

# Product Data Sheet

## HYTHERM EPS 200 / EPS 300

Insulation for Inverted Roofs

**Axter Hytherm EPS 200 and EPS 300 are durable, lightweight, rigid expanded polystyrene insulation (EPS) boards with low water absorption properties. They are used in conjunction with the Axter water flow reducing layer and are suitable for roofs with maintenance access, roof terraces and balconies and in tapered schemes.**

### Key benefits

- Lightweight, easy to install.
- Excellent compression properties.
- High dimensional stability
- Resistant to moisture and the effects of freeze/thaw.
- Overlap on boards prevents uplift during installation.
- Single layer installation up to 240mm.
- Suitable for use on flat roofs with zero pitch and slopes between 1:80 and 1:6.
- Manufactured in accordance with BS EN 13163, BS EN ISO 14001 and BS EN ISO 9001.
- GWP (Global Warming Potential) <5.
- ODP (Ozone Depletion Potential) zero.
- BBA and ETAG 031 approved.
- BRE Green Guide Rating A+ (see Sustainability section).

## Application

Hytherm EPS 200 / 300 insulation can be used in conjunction with hot melt and bituminous waterproofing, mastic asphalt, single ply (PVC\*, TPO, EPDM) or liquid applied polyurethane systems (\*with a PVC single ply membrane, an isolating layer such as polyester fleece or fibreglass fabric must be installed between the insulation and the membrane).

Hytherm EPS 200 is suitable for roofs where normal maintenance traffic is expected. Hytherm EPS 300 should be selected for roof terraces or balconies. The insulation boards are loose laid over the waterproofing with no requirement to adhere or mechanically fix the boards, ensuring all overlap joints are tightly butted together. Boards are laid in a staggered pattern starting from the point of access to the roof. The Axter Water Flow Reducing Layer and gravel ballast and/or paving slabs secure the insulation to the deck.

## Axter Water Flow Reducing Layer

The water flow reducing layer (WFRL) is a non-woven polypropylene flexible membrane supplied as part of the inverted roof insulation system. This helps to minimise water flow below the insulation and the cooling effect on the deck, improve thermal performance and reduce the flotation effect and the weight of ballast required. The layer allows water vapour from below to permeate and reduces the risk of condensation being trapped within the construction.

## Axter Water Flow Reducing Layer

Length (m)	Width (m)	Area per roll (m <sup>2</sup> )	Water vapour resistance to BS EN ISO 12572 (MNs/g)
100	3	300*	0.011

\* Not allowing for overlap (300mm).

The water flow reducing layer is loose laid over the insulation running across the fall of the roof with 300mm overlaps. It is turned up at all roof penetrations and upstands to a height to ensure it finishes above the level of the ballast or paving.

## Compressive Strength

Where paving slabs are to be placed over the insulation on paving supports the point loads should be calculated to an equivalent uniformly distributed load. Long term compressive creep – the 1% compressive strength value should be used when designing for roofs with pedestrian traffic or other temporary imposed loads. Where Hytherm EPS 200 / 300 inverted insulation is installed on a roof where heavy items such as air handling units or water tanks will place a permanent extra load on the insulation, the calculation should allow for compressive creep. The design load to use for this application is 30% of the 10% compressive strength figure. This will result in less than 2% compression in the insulation boards over 50 years.

Design loads for long term compressive creep (kN/m <sup>2</sup> )	Hytherm EPS 200 inverted	60
	Hytherm EPS 300 inverted	90

**Hytherm EPS 200 / EPS 300 – Sizes Available**

Thickness	Length	Width	m <sup>2</sup> /board	Boards/pack
50	1200	1200	1.44	24
70	1200	1200	1.44	17
80	1200	1200	1.44	15
90	1200	1200	1.44	14
100	1200	1200	1.44	12
110	1200	1200	1.44	11
120	1200	1200	1.44	10
125	1200	1200	1.44	10
130	1200	1200	1.44	9
140	1200	1200	1.44	8
150	1200	1200	1.44	8
155	1200	1200	1.44	7
160	1200	1200	1.44	7
170	1200	1200	1.44	7
180	1200	1200	1.44	7
190	1200	1200	1.44	6
195	1200	1200	1.44	6
200	1200	1200	1.44	6
205	1200	1200	1.44	6
210	1200	1200	1.44	6
215	1200	1200	1.44	5
220	1200	1200	1.44	5
225	1200	1200	1.44	5
230	1200	1200	1.44	5
240	1200	1200	1.44	5

## Thickness of Inverted Board to Achieve Specified U-Value

The thickness of insulation required to achieve a specific U-value depends on the roof deck construction. The figures below are guidelines and apply only when used with the Axter water flow reducing layer.

This table below is based on an inverted roof construction of 150mm reinforced concrete deck, structural waterproofing, Hytherm EPS 200 / EPS 300 insulation and Axter water flow reducing layer. Drainage factor  $f_x = 0.001$  and average rate of participation ( $P$ )  $\leq 3.000$  (mm/day).

Hytherm EPS 200 Thickness (mm)	Hytherm EPS 300 Thickness (mm)	U Value (W/m <sup>2</sup> K)
145	145	0.25
150	150	0.24
155	155	0.23
165	165	0.22
170	170	0.21
180	180	0.20
190	190	0.19
200	200	0.18
210	210	0.17
225	225	0.16
240	240	0.15
260	260	0.14
275	275	0.13
300	300	0.12
325	325	0.11
355	355	0.10

## Hytherm EPS 200 / EPS 300 – Technical Characteristics

Properties	Hytherm EPS 200	Hytherm EPS 300
<b>Dimensions</b>		
Board size mm	1200 x 1200 with 15mm rebated edges	1200 x 1200 with 15mm rebated edges
Board coverage	1.44m <sup>2</sup>	1.44m <sup>2</sup>
Board thickness mm	50mm to 240mm	50mm to 240mm

Properties	Hytherm EPS 200	Hytherm EPS 300
<b>Thermal Properties</b>		
Declared thermal conductivity W/mK	0.033	0.033
Corrected thermal conductivity W/mK	0.038	0.038
<b>Mechanical Properties</b>		
Design load at 10% nominal compression kN/m <sup>2</sup>	200	300
Design load at 1% nominal compression kN/m <sup>2</sup>	90	120
Bending strength kN/m <sup>2</sup>	250	450
<b>Moisture properties</b>		
Long term water absorption by immersion BS EN 12087	≤1%	
Long term water absorption by diffusion BS EN 12088	≤1%	
<b>Fire Performance</b>		
Classification to BS EN 13501-1	Euroclass E (BS EN 13501-1)	
Designation to BS 476-3	Designated AA (low vulnerability in Scotland) when used within a ballasted inverted roof construction	

## Sustainability

Properties	Inverted EPS 200	Inverted EPS 300
EPS Rating: BRE Green Guide The BRE Green Guide to Specification ( <a href="http://www.bre.co.uk/greenguide/">www.bre.co.uk/greenguide/</a> ) provides guidance on how to make the best environmental choices when selecting construction materials and components.	A+ Element number 815320025	A+ Element number 1315320001
Ozone Depletion Potential (ODP)	Zero	
Global Warming Potential (GWP)	< 5	
BREEAM Compliance	YES	
Hytherm EPS 200 / 300 is manufactured in factories which are ISO14001 certified and raw material comes from suppliers who are ISO14001 certified.		
Hytherm EPS 200 / 300 insulation is 100% recyclable.		

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