

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

ETA-19/0118  
of 18 January 2023

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### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

URSA XPS D N-III  
URSA XPS D N-V  
URSA XPS D N-VII

Product family  
to which the construction product belongs

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

Manufacturer

URSA Deutschland GmbH  
Carl-Friedrich-Benz-Straße 46-48  
04509 Delitzsch  
DEUTSCHLAND

Manufacturing plant

Werk Queis  
Uralitastraße 1  
D-06188 Queis  
Werk St. Avold  
Zone industrielle de l'europort  
F-57500 Saint-Avold

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>) and additives. 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:

- "URSA XPS D N-III",
- "URSA XPS D N-V" and
- "URSA XPS D N-VII".

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

Nominal thicknesses:	50 mm to 160 mm for URSA XPS D N-III, 50 mm to 140 mm for URSA XPS D N-V, 60 mm to 120 mm for URSA XPS D N-VII
Nominal length:	1250 mm
Nominal widths:	600 mm

The European Technical Assessment has been issued for the products 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 for "URSA XPS D N-III " boards up to 160 mm thickness, for boards "URSA XPS D N-V" and "URSA XPS D N-VII" up to 120 mm thickness
- 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 extruded polystyrene foam 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 extruded polystyrene foam boards, also the respective national regulations shall be observed.

Where extruded polystyrene foam 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 "URSA XPS D N-III" "URSA XPS D N-V" thickness $50 \text{ mm} \leq d \leq 120 \text{ mm}$ "URSA XPS D N-VII"	Level (individual values may fall below this level up to 10 %):  $\geq 300 \text{ kPa}$  $\geq 500 \text{ kPa}$  $\geq 700 \text{ kPa}$
Slip deformation	See Annex A
Compressive stress or compressive strength in the transverse and longitudinal directions	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 "URSA XPS D N-III " thickness $50 \text{ mm} \leq d \leq 120 \text{ mm}$  thickness $120 \text{ mm} < d \leq 160 \text{ mm}$  "URSA XPS D N-V" thickness $50 \text{ mm} \leq d \leq 120 \text{ mm}$  "URSA XPS D N-VII" thickness $60 \text{ mm} \leq d \leq 120 \text{ mm}$	  $\sigma_{0,05} = 387 \text{ kPa}$ (n= 50; $\sigma_{\text{mean}} = 432 \text{ kPa}$ ; $s_{\sigma} = 27 \text{ kPa}$ )  $\sigma_{0,05} = 361 \text{ kPa}$ (n= 50; $\sigma_{\text{mean}} = 420 \text{ kPa}$ ; $s_{\sigma} = 36 \text{ kPa}$ )  $\sigma_{0,05} = 563 \text{ kPa}$ (n= 50; $\sigma_{\text{mean}} = 648 \text{ kPa}$ ; $s_{\sigma} = 50 \text{ kPa}$ )  $\sigma_{0,05} = 706 \text{ kPa}$ (n= 50; $\sigma_{\text{mean}} = 759 \text{ kPa}$ ; $s_{\sigma} = 31 \text{ kPa}$ )
Compressive creep	See Annex A
Behaviour under shear load (large-sized specimen)	See Annex A
Creep under shear load	See Annex A
Creep under combined compressive and shear load	See Annex A

Essential characteristic	Performance
Compressive modulus of elasticity	No performance assessed
Adhesion behaviour under compressive and shear load on large-sized samples	See Annex A
Shear strength	No performance assessed
Density test acc. to EN 1602:2013 "URSA XPS D N-III " "URSA XPS D N-V" thickness $50 \text{ mm} \leq d \leq 120 \text{ mm}$ "URSA XPS D N-VII"	density range: $33 \text{ kg/m}^3 - 41 \text{ kg/m}^3$ $36 \text{ kg/m}^3 - 43 \text{ kg/m}^3$ $40 \text{ kg/m}^3 - 49 \text{ kg/m}^3$

