

Technical data sheet

evguard® - colorless transparent

EVA interlayer for laminated safety, security & architectural glass

evguard® - laminating film is an ethylene-vinyl-acetate (EVA) based thermoset interlayer for the manufacturing of laminated safety glass. Through processing, it forms a highly cross-linked three-dimensional composite interlayer that provides the strength for laminated safety, security and architectural glass.

🌐 Internationally certified

DIBt – (Germany) – Deutsches Institut für Bautechnik	AbZ (national technical approval), expertise G-70-21-0003	—	certified
American National Standard Institute	ANSI Z97.1 -2009, CPSC 16 CFR 1201, CAN/CGSB 12.1-M90	33.3	approved
SGCC – Safety Glazing Certification Council	SGCC list of accepted interlayers (SD-099)	evguard®	listed
Miami-Dade — Checklist #0445	ASTM C158 (flexural strength change), ASTM D1929 (ignition temp. 440 °C 824 F), ASTM D2843 (smoke density), ASTM D635 (rate of burn: CC1), ASTM G155/D638 (weathering)	33.1	approved (NOA No. 24-0117.03)
Miami-Dade — Testing of large missile impacts and cyclic loads	ASTM D1929 (ignition temp. 377 °C 711 F), ASTM D2843 (smoke density), ASTM D635 (rate of burn: C1)	22.2.MPE(200)	approved (NOA No. 25-0421.02)
Shooter attack test	TAS 201-94 (Large Missile), TAS 203-94 at ± 120 psf (Cycling)	55.4.MPE(800) 55.4.MPE(800)	approved approved
Ballistic & impact tests	ASTM F3561-22 (active shooter certified)	—	FTD-SA-C6
Blast test	ASTM C 1036-06 16 CFR 1201	—	approved
Boil test	ASTM F2912-17 & F1642-17	IGU	hazard level H4 (low)
	ANSI Z97.1	33.2	approved

Processing

Minimum temperature	105 °C 220 F
Maximum temperature	160 °C 320 F
Production process	vacuum / nip-roll / autoclave lamination

Dimensions & Packaging

Thickness	min. 0.2 mm, max. 1.14 mm	customized dimensions and packaging on individual request
Width	min. 800 mm, max. 2,400 mm	
Core	76 mm cardboard core	
Packaging	in cardboard boxes	





Stability*

Resistance against heat, humidity and UV radiation	DIN EN ISO 12543-4,	44.1	approved
		44.2	approved
		44.2.MPE(200)	approved
	ASTM G155-05a (optical),	33.2	approved
	ASTM D1003-11 (transparency & haze), ASTM E313-10 (yellowing index), ASTM E308-12 (color change)	33.1.MPE(200)	approved
Salt spray test (3,000 hours)	ASTM B117, ISO 9227	44.2	approved
		44.2.MPE(200)	approved
Fire classification & reaction to fire	DIN EN 13501-1 (classification), DIN EN ISO 11925-2 (ignition), DIN EN 13823 (SBI)	44.2	B-s1-d0, no ignition, no afterburning
Bake test	DIN EN ISO 12543-4	44.1	up to 240 °C 464 F, without delamination
Frost resistance test	GOST 30826-2014 (-70 °C -94 F, 14 days)	66.2	approved
Ball drop test at low temperatures 0 °C 32 F/-20 °C -4 F/-40 °C -40 F	DIN 52338 (4.5 m height)	44.2	passed
Ball drop test	DIN EN 356	44.2	P1A
		44.3	P1A
	DIN EN 356	22.2.MPE(200)	P1A
		22.2.MPE(400)	P2A
		22.2.MPE(800)	P4A
		44.2.MPE(200)	P2A
		44.2.MPE(400)	P3
		44.4.MPE(600)	P4A
		44.8.MPE(600)	P5A
		(0.7)2.2.MPE(200)	approved
	DIN 52338 (6 m height) DIN 52338 (12 m height)	22.2.MPE(400)	approved
Freestanding barrier glass / Glass railings**	BS 6180	88.2	approved
	DIN 18008-3, category B	1010.2	approved
	residual carrying capacity,	66.4.MPE(600)	approved
	AS/NZS 1170.1	88.2.MPE(200)	approved
Pummel test (20 °C 68 F)	internal standard	44.2	≥ 7
Glass railing category B	DIN EN 1990/1991/1993/1999, DIN 18008-1 to -4 (Germany), UNI 11678:2017, NTC:2018 (Italy)	88.1	passed
		88.2	passed
		88.2.MPE(200)	passed
		88.2.MPE(400)	passed
		88.2.MPE(600)	passed
Deflection & pendulum impact test	AS/NZS 1170.1	88.2.MPE(600)	approved
Pendulum test	DIN EN 12600	88.4.MPE(600)	approved
		44.1	1B1
		33.2	2B2
		33.1	3B3





