

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

**ETA-17/0910**  
**of 22 November 2017**

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

FIBRANxps S 300-L, FIBRANxps S 500-L" and  
FIBRANxps S 700-L

Product family  
to which the construction product belongs

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

Manufacturer

FIBRAN NORD  
proizvodnja izolacijskih materialov d.o.o  
Kocevarjeva ulica 1  
8000 NOVO MESTO  
SLOVENIA

Manufacturing plant

FIBRAN NORD d.o.o.  
PO Sodražica  
Cesta Notranjskega odreda 45  
1317 Sodražica  
Slovenia

This European Technical Assessment  
contains

12 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 No 040650-00-1201

**European Technical Assessment**

**ETA-17/0910**

English translation prepared by DIBt

Page 2 of 12 | 22 November 2017

The European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and shall be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may only be made with the written consent of the issuing Technical Assessment Body. Any partial reproduction shall be identified as such.

This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission in accordance with Article 25(3) of Regulation (EU) No 305/2011.

## 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>), isobutene and dimethyl ether. 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 designation:

- "FIBRANxps S 300-L",
- "FIBRANxps S 500-L" and
- "FIBRANxps S 700-L".

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

- Nominal thicknesses: 50 mm to 200 mm ("FIBRANxps S 700-L" 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 outside the waterproofing. The boards are laid uniformly on the substrate to which they are applied. In particular the following applications are intended:

- Load bearing and thermal insulation underneath foundation slabs
- External horizontal and vertical thermal insulation of in-ground constructions in non-structural applications (also in case of groundwater)
- Inverted roof insulation (including park deck and green roof applications)

The performance according to section 3 only applies if the thermal insulation boards are installed according to the manufacture'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 test acc. to EN 826:2013 "FIBRANxps S 300-L" "FIBRANxps S 500-L" "FIBRANxps S 700-L" Slip deformation (until the conventional elastic zone (distinct straight portion of the force-displacement curve)) in case of 2-3 layer installation thickness of the single boards $\leq 120$ mm Compressive stress or compressive strength in the transverse and longitudinal directions	Level (individual values may fall below this level up to 10 %):  $\geq 300$ kPa $\geq 500$ kPa $\geq 700$ kPa See Annex A  No performance assessed
Characteristic value of compressive stress or compressive strength 5%-fractile value for a one-sided confidence level of 75 % under unknown or known variance using ISO 12491:1997 "FIBRANxps S 300-L" thickness $50 \text{ mm} \leq d < 120 \text{ mm}$ thickness $120 \text{ mm} \leq d \leq 200 \text{ mm}$ "FIBRANxps S 500-L" thickness $50 \text{ mm} \leq d < 120 \text{ mm}$ thickness $120 \text{ mm} \leq d \leq 200 \text{ mm}$ "FIBRANxps S 700-L" thickness $80 \text{ mm} \leq d \leq 120 \text{ mm}$	$\sigma_{0,05} = 316 \text{ kPa}$ ( $n= 50$ ; $\sigma_{\text{mean}} = 418 \text{ kPa}$ ; $s_{\sigma} = 63 \text{ kPa}$ ) $\sigma_{0,05} = 395 \text{ kPa}$ ( $n= 50$ ; $\sigma_{\text{mean}} = 461 \text{ kPa}$ ; $s_{\sigma} = 40 \text{ kPa}$ ) $\sigma_{0,05} = 475 \text{ kPa}$ ( $n= 35$ ; $\sigma_{\text{mean}} = 578 \text{ kPa}$ ; $s_{\sigma} = 62 \text{ kPa}$ ) $\sigma_{0,05} = 483 \text{ kPa}$ ( $n= 33$ ; $\sigma_{\text{mean}} = 594 \text{ kPa}$ ; $s_{\sigma} = 65 \text{ kPa}$ ) $\sigma_{0,05} = 678 \text{ kPa}$ ( $n= 20$ ; $\sigma_{\text{mean}} = 784 \text{ kPa}$ ; $s_{\sigma} = 57 \text{ kPa}$ )
Compressive creep	See Annex A

