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European Technical Assessment Body  
for construction products



## European Technical Assessment

ETA-19/0120  
of 5 March 2026

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

Styrodur 3035 CS  
Styrodur 4000 CS  
Styrodur 5000 CS

Product family  
to which the construction product belongs

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

Manufacturer

Karl Bachl GmbH & Co. KG  
Deching 3  
94133 Röhrnbach  
GERMANY

Manufacturing plant

Werk 1

This European Technical Assessment  
contains

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

This European Technical Assessment is  
issued in accordance with Article 95(4) of  
Regulation (EU) No 2024/3110, on the basis of

EAD 040650-00-1201

This version replaces

ETA-19/0120 issued on 2 July 2025

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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>), isobutane and additives. 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:

"Styrodur 3035 CS",

"Styrodur 4000 CS" and

"Styrodur 5000 CS".

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

Nominal thicknesses:

50 mm to 200 mm for Styrodur 3035 CS,

60 mm to 140 mm for Styrodur 4000 CS,

60 mm to 120 mm for Styrodur 5000 CS

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
- 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 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.





Essential characteristic	Performance
<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 thickness &lt; 100 mm</p> <p>thickness ≥ 100 mm</p>	<p>WL(T)0,7 (<math>W_{it} \leq 0,7</math> Vol.%)</p> <p>WD(V)3 (<math>W_{dv} \leq 3,0</math> Vol.%)</p> <p>WD(V)1 (<math>W_{dv} \leq 1,0</math> 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 (<math>W_v \leq 1,0</math> Vol.%)</p> <p>≤ 10 %</p>
<p>Water vapour diffusion resistance factor</p>	<p>No performance assessed</p>
<p>Geometrical properties</p> <p>Thickness test acc. EN 823:2013 (clause 7.2, figure 2, measuring set-up 3) thickness ≤ 120 mm thickness &gt; 120 mm</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 thickness ≤ 120 mm thickness &gt; 120 mm</p>	<p>tolerance</p> <p>± 2 mm +4/-2 mm</p> <p>± 8 mm</p> <p>5 mm/m</p> <p>2 mm 3 mm</p>

Essential characteristic	Performance
Deformation under specified compressive load and temperature conditions test acc. to EN 1605:2013	load: 40 kPa; temperature: $(70 \pm 1) \text{ }^\circ\text{C}$ ; time: $(168 \pm 1) \text{ h}$ $\leq 5 \%$
Dimensional stability under specified conditions test acc. to EN 1604:2013	temperature: $70 \text{ }^\circ\text{C}$ and 90 % R.H. DS(70,90) ( $\Delta\epsilon_l \leq 5 \%$ , $\Delta\epsilon_b \leq 5 \%$ , $\Delta\epsilon_d \leq 5 \%$ )
Tensile strength perpendicular to faces test acc. to EN 1607:2013	TR150 ( $\sigma_{mt} \geq 150 \text{ kPa}$ )
Volume percentage of closed cells test acc. to EN ISO 4590:2016 (method 1 with correction)	$\geq 95 \%$

**4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base**

In accordance with EAD 040650-00-1201, the applicable European legal acts are: 1995/467/EC and 1999/91/EC<sup>5</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 6 March 2026 by Deutsches Institut für Bautechnik

Frank Iffländer  
Referatsleiter

*beglaubigt:*  
Meyer

<sup>5</sup> as amended

Styrodur 3035 CS  
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Annex A

1. Compressive stress

Slip deformation

acc. to EAD, chapter 2.2.1.2

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

<b>Styrodur 3035 CS</b> ( $\varphi = 32 \text{ kg/m}^3$ )				
thickness (mm)	1x120	2x120	1x100	3x100
compressive stress, $\sigma_a$	90	74	79	80
initial displacement $X_a$ (mm)	<b>1,0</b>	<b>1,7</b>	<b>0,5</b>	<b>1,3</b>
<b>Styrodur 5000 CS</b> ( $\varphi = 43 \text{ kg/m}^3$ )				
thickness (mm)	1x120	2x120	1x100	3x100
compressive stress, $\sigma_a$	115	126	117	142
initial displacement $X_a$ (mm)	<b>0,9</b>	<b>1,6</b>	<b>0,9</b>	<b>1,6</b>

