Physical material properties
of the applied materials

FRINORM®

Substructure elements for windows and doors
Resistant to moisture and mildew

Polyurethane recycled board, CL	Symbol	Test method	Unit	Value
Nominal density		EN ISO 845 EN 1602 ASTM D1622	kg/m³	600
Initial thermal conductivity (–10°C)		EN 12667 ASTM C518 ASTM C177	mW/mK	75
Initial thermal conductivity (0°C)		EN 12667 ASTM C518 ASTM C177	mW/mK	78
Initial thermal conductivity (20°C)		EN 12667 ASTM C518 ASTM C177	mW/mK	84
Fire behaviour		DIN 4102	Class	B2
Fire behaviour (fire spread)		EN ISO 3582	mm	<60
Fire behaviour (extinguishing time)		EN ISO 3582	s	<120
Fire behaviour (blocks, boards)		EN 13501 EN 11925	Euroclass	E
Bending strength – parallel, met. I (23°C)		EN 12089 ASTM C203	MPa	15.6
Bending module – parallel (23°C)		EN 12089 ASTM C203	MPa	513
Max. bending deformation (23°C) – met. I		EN 12089 ASTM C203	mm/mm	0.036
Compressive strength – parallel (23°C)		EN 826 ASTM D1621	MPa	15.7
Compressive strength – vertical (23°C)		EN 826 ASTM D1621	MPa	18.2
Pressure module – parallel (23°C)		EN 826 ASTM D1621	MPa	270
Pressure module – vertical (23°C)		EN 826 ASTM D1621	MPa	366
Dimensional stability (48 h, –25°C) Length/width – thickness		EN 1604 ASTM D2126	%	±0.05; ±0.05; ±0.05
Dimensional stability (48 h, +70°C r.h.) Length/width – thickness		EN 1604 ASTM D2126	%	–0.01; –0.01; –0.01
Water absorption		EN 317	kg/m²	<0.2
Water absorption		EN 317	%	1.8
Thickness swelling		EN 317	%	0.25
Surface hardness		EN ISO 868 ASTM D2240	Shore D	55
Temperatures applied			°C	-180/+100
Closed-cell content		EN ISO 4590 ASTM D6226	%	45
Screw retention		EN 320	kgf	153

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Physical material properties
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Substructure elements for windows and doors
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Polyurethane recycled board, PH	Symbol	Test method	Unit	Value
Material	Polyurethane product free of CFCs, HCFCs and formaldehyde			
Resistance to ageing	Mildew- and rot-resistant			
Gross density	ρ_a	DIN EN 1602	kg/m³	550 ± 50
Thermal conductivity	λ_D		W/mK	0.076
Fire behaviour		DIN EN 13501-1	Class	E
Fire behaviour		DIN 4102, Part 1	Class	B2
Bending strength			N/mm²	Approx. 7.8
Thickness swelling (after 24 hrs immersion in water)			%	Approx. 1
Structural properties – strength (elasticity modulus)			N/mm²	500
Water vapour diffusion resistance factor				Approx. 12
Screw retention Screw depth 15 mm[2]			N	Approx. 650
Screw retention Screw depth 40 mm[4]			N	Approx. 3500
Compressive strength[3]		DIN EN 826	kPa	Approx. 7000
Length expansion due to moisture			mm/m	±2
Length expansion coefficient in the range –20 to +60 °C			K	Approx. 28.375 · 10^6
Residual moisture			%	Approx. 2–4
Construction material class		DIN EN 4102	Non-dripping	B2
Thickness tolerance, unsanded			mm	±0.4
Thickness tolerance, sanded			mm	±0.2
Applicable in temperature range	–50 °C to +100 °C			

Intensely expanded polystyrene rigid foam (EPS perimeter)	Symbol	Test method	Unit	Value
Gross density	ρ_a	1602	kg/m³	30
Thermal conductivity	λ_D	279	W/(mK)	0.033
Specific thermal capacity	c		Wh/(kgK)	0.39
Water vapour diffusion resistance factor	μ	12086		70
Thermal length expansion coefficient			K^{-1}	$5–7 \cdot 10^{-5}$
Water absorption after long-term submersion	W_{lt}	12087	%	≤3
Water absorption through diffusion	W_{dV}	12088	%	≤5
Fire behaviour classification in acc. with EN		13501–1		E
Fire behaviour group		VKF		RF3 (cr)
Compression stress at 10% compression	○10	826	kPa	≥250v
Top application limit temperature, non-weight-bearing			°C	75
Cell content				Air

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