Stability*

Young's modulus***	DMA analysis	44.1	Temperature range 10 °C 50 F to 80 °C 176 F, see table below
Shear modulus***	DIN EN 16613 DMA	44.1 44.2.MPE(200) 44.2.MPE(400) 44.4.MPE(400) 44.4.MPE(600)	see table below
Bending strength	DIN EN ISO 1288-3	44.1	temperature range 25 °C 77 F to 60 °C 140 F
Sound reduction	DIN EN ISO 10140-2	44.1 44.2 88.2	36 db 37 db 40 db
* officially certified for evguard® colorless transparent			
** independent evaluation by J.B. Colvin			
*** detailed figures are provided later in this document (see Shear modulus / Young's modulus tables)			





Properties

Solar characteristics (G-value)	DIN EN 410, VDI 2078	66.2	SHGC: 0.80, SC: 1
CTI — Comparative Tracking Indices (for solid insulation material)	DIN EN 60112	evguard® 3 mm	CTI 925
Water vapour transmission rate	DIN EN ISO 15106-2, ASTM F 1249	—	< 18 g/m ² /d
Poisson ratio	—	—	0.49



Material properties	Test method	non cross-linked	cross-linked*
Density	ISO 1183	0.95 – 0.97 g/cm ³	
Optical appearance		colorless translucent	colorless transparent
Tensile strength	ISO 527-3	MD > 5 N/mm ² CD > 5 N/mm ²	MD > 20 N/mm ² CD > 20 N/mm ²
Adhesion test	DIN EN ISO 8510-2		> 29 N/cm (0.76 mm evguard®)
Elongation at break	ISO 527-3	MD > 700 % CD > 700 %	MD > 400 % CD > 400 %
Hardness	DIN 53505		> 65 Shore A
Coefficient of thermal expansion	DIN 52328		10 ⁻⁴ K ⁻¹
Crosslinking (gel rate)	DIN EN 62788-1-6		> 80 %
Refractive Index			1.48
Light transmission (400 – 750 nm)			> 85 % (laminated glass)
UV cut-off			365 nm
Moisture absorption	DIN EN ISO 62	< 0.067 %	< 0.072 %

* values depend on appropriate lamination



Storage recommendation

Temperature	< 30 °C < 85 F
Humidity	< 80 %
Shelf life	use within 12 months after date of delivery. Opened rolls have to be protected against direct sunlight and dust.



Shear modulus (evguard®: 44.1)

Shear modulus by Friedmann & Kirchner, Rohrbach/Germany (5 % quantile values measured by bending test according to EN 16613 DMA, test load 166 N and for 30 °C 86 F), 2017.

Temperature in °C (F)	3 s	1 min	10 min	1 h
25 (77)	2.172	1.947	1.825	1.725
30 (86)	1.775	1.589	1.488	1.381
40 (104)	1.492	1.360	1.249	1.136
50 (122)	1.060	0.961	0.898	0.823
60 (140)	0.701	0.616	0.563	0.451

Shear modulus G (MPa)

Shear modulus (evguard® - MPE)

Shear modulus by Friedmann & Kirchner, Rohrbach/Germany (5 % quantile values measured by bending test according to EN 16613 DMA, test load 166 N and for 30 °C 86 F), 2017.

Laminate build-up	3 s	1 min	10 min	1 h
44.2.MPE(200)	3.665	3.323	3.121	2.884
44.2.MPE(400)	6.000	4.900	4.433	4.166
44.4.MPE(400)	3.738	3.379	3.093	2.826
44.4.MPE(600)	4.058	3.705	3.408	3.086

Shear modulus G (MPa)

Calculated values for Young's modulus (evguard®: 44.1)

Temperature in °C (F)	3 s	1 min	10 min	1 h
25 (77)	6.516	5.841	5.475	5.175
30 (86)	5.325	4.767	4.464	4.143
40 (104)	4.476	4.080	3.747	3.408
50 (122)	3.180	2.883	2.694	2.469
60 (140)	2.103	1.848	1.689	1.353

Young's modulus E (MPa)

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Disclaimer

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