

## What is XPS (extruded polystyrene foam):

### Production:

Extruded polystyrene hard foam (XPS) is produced on extruding machines in the form of continuous foam billets. In the extruder polystyrene is melted and, after addition of CO<sub>2</sub> (carbon dioxide) or in other countries HFCKW (partially halogenated fluorochlorohydrocarbon) as a foaming agent, extruded through a nozzle with wide slit to obtain a foam billet. Thicknesses between 20 and 200 mm can be produced. After running through a cooling zone the billet can be sawed into panels in a subsequent machine and the edges formed. The foam skin remains on the outer surfaces of the panels. When used for "insulation under plaster" the foam skin is either removed, giving the panel a rough surface, or the surface is embossed to obtain a waffle pattern. After cutting to size the panels are aged to ensure dimensional consistency.

### Properties:

Extruded polystyrene hard foam is a closed-cell foam material which absorbs only minimum quantities of moisture. XPS is only slightly resilient and is resistant to rotting and aging. Extruded polystyrene foam is not resistant to UV light.

### Characteristic values:

Thermal conductivity $\lambda(R)$ :	0.035-0.045 W/(m·K)
Spec. thermal storage capacity c:	1,500 J/(kg·K)
Water vapor diffusion resistance $\mu$ :	80-200
Construction material class:	B 1 flame resistant
Resistance to temperature:	75 °C (long-term at 5 kN/m <sup>2</sup> ) °C (short-term)
Bulk density $\rho$ :	25-45 kg/m <sup>3</sup>
Resistance to pressure:	0,15-0,70 N/mm <sup>2</sup> (compressive strength at 10% compression acc. to DIN EN 826) 0.06-0.25 N/mm <sup>2</sup> (compressive strength at <2% compression)
Expansion coefficient:	$6-8 \cdot 10^{-5} 1/K$
Primary energy content:	450-1,000 kWh/m <sup>3</sup>

### Applications:

Roofs: Flat roofs, inverted roofs  
 Ceilings: Floor insulation with high load-bearing capacity  
 Walls: Plinth area  
 Basements/cellars: Perimeter insulation  
 in presence of moisture  
 Swimming pool insulation  
 Load bearing insulation, special applications.

### Remarks:

In Germany XPS is produced without using any FCHC's as foaming agents

### Environmental aspects:

+ down recycling possible and economical.  
 - In event of fire hazardous substances can be released, limited quantity of raw materials, present use of H-FCHC (imported goods), initial materials toxic

**Standards:**

DIN EN 13164:2001-10

Thermal insulation products for buildings – Factory made products of extruded polystyrene (XPS) – Specification; German version EN 13164:2001

DIN 18164-1:1992-08,

Thermal insulating products for building applications;  
Insulating materials for thermal insulation

DIN 18,164-2:2001-09

Thermal insulating products for building applications;  
Insulating materials for impact sound insulation; Polystyrene particle foam materials

ÖNORM B 6053 XPS-G/-R

ÖNORM EN 13164

Thermal insulation products for buildings – Factory made products of extruded polystyrene – Specification

**Additional information:**

<http://www.fpx-daemmstoffe.de>

**Manufactured by:**

BASF Aktiengesellschaft,  
DOW Deutschland GmbH & Co. KG  
Austrotherm Dämmstoffe GmbH  
Jackodur GmbH