good interlock between boards, not only helping to prevent thermal bridging but also acting against wind uplift, which is particularly important in exposed conditions. The boards can also be cut accurately and to close tolerances thanks to their uniform density and homogeneous cell structure.

9. Rigidity giving a firm base for ballast layers

The high compressive strength of ROOFMATE SL-A, sustaining high design loads - along with rigidity of the board giving stability - allows for a range of ballast material including gravel, soil and concrete slabs.

10. A Global Warming Potential of less than five

STYROFOAM-A products use carbon dioxide as the main blowing agent, so that the Ozone Depletion Potential (ODP) is zero and the Global Warming Potential (GWP) is less than five. STYROFOAM insulation is also certified to ISO 14001:2004.



ROOFMATE SL-A features on several structures designed for the London 2012 Olympic Games including the Olympic Stadium, International Broadcast Centre, London 2012 Olympic and Paralympic Village and The Copper Box (Handball Arena)

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And finally...

- ✓ Look for the CE mark: all STYROFOAM products are CE-marked, meaning specifiers, installers and end-users can rely on the fact that declared lambda values are made in accordance with BS EN 13164:2008 and BBA datasheet No 40/10.
- ✓ Always remember that corrections must be made for moisture diffusion and rainwater cooling when making calculations and assessing inverted roof U-values for specific projects.

*For technical support or help calculating a U-value contact our Technical Services Team on **FKLTECH@dow.com**.*

Literature and a stockist list can be found at

www.styrofoam.co.uk.

For more details contact Dow Building Solutions

*by email on **FKLMAIL@dow.com** and one of the account managers will be in touch.*



(Picture courtesy of London 2012)

Recommendations

STYROFOAM products include FLOORMATE, ROOFMATE and PERIMATE.

STYROFOAM products contain a flame retardant additive to inhibit accidental ignition from a small fire source. STYROFOAM is, however, combustible and if exposed to an intensive fire may burn rapidly.

During shipment, storage, installation and use STYROFOAM products should not be exposed to flames or other ignition sources. Fire classification is based on small scale tests, which may not reflect the reaction of the products in its end use state under actual fire conditions. STYROFOAM products should, when installed, be adequately protected from direct exposure to fire.

Recommendations about the methods, use of materials and construction details are given as a service to designers and contractors. These are based on the experience of Dow with the use of STYROFOAM products.

Any drawings offered by Dow are meant only to illustrate various possible applications and should not be taken as a basis for design. Since Dow is a materials supplier and exercises no control over the installation of STYROFOAM products, no responsibility is accepted for such drawings and recommendations.

In particular, no responsibility is accepted by Dow for the systems in which STYROFOAM is used or the method of application by which it is installed. The legal obligations of Dow in respect of any sale of STYROFOAM products shall be determined solely by the terms of the respective sales contract.

Note:

The information and data contained in this brochure do not represent exact sales specifications. The features of the products mentioned may vary. The information contained in this document has been provided in good faith, however Dow excludes as far as possible any liability relating to it and does not give any guarantee or assurance of product performance. It is the purchaser's responsibility to determine whether these Dow products are suitable for the application desired and to ensure that the site of work and method of application conform with current legislation. No licence is hereby granted for the use of patents or other industrial or intellectual property rights. If Dow products are purchased, we advise following the most up-to-date suggestions and recommendations.

Visit www.styrofoam.co.uk for further information on STYROFOAM-A insulation products and adhesives and sealants from Dow Building Solutions, or email FKLMAIL@dow.com and one of the account managers will be in touch.

For technical enquiries email FKLTECH@dow.com.

Alternatively, please contact us at:



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