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and types of construction

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General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

X-Foam HBT 300,
X-Foam HBT 500 and
X-Foam HBT 700

Product family
to which the construction product belongs

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

Manufacturer

Ediltec Bayern GmbH
Ottostraße 5
92442 Wackersdorf
DEUTSCHLAND

Manufacturing plant

Ediltec Bayern GmbH
Ottostraße 5
92442 Wackersdorf
DEUTSCHLAND

This European Technical Assessment
contains

10 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 (CO₂), isobutene 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:

"X-FOAM HBT 300",
"X-FOAM HBT 500" and
"X-FOAM HBT 700".

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

Nominal thicknesses:

"X-FOAM HBT 300"	50 mm to 160 mm
"X-FOAM HBT 500"	50 mm to 120 mm
"X-FOAM HBT 700"	50 mm to 120 mm

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 covered:

- Load bearing and thermal insulation with a thickness 60 mm up to 160 mm ("X-FOAM HBT 500" and "X-FOAM HBT 700" 50 mm to 120 mm) 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 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 boards, also the respective national regulations shall be observed.

Where the 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.

Essential characteristic	Performance
<p>Thermal conductivity</p> <p>"X-FOAM HBT 700"</p> <p>thickness 50 ≤ d < 80 mm</p> <p>thickness 80 ≤ d ≤ 100 mm</p> <p>thickness 100 < d ≤ 120 mm</p>	<p>$\lambda_{D(90d)} = 0,034 \text{ W/(m} \cdot \text{K)}$</p> <p>$\lambda_{D(90d)} = 0,037 \text{ W/(m} \cdot \text{K)}$</p> <p>$\lambda_{D(90d)} = 0,039 \text{ W/(m} \cdot \text{K)}$</p>
Moisture conversion coefficient	No performance assessed
<p>Water absorption</p> <p>Long term water absorption by total immersion test acc. to EN 12087:2013 (method 2A)</p> <p>Long term water absorption by diffusion test acc. to EN 12088:2013</p>	<p>WL(T)0,7 ($W_{it} \leq 0,7 \text{ Vol.}\%$)</p> <p>WD(V)3 ($W_{dv} \leq 3,0 \text{ Vol.}\%$)</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>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>FTCD1 ($W_v \leq 1,0 \text{ Vol.}\%$)</p> <p>≤ 10 %</p>
Water vapour diffusion resistance factor	No performance assessed
<p>Geometrical properties</p> <p>Thickness test acc. EN 823:2013 (clause 7.2, figure 2, measuring set-up 3)</p> <p>Length, width test acc. EN 822:2013</p> <p>Squareness in direction of length and width; in direction of thickness test acc. EN 824:2013</p> <p>Flatness in direction of length and width test acc. EN 825:2013</p>	<p>tolerance</p> <p>± 2 mm</p> <p>± 8 mm</p> <p>5 mm/m</p> <p>2 mm</p>
<p>Deformation under specified compressive load and temperature conditions test acc. to EN 1605:2013</p>	<p>load: 40 kPa; temperature: (70 ± 1) °C; time: (168 ± 1) h</p> <p>≤ 5 %</p>

Essential characteristic	Performance
Compressive stress at 10 % deformation or compressive strength test acc. to EN 826:2013 "X-FOAM HBT 300" thickness 50 mm	≥ 300 kPa
Dimensional stability under specified conditions test acc. to EN 1604:2013	temperature: 70 °C and 90 % R.H. DS (70,90) ($\Delta\varepsilon_l \leq 5 \%$, $\Delta\varepsilon_b \leq 5 \%$, $\Delta\varepsilon_d \leq 5 \%$)
Tensile strength perpendicular to faces	No performance assessed
Density test acc. to EN 1602:2013 "X-FOAM HBT 300" thickness 50 mm	density range: 30 kg/m ³ - 37 kg/m ³
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/EC¹

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.

