# Product Data Sheet

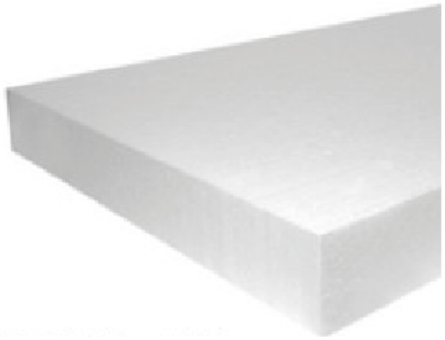
## HYTHERM EPS ADH
Insulation

### High performance insulation for warm roofs

Axter Hytherm EPS ADH is a durable, lightweight, rigid expanded polystyrene (EPS) insulation available in both uniform and tapered boards for use in warm flat roofs with limited access and balconies and terraces with regular pedestrian traffic.

### Key benefits

- BBA approved
- Fast, easy installation
- Lightweight, easy to handle
- Excellent compressive strength
- Long lasting dimensional stability
- Resistant to moisture
- Manufactured to requirements of BS EN 13163, BS EN ISO 14001 and BS EN ISO 9001
- A+ rated in the BRE Green Guide to Specification
- Zero ODP and virtually zero GWP



## Product information

Hytherm EPS ADH is a closed cell expanded polystyrene (EPS) insulation board suitable for use in warm flat roof constructions. The following options are available:

- Hytherm EPS ADH (150 kPa standard board)
- Hytherm EPS 300
- Hytherm EPS 500

These boards are supplied:

- with a laminate for use with reinforced bitumen membranes, EPDM, cold applied liquid waterproofing and membranes where solvent based adhesives are used (single ply TPO, PVC with no backing)
- as un-faced EPS for use with fleece backed single ply PVC membranes and where only solvent free adhesives are used (TPO mechanically fixed or fully adhered)

Hytherm EPS ADH is lightweight and easy to install. It is manufactured in accordance with BS EN ISO 13163 under a Quality Assurance System approved to BS EN ISO 9001 and Environmental Management System to ISO 14001.

## HYTHERM EPS ADH – Technical Characteristics

| Properties | Measure unit | Value |
|---|---|---|
| **Dimensions** | | |
| FLAT BOARD | | |
| Board size | mm | 1200 x 1200<br>1200 x 900<br>1200 x 600 |
| Board minimum thickness | mm | 20mm |
| Board maximum thickness | mm | 600mm |
| TAPERED BOARD | | |
| Board size | mm | 1200 x 1200<br>1200 x 900<br>1200 x 600 |
| Board minimum thickness | mm | 20mm |
| Board maximum thickness | mm | 600mm |
| | | |
| Working temperature range | °C | -150 to +80 |
| Bending strength | kPa | 200 |
| Water vapour diffusion resistance factor | μ | 30-70 |
| Water vapour permeability δ mg/(Pa.h.m) | 0.009-0.020 | |

| Properties | Measure unit | Value | |
|---|---|---|---|
| Vapour resistivity (MNs/gm) | 238 | | |
| Fire performance – Euroclass (BS EN 13501-1) | E | | |
| EPS Rating: BRE Green Guide | EPS ADH 150 | EPS ADH 300 | EPS ADH 500 |
| | A+ | A | A |
| Ozone Depletion Potential (ODP) | Zero | | |
| Global Warming Potential | < 5 | | |

## Compressive strength

Hytherm EPS ADH has a high compressive strength capability and the choice of grade will be dependent on the calculated imposed load. Where heavy objects are supported on spacer pads the point load exerted on the insulation should be calculated to an equivalent uniformly distributed load. Example calculation for an air handling unit on spacer pads is shown later.

To help in the assessment of which grade to specify or use the compressive strengths are given in the table below.

| Properties | | | | |
|---|---|---|---|---|
| | | Hytherm EPS ADH (150) | Hytherm EPS ADH (300 | Hytherm EPS ADH (500) |
| Thermal Conductivity (lambda) | W/mK | 0.035 | 0.033 | 0.033 |
| Design load at 1% nominal compression | kPa | 70 | 120 | 190 |
| Design load at 10% nominal compression | kPa | 150 | 300 | 500 |

## Designing for 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 there will be a permanent extra load imposed on the insulation (water tanks, air handling units) the calculation should allow for compressive creep. air handling units, water tanks or similar heavy items. Hytherm EPS ADH has been tested and assessed for long term compression in accordance with BS EN ISO 1606 – Thermal insulating products for building applications. Determination of compressive creep.