Essential characteristic	Performance
Behaviour under shear load (large-sized specimen) test acc. to the EAD and the guidelines in EN 12090:2013 "FIBRANxps S 300-L", thickness 200 mm	$\tau_{\text{large}} = 125 \text{ kPa}$
Creep under shear load	See Annex A
Creep under combined compressive and shear load	See Annex A
Compressive modulus of elasticity	No performance assessed
Adhesion behaviour under compressive and shear load on large-sized samples	No performance assessed
Shear strength test acc. to EN 12090:2013 "FIBRANxps S 300-L" (thickness 200 mm) "FIBRANxps S 500-L", "FIBRANxps S 700-L"	$\tau = 104 \text{ kPa}$ (SS 100) No performance assessed
Density test acc. to EN 1602:2013 "FIBRANxps S 300-L" "FIBRANxps S 500-L" "FIBRANxps S 700-L"	density range: 29 kg/m <sup>3</sup> - 38 kg/m <sup>3</sup> 31 kg/m <sup>3</sup> - 40 kg/m <sup>3</sup> 36 kg/m <sup>3</sup> - 46 kg/m <sup>3</sup>

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

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

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

Essential characteristic	Performance
Thermal conductivity at mean reference temperature of 10 °C test acc. to EN 12667:2001 or EN 12939:2001 and aging procedure acc. EN 13164:2012+A1:2015, Annex C with deviating storage time period (sliced specimen) of (90 +2/-2) days prior to testing "FIBRANxps S 300-L" thickness 50 – 120 mm thickness >120 – 200 mm	$\lambda_{D(90d)} = 0,036 \text{ W/(m} \cdot \text{K)}$ $\lambda_{D(90d)} = 0,039 \text{ W/(m} \cdot \text{K)}$

Essential characteristic	Performance
<p>Thermal conductivity</p> <p>at mean reference temperature of 10 °C test acc. to EN 12667:2001 or EN 12939:2001 and aging procedure acc. EN 13164:2012+A1:2015, Annex C with deviating storage time period (sliced specimen) of (90 +2/-2) days prior to testing</p> <p>"FIBRANxps S 500-L"</p> <p>thickness 50 mm</p> <p>thickness 60 – 120 mm</p> <p>thickness &gt;120 – 160 mm</p> <p>"FIBRANxps S 700-L"</p> <p>thickness 80 mm</p> <p>thickness 100 – 120 mm</p> <p>Moisture conversion coefficient</p>	<p><math>\lambda_{D(90d)} = 0,036 \text{ W/(m} \cdot \text{K)}</math></p> <p><math>\lambda_{D(90d)} = 0,037 \text{ W/(m} \cdot \text{K)}</math></p> <p><math>\lambda_{D(90d)} = 0,039 \text{ W/(m} \cdot \text{K)}</math></p> <p><math>\lambda_{D(90d)} = 0,035 \text{ W/(m} \cdot \text{K)}</math></p> <p><math>\lambda_{D(90d)} = 0,036 \text{ W/(m} \cdot \text{K)}</math></p> <p>No performance assessed</p>
<p>Water absorption</p> <p>Long term water absorption by total immersion test acc. to EN 12087:2013 (method 2A)</p> <p>"FIBRANxps S 300-L", "FIBRANxps S 500-L", "FIBRANxps S 700-L"</p> <p>Long term water absorption by diffusion test acc. to EN 12088:2013</p> <p>"FIBRANxps S 300-L", "FIBRANxps S 500-L" "FIBRANxps S 700-L"</p>	<p>WL(T)0,7 (<math>W_{it} \leq 0,7 \text{ Vol.}\%</math>)</p> <p>WD(V)3 (<math>W_{dv} \leq 3,0 \text{ Vol.}\%</math>)</p>
<p>Freeze-thaw resistance test acc. to EN 12091:2013</p> <p>using the wet test specimens from having done the water diffusion test in accordance with EN 12088:2013</p> <p>"FIBRANxps S 300-L", "FIBRANxps S 500-L", "FIBRANxps S 700-L"</p>	<p>FTCD1 (<math>W_v \leq 1,0 \text{ Vol.}\%</math>)</p>
<p>Reduction in compressive stress at 10 % deformation or in compressive strength of the re-dried specimens, when tested in accordance with EN 826:2013</p> <p>"FIBRANxps S 300-L", "FIBRANxps S 500-L", "FIBRANxps S 700-L"</p>	<p><math>\leq 10 \%</math></p>
<p>Water vapour diffusion resistance factor</p>	<p>No performance assessed</p>

