

EPS Prime Insulation Board 3870



034 WDV, blunt edges, for use in the Brillux ETIC System EPS Prime

Field of application

Insulation board approved in system build-up for use in the Brillux ETIC System EPS Prime.

Properties

- Facade insulation board made of expanded polystyrene hard foam
- Aging-resistant
- Easy to apply
- Diffusible

Material description

Rated thermal conductivity λ_B	0.034 W/(m·K) in accordance with DIN 4108-4
Nominal value of the thermal conductivity λ_D	0.033 W/(m·K) in accordance with EN 13163
Reaction to fire	“normalentflammbar” (flammable) or “schwerentflammbar” (flame-retardant) in the Brillux ETIC System EPS Prime.
Water vapor diffusion resistance factor μ	20/70 in accordance with DIN EN 12086
Tensile strength perpendicular to the board plane	≥ 100 kPa in accordance with DIN EN 1607
Irreversible elongation	$< 0.15\%$ (measure of post-shrinkage)
Length and width tolerance	± 2 mm/m
Thickness tolerance	± 1 mm
Board planarity	± 3 mm/m

Material description

Perpendicularity	± 2 mm/m
Film formation on edge	Blunt edges
Insulation board format	Length: 100 cm / Width: 50 cm
Thicknesses/packaging	Insulation board thicknesses
	m ² per pack
	1 cm ¹⁾ approx. 24,0 m ²
	2 cm ¹⁾ approx. 12,0 m ²
	3 cm ¹⁾ approx. 8,0 m ²
	4 cm approx. 6,0 m ²
	5 cm approx. 4,5 m ²
	6 cm approx. 4,0 m ²
	8 cm approx. 3,0 m ²
	10 cm approx. 2,0 m ²
	12 cm approx. 2,0 m ²
	14 cm approx. 1,5 m ²
	16 cm approx. 1,5 m ²
	18 cm approx. 1,0 m ²
	20 cm approx. 1,0 m ²
	22 cm approx. 1,0 m ²
	24 cm approx. 1,0 m ²
	26 cm approx. 0,5 m ²
	28 cm approx. 0,5 m ²
	30 cm approx. 0,5 m ²

¹⁾ Insulation board thicknesses up to 3 cm are used for insulating small areas, e.g. reveals.

Also available plasticized on request (with improved noise insulation properties). Observe the section on "Plasticized insulation boards" under Notes.

Storage

Store in a dry place and protect from moisture. Do not allow exposure to intensive sunlight for an extended period of time.

Use

Substrate preparation	Follow the instructions in the relevant EPS Prime System Description.
Bonding	Bond the EPS Prime Insulation Board 3870 with adhesive mortar in accordance with the instructions in the relevant EPS Prime system description. Follow the instructions in the Data Sheet for the relevant adhesive mortar. Protect insulation boards attached to the facade against weathering, e.g., direct sunlight at high summer temperatures, rain and hail, by taking appropriate measures or coat them immediately with reinforcement plaster.
Application temperature	Do not install at air and object temperatures above +30 °C; also during the curing time.
Cutting insulation boards to size	The individual insulation boards can be cut to size with a hot wire cutter or a hard foam saw. Further information can be found in the Brillux tool product range.

Depending on the substrate condition, we differentiate between the following anchoring methods for EPS Prime insulation boards:

- a) bonded and structurally anchored
- b) bonded and statically relevantly anchored

with ceramic coverings When using ceramic coverings as a top coat, it is important to follow the specific instructions on anchoring in accordance with the General National Technical Approvals No. Z-33.46-1327 and the instructions for the relevant system application.

a) bonded and structurally anchored Additional structural anchoring of the bonded ETICS hard foam insulation boards with ETICS anchors is recommended on intact, firmly adherent substrates, e.g., concrete or brickwork with intact, fixed adhesive coating, decorative render, etc.

Anchor quantity

Based on the long-term practical experience and application, a total of 6 anchors/m² has proved to be adequate. Please also refer to "Anchor arrangement" below.

b) bonded and statically relevantly anchored Statically-relevant anchoring must be implemented on all substrates for which an expert examination and assessment has revealed that they do not have adequate tear strength, in accordance with the General National Technical Approval No. Z-33.43-257. Approved ETICS anchors must be used for this purpose. Substrate unevennesses of up to max. 2 cm/m can be bridged for statically-relevantly anchored ETICS insulation boards.

Determining wind load The wind loads for statically-relevant anchoring must be calculated in accordance with DIN EN 1991-1-4/NA. The anchor quantities can be stipulated in line with the information below in accordance with calculated max. wind loads depending on the anchor load class.

