



Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments



European Technical Assessment

ETA-17/0912 of 26 November 2019

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:

Trade name of the construction product

Product family

to which the construction product belongs

Manufacturer

Manufacturing plant

This European Technical Assessment contains

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

This version replaces

Deutsches Institut für Bautechnik

Sundolitt XPS 300 Sundolitt XPS 500 Sundolitt XPS 700

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

Sundolitt GmbH Langer Kamp 1 38644 Goslar DEUTSCHLAND

Sundolitt GmbH Langer Kamp 1 38644 Goslar

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

EAD 040650-00-1201

ETA-17/0912 issued on 15 November 2017



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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 (CO₂). 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:

"Sundolitt XPS 300"

"Sundolitt XPS 500"

"Sundolitt XPS 700".

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

Nominal thicknesses: 50 mm to 120 mm for Sundolitt XPS 300

60 mm to 120 mm for Sundolitt XPS 500 and Sundolitt XPS 700

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.



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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	eristic Performance				
Compressive stress at 10 % deformation or	Level (individual values may fall				
compressive strength	below this level up to 10 %):				
test acc. to EN 826:2013	> 000 LD-				
"Sundolitt XPS 300"	≥ 300 kPa				
"Sundolitt XPS 500"	≥ 500 kPa				
"Sundolitt XPS 700"	≥ 700 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					
5 %-fractile value for a one-sided confidence level of 75 % under unknown or known variance using ISO 12491:1997					
"Sundolitt XPS 300"					
thickness 50 mm ≤ d ≤ 80 mm	$\sigma_{0,05}$ = 251 kPa (n= 50; σ_{mean} = 344 kPa; s_{σ} = 62 kPa)				
thickness 80 mm < d ≤ 120 mm	$\sigma_{0,05}$ = 301 kPa (n= 50; σ_{mean} = 367 kPa; s_{σ} = 41 kPa)				
"Sundolitt XPS 500"	,				
thickness 60 mm ≤ d ≤ 80 mm	$\sigma_{0.05}$ = 521 kPa (n= 50; σ_{mean} = 601 kPa; s_{σ} = 48 kPa)				
thickness 100 mm ≤ d ≤ 120 mm	$\sigma_{0,05}$ = 558 kPa (n= 15; σ_{mean} = 667 kPa; s_{σ} = 57 kPa)				
"Sundolitt XPS 700"					
thickness 60 mm ≤ d ≤ 80 mm	$\sigma_{0,05}$ = 755 kPa (n= 41; σ_{mean} = 826 kPa; s_{σ} = 41 kPa)				
thickness 100 mm ≤ d ≤ 120 mm	$\sigma_{0,05}$ = 747 kPa (n= 47; σ_{mean} = 794 kPa; s_{σ} = 27 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				



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Essential characteristic	Performance		
Density			
test acc. to EN 1602:2013	density range:		
"Sundolitt XPS 300"			
thickness 50 mm ≤ d ≤ 80 mm	32 kg/m³ - 38 kg/m³		
thickness 80 mm < d ≤ 120 mm	30 kg/m³ - 35 kg/m³		
"Sundolitt XPS 500"			
thickness 60 mm ≤ d ≤ 120 mm	37 kg/m³ - 45 kg/m³		
"Sundolitt XPS 700"			
thickness 60 mm ≤ d ≤ 80 mm	46 kg/m³ - 51 kg/m³		
thickness 80 mm < d ≤ 120 mm	37 kg/m³ - 42 kg/m³		

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			
"Sundolitt XPS 300			
thickness 50 mm ≤ d ≤ 60 mm	$\lambda_{D(90d)} = 0.033 \text{ W/(m \cdot K)}$		
thickness 60 mm < d ≤ 120 mm	$\lambda_{D(90d)} = 0.037 \text{ W/(m \cdot K)}$		
"Sundolitt XPS 500			
thickness d = 60 mm	$\lambda_{D(90d)} = 0.033 \text{ W/(m \cdot K)}$		
thickness 60 mm < d ≤ 80 mm	$\lambda_{D(90d)} = 0.035 \text{ W/(m \cdot K)}$		
thickness 80 mm < d ≤ 120 mm	$\lambda_{D(90d)} = 0.037 \text{ W/(m·K)}$		
"Sundolitt XPS 700			
thickness d = 60 mm	$\lambda_{D(90d)} = 0.035 \text{ W/(m \cdot K)}$		
thickness 60 mm < d ≤ 120 mm	$\lambda_{D(90d)} = 0.037 \text{ W/(m \cdot K)}$		
Moisture conversion coefficient	No performance assessed		
Water absorption			
Long term water absorption by total immersion			
test acc. to EN 12087:2013 (method 2A)	WL(T)0,7		
	(W _{It} ≤ 0,7 Vol.%)		