Essential characteristic	Performance
<p>Geometrical properties</p> <p>Thickness</p> <p>test acc. EN 823:2013 (clause 7.2, figure 2, measuring set-up 3)</p> <p>"FIBRANxps S 300-L", "FIBRANxps S 500-L", "FIBRANxps S 700-L"</p> <p>Thickness <math>\leq</math> 120 mm Thickness &gt; 120 mm</p> <p>Length, width</p> <p>test acc. EN 822:2013</p> <p>"FIBRANxps S 300-L", "FIBRANxps S 500-L", "FIBRANxps S 700-L"</p> <p>Squareness</p> <p>in direction of length and width; in direction of thickness</p> <p>test acc. EN 824:2013</p> <p>"FIBRANxps S 300-L", "FIBRANxps S 500-L", "FIBRANxps S 700-L"</p> <p>Flatness</p> <p>in direction of length and width</p> <p>test acc. EN 825:2013</p> <p>"FIBRANxps S 300-L", "FIBRANxps S 500-L", "FIBRANxps S 700-L"</p>	<p>tolerance</p> <p><math>\pm</math> 2 mm +4/-2 mm</p> <p><math>\pm</math> 8 mm</p> <p>5 mm/m</p> <p>2 mm</p>
<p>Deformation under specified compressive load and temperature conditions</p> <p>test acc. to EN 1605:2013</p> <p>"FIBRANxps S 300-L", "FIBRANxps S 500-L", "FIBRANxps S 700-L"</p>	<p>load: 40 kPa; temperature: (70 <math>\pm</math> 1) °C; time: (168 <math>\pm</math> 1) h</p> <p><math>\leq</math> 5 %</p>
<p>Dimensional stability under specified conditions</p> <p>test acc. to EN 1604:2013</p> <p>"FIBRANxps S 300-L", "FIBRANxps S 500-L", "FIBRANxps S 700-L"</p>	<p>temperature: 70 °C and 90% R.H.</p> <p>DS(70,90)</p> <p>(<math>\Delta\epsilon_l \leq</math> 5 %, <math>\Delta\epsilon_b \leq</math> 5 %, <math>\Delta\epsilon_d \leq</math> 5 %)</p>
<p>Tensile strength perpendicular to faces</p> <p>test acc. to EN 1607:2013</p> <p>"FIBRANxps S 300-L", "FIBRANxps S 500-L", "FIBRANxps S 700-L"</p>	<p>TR400</p> <p>(<math>\sigma_{mt} \geq</math> 400 kPa)</p>
<p>Volume percentage of closed cells</p> <p>test acc. to EN ISO 4590:2003 (method 1 with correction)</p> <p>"FIBRANxps S 300-L", "FIBRANxps S 500-L", "FIBRANxps S 700-L"</p>	<p><math>\geq</math> 95%</p>

**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 22 November 2017 by Deutsches Institut für Bautechnik

Prof. Gunter Hoppe  
Head of Department

*Beglaubigt:*  
Wendler



**FIBRANxps S 300-L, FIBRANxps S 500-L" and  
FIBRANxps S 700-L**

**Annex A**

**1. Compressive stress**

**Slip deformation**

Deformation until the conventional elastic zone (distinct straight portion of the force-displacement curve) is reached

