

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

**ETA-18/0015**  
**of 10 April 2018**

English translation prepared by DIBt - Original version in German language

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

XENERGY SLP,  
XENERGY 500P

Product family  
to which the construction product belongs

Extruded polystyrene foam boards as load bearing layer  
and / or thermal insulation outside the waterproofing

Manufacturer

Dow Deutschland Anlagengesellschaft mbH  
Am Kronberger Hang 4  
65824 Schwalbach  
DEUTSCHLAND

Manufacturing plant

Werk 1:  
F-67410 Drusenheim  
Werk 2:  
D-06258 Schkopau

This European Technical Assessment  
contains

7 pages including 1 annex which form an integral part of  
this assessment

This European Technical Assessment is  
issued in accordance with Regulation (EU)  
No 305/2011, on the basis of

EAD 040650-00-1201

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## Specific part

### 1 Technical description of the product

The extruded polystyrene foam boards are made of rigid cellular plastics material extruded from polystyrene or one of its copolymers and which has a closed cell structure. The blowing agent mixture is carbon dioxide (CO<sub>2</sub>) and isobutane. The extruded polystyrene foam boards have a skin on both surfaces and a special edge treatment (shiplap).

The extruded polystyrene foam boards do not contain Hexabromocyclododecane (HBCD).

The extruded polystyrene foam boards have the following designations:

"XENERGY SLP" and

"XENERGY 500P".

The extruded polystyrene foam boards are manufactured with the following dimensions:

Nominal thicknesses: 80 mm to 120 mm

Nominal length: 1250 mm

Nominal widths: 600 mm

The European Technical Assessment has been issued for the product on the basis of agreed data/information, deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed. The European Technical Assessment applies only to products corresponding to this agreed data/information.

### 2 Specification of the intended use in accordance with the applicable European Assessment Document

The extruded polystyrene foam boards are intended to be used as load bearing layer and/or thermal insulation underneath foundation slabs inside or outside the waterproofing. The boards are laid uniformly on the substrate to which they are applied.

The performance according to section 3 only applies if the thermal insulation boards are installed according to the manufacturer's installation instructions and if they are protected from precipitation, wetting or weathering during transport and storage before installation.

Concerning the application of the thermal insulation boards, also the respective national regulations shall be observed.

Where the thermal insulation boards are fixed by using adhesives, only such adhesions shall be used, which are suitable for this purpose. The assessment of these fixings is not subject of this European Technical Assessment.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the extruded polystyrene foam boards of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

### 3 Performance of the product and references to the methods used for its assessment

For sampling, conditioning and testing the provisions of the EAD No 040650-00-1201 "Extruded polystyrene foam boards as load bearing layer and/or thermal insulation outside the waterproofing" apply.

#### 3.1 Mechanical resistance and stability (BWR 1)

| Essential characteristic  | Performance  |
|---|--|
| Compressive stress at 10 % deformation or compressive strength<br>test acc. to EN 826:2013<br>"XENERGY SLP"<br>"XENERGY 500P"   | Level (individual values may fall below this level up to 10 %):<br><br>≥ 300 kPa<br>≥ 500 kPa  |
| Slip deformation  | No performance assessed  |
| Compressive stress or compressive strength in the transverse and longitudinal directions  | No performance assessed  |
| Characteristic value of compressive stress or compressive strength<br>5 %-fractile value for a one-sided confidence level of 75 % under unknown or known variance using ISO 12491:1997<br>"XENERGY SLP"<br>"XENERGY 500P" | $\sigma_{0,05} = 364 \text{ kPa}$ (n= 50; $\sigma_{\text{mean}} = 471 \text{ kPa}$ ; $s_{\sigma} = 64 \text{ kPa}$ )<br>$\sigma_{0,05} = 528 \text{ kPa}$ (n= 18; $\sigma_{\text{mean}} = 609 \text{ kPa}$ ; $s_{\sigma} = 43 \text{ kPa}$ ) |
| Compressive creep   | See Annex A  |
| Behaviour under shear load (large-sized specimen)   | No performance assessed  |
| Creep under shear load  | No performance assessed  |
| Creep under combined compressive and shear load   | No performance assessed  |
| Compressive modulus of elasticity   | No performance assessed  |
| Adhesion behaviour under compressive and shear load on large-sized samples  | No performance assessed  |
| Shear strength  | No performance assessed  |
| Density<br>test acc. to EN 1602:2013<br>"XENERGY SLP"<br>"XENERGY 500P"   | density range:<br>34 kg/m <sup>3</sup> - 38 kg/m <sup>3</sup><br>39 kg/m <sup>3</sup> - 42 kg/m <sup>3</sup>   |

