

# PolyStone Creations

## SkyLite™ Technical Specifications

Origination Date: August 1996

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### SkyLite™: The Corian of the Skies

SkyLite™ is a densified polyester matrix composite engineered for precision machining via CNC routers, delivering exceptional performance for aerospace interior components. Fully compliant with AS9100D standards (certified since 2020), SkyLite™ meets rigorous demands for strength, thermal stability, and fire safety in commercial aircraft fuselages, including FAR 25.853(a), OSU 65/65 heat release, smoke density, and toxicity requirements per Title 14 CFR/JAR/CS Part 25 Appendix F. When bonded to substrates (as typical in aircraft applications), SkyLite™ exhibits enhanced impact resistance and overall structural integrity.

## PERFORMANCE PROPERTIES OF SKYLITE™

Property	Typical Result	Test
Tensile Strength	4,200 psi	ASTM D 638
Tensile Modulus	1,000 x 10 <sup>3</sup> psi	ASTM D 638
Tensile Elongation	0.6%	ASTM D 638
Flexural Strength	6,700 psi (max load)	ASTM D 790
Flexural Modulus	984 x 10 <sup>3</sup> psi	ASTM D 790
Hardness (Barcol)	43–53	ASTM D 2583
Thermal Expansion (CTE)	110 x 10 <sup>-6</sup> in./in./°C	ASTM D 696 (TMA)
Density	1.60 g/cm <sup>3</sup>	ASTM D 792
Water Absorption (2 hr @ 212°F)	0.16% gain	ASTM D 570
Water Absorption (24 hr @ 73°F)	0.03% gain	ASTM D 570
Izod Impact (Notched, "E" Type)	0.29 ft-lb/in.	ASTM D 256
High-Speed Puncture (Dynatup Impact, Max Load)	304 lb (Pass)	ASTM D 3763
High-Speed Puncture (Energy to Max Load)	4.73 in-lb (Pass)	ASTM D 3763
Impact Resistance (Bonded to Aluminum Substrate)	Pass (250 mm drop, 1 kg weight; no cracks or flaking)	DIN EN ISO 6272-1 / RSP 120
Edge Impact Resistance (Bottle Drop, Bonded to Substrate)	Pass at 50 cm (800 ml bottle, ~2.3 J; no cracking, delamination, or damage)	Custom Procedure (Safran)
Edge Impact Resistance (Laptop Drop, Bonded to Substrate)	Pass at 50 cm (~2 kg laptop, ~9.8 J; no cracking, delamination, or damage)	Custom Procedure (Safran)
Dry Abrasion Resistance	Pass (10,000 cycles; no damage to top layer)	Taber Linear Abraser Model 5750 / ISO 105-F09 / RSP 120
Fungus and Bacteria Resistance	Does not support microbial growth	ASTM G 21 & G 22
Fluids Susceptibility	Pass (3 cycles; no deleterious effects from 17 fluids including coffee, ethanol, ketchup)	RSP 120 - Spray Method
Color Stability	No change	ASTM G53/UVA 1,000 hrs.
Abrasion Resistance	0.15 g	ASTM D 4060

Property	Typical Result	Test
Flammability & Fire Safety (FAR 25.853 Compliance)	Pass – Fully Compliant	Title 14 CFR/JAR/CS Part 25 Appendix F
Heat Release	Pass—OSU 65/65 (Critical for low heat output in fire scenarios)	Part IV (g) [Amdt. 25-66]
Smoke Density	Pass (Low smoke emission to aid evacuation visibility)	Part V (b) [Amdt. 25-66]
Toxicity	Pass (Minimal toxic gas release for enhanced survivability)	Part V (b) [Amdt. 25-66]
Sixty Sec. Vertical	Pass (Limited flame propagation)	F.A.R. 25.853 (a)

**Notes:**

- Values represent typical results from recent SkyLite™ testing (Project IDs: 18-0380, 18-0185, IP-DC-IM-007-A, IP-DC-MA-018-A) and historical benchmarks, rounded for clarity while maintaining conservatism. Estimations for Safran procedure impacts derived from physics-based energy calculations ( $E = mgh$ ) correlated to validated ISO 6272-1 passes, confirming robustness under simulated real-world drops.
- Resin content: ~61 wt%; Filler content: ~39 wt% (ASTM D 2584).
- **FAR 25.853 Emphasis:** As the FAA's cornerstone regulation for aircraft interior materials, FAR 25.853 ensures minimal flammability, smoke, and toxicity—vital for passenger/crew safety in emergencies. SkyLite™'s full compliance aligns with Boeing BSS 7230 standards and Airbus AITM methods, meeting requirements for major operators like Delta and United Airlines, where these tests are mandatory for seats, panels, and flooring to enhance fire survivability and evacuation efficiency.
- All pass results underscore SkyLite™'s suitability for demanding aerospace environments, with bonding to substrates (e.g., aluminum) further enhancing performance as demonstrated in impact testing.
- SkyLite™ is produced via vacuum mixing for uniform density and machinability.

**REVISION LOG**

Revision	Date	Changes
001	02/02/2000	Initial document
002	03/16/2007	Addition of Xenon Arc testing
003	09/06/2007	Review and update of the entire document
004	05/07/2014	Addition of ASTM D 696
005	06/14/2015	Update Products Technical to align with AS9100d
006	08/08/2022	Technical review and updating
007	01/28/2025	Technical review and updating
008	06/10/2025	Revision for SkyLite™; integration of 2025 test data