<b>FIBRANxps S 300-L</b>				
thickness (mm)	120	2x120	100	3x100
compressive stress, $\sigma_a$	50	75	50	70
initial displacement $X_a$ (mm)	<b>0,291</b>	<b>0,757</b>	<b>0,352</b>	<b>0,346</b>
<b>FIBRANxps S 700-L</b>				
thickness (mm)	120	2x120	100	3x100
compressive stress, $\sigma_a$	45	60	35	60
initial displacement $X_a$ (mm)	<b>0,405</b>	<b>0,911</b>	<b>0,446</b>	<b>1,074</b>

**2. Compressive creep**

**3. Compressive creep (single-layer board)**

<b>FIBRANxps S 300-L</b>	<b>thickness 50 mm</b>			<b>thickness 120 mm</b>		
density (kg/m <sup>3</sup> )	28			30		
compressive stress/ deformation acc. EN 826 (kPa / %)	390/3			515/3		
<b>load stage (kPa)</b>	<b>90</b>	<b>130</b>	<b>170</b>	<b>90</b>	<b>130</b>	<b>170</b>
$X_0$ (mm)	0,43	0,53	0,68	0,49	0,62	0,85
$X_{ct}$ (mm)	0,13	0,20	0,31	0,24	0,33	0,49
$X_{ct50}$ (mm)	0,28	0,43	0,79	0,56	0,83	1,29
<b><math>X_{t50}</math>(mm)</b>	<b>0,71</b>	<b>0,96</b>	<b>1,47</b>	<b>1,05</b>	<b>1,45</b>	<b>2,14</b>
<b>FIBRANxps S 300-L</b>	<b>thickness 200 mm</b>					
density (kg/m <sup>3</sup> )	31,5					
compressive stress/ deformation acc. EN 826 (kPa / %)	510/2					
<b>load stage (kPa)</b>	<b>85</b>	<b>115</b>	<b>145</b>			
$X_0$ (mm)	0,80	1,03	1,34			
$X_{ct}$ (mm)	0,36	0,51	0,65			
$X_{ct50}$ (mm)	1,58	1,54	1,87			
<b><math>X_{t50}</math>(mm)</b>	<b>2,38</b>	<b>2,57</b>	<b>3,21</b>			

FIBRANxps S 300-L, FIBRANxps S 500-L" and  
FIBRANxps S 700-L

Annex A

FIBRANxps S 500-L	thickness 50 mm			thickness 120 mm		
density (kg/m <sup>3</sup> )	32			36		
compressive stress/ deformation acc. EN 826 (kPa / %)	595/2			746/2		
<b>load stage (kPa)</b>	<b>130</b>	<b>180</b>	<b>210</b>	<b>130</b>	<b>180</b>	<b>210</b>
X <sub>0</sub> (mm)	0,29	0,37	0,49	0,48	0,58	0,74
X <sub>ct</sub> (mm)	0,14	0,20	0,23	0,21	0,30	0,37
X <sub>ct50</sub> (mm)	0,26	0,45	0,56	0,47	0,24	0,90
<b>X<sub>t50</sub>(mm)</b>	<b>0,55</b>	<b>0,82</b>	<b>1,05</b>	<b>0,95</b>	<b>0,82</b>	<b>1,64</b>

FIBRANxps S 500-L	thickness 200 mm		
density (kg/m <sup>3</sup> )	35		
compressive stress/ deformation acc. EN 826 (kPa / %)	693/2		
<b>load stage (kPa)</b>	<b>130</b>	<b>180</b>	<b>210</b>
X <sub>0</sub> (mm)	0,84	1,11	1,40
X <sub>ct</sub> (mm)	0,52	0,68	0,79
X <sub>ct50</sub> (mm)	1,46	1,73	2,00
<b>X<sub>t50</sub>(mm)</b>	<b>2,30</b>	<b>2,84</b>	<b>3,40</b>