### 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 $10 \text{ }^\circ\text{C}$ 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 $(90 \pm 2/-2)$ days prior to testing "URSA XPS D N-III " thickness $50 \text{ mm} \leq d \leq 60 \text{ mm}$ thickness $60 \text{ mm} < d \leq 80 \text{ mm}$ thickness $80 \text{ mm} < d \leq 120 \text{ mm}$ thickness $120 \text{ mm} < d \leq 160 \text{ mm}$ "URSA XPS D N-V" thickness $50 \text{ mm} \leq d \leq 60 \text{ mm}$ thickness $60 \text{ mm} < d \leq 80 \text{ mm}$ thickness $80 \text{ mm} < d \leq 120 \text{ mm}$ thickness $120 \text{ mm} < d \leq 140 \text{ mm}$ "URSA XPS D N-VII" thickness $60 \text{ mm} \leq d \leq 80 \text{ mm}$ thickness $80 \text{ mm} < d \leq 100 \text{ mm}$ thickness $100 \text{ mm} < d \leq 120 \text{ mm}$	$\lambda_{D(90d)} = 0.033 \text{ W/(m} \cdot \text{K)}$ $\lambda_{D(90d)} = 0.035 \text{ W/(m} \cdot \text{K)}$ $\lambda_{D(90d)} = 0.036 \text{ W/(m} \cdot \text{K)}$ $\lambda_{D(90d)} = 0.037 \text{ W/(m} \cdot \text{K)}$ $\lambda_{D(90d)} = 0.034 \text{ W/(m} \cdot \text{K)}$ $\lambda_{D(90d)} = 0.036 \text{ W/(m} \cdot \text{K)}$ $\lambda_{D(90d)} = 0.037 \text{ W/(m} \cdot \text{K)}$ $\lambda_{D(90d)} = 0.039 \text{ W/(m} \cdot \text{K)}$ $\lambda_{D(90d)} = 0.035 \text{ W/(m} \cdot \text{K)}$ $\lambda_{D(90d)} = 0.036 \text{ W/(m} \cdot \text{K)}$ $\lambda_{D(90d)} = 0.037 \text{ W/(m} \cdot \text{K)}$

Essential characteristic	Performance
Moisture conversion coefficient	No performance assessed
Water absorption Long term water absorption by total immersion test acc. to EN 12087:2013 (method 2A)  Long term water absorption by diffusion test acc. to EN 12088:2013	WL(T)0,7 ( $W_{it} \leq 0.7$ Vol.%)  WD(V)3 ( $W_{dv} \leq 3.0$ Vol.%)
Freeze-thaw resistance test acc. to EN 12091:2013 using the wet test specimens from having done the water diffusion test in accordance with EN 12088: 2013  Reduction in compressive stress at 10 % deformation or in compressive strength of the re-dried specimens, when tested in accordance with EN 826:2013	FTCD1 ( $W_v \leq 1.0$ Vol.%)  $\leq 10$ %
Water vapour diffusion resistance factor	No performance assessed
Geometrical properties Thickness test acc. EN 823:2013 (clause 7.2, figure 2, measuring set-up 3) Length, width test acc. EN 822:2013  Squareness in direction of length and width; in direction of thickness test acc. EN 824:2013  Flatness in direction of length and width test acc. EN 825:2013	tolerance  $\pm 2$ mm (thickness $\leq 120$ mm) $+4/-2$ mm (thickness $> 120$ mm)  $\pm 10$ mm  5 mm/m  2 mm (thickness $\leq 120$ mm) 3 mm (thickness $> 120$ mm)
Deformation under specified compressive load and temperature conditions test acc. to EN 1605:2013	load: 40 kPa; temperature: $(70 \pm 1)$ $^{\circ}\text{C}$ ; time: $(168 \pm 1)$ h  $\leq 5$ %

