PRODUCT COMPLIANCE REPORT · SAFETY & SECURITY FILMS

4 Mil Clear Safety Film

Impact safety classification to EN 12600:2002

Independently tested by TÜV Rheinland Nederland B.V. (Notified Body 0336), Arnhem

EN 12600 CLASS 2(B)2 | GLASS SIDE: PASS | FILM SIDE: PASS | UV BLOCKING >99%

REPORT REF.	DATE OF ISSUE	TEST REPORTS	REGION
GHF/CR/SF4M/2026-01	14 October 2026	89224672-17 / -18	Middle East & GCC

This report consolidates the compliance evidence for **Global Hi-Tech Films 4 Mil Clear Safety Film** applied to annealed float glass. It summarises two independent pendulum impact test reports issued by **TÜV Rheinland Nederland B.V.** under **EN 12600:2002** (impact from the glass side and from the film side), together with the declared optical and mechanical properties from the product Technical Data Sheet (TDS).

OVERALL RESULT	
PASS — EN 12600 Class 2(B)2	4 mm clear float glass + 4 Mil Safety Film met the requirements of EN 12600 clause 4(a) at the 450 mm drop height, with impact from **either face**. Breakage was Type B — fragments held together, as with laminated glass.

01 Product Identification

Product	4 Mil Clear Safety Film (Global Hi-Tech Films)
Film type	High-impact-resistant, micro-layered clear polyester safety film with pressure-sensitive adhesive
Nominal film thickness	4 mil (approx. 100 micron)
Manufacturer (as stated in test reports)	Garware Hi Tech Films Limited, Naigaon, P.O. Waluj, Aurangabad – 431 133, Maharashtra, India
Tested assembly	4 mm clear float glass + 4 Mil Safety Film (single pane)
Key applications	Glass doors and partitions, shopfronts and windows, bathroom mirrors, elevator finishes, vehicle glazing and other vulnerable glass surfaces

02 Compliance Summary

Standard / Property	Requirement	Result	Evidence	Status
EN 12600:2002 — impact from glass side	Clause 4(a) at 190 mm and 450 mm drop heights, 4 of 4 samples	**2 (B) 2**	TÜV 89224672-17	**PASS**
EN 12600:2002 — impact from film side	Clause 4(a) at 190 mm and 450 mm drop heights, 4 of 4 samples	**2 (B) 2**	TÜV 89224672-18	**PASS**
Sphere penetration (76 mm, 25 N)	No opening through which the sphere passes	No penetration	TÜV -17 / -18	**PASS**
UV blocking (film on glass)	Declared performance	>99%	Product TDS	Declared
Optical / solar data	ASHRAE, ASTM, BS EN 410, AIMCAL methods	See Section 07	Product TDS	Declared

“Declared” values are manufacturer data from the TDS and are not part of the TÜV Rheinland test scope.

03 Test Programme & Laboratory Details

Item	Report 89224672-17	Report 89224672-18
Attack face (impact side)	**Glass side**	**Film (foil) side**
Composition from attack side	4 mm Glass + 4 mil Safety Film	4 mil Safety Film + 4 mm Glass
Testing laboratory	TÜV Rheinland Nederland B.V. (NoBo 0336), Arnhem, the Netherlands	Same
Accreditation	EN 12600 test clauses performed under ISO/IEC 17025 accreditation	Same
Order no. / date	89224672 (24.A160) / 22 Jul 2024	Same
Samples received / tested	01 Aug 2024 / 26 Nov 2024	Same
Report issue date	21 Jan 2025	21 Jan 2025
Sample size / quantity	876 × 1938 mm, 4 samples	876 × 1938 mm, 4 samples
Glass	Clear float glass, 4 mm nominal	Clear float glass, 4 mm nominal
Impactor tyre pressure	0.35 ± 0.02 MPa — confirmed	0.35 ± 0.02 MPa — confirmed
Test temperature	20 ± 5 °C (per standard)	20 ± 5 °C (per standard)
Tested / authorised by	Salah El Bardai / Sef Hovens (Experts)	Salah El Bardai / Sef Hovens (Experts)

04 Sample-by-Sample Results at 450 mm Drop Height (Class 2)

Attack face	Sample #1	Sample #2	Sample #3	Sample #4	Classification
Glass side (Rpt -17)	No breakage	Breakage — **Type B**, clause 4(a) met	Breakage — **Type B**, clause 4(a) met	Breakage — **Type B**, clause 4(a) met	**2 (B) 2 PASS**
Film side (Rpt -18)	Breakage — **Type B**, clause 4(a) met	Breakage — **Type B**, clause 4(a) met	No breakage	No breakage	**2 (B) 2 PASS**

Where samples broke, numerous cracks appeared but the film held the fragments together and no opening was formed through which the 76 mm sphere could pass under a 25 N force. Samples that did not break remained intact at the 450 mm drop height.