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Essential characteristic	characteristic Performance			
Water absorption				
Long term water absorption by diffusion				
test acc. to EN 12088:2013	$WD(V)3$ $(W_{dV} \le 3,0 \text{ Vol.\%})$			
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	FTCD1 (W _V ≤ 1,0 Vol.%)			
Reduction in compressive stress at 10 % deformation or in compressive strength of the re-dried specimens, when tested in accordance with EN 826:2013	≤ 10 %			
Water vapour diffusion resistance factor	No performance assessed			
Geometrical properties Thickness	tolerance			
test acc. EN 823:2013 (clause 7.2, figure 2, measuring set-up 3)	-2/+3 mm			
Length, width test acc. EN 822:2013	± 8 mm			
Squareness in direction of length and width; in direction of thickness test acc. EN 824:2013	5 mm/m			
Flatness				
in direction of length and width test acc. EN 825:2013	2 mm			
Deformation under specified compressive load and temperature conditions				
test acc. to EN 1605:2013	load: 40 kPa; temperature: (70 ± 1) °C; time: (168 ± 1) h			
	≤ 5 %			
Dimensional stability under specified conditions				
test acc. to EN 1604:2013	temperature: 70 °C and 90 % R.H. DS(70,90) $(\Delta \epsilon_l \le 5 \%, \Delta \epsilon_b \le 5 \%, \Delta \epsilon_d \le 5 \%)$			
Tensile strength perpendicular to faces	No performance assessed			
Volume percentage of closed cells				
test acc. to EN ISO 4590:2016 (method 1 with correction)	≥ 95 %			





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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 $1999/91/EC^1$

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.

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Maja Tiemann Head of Department beglaubigt: Iffländer

8.12.01-34/19

as amended

Z61304.19



Sundolitt XPS 300 Sundolitt XPS 500 Sundolitt XPS 700 Annex A

1. Compressive creep

1.1 Compressive creep (single-layer board)

Sundolitt XPS 300	thi	ckness 50	mm	thick	ness 120	mm	
density (kg/m³)		35			33		
compressive stress/ deformation acc. EN 826 (kPa / %)	380/10			411/10			
load stage (kPa)	80	121	161	87	131	174	
X ₀ (mm)	0,04	0,14	0,21	0,48	0,64	0,92	
X _{ct} (mm)	0,12	0,23	0,31	0,52	1,43	3,00	
X _{ct50} (mm)	0,28	0,41	0,55	1,17	3,15	7,15	
X _{t50} (mm)	0,32	0,55	0,76	1,65	3,79	8,07	
Sundolitt XPS 500	thickness 60 mm			thickness 120 mm			
density (kg/m³)	38			38			
compressive stress/ deformation acc. EN 826 (kPa / %)	611/10			645/10			
load stage (kPa)	132	199	265	139	209	279	
X ₀ (mm)	0,26	0,41	0,50	0,52	0,77	1,04	
X _{ct} (mm)	0,19	0,33	0,78	0,32	0,51	1,71	
X _{ct50} (mm)	0,37	0,62	1,52	0,77	1,19	4,28	
X _{t50} (mm)	0,63	1,03	2,02	1,29	1,96	5,32	
Sundolitt XPS 700	# 1						
density (kg/m³)	thickness 60 mm			thickness 120 mm			
compressive stress/ deformation acc. EN 826 (kPa / %)	757/10			806/10			
load stage (kPa)	160	240	321	171	256	341	
X ₀ (mm)	0,17	0,28	0,39	0,58	0,83	1,25	
X _{ct} (mm)	0,20	0,30	0,55	0,95	2,07	4,24	
X _{ct50} (mm)	0,39	0,56	1,11	1,52	3,20	7,19	
X _{t50} (mm)	0,56	0,84	1,50	2,10	4,03	8,44	