Essential characteristic	Performance
Dimensional stability under specified conditions test acc. to EN 1604:2013	temperature: 70 °C and 90 % R.H. DS (70,90) ( $\Delta\varepsilon_l \leq 5 \%$ , $\Delta\varepsilon_b \leq 5 \%$ , $\Delta\varepsilon_d \leq 5 \%$ )
Compressive stress at 10 % deformation or compressive strength test acc. to EN 826:2013 "URSA XPS D N-V" thickness 120 mm < d ≤ 140 mm	Level  ≥ 500 kPa
Tensile strength perpendicular to faces test acc. to EN 1607:2013	TR100 ( $\sigma_{mt} \geq 100$ kPa)
Density test acc. to EN 1602:2013 "URSA XPS D N-V" thickness 120 mm < d ≤ 140 mm	density range:  36 kg/m <sup>3</sup> - 43 kg/m <sup>3</sup>
Volume percentage of closed cells test acc. to EN ISO 4590:2016 (method 1 with correction)	≥ 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<sup>1</sup>.

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 18 January 2023 by Deutsches Institut für Bautechnik

Frank Iffländer  
Head of Section

*beglaubigt:*  
Wendler

<sup>1</sup> as amended

URSA XPS D N-III  
URSA XPS D N-V  
URSA XPS D N-VII

Annex A

1. Compressive stress

Slip deformation

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

URSA XPS D N-III ( $\rho = 34 \text{ kg/m}^3$ )			
thickness (mm)	1x100	2x100	3x100
compressive stress, $\sigma_a$	130	102	90
initial displacement $X_a$ (mm)	<b>0.7</b>	<b>0.8</b>	<b>0.9</b>
URSA XPS D N-VII ( $\rho = 41 \text{ kg/m}^3$ )			
thickness (mm)	1x100	2x100	3x100
compressive stress, $\sigma_a$	135	114	113
initial displacement $X_a$ (mm)	<b>0.47</b>	<b>0.92</b>	<b>1.05</b>

2. Compressive creep

2.1 Compressive creep (single-layer board)

URSA XPS D N-III	thickness 50 mm			thickness 50 mm	thickness 80 mm
density ( $\text{kg/m}^3$ )	34			33	34
compressive stress/ deformation acc. to EN 826 (kPa / %)	380/2			350/3	422/2
<b>load stage (kPa)</b>	<b>105</b>	<b>125</b>	<b>150</b>	<b>143</b>	<b>130</b>
$X_0$ (mm)	0.26	0.25	0.32	0.38	0.37
$X_{ct}$ (mm)	0.10	0.15	0.13	0.33	0.29
$X_{ct50}$ (mm)	0.36	0.34	0.80	0.75	1.06
<b><math>X_{t50}</math> (mm)</b>	<b>0.62</b>	<b>0.59</b>	<b>1.12</b>	<b>1.13</b>	<b>1.43</b>
URSA XPS D N-III	thickness 120 mm				
density ( $\text{kg/m}^3$ )	39				
compressive stress/ deformation acc. to EN 826 (kPa / %)	492/2				
<b>load stage (kPa)</b>	<b>100</b>	<b>130</b>	<b>150</b>		
$X_0$ (mm)	0.51	0.66	0.77		
$X_{ct}$ (mm)	0.39	0.42	0.56		
$X_{ct50}$ (mm)	1.67	1.68	1.71		
<b><math>X_{t50}</math> (mm)</b>	<b>2.18</b>	<b>2.34</b>	<b>2.48</b>		