05 Understanding the EN 12600 Classification

EN 12600 expresses performance as **α (β) φ**. For this product the result **2 (B) 2** means:

Code	Meaning	Result for 4 Mil Safety Film
α = 2	Highest drop-height class at which the product did not break, or broke safely per clause 4(a) or 4(b)	Passed at 190 mm and 450 mm drop heights
β = B	Mode of breakage: A = annealed (sharp loose shards), B = laminated (fragments held together), C = toughened (small particles)	Type B — fragments retained by the film, behaving like laminated glass
φ = 2	Highest drop-height class at which the product did not break, or broke per clause 4(a) (retention)	Clause 4(a) met at the 450 mm drop height

Impact class	Drop height	Typical description	This product
3	190 mm	Low impact level	PASS
2	**450 mm**	**Medium impact level**	PASS
1	1200 mm	Highest impact level	Not tested

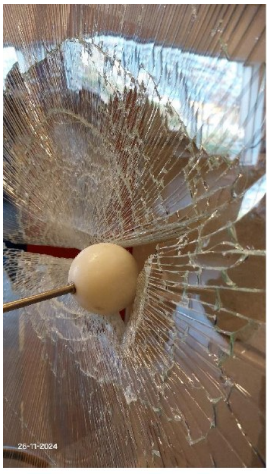
06 Photographic Evidence (from TÜV Rheinland Reports)



Film side – Sample 1 after impact



Film side – Sample 2 after impact



Glass side – Sample 3: 76 mm sphere, no penetration



Glass side – Sample 4 after impact

07 Declared Optical & Mechanical Performance (Product TDS)

Mechanical property	Unit	Nominal value
Tensile strength at break (MD)	kg/cm² (psi)	**1,800 (25,600)**
Break load (MD)	kg/cm	**19**
Elongation at break (MD)	%	**130**
Peel strength (after curing)	g/inch	**2,500**
Abrasion resistance	100 cycles haze addition	**< 5%**

Property	Single clear glass only	Single clear + film	Single tinted + film	Dual clear + film	Dual tinted + film
Visible light transmitted (%)	88	**86**	53	77	47
VLR interior / exterior (%)	8 / 8	**9 / 9**	7 / 8	15 / 14	13 / 8
Solar heat gain coefficient	0.82	**0.83**	0.64	0.71	0.63
Total solar energy rejected (%)	18	**17**	36	29	37
U-value	1.03	**1.08**	1.05	0.47	0.47
UV blocking (%)	43	**>99**	>99	>99	>99
Glare reduction (%)	—	**2**	5	3	8

Glass references: 1/4" clear or tinted single pane; dual = 1/4" + 1/4" insulated unit. Testing standards declared in TDS: ASHRAE, ASTM, BS EN 410 and AIMCAL.

08 Scope, Limitations & Conclusion

- **Asymmetric product.** EN 12600 classifies asymmetric glazing by attack face. Because both faces were tested and both achieved 2(B)2, the classification applies whether impact comes from the glass side or the film side.
- **Tested configuration only.** Results relate to 4 mm clear float glass with 4 Mil Safety Film, 876 × 1938 mm, as supplied by the manufacturer. Other glass types, thicknesses or film grades are not covered without further testing.
- **Class 1 not claimed.** The 1200 mm drop height was not tested, so no Class 1 performance is stated.
- **Application suitability.** EN 12600 does not set application requirements. Suitability for a specific location must be confirmed against the project specification and applicable local codes.
- **Source documents.** TÜV Rheinland reports 89224672-17 and 89224672-18 should accompany this summary in full; the laboratory does not permit them to be reproduced in extracts, and they do not entitle the product to carry a test mark.

CONCLUSION

Global Hi-Tech Films **4 Mil Clear Safety Film** on 4 mm clear float glass is classified **EN 12600 Class 2(B)2** for impact from both the glass side and the film side, as independently verified by TÜV Rheinland Nederland B.V. The film converts annealed-glass breakage into retained, laminated-type (Type B) breakage while blocking more than 99% of UV radiation.

Reference documents

TDS – 4 Mil Clear Safety Film
TÜV Rheinland Test Report 89224672-17
TÜV Rheinland Test Report 89224672-18