Frank Iffländer
Head of Section

beglaubigt:
Wendler

¹ as amended

**X-Foam HBT 300,
X-Foam HBT 500 and
X-Foam HBT 700**

Annex A

1. Compressive creep

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

X-FOAM HBT 300	thickness 60 mm			thickness 120 mm		
density (kg/m ³)	30			34		
compressive stress/ deformation acc. EN 826:2013 (kPa / %)	380/4			406/2		
load stage (kPa)	100	130	150	100	130	150
X ₀ (mm)	0,31	0,37	0,46	0,46	0,57	0,68
X _{ct} ¹ (mm)	0,23	0,34	0,47	0,19	0,21	0,26
X _{ct50} (mm)	0,57	0,77	1,00	0,41	0,46	0,5
X_{t50}(mm)	0,88	1,15	1,46	0,87	1,02	1,18
X-FOAM HBT 300						
	thickness 60 mm			thickness 120 mm		
density (kg/m ³)	30,5			30,6		
compressive stress/ deformation acc. EN 826:2013 (kPa / %)	400/2			377/2		
load stage (kPa)	100	130	180	100	130	180
X ₀ (mm)	0,33	0,41	0,60	0,67	0,85	1,12
X _{ct} ¹ (mm)	0,16	0,20	0,33	0,22	0,26	0,47
X _{ct50} (mm)	0,37	0,45	0,75	0,40	0,56	1,16
X_{t50}(mm)	0,70	0,86	1,35	1,07	1,41	2,28
X-FOAM HBT 300						
	thickness 160 mm					
density (kg/m ³)	31		33			
compressive stress/ deformation acc. EN 826:2013 (kPa / %)	360/2		434/2			
load stage (kPa)	100	140	100	130	180	
X ₀ (mm)	0,69	1,02	0,67	0,93	1,14	
X _{ct} ¹ (mm)	0,44	0,72	0,24	0,34	0,49	
X _{ct50} (mm)	1,47	2,34	0,53	0,82	1,13	
X_{t50}(mm)	2,16	3,35	1,20	1,75	2,27	

¹ Measured value after the test period of 20 month

**X-Foam HBT 300,
X-Foam HBT 500 and
X-Foam HBT 700**

Annex A

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

X-FOAM HBT 500	thickness 50 mm			thickness 120 mm		
density (kg/m ³)	36			37,5		
compressive stress/ deformation acc. EN 826:2013 (kPa / %)	606/3			590/2		
load stage (kPa)	150	180	220	150	180	220
X ₀ (mm)	0,23	0,27	0,32	0,39	0,49	0,61
X _{ct} ¹ (mm)	0,16	0,16	0,23	0,23	0,28	0,39
X _{ct50} (mm)	0,34	0,42	0,49	0,58	0,69	1,05
X_{t50}(mm)	0,57	0,70	0,81	0,97	1,18	1,66

X-FOAM HBT 500	thickness 50 mm		thickness 120 mm	
density (kg/m ³)	36,6		35,9	
compressive stress/ deformation acc. EN 826:2013 (kPa / %)	683/2		662/2	
load stage (kPa)	180	250	180	250
X ₀ (mm)	0,36	0,49	0,64	0,82
X _{ct} ¹ (mm)	0,21	0,33	0,24	0,35
X _{ct50} (mm)	0,45	0,76	0,61	0,89
X_{t50}(mm)	0,81	1,25	1,25	1,71

X-FOAM HBT 700	thickness 50 mm			thickness 120 mm		
density (kg/m ³)	43			42		
compressive stress/ deformation acc. EN 826:2013 (kPa / %)	827/2			921/2		
load stage (kPa)	200	250	320	180	250	320
X ₀ (mm)	0,35	0,37	0,49	0,56	0,68	0,85
X _{ct} ¹ (mm)	0,17	0,20	0,34	0,23	0,28	0,36
X _{ct50} (mm)	0,38	0,47	0,8	0,53	0,67	0,98
X_{t50}(mm)	0,72	0,85	1,29	1,08	1,34	1,83

X-Foam HBT 300,
X-Foam HBT 500 and
X-Foam HBT 700

Annex A

2. Creep under shear load

X-FOAM HBT 300	thickness 160 mm
density (kg/m ³)	34
shear strength/ deformation acc. EN 12090 (kPa)	146
load stage (kPa)	51,1
X _{τ0} (mm)	1,56
X _{τct} (mm)	0,74
X _{τct50} (mm)	1,83
X_{τt50}(mm)	3,40

3. Creep under combined compressive and shear load

X-FOAM HBT 300		
thickness	160 mm	
density (kg/m ³)	34	
load stage (kPa)	51,1	103,2
deformation under	shear load	compressive load
X _{τ0} /X ₀ (mm)	1,57	0,67
X _{τct} /X _{ct} (mm)	0,96	0,69
X _{τct50} /X _{ct50} (mm)	2,63	1,45
X_{τt50}/X_{t50}(mm)	4,20	2,12