Anchor selection according to the substrate

Substrate (with usage category)	ETICS Sunk Anchor STR U 2G 3811 ¹⁾	ETICS Impact Anchor H1 eco 3856	ETICS Metal Fastener STR-H plus 3730
(A) Standard concrete	X	X	
(B) Solid bricks	X	X	
(C) Hollow/perforated bricks	X	X	
(D) Lightweight aggregate concrete	X		
(E) Aerated concrete	X		
Standardized or approved board materials			X ²⁾

¹⁾ Can be used for the countersunk mounting from an insulation board thickness of ≥ 80 mm.

²⁾ Can only be used for structurally anchoring.

Please follow the instructions on anchor installation, anchor lengths and approved anchoring substrates with anchor load classes in the Data Sheets of the respective ETICS anchors. The stipulated anchor quantities apply to the use of anchor washers with Ø = 60 mm and the anchoring under the mesh.

Determining the anchor quantities

Across-the-board assumption of anchor quantities

The anchor quantity can also be stipulated across the board for rectangular buildings with the aid of Tables 1a and 1b below as a function of the building height by solely determining the wind zone. A detailed calculation of the wind load must be performed for all other buildings. This results in a reduction of the number of anchors in some cases.

In accordance with the determined wind load

The number of anchors for the statically-relevant anchoring of the EPS Prime Insulation Boards 3870 can be determined using the calculated wind loads based on Table 2 below.

Table 1a
General anchor quantities for statically-relevant anchoring of the EPS Prime Insulation Board 3870 (standard insulation boards) as a function of the building height with countersunk and surface-flush anchoring

Required number of anchors per m² (surface and edge area) as a function of the calculated wind zone and the insulation thickness ¹⁾

Building height	≤ 10 m		> 10 m to ≤ 18 m		> 18 m to ≤ 25 m	
	Insulation thickness [mm]	Anchor load class [kN]	Insulation thickness [mm]	Anchor load class [kN]	Insulation thickness [mm]	Anchor load class [kN]
Wind Zone 1 Inland	≥ 6–30	≥ 0.15	≥ 12–30	≥ 0.167	≥ 6–30	≥ 0.15
Wind Zone 2 Inland	8	6	8	6	10	8
Wind zone 2 Coasts and islands in the Baltic Sea	10	8	10	10	12	10
Wind Zone 3 Inland	8	8	10	8	12	10
Wind zone 3 Coasts and islands in the Baltic Sea	10	10	12	12	14	12
Wind Zone 4 Inland	10	8	12	10	14	12
Wind zone 4 Coasts and islands in the Baltic Sea	14	12	14	12	16	14
Wind Zone 4 Islands in the North Sea	14	12	2)	2)	2)	2)

¹⁾ Anchor arrangement in accordance with the overview below.

²⁾ According to the relevant standard, the simplified calculation procedure cannot be used in this case. Precise calculations based on the calculated wind load are required.

In the across-the-board assumption of anchor quantities presented here, more anchors could be used than would be required subsequent to a precise calculation. When using plasticized insulation boards and for further information, the Brillux Consulting Service should be consulted.

Anchoring

Table 1b
General anchor quantities for statically-relevant anchoring of the EPS Prime Insulation Board 3870 (standard insulation boards) depending on the building height with countersunk anchoring with ETICS Sunk Anchor STR U 2G 3811 and insulation thickness ≥ 140 mm

Required number of anchors per m² (surface and edge area) as a function of the calculated wind zone and the insulation thickness ¹⁾

Building height	≤ 10 m			> 10 m to ≤ 18 m			> 18 m to ≤ 25 m	
Insulation thickness [cm]	$\geq 14-30$			$\geq 14-30$			$\geq 14-30$	
Anchor load class [kN] ³⁾	0.20	0.25	≥ 0.3	0.20	0.25	≥ 0.3	0.20	≥ 0.25
Wind Zone 1 Inland	4	4	4	6	4	4	6	6
Wind Zone 2 Inland	6	4	4	6	4	4	8	6
Wind zone 2 Coasts and islands in the Baltic Sea	6	6	4	8	6	6	8	8
Wind Zone 3 Inland	6	6	4	8	6	6	8	8
Wind zone 3 Coasts and islands in the Baltic Sea	8	6	6	10	8	6	10	8
Wind Zone 4 Inland	8	6	6	10	8	6	10	8
Wind zone 4 Coasts and islands in the Baltic Sea	10	8	6	10	8	8	12	10
Wind Zone 4 Islands in the North Sea	10	8	8	²⁾			²⁾	