URSA XPS D N-III  
URSA XPS D N-V  
URSA XPS D N-VII

Annex A

URSA XPS D N-III	thickness 160 mm			
density (kg/m <sup>3</sup> )	38			
compressive stress/ deformation acc. to EN 826 (kPa / %)	468/1			
<b>load stage (kPa)</b>	<b>100</b>	<b>130</b>	<b>185</b>	
X <sub>0</sub> (mm)	0.47	0.62	0.89	
X <sub>ct</sub> (mm)	0.44	0.46	0.70	
X <sub>ct50</sub> (mm)	1.58	1.63	2.34	
<b>X<sub>t50</sub>(mm)</b>	<b>2.05</b>	<b>2.25</b>	<b>3.23</b>	
URSA XPS D N-V	thickness 50 mm			thickness 60 mm
density (kg/m <sup>3</sup> )	40			37
compressive stress/ deformation acc. to EN 826 (kPa / %)	550/2			517/3
<b>load stage (kPa)</b>	<b>125</b>	<b>175</b>	<b>200</b>	<b>198</b>
X <sub>0</sub> (mm)	0.24	0.34	0.39	0.37
X <sub>ct</sub> (mm)	0.60	0.80	0.74	0.34
X <sub>ct50</sub> (mm)	1.02	1.42	1.44	0.98
<b>X<sub>t50</sub>(mm)</b>	<b>1.26</b>	<b>1.76</b>	<b>1.83</b>	<b>1.35</b>
URSA XPS D N-V	thickness 120 mm			thickness 100 mm
density (kg/m <sup>3</sup> )	36,5			36
compressive stress/ deformation acc. to EN 826 (kPa / %)	665/5			557/3
<b>load stage (kPa)</b>	<b>150</b>	<b>180</b>	<b>250</b>	<b>198</b>
X <sub>0</sub> (mm)	0.52	0.56	0.77	0.67
X <sub>ct</sub> (mm)	0.46	0.54	0.78	0.57
X <sub>ct50</sub> (mm)	1.56	1.85	2.50	1.54
<b>X<sub>t50</sub>(mm)</b>	<b>2.08</b>	<b>2.41</b>	<b>3.27</b>	<b>2.21</b>
URSA XPS D N-VII	thickness 50 mm			thickness 60 mm
density (kg/m <sup>3</sup> )	42			46
compressive stress/ deformation acc. to EN 826 (kPa / %)	767/-			719/3
<b>load stage (kPa)</b>	<b>200</b>	<b>245</b>	<b>280</b>	<b>275</b>
X <sub>0</sub> (mm)	0.19	0.23	0.23	0.41
X <sub>ct</sub> (mm)	0.20	0.22	0.21	0.37
X <sub>ct50</sub> (mm)	0.52	0.59	0.67	0.87
<b>X<sub>t50</sub>(mm)</b>	<b>0.71</b>	<b>0.82</b>	<b>0.90</b>	<b>1.28</b>

URSA XPS D N-III  
URSA XPS D N-V  
URSA XPS D N-VII

Annex A

URSA XPS D N-VII	thickness 120 mm			thickness 100 mm
density (kg/m <sup>3</sup> )	42			42
compressive stress/ deformation acc. to EN 826 (kPa / %)	869/5			744/2
<b>load stage (kPa)</b>	<b>200</b>	<b>250</b>	<b>350</b>	<b>275</b>
X <sub>0</sub> (mm)	0.51	0.61	0.93	0.56
X <sub>ct</sub> (mm)	0.43	0.52	0.81	0.64
X <sub>ct50</sub> (mm)	1.61	1.71	2.74	1.87
<b>X<sub>t50</sub>(mm)</b>	<b>2.12</b>	<b>2.32</b>	<b>3.67</b>	<b>2.43</b>

## 2.2 Compressive creep (multi-layer installation)

URSA XPS D N-III	thickness 3x 100 mm		
density (kg/m <sup>3</sup> )	34		
compressive stress/ deformation acc. to EN 826 (kPa / %)	325/2		
<b>load stage (kPa)</b>	<b>100</b>	<b>130</b>	<b>185</b>
X <sub>0</sub> (mm)	1.42	1.92	2.52
X <sub>ct</sub> (mm)	1.11	1.50	2.86
X <sub>ct50</sub> (mm)	4.13	4.62	8.12
<b>X<sub>t50</sub>(mm)</b>	<b>5.55</b>	<b>6.54</b>	<b>10.64</b>
URSA XPS D N-VII	thickness 2x 120 mm		
density (kg/m <sup>3</sup> )	42		
compressive stress/ deformation acc. to EN 826 (kPa / %)	819/4		
<b>load stage (kPa)</b>	<b>200</b>	<b>250</b>	<b>350</b>
X <sub>0</sub> (mm)	1.04	1.22	1.60
X <sub>ct</sub> (mm)	0.92	1.04	1.53
X <sub>ct50</sub> (mm)	3.24	3.94	5.04
<b>X<sub>t50</sub>(mm)</b>	<b>4.29</b>	<b>5.16</b>	<b>6.64</b>

