

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 2 April 2020

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### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

FIBRANxps 300-L, FIBRANxps 500-L und FIBRANxps  
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  
proizvodnja izolacijskih materialov d.o.o.  
Kocevarjeva ulica 1  
8000 NOVO MESTO  
SLOWENIEN

Manufacturing plant

FIBRAN d.o.o.  
PO Sodražica  
Cesta Notranjskega odreda 45  
1317 Sodražica  
Slovenien

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 040650-00-1201

This version replaces

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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>), 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 300-L",  
"FIBRANxps 500-L" and  
"FIBRANxps 700-L".

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

Nominal thicknesses:	50 mm to 200 mm ("FIBRANxps 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 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 adhesives 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
<p>Compressive stress at 10 % deformation or compressive strength</p> <p>test acc. to EN 826:2013</p> <p>"FIBRANxps 300-L"</p> <p>"FIBRANxps 500-L"</p> <p>"FIBRANxps 700-L"</p> <p>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 <math>\leq 120</math> mm</p> <p>Compressive stress or compressive strength in the transverse and longitudinal directions</p>	<p>Level (individual values may fall below this level up to 10 %):</p> <p><math>\geq 300</math> kPa</p> <p><math>\geq 500</math> kPa</p> <p><math>\geq 700</math> kPa</p> <p>See Annex A</p> <p>No performance assessed</p>
<p>Characteristic value of compressive stress or compressive strength</p> <p>5%-fractile value for a one-sided confidence level of 75 % under unknown or known variance using ISO 12491:1997</p> <p>"FIBRANxps 300-L"</p> <p>thickness <math>50 \text{ mm} \leq d &lt; 120 \text{ mm}</math></p> <p>thickness <math>120 \text{ mm} \leq d \leq 200 \text{ mm}</math></p> <p>"FIBRANxps 500-L"</p> <p>thickness <math>50 \text{ mm} \leq d &lt; 120 \text{ mm}</math></p> <p>thickness <math>120 \text{ mm} \leq d \leq 200 \text{ mm}</math></p> <p>"FIBRANxps 700-L"</p> <p>thickness <math>80 \text{ mm} \leq d \leq 120 \text{ mm}</math></p>	<p><math>\sigma_{0,05} = 316</math> kPa (<math>n= 50</math>; <math>\sigma_{\text{mean}}= 418</math> kPa; <math>s_{\sigma}= 63</math> kPa)</p> <p><math>\sigma_{0,05} = 395</math> kPa (<math>n= 50</math>; <math>\sigma_{\text{mean}}= 461</math> kPa; <math>s_{\sigma}= 40</math> kPa)</p> <p><math>\sigma_{0,05} = 475</math> kPa (<math>n= 35</math>; <math>\sigma_{\text{mean}}= 578</math> kPa; <math>s_{\sigma}= 62</math> kPa)</p> <p><math>\sigma_{0,05} = 483</math> kPa (<math>n= 33</math>; <math>\sigma_{\text{mean}}= 594</math> kPa; <math>s_{\sigma}= 65</math> kPa)</p> <p><math>\sigma_{0,05} = 678</math> kPa (<math>n= 20</math>; <math>\sigma_{\text{mean}}= 784</math> kPa; <math>s_{\sigma}= 57</math> kPa)</p>
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 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 300-L" (thickness 200 mm) "FIBRANxps 500-L", "FIBRANxps 700-L"	$\tau = 104 \text{ kPa}$ (SS 100) No performance assessed
Density test acc. to EN 1602:2013 "FIBRANxps 300-L" "FIBRANxps 500-L" "FIBRANxps 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 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 500-L"</p> <p>thickness 50 mm</p> <p>thickness 60 – 120 mm</p> <p>thickness &gt;120 – 160 mm</p> <p>"FIBRANxps 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 300-L", "FIBRANxps 500-L", "FIBRANxps 700-L"</p> <p>Long term water absorption by diffusion test acc. to EN 12088:2013</p> <p>"FIBRANxps 300-L", "FIBRANxps 500-L" "FIBRANxps 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 300-L", "FIBRANxps 500-L", "FIBRANxps 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 300-L", "FIBRANxps 500-L", "FIBRANxps 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 300-L", "FIBRANxps 500-L", "FIBRANxps 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 300-L", "FIBRANxps 500-L", "FIBRANxps 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 300-L", "FIBRANxps 500-L", "FIBRANxps 700-L"</p> <p>Flatness</p> <p>in direction of length and width</p> <p>test acc. EN 825:2013</p> <p>"FIBRANxps 300-L", "FIBRANxps 500-L", "FIBRANxps 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 300-L", "FIBRANxps 500-L", "FIBRANxps 700-L"</p>	<p>load: 40 kPa; temperature: <math>(70 \pm 1)</math> °C; time: <math>(168 \pm 1)</math> 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 300-L", "FIBRANxps 500-L", "FIBRANxps 700-L"</p>	<p>temperature: 70 °C and 90% R.H.</p> <p>DS(70,90) <math>(\Delta\epsilon_l \leq 5 \%</math>, <math>\Delta\epsilon_b \leq 5 \%</math>, <math>\Delta\epsilon_d \leq 5 \%)</math></p>
<p>Tensile strength perpendicular to faces</p> <p>test acc. to EN 1607:2013</p> <p>"FIBRANxps 300-L", "FIBRANxps 500-L", "FIBRANxps 700-L"</p>	<p>TR400 <math>(\sigma_{mt} \geq 400 \text{ kPa})</math></p>
<p>Volume percentage of closed cells</p> <p>test acc. to EN ISO 4590:2003 (method 1 with correction)</p> <p>"FIBRANxps 300-L", "FIBRANxps 500-L", "FIBRANxps 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 2 April 2020 by Deutsches Institut für Bautechnik

Maja Tiemann  
Head of Department

*beglaubigt:*  
Wendler



FIBRANxps 300-L, FIBRANxps 500-L und FIBRANxps 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

FIBRANxps 300-L				
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>
FIBRANxps 700-L				
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

2.1 Compressive creep (single-layer board)

FIBRANxps 300-L	thickness 50 mm			thickness 120 mm		
density (kg/m <sup>3</sup> )	29			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>
FIBRANxps 300-L	thickness 200 mm					
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 300-L, FIBRANxps 500-L und FIBRANxps  
700-L

Annex A

FIBRANxps 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 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 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 300-L, FIBRANxps 500-L und FIBRANxps  
700-L

Annex A

2.2. Compressive creep (multi-layer installation)

FIBRANxps 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 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 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>

FIBRANxps 300-L, FIBRANxps 500-L und FIBRANxps  
700-L

Annex A

4. Creep under combined compressive and shear load

FIBRANxps 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>