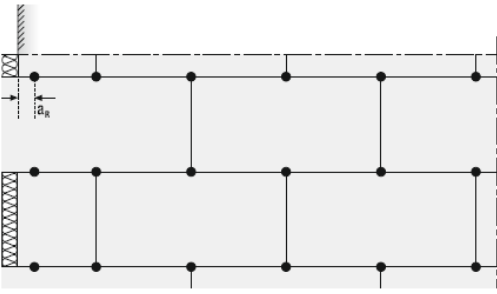
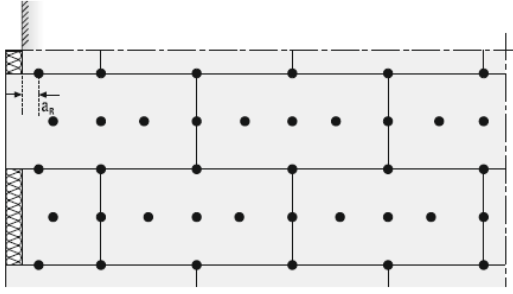
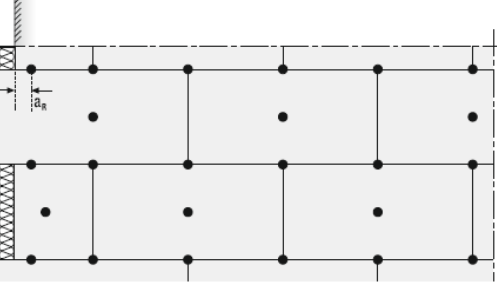
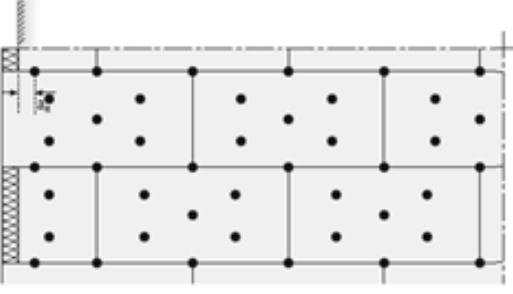
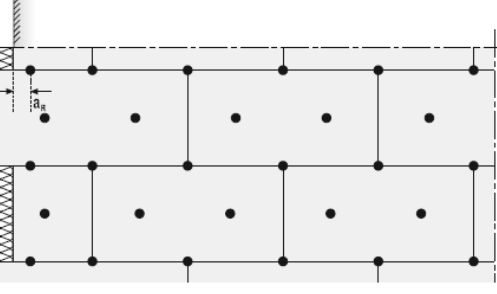
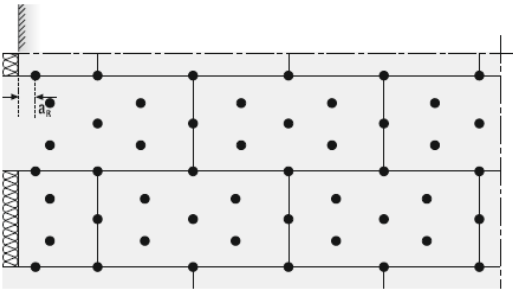
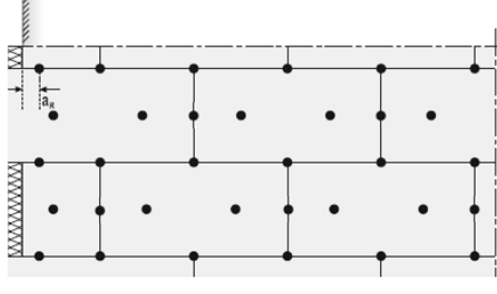
¹⁾ Anchor arrangement in accordance with the overview below.

²⁾ According to the relevant standard, the simplified calculation procedure cannot be used in this case. Precise calculations based on the calculated wind load are required.

³⁾ With anchor load class < 0.20 , the information in Table 1a applies.

In the across-the-board assumption of anchor quantities presented here, more anchors could be used than would be required subsequent to a precise calculation. When using plasticized insulation boards and for further information, the Brillux Consulting Service should be consulted.

Anchor arrangements for statically-relevant anchoring of the EPS Prime Insulation Board 3870

Anchor /m ²	Anchor arrangements	Anchor /m ²	Anchor arrangements
4		12	
6		14	
8		16	
10			

Differing anchor arrangements are possible, but generally result in higher anchor numbers/m². The Brillux Consulting Service should be consulted in this context.