FIBRANxps S 700-L	thickness 80 mm			thickness 120 mm		
density (kg/m <sup>3</sup> )	40			36,5		
compressive stress/ deformation acc. EN 826 (kPa / %)	739/2			815/2		
<b>load stage (kPa)</b>	<b>185</b>	<b>235</b>	<b>285</b>	<b>185</b>	<b>235</b>	<b>285</b>
X <sub>0</sub> (mm)	0,43	0,54	0,66	0,57	0,64	0,82
X <sub>ct</sub> (mm)	0,24	0,32	0,59	0,28	0,38	0,53
X <sub>ct50</sub> (mm)	0,61	0,89	1,74	0,68	0,95	1,36
<b>X<sub>t50</sub>(mm)</b>	<b>1,04</b>	<b>1,43</b>	<b>2,40</b>	<b>1,25</b>	<b>1,59</b>	<b>2,18</b>

FIBRANxps S 300-L, FIBRANxps S 500-L" and  
FIBRANxps S 700-L

Annex A

2.2. Compressive creep (multi-layer installation)

FIBRANxps S 300-L	thickness 2x120 mm			thickness 3x 100 mm		
density (kg/m <sup>3</sup> )	31			30		
compressive stress/ deformation acc. EN 826 (kPa / %)	385/-			385/-		
<b>load stage (kPa)</b>	<b>77</b>	<b>115</b>	<b>153</b>	<b>77</b>	<b>115</b>	<b>153</b>
X <sub>0</sub> (mm)	1,37	1,76	2,25	2,52	3,59	4,15
X <sub>ct</sub> (mm)	0	0,94	1,15	1,19	1,69	2,25
X <sub>ct50</sub> (mm)	1,71	2,16	2,38	2,92	3,78	4,67
<b>X<sub>t50</sub>(mm)</b>	<b>3,08</b>	<b>3,92</b>	<b>4,63</b>	<b>5,44</b>	<b>7,37</b>	<b>8,82</b>
FIBRANxps S 700-L	thickness 2x120 mm			thickness 3x 100 mm		
density (kg/m <sup>3</sup> )	39			39		
compressive stress/ deformation acc. EN 826 (kPa / %)	780/-			795/-		
<b>load stage (kPa)</b>	<b>156</b>	<b>234</b>	<b>312</b>	<b>159</b>	<b>238</b>	<b>318</b>
X <sub>0</sub> (mm)	1,07	1,35	1,70	2,45	2,70	3,16
X <sub>ct</sub> (mm)	0,39	0,59	0,88	0,77	1,08	1,99
X <sub>ct50</sub> (mm)	0,83	1,54	2,44	2,16	3,39	5,42
<b>X<sub>t50</sub>(mm)</b>	<b>1,90</b>	<b>2,89</b>	<b>4,14</b>	<b>4,61</b>	<b>6,09</b>	<b>8,58</b>

3. Creep under shear load

FIBRANxps S 300-L	thickness 200 mm
density (kg/m <sup>3</sup> )	33
shear strength/ deformation acc. EN 12090 (kPa)	104/-
<b>load stage (kPa)</b>	<b>36,4</b>
X <sub>τ0</sub> (mm)	1,70
X <sub>τct</sub> (mm)	0,82
X <sub>τct50</sub> (mm)	2,65
<b>X<sub>τt50</sub>(mm)</b>	<b>4,35</b>

electronic copy of the eta by dibt: eta-17/0910

FIBRANxps S 300-L, FIBRANxps S 500-L" and  
FIBRANxps S 700-L

Annex A

4. Creep under combined compressive and shear load

FIBRANxps S 300-L		
thickness	200 mm	
density (kg/m <sup>3</sup> )	33	
load stage (kPa)	36,4	130
deformation under	shear load	compressive load
$X_{\tau 0} / X_0$ (mm)	1,40	1,97
$X_{\tau ct} / X_{ct}$ (mm)	1,41	0,86
$X_{\tau ct 50} / X_{ct 50}$ (mm)	4,28	1,93
<b><math>X_{\tau 50} / X_{t 50}</math> (mm)</b>	<b>5,68</b>	<b>3,90</b>