#### 3.2 Safety in case of fire (BWR 2)

| Essential characteristic                             | Performance                                  |
|--|--|
| Reaction to fire<br>test acc. to EN ISO 11925-2:2010 | Class E<br>acc. to EN 13501-1:2007 + A1:2009 |

### 3.3 Energy economy and heat retention (BWR 6)

| Essential characteristic  | Performance   |
|---|---|
| <p>Thermal conductivity<br/>at mean reference temperature of 10 °C<br/>test acc. to EN 12667:2001 or EN 12939:2001 and<br/>aging procedure acc. EN 13164:2012+A1:2015,<br/>Annex C with deviating storage time period (sliced<br/>specimen) of (90 +2/-2) days prior to testing</p> <p>"XENERGY SLP"<br/>thickness d = 80mm<br/>thickness 80 &lt; d ≤ 120mm</p> <p>"XENERGY 500P"<br/>thickness 80 ≤ d ≤ 120mm</p> <p>Moisture conversion coefficient</p> | <p><math>\lambda_{D(90d)} = 0,031 \text{ W/(m} \cdot \text{K)}</math><br/><math>\lambda_{D(90d)} = 0,032 \text{ W/(m} \cdot \text{K)}</math><br/><math>\lambda_{D(90d)} = 0,032 \text{ W/(m} \cdot \text{K)}</math><br/>No performance assessed</p> |
| <p>Water absorption<br/>Long term water absorption by total immersion<br/>test acc. to EN 12087:2013 (method 2A)</p> <p>Long term water absorption by diffusion<br/>test acc. to EN 12088:2013</p>  | <p>WL(T)0,7<br/>(<math>W_{it} \leq 0,7 \text{ Vol.}\%</math>)<br/>WD(V)3<br/>(<math>W_{dV} \leq 3,0 \text{ Vol.}\%</math>)</p>  |
| <p>Freeze-thaw resistance<br/>test acc. to EN 12091<br/>using the wet test specimens from having done the<br/>water diffusion test in accordance with EN 12088:<br/>2013<br/>Reduction in compressive stress at 10 % deformation<br/>or in compressive strength of the re-dried specimens,<br/>when tested in accordance with EN 826:2013</p>   | <p>FTCD1<br/>(<math>W_v \leq 1,0 \text{ Vol.}\%</math>)<br/><math>\leq 10 \%</math></p>   |
| <p>Water vapour diffusion resistance factor</p>   | <p>No performance assessed</p>  |
| <p>Geometrical properties<br/>Thickness<br/>test acc. EN 823:2013 (clause 7.2, figure 2,<br/>measuring set-up 3)<br/>Length, width<br/>test acc. EN 822:2013<br/>Geometrical properties<br/>Squareness<br/>in direction of length and width; in direction of<br/>thickness<br/>test acc. EN 824:2013</p>  | <p>tolerance<br/><math>\pm 2 \text{ mm}</math><br/><math>\pm 8 \text{ mm}</math><br/>tolerance<br/>5 mm/m</p>   |

