Physical material properties
of the applied materials

FRINORM®

Substructure elements for plastic lifting sliding doors

Polyurethane	Symbol	Test method	Unit	Value
Material	CFC-, HCFC- and formaldehyde-free polyurethane product			
Resistance to ageing	Mildew- and rot-resistant			
Gross density	ρ_a		kg/m³	550 ± 50
Thermal conductivity	λ_D	EN 12667	W/mK	0.076
Construction material class		DIN 4102, part 1		B2
Fire behaviour		DIN EN 13501-1		Class E
Bending strength			N/mm²	Approx. 7.8
Elastic modulus			N/mm²	Approx. 500
Screw retention			N	Approx. 650
Thickness swelling (after 24 hrs immersion in water)			%	Approx. 1
Water absorption (after 24 hrs immersion in water)			%	Approx. 5
Length alteration due to moisture			mm/m	±2
Length expansion coefficient in the range –20 °C to +60 °C				Approx. 28.375*10^{-6}/K
Water vapour diffusion resistance factor	μ			Approx. 12
Residual moisture			%	Approx. 2–4
Thickness tolerance, unsanded			mm	±0.4
Thickness tolerance, sanded			mm	±0.2
Applicable in temperature range			°C	–50 to +100

Integral foam board	Symbol	Test method	Unit	Value	Value
Thickness			mm	10	19
Thermal conductivity	λ_D	DIN 52612	W/mK	0.051	0.060
Sound insulation values		DIN ISO 717-1	dB	27	30
Gross density	ρ_a	DIN EN ISO 1183	kg/m³	~430–500	~430–500
Fire behaviour		DIN 4102		B2	– – –
		NFP 92-512		– – –	M1/19 mm
Tensile elastic modulus		ISO 527 (50 mm/min.)	MPa	1050	1050
Impact resistance		ISO 179/1eU	kJ/m²	20	20
Tensile strength		ISO 527 (50 mm/min.)	MPa	11	11
Bending strength		ISO 178 (2 mm/min.)	MPa	21	21
Shore hardness D		ISO 868		50–70	60–70
Surface resistance		DIN IEC 60 167	ROE [Ω]	2.00E + 14	– – –
Contact resistance		DIN IEC 60 093	RD [Ωcm]	1.86E + 14	– – –
Dielectric constant	εr	DIN 53 483		1.6–1.8	– – –
Expansion coefficient		DIN 53 752	10⁴/K	6.10–⁵	6.10–⁵
Compressive strength		DIN 53 421	N/mm²	~3.5	– – –
Vicat softening point		ISO 306 (B50)	°C	49	49
Heat deflection temperature		ISO 75-2 (1.8 MPa)	°C	57	57
Water absorption		ISO 62 (after 216 hrs)	%	4.9	4.9
Water-vapour-diffusion-equivalent air layer thickness sd		DIN 52 615	m	157 (for 10 mm)	

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/(kg·K)	0.39
Water vapour diffusion resistance factor	μ	12086		70
Thermal length expansion coefficient			K^{-1}	$5–7·10^{-5}$
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	σ_{10}	826	kPa[2)]	≥150
Top application limit temperature, non-weight-bearing			°C	75
Cell content				Air

Frinorm AG, Wärmedämmelemente
Föhrenweg 12, FL-9496 Balzers, phone 00423 384 23 66, fax 00423 384 23 35, www.frinorm.com, info@frinorm.com