URSA XPS D N-III  
URSA XPS D N-V  
URSA XPS D N-VII

Annex A

3. Behaviour under shear load (large-sized specimen)

URSA XPS D N-III	thickness 160 mm
density (kg/m <sup>3</sup> )	38
<b>shear strength</b> $\tau_{\text{large}}$ acc. to EAD chapter 2.2.4 and the guidelines in EN 12090 (kPa)	<b>152</b>

4. Creep under shear load

URSA XPS D N-III	thickness 160 mm
density (kg/m <sup>3</sup> )	38
shear strength $\tau_{\text{large}}$ (kPa)	152
<b>load stage (kPa)</b>	<b>52,5</b>
X <sub><math>\tau_0</math></sub> (mm)	2.02
X <sub><math>\tau_{ct}</math></sub> (mm)	0.82
X <sub><math>\tau_{ct50}</math></sub> (mm)	2.20
<b>X<sub><math>\tau_{t50}</math></sub>(mm)</b>	<b>4.22</b>

5. Creep under combined compressive and shear load

URSA XPS D N-III		
thickness	160 mm	
density (kg/m <sup>3</sup> )	38	
shear strength $\tau_{\text{large}}$ (kPa)	152	
compressive stress/ deformation acc. to EN 826 (kPa / %)	468/1	
<b>load stage (kPa)</b>	<b>52.5</b>	<b>122,4</b>
deformation under	shear load	compressive load
X <sub><math>\tau_0</math></sub> /X <sub>0</sub> (mm)	1.77	1.37
X <sub><math>\tau_{ct}</math></sub> /X <sub>ct</sub> (mm)	2.28	0.94
X <sub><math>\tau_{ct50}</math></sub> /X <sub>ct50</sub> (mm)	2.55	1.82
<b>X<sub><math>\tau_{t50}</math></sub>/X<sub>t50</sub>(mm)</b>	<b>4.32</b>	<b>3.19</b>

URSA XPS D N-III  
URSA XPS D N-V  
URSA XPS D N-VII

Annex A

6. Adhesion behaviour under compressive and shear load on large-sized samples  
acc. to EAD, chapter 2.2.8

URSA XPS D N-III			
<b>Adhesive friction coefficient between the extruded polystyrene foam boards</b> Acc. to EAD chapter 2.2.8, Annex A, A.3.1			
<b>thickness</b>	<b>2x 120 mm</b>		
density (kg/m <sup>3</sup> )	35		
<b>Compression stress – load stage (kPa)</b>	<b>15</b>	<b>45</b>	<b>90</b>
Adhesive friction coefficient regarding the compression stress – load stage	0.56	0.66	0.70
<b>Adhesive friction coefficient</b>	<b>0.64</b>		
<b>Adhesive friction coefficient between the extruded polystyrene foam boards and in-situ concrete as well as a concrete finished part with foil</b> Acc. to EAD chapter 2.2.8, Annex A, A.3.2			
<b>thickness</b>	<b>1x 160 mm</b>		
density (kg/m <sup>3</sup> )	33		
<b>Compression stress – load stage (kPa)</b>	<b>15</b>	<b>45</b>	<b>90</b>
Adhesive friction coefficient regarding the compression stress – load stage	0.35	0.43	0.47
<b>Adhesive friction coefficient</b>	<b>0.41</b>		