| Essential characteristic   | Performance  |
|--|--|
| Geometrical properties<br>Flatness<br>in direction of length and width<br>test acc. EN 825:2013<br>Deformation under specified compressive load and<br>temperature conditions<br>test acc. to EN 1605:2013 | tolerance<br><br>2 mm<br><br>load: 40 kPa; temperature: $(70 \pm 1)$<br>$^{\circ}\text{C}$ ; time: $(168 \pm 1)$ h<br><br>$\leq 5 \%$                          |
| Dimensional stability under specified conditions<br>test acc. to EN 1604:2013  | temperature: $70^{\circ}\text{C}$ and 90 % R.H.<br>DS(70,90)<br>( $\Delta\epsilon_l \leq 5 \%$ , $\Delta\epsilon_b \leq 5 \%$ , $\Delta\epsilon_d \leq 5 \%$ ) |
| Tensile strength perpendicular to faces  | No performance assessed  |
| Volume percentage of closed cells<br>test acc. to EN ISO 4590:2016 (method 1 with<br>correction)   | $\geq 95 \%$   |

**4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base**

In accordance with EAD No. 040650-00-1201, the applicable European legal acts are: 1995/467/EC and 1999/91/EC

The systems to be applied are:

- System 1 for Essential characteristics concerning Mechanical resistance and stability (BWR 1)
- System 3 all other Essential characteristics

**5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD**

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 10 April 2018 by Deutsches Institut für Bautechnik

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Head of Department

*beglaubigt:*  
Wendler

**XENERGY SLP,  
XENERGY 500P**

**Annex A**

**Compressive creep**

test acc. to EN 1606:2013 and EAD 040650-00-1201

| <b>XENERGY SLP</b>  | <b>thickness 80 mm</b> |             |             | <b>thickness 140 mm</b> |             |             |
|---|------------------------|-------------|-------------|-------------------------|-------------|-------------|
| density (kg/m <sup>3</sup> )                                  | 34,4                   |             |             | 36,1                    |             |             |
| compressive stress/ deformation<br>acc. EN 826:2013 (kPa / %) | 561/4                  |             |             | 473/2                   |             |             |
| <b>load stage (kPa)</b>                                       | <b>80</b>              | <b>110</b>  | <b>140</b>  | <b>80</b>               | <b>110</b>  | <b>140</b>  |
| X <sub>0</sub> (mm)   | 0,12                   | 0,22        | 0,29        | 0,26                    | 0,42        | 0,63        |
| X <sub>ct</sub> (mm)  | 0,14                   | 0,17        | 0,24        | 0,16                    | 0,20        | 0,28        |
| X <sub>ct50</sub> (mm)  | 0,32                   | 0,40        | 0,58        | 0,3                     | 0,39        | 0,52        |
| <b>X<sub>t50</sub>(mm)</b>                                    | <b>0,44</b>            | <b>0,61</b> | <b>0,87</b> | <b>0,55</b>             | <b>0,81</b> | <b>1,14</b> |

| <b>XENERGY 500P</b>   | <b>thickness 80 mm</b> |             |             | <b>thickness 160 mm</b> |             |             |
|---|------------------------|-------------|-------------|-------------------------|-------------|-------------|
| density (kg/m <sup>3</sup> )                                  | 41,2                   |             |             | 41                      |             |             |
| compressive stress/ deformation<br>acc. EN 826:2013 (kPa / %) | 565/10                 |             |             | 655/10                  |             |             |
| <b>load stage (kPa)</b>                                       | <b>150</b>             | <b>180</b>  | <b>210</b>  | <b>150</b>              | <b>180</b>  | <b>210</b>  |
| X <sub>0</sub> (mm)   | 0,40                   | 0,42        | 0,34        | 0,79                    | 0,92        | 1,09        |
| X <sub>ct</sub> (mm)  | 0,27                   | 0,35        | 0,72        | 0,31                    | 0,36        | 0,43        |
| X <sub>ct50</sub> (mm)  | 0,59                   | 0,71        | 1,10        | 0,62                    | 0,77        | 0,93        |
| <b>X<sub>t50</sub>(mm)</b>                                    | <b>0,99</b>            | <b>1,13</b> | <b>1,44</b> | <b>1,41</b>             | <b>1,69</b> | <b>2,02</b> |