The design load allowing for creep is 30% of the 10% compressive strength figure. Under this design load Hytherm EPS ADH will compress less than 2% of its original thickness over 50 years.

| Design loads for long term compressive creep (kN/m²) | |
|---|---|
| Hytherm EPS ADH 150 | 45 |
| Hytherm EPS ADH 300 | 90 |
| Hytherm EPS ADH 500 | 150 |

**Example Point Load Calculation**

| | |
|---|---|
| Air handling unit (AH) | 2000kg |
| Square space loads | 300 x 300mm x 4 no. |
| Convert AHU weight to kN | 2000 x 0.00981 = 19.62 kN |
| Area of four support pads | 0.300 x 0.300 x 4 = 0.36 $m^2$ |
| Load on Hytherm EPS ADH insulation board through support pads | **19.65 KN ÷ 0.54$m^2$ = 54.50 $kN/m^2$** |

In this example the AHU load has been spread sufficiently by using large spacer pads to enable the Hytherm EPS ADH 200 board to be used as the insulation allowing for compressive strength for creep at 60 $kN/m^2$.

## U Values

The table below shows the thickness of Hytherm EPS ADH required to achieve the specific U values shown; calculations have been carried out in accordance with BS EN ISO 6946

| U Value | Thickness – Hytherm EPS ADH Flat Board | |
|---|---|---|
| | 150 | 300-500 |
| 0.30 | 100 | 95 |
| 0.25 | 125 | 115 |
| 0.22 | 140 | 135 |
| 0.20 | 155 | 150 |
| 0.18 | 175 | 165 |
| 0.15 | 210 | 200 |
| 0.10 | 320 | 300 |

## Environment and Sustainability

**Hytherm EPS ADH (150 kPa) has an A+ rating**
in the BRE Green Guide (Element Number 815320023 – 815220025)

**Hytherm EPS ADH 300 and Hytherm EPS ADH 500 have an A rating**
in the BRE Green Guide (Element Number 1315320001)

The BRE Green Guide to Specification - www.bre.co.uk/greenguide/ - provides guidance on how to make the best environmental choices when selecting construction materials and components.

The insulation has an Ozone Depletion Potential (ODP) of zero and a virtually zero Global Warming Potential (GWP).

Hytherm EPS ADH flat boards are 100% recyclable.

## Tapered insulation

Hytherm EPS ADH insulation board are available as a tapered insulation to create the falls required on the roof to provide adequate water flow to the drainage outlets. Using the EPS insulation layer to create the roof falls helps to reduce the overall weight of the roof structure and speeds up construction.

The following are part of Axter's Hytherm EPS ADH tapered scheme design service. For further details please contact us.

- Bespoke project design
- Layout drawings to assist installation
- Tapered insulation board cut to falls and marked with reference letters as shown on the layout drawings
- Gutter boards – flat or tapered to a slight fall such as 1:120
- Single piece pre-cut hop and valley corner joints

## Installation

Hytherm EPS ADH is suitable for installation over all deck types. The roof deck must be level, even and dry to reduce the risk of high levels of condensation once the insulation and waterproofing are installed.For refurbishment projects the existing deck or waterproofing must be free of loose chippings and any defects made good.

Using flat boards, installation will start from the point of access to the roof. For a tapered scheme the boards are laid from the start points shown on the design drawing provided.

Although Hytherm EPS ADH has significant resistance to the passage of water vapour, it should not be considered to be a vapour control layer and will not provide a barrier against damp penetration. A suitable waterproof membrane will be required in most forms of construction. For full details of the complete roof waterproofing system and the installation method, refer to the relevant Axter specification and recommendations.

Hytherm EPS ADH 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.

Correctly installed and protected, Hytherm EPS ADH will remain effective for the life of the building.

**Storage:** Hytherm EPS ADH boards should be kept under cover and protected from high winds and direct sunlight. Boards should not 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, e.g. enclosed by an air gap or in a conduit.

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