WINDOW AND DOOR REPLACEMENT

Ultrex® Fiberglass Technical Guide

INFINITY® from MARVIN®
REPLACEMENT WINDOWS
Built for life®

8x stronger than vinyl

Ultrex is 8x stronger than vinyl and has a low thermal expansion rate. It is heat resistant, non-corrosive and has low conductivity. The strength of Ultrex translates into exceptional stability, long-term ease of operation, low maintenance and superior performance.

A finish that lasts

Infinity's proprietary acrylic finish is three times thicker and smoother than the competition. No sanding, scraping or painting required. Our finish resists scratching and denting and performs so well that we offer dark colors without fear of UV degradation or fading.

A fit that never quits

Ultrex's low thermal expansion rate means that our windows and doors stay tight and true even after extreme temperature swings. By expanding and contracting at nearly the same rate as glass, Infinity windows made with Ultrex are more resistant to leaks and seal failures.

An investment that pays

Ultrex's low thermal conductivity and superior performance combined with a selection of energy-efficient glazing options can help save money on your energy bills.

What is Ultrex® fiberglass?

- Pultruded fiberglass composite
- Pioneered by Marvin®
- Sets Infinity® windows and doors apart from the competition

What is a composite?

- A composite is two or more materials combined to create properties that are superior to their individual attributes
- The materials remain easily distinguishable within the composite
- Not all composites are the same

How is Ultrex made?

- Through a process called pultrusion
- Continuous cables of glass are saturated with specially compounded resins, pulled through a heated die and cut with diamond-edge blades
- A proprietary acrylic finish is bonded to the substrate

STANDS UP TO THE PRESSURE

Strength and rigidity

- 1 square inch of Ultrex fiberglass supports up to 34,000 lbs
- 8 times stronger than vinyl and 3 times stronger than vinyl/wood composites like Fibrex®
- Strength of Ultrex allows for narrow frames and bigger views
- Ultrex stays true and square for years of dependable operation and performance
- Highly rigid and impact resistant to handle whatever Mother Nature dishes out

Impact resistant

ULTREX — FIBERGLASS 44

14
FIBREX — VINYL/WOOD COMPOSITE

MFE (in *LBF) — ASTM D5628

Tensile strength

ULTREX — FIBERGLASS 40.14

5.675
FIBREX — VINYL/WOOD COMPOSITE

7
VINYL

PEAK STRESS (KSI) — ASTM D7137

Flexural modulus

ULTREX — FIBERGLASS 3000

807.6
FIBREX — VINYL/WOOD COMPOSITE

385
VINYL

(KSI) — ASTM D790

A FINISH THAT LASTS

Acrylic finish

- Ultrex is the first and only fiberglass finish to be third-party verified to AAMA 624 finish specifications
- Acrylic is mechanically bonded to the Ultrex, not painted
- 3 times thicker than paint, providing a smoother, superior appearance that is highly durable
- Resists discoloration, scratching, denting, fading and chalking
- Virtually maintenance-free — no sanding, scraping or painting required
- Can be painted without impacting the protective properties of Ultrex

ULTREX

COMPETITOR

ULTREX