2. Compressive creep

2.1 Compressive creep (single-layer board)

acc. to EAD, chapter 2.2.3.1

<b>Styrodur 3035 CS</b>	<b>thickness 50 mm</b>			<b>thickness 120 mm</b>		
density ( $\text{kg/m}^3$ )	32			32		
compressive stress / deformation acc. to EN 826 ( $\text{kPa} / \%$ )	428/2			451/5		
<b>load stage (kPa)</b>	<b>90</b>	<b>130</b>	<b>190</b>	<b>90</b>	<b>130</b>	<b>190</b>
$X_0$ (mm)	0,19	0,26	0,38	0,45	0,61	0,93
$X_{ct}$ (mm)	0,15	0,23	0,44	0,25	0,42	1,56
$X_{ct50}$ (mm)	0,50	0,69	1,25	0,66	1,13	3,75
<b><math>X_{t50}</math> (mm)</b>	<b>0,69</b>	<b>0,95</b>	<b>1,63</b>	<b>1,11</b>	<b>1,74</b>	<b>4,68</b>
<b>Styrodur 3035 CS</b>	<b>thickness 140 mm</b>			<b>thickness 200 mm</b>		
density ( $\text{kg/m}^3$ )	33,4			37,8		
compressive stress / deformation acc. to EN 826 ( $\text{kPa} / \%$ )	492/10 (413/2)			529/2		
<b>load stage (kPa)</b>	<b>100</b>	<b>130</b>	<b>185</b>	<b>90</b>	<b>130</b>	<b>190</b>
$X_0$ (mm)	0,48	0,59	0,87	0,59	0,74	0,98
$X_{ct}$ (mm)	0,32	0,43	0,78	0,50	0,58	0,76
$X_{ct50}$ (mm)	0,94	1,28	2,22	1,44	1,71	2,29
<b><math>X_{t50}</math> (mm)</b>	<b>1,41</b>	<b>1,87</b>	<b>3,10</b>	<b>2,03</b>	<b>2,45</b>	<b>3,27</b>

Styrodur 3035 CS  
Styrodur 4000 CS  
Styrodur 5000 CS

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Styrodur 4000 CS	thickness 60 mm			thickness 120 mm		
density (kg/m <sup>3</sup> )	36,1			37,4		
compressive stress / deformation acc. to EN 826 (kPa / %)	616/10 (489/2)			553/2		
<b>load stage (kPa)</b>	<b>130</b>	<b>180</b>	<b>255</b>	<b>130</b>	<b>180</b>	<b>255</b>
X <sub>0</sub> (mm)	0,26	0,35	0,50	0,40	0,54	0,77
X <sub>ct</sub> (mm)	0,17	0,25	0,65	0,32	0,49	1,10
X <sub>ct50</sub> (mm)	0,46	0,68	1,98	0,88	1,37	3,69
<b>X<sub>t50</sub> (mm)</b>	<b>0,72</b>	<b>1,03</b>	<b>2,48</b>	<b>1,28</b>	<b>1,92</b>	<b>4,46</b>

Styrodur 4000 CS	thickness 140 mm		
density (kg/m <sup>3</sup> )	37,8		
compressive stress / deformation acc. to EN 826 (kPa / %)	672/3		
<b>load stage (kPa)</b>	<b>130</b>	<b>180</b>	<b>255</b>
X <sub>0</sub> (mm)	0,51	0,57	0,77
X <sub>ct</sub> (mm)	0,29	0,53	0,97
X <sub>ct50</sub> (mm)	0,76	1,29	2,79
<b>X<sub>t50</sub> (mm)</b>	<b>1,27</b>	<b>1,86</b>	<b>3,56</b>