Table 2

Load-bearing capacity table for statically-relevant anchoring of the EPS Prime Insulation Board 3870 (standard insulation boards) *)

Anchor washer	Insulation board thickness [cm]	Anchor load class ¹⁾ [kN]	Maximum absorbable wind load [kN/m ²]	Number of anchors Anchor/m ²
Standard Ø 60 mm	≥ 6	≥ 0,15	-0,600	4
	≥ 12	≥ 0,167	-0,668	
	≥ 14 for countersunk mounting ²⁾	≥ 0,20	-0,800	
		≥ 0,25	-1,000	
Standard Ø 60 mm	≥ 6	≥ 0,15	-0,900	6
	≥ 12	≥ 0,167	-1,000	
	≥ 14 for countersunk mounting ²⁾	≥ 0,20	-1,200	
		≥ 0,25	-1,500	
		≥ 0,30	-1,600	
Standard Ø 60 mm	≥ 6	≥ 0,15	-1,213	8
	≥ 12	≥ 0,167	-1,336	
	≥ 14 for countersunk mounting ²⁾	≥ 0,20	-1,600	
		≥ 0,25	-2,000	
		≥ 0,30	-2,200	
Standard Ø 60 mm	≥ 6	≥ 0,15	-1,600	10
	≥ 12	≥ 0,167	-1,670	
Standard Ø 60 mm	≥ 6	≥ 0,15	-1,820	12
	≥ 12	≥ 0,167	-2,004	
Standard Ø 60 mm	≥ 6	≥ 0,15	-2,200	14
	≥ 12	≥ 0,167	-2,338	
Standard Ø 60 mm	≥ 6	≥ 0,15	-2,573	16
	≥ 12	≥ 0,167	-2,672	
Standard Ø 60 mm	≥ 6	≥ 0,15	-2,913	16
	≥ 12	≥ 0,167	-3,006	

¹⁾ This sometimes results in higher load-bearing capacity values in individual cases. Anchor arrangement in accordance with the overview above. For further information, the Brillux Consulting Service should be consulted.

¹⁾ The determined load for each anchor is decisive for lower load-bearing capacity values. [Load-bearing capacity for each anchor (calculated pull-out value) x number of anchors = significantly higher resistance to wind load]

²⁾ with ETICS Sunk Anchor STR U 2G 3811

Anchoring

Thermal bridge impact through anchoring

When using anchoring, the thermal bridge impact of the anchors must be taken into account as follows:

$$U_c = U + \chi \cdot n \quad [\text{in } W/(m^2 \cdot K)]$$

Where:

U_c = is the corrected thermal transmission coefficient of the component
 U = is the thermal transmission coefficient of the undisturbed component in $W/(m^2 \cdot K)$

χ = point-based thermal transmission coefficient of an anchor in W/K

n = number of anchors l/m^2 (average of the facade areas)

It is not necessary to consider the thermal bridge impact of the anchors if the maximum amount of anchors n per m^2 wall area (average of the facade areas), depending on the insulation material thickness and the thermal transmission coefficient of the anchor, corresponds to the specifications in the following table.

The thermal bridge impact of the anchors also does not have to be considered if it has been verified in individual cases that the increase in the thermal transmission coefficient of the undisturbed component does not exceed 3% as a result of the thermal bridge impact of the anchors.

Number of anchors per m^2 , up to which it does not have to be considered in the U-value if the insulation material has a rated thermal conductivity of $\lambda = 0.034 W/(m \cdot K)$

χ in W/K	Insulation thickness in cm					
	$d \leq 5$	$5 < d \leq 10$	$10 < d \leq 15$	$15 < d \leq 20$	$20 < d \leq 25$	$25 < d$
0.002	9	5	3	3	2	2
0.001	16 ¹⁾	10	7	5	4	3

¹⁾ Maximum number of anchors without reciprocal interference

Notes

Solvent-free priming

Polystyrene hard foam is attacked by solvents. Therefore, only solvent-free primers should be used.

Cables on the exterior wall

If cables are installed on the exterior wall, it is important to mark their paths on the insulation board to avoid damage (resulting from additional mechanical mounting) to them.

Plasticized insulation boards

Plasticized insulation boards are available on request as a special order. When using plasticized insulation boards, use only mineral reinforcement plaster.

Dynamic stiffness s' :

$\leq 20 \text{ MN/m}^3$ Thickness $\geq 8.0 \text{ cm}$

$\leq 15 \text{ MN/m}^3$ Thickness $\geq 12.0 \text{ cm}$

$\leq 10 \text{ MN/m}^3$ Thickness $\geq 16.0 \text{ cm}$

$\leq 7 \text{ MN/m}^3$ Thickness $\geq 20.0 \text{ cm}$

Tensile strength:

$\geq 80 \text{ kPa}$ in accordance with DIN EN 1607

Further information

Follow the instructions on the data sheets of the products used.

Remark

This Data Sheet is based on extensive development work and years of practical experience. The translation corresponds to the current German version, in compliance with the German laws, regulations, standards and guidelines. Its content does not constitute a contractual legal relationship. The user/buyer is not released from the responsibility of checking our products to ensure they are suitable for the intended application. In addition, our general terms of business apply.

When a new version of this Data Sheet with updated information is published, the previous version no longer applies. The current version is available on our website.

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