Styrodur 5000 CS	thickness 60 mm			thickness 120 mm		
density (kg/m <sup>3</sup> )	44			44,6		
compressive stress / deformation acc. to EN 826 (kPa / %)	791/10 (608/2)			899/10 (753/2)		
<b>load stage (kPa)</b>	<b>180</b>	<b>250</b>	<b>350</b>	<b>180</b>	<b>250</b>	<b>350</b>
X <sub>0</sub> (mm)	0,33	0,41	0,58	0,43	0,65	0,81
X <sub>ct</sub> (mm)	0,22	0,34	1,19	0,43	0,61	1,36
X <sub>ct50</sub> (mm)	0,68	0,95	3,84	1,30	1,93	4,25
<b>X<sub>t50</sub> (mm)</b>	<b>1,01</b>	<b>1,36</b>	<b>4,42</b>	<b>1,73</b>	<b>2,58</b>	<b>5,06</b>

Styrodur 3035 CS  
Styrodur 4000 CS  
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Annex A

## 2.2. Compressive creep (multi-layer installation)

acc. to EAD, chapter 2.2.3.1

<b>Styrodur 3035 CS</b>	<b>thickness 300 mm (3x 100mm)</b>			<b>thickness 240 mm (2x120) mm</b>		
density (kg/m <sup>3</sup> )	32			32		
compressive stress / deformation acc. to EN 826 (kPa / %)	425/10 (338/2)			468/8 (382/2)		
<b>load stage (kPa)</b>	<b>90</b>	<b>130</b>	<b>190</b>	<b>90</b>	<b>130</b>	<b>190</b>
X <sub>0</sub> (mm)	1,76	2,21	3,15	1,35	1,48	2,00
X <sub>ct</sub> (mm)	0,66	1,04	4,00	0,57	0,67	1,84
X <sub>ct50</sub> (mm)	1,89	2,72	11,50	1,31	1,63	4,77
<b>X<sub>t50</sub> (mm)</b>	<b>3,65</b>	<b>4,93</b>	<b>14,65</b>	<b>2,66</b>	<b>3,11</b>	<b>6,77</b>
<hr/>						
<b>Styrodur 5000 CS</b>	<b>thickness 300 mm (3x 100mm)</b>			<b>thickness 240 mm (2x120) mm</b>		
density (kg/m <sup>3</sup> )	44			45,4		
compressive stress / deformation acc. to EN 826 (kPa / %)	840/10 (639/2)			890/10 (700/2)		
<b>load stage (kPa)</b>	<b>180</b>	<b>250</b>	<b>350</b>	<b>180</b>	<b>250</b>	<b>350</b>
X <sub>0</sub> (mm)	2,24	2,54	3,61	1,20	1,53	2,31
X <sub>ct</sub> (mm)	1,25	1,38	3,38	0,87	1,20	2,01
X <sub>ct50</sub> (mm)	3,28	3,69	8,36	2,36	3,32	6,02
<b>X<sub>t50</sub> (mm)</b>	<b>5,52</b>	<b>6,22</b>	<b>11,98</b>	<b>3,57</b>	<b>4,85</b>	<b>8,32</b>

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

acc. to EAD, chapter 2.2.4

<b>Styrodur 3035 CS</b>	<b>thickness 140 mm</b>	<b>thickness 200 mm</b>
density (kg/m <sup>3</sup> )	36,5 / 34,1 / 33,5	36
<b>shear strength <math>\tau_{large}</math></b> acc. to EAD chapter 2.2.4 and the guidelines in EN 12090 (kPa)	<b>174</b>	<b>126</b>
<hr/>		
<b>Styrodur 5000 CS</b>	<b>thickness 120 mm</b>	
density (kg/m <sup>3</sup> )	45,2	
<b>shear strength <math>\tau_{large}</math></b> acc. to EAD chapter 2.2.4 and the guidelines in EN 12090 (kPa)	<b>209</b>	

Styrodur 3035 CS  
Styrodur 4000 CS  
Styrodur 5000 CS

Annex A

4. Creep under shear load  
acc. to EAD, chapter 2.2.5

<b>Styrodur 3035 CS</b>	<b>thickness 140 mm</b>	<b>thickness 200 mm</b>
Density (kg/m <sup>3</sup> )	36,5 / 34,1 / 33,5	37
shear strength / deformation acc. to EN 12090 (kPa)	174	126
<b>load stage (kPa)</b>	<b>61</b>	<b>44,1</b>
X <sub>τ0</sub> (mm)	1,50	1,68
X <sub>τct</sub> (mm)	0,73	0,18
X <sub>τct50</sub> (mm)	1,86	0,31
<b>X<sub>τ50</sub> (mm)</b>	<b>3,36</b>	<b>1,99</b>
<b>Styrodur 5000 CS</b>		
	<b>thickness 120 mm</b>	
Density (kg/m <sup>3</sup> )	45,2	
shear strength / deformation acc. to EN 12090 (kPa)	209	
<b>load stage (kPa)</b>	<b>73</b>	
X <sub>τ0</sub> (mm)	0,79	
X <sub>τct</sub> (mm)	0,44	
X <sub>τct50</sub> (mm)	1,41	
<b>X<sub>τ50</sub> (mm)</b>	<b>2,20</b>	

Styrodur 3035 CS  
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Annex A

5. Creep under combined compressive and shear load  
acc. to EAD, chapter 2.2.6

<b>Styrodur 3035 CS</b>		
<b>thickness</b>	<b>140 mm</b>	
Density (kg/m <sup>3</sup> )	36,5 / 34,1 / 33,5	
compressive stress / deformation acc. to EN 826 (kPa / %)	537/2 417/2 426/4 (363/2)	
shear strength / deformation acc. to EN 12090 (kPa)	174	
<b>load stage (kPa)</b>	<b>61</b>	<b>138</b>
deformation under	shear load	compressive load
X <sub>τ0</sub> / X <sub>0</sub> (mm)	1,48	1,36
X <sub>τct</sub> / X <sub>ct</sub> (mm)	0,97	1,47
X <sub>τct50</sub> / X <sub>ct50</sub> (mm)	2,14	2,46
<b>X<sub>τt50</sub> / X<sub>t50</sub> (mm)</b>	<b>3,62</b>	<b>3,82</b>
<b>Styrodur 3035 CS</b>		
<b>thickness</b>	<b>200 mm</b>	
Density (kg/m <sup>3</sup> )	37	
compressive stress / deformation acc. to EN 826 (kPa / %)	490	
shear strength / deformation acc. to EN 12090 (kPa)	126	
<b>load stage (kPa)</b>	<b>44,1</b>	<b>147</b>
deformation under	shear load	compressive load
X <sub>τ0</sub> / X <sub>0</sub> (mm)	1,81	0,41
X <sub>τct</sub> / X <sub>ct</sub> (mm)	0,45	0,38
X <sub>τct50</sub> / X <sub>ct50</sub> (mm)	0,79	3,22
<b>X<sub>τt50</sub> / X<sub>t50</sub> (mm)</b>	<b>2,60</b>	<b>2,03</b>

Styrodur 3035 CS  
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Annex A

<b>Styrodur 5000 CS</b>		
<b>thickness</b>	<b>120 mm</b>	
Density (kg/m <sup>3</sup> )	45,2	
compressive stress / deformation acc. to EN 826 (kPa / %)	747(2) 859(10)/647(2)	
shear strength / deformation acc. to EN 12090 (kPa)	209	
<b>load stage (kPa)</b>	<b>73</b>	<b>239</b>
deformation under	shear load	compressive load
X <sub>t0</sub> / X <sub>0</sub> (mm)	0,84	1,44
X <sub>tct</sub> / X <sub>ct</sub> (mm)	0,78	1,56
X <sub>tct50</sub> / X <sub>ct50</sub> (mm)	1,99	2,82
<b>X<sub>t50</sub> / X<sub>t50</sub> (mm)</b>	<b>2,83</b>	<b>4,26</b>

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

<b>Styrodur 3000 CS</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 120 mm</b>		
density (kg/m <sup>3</sup> )	32		
<b>Compression stress – load stage (kPa)</b>	<b>20</b>	<b>60</b>	<b>120</b>
Adhesive friction coefficient regarding the compression stress – load stage	0,40	0,44	0,45
<b>Adhesive friction coefficient</b>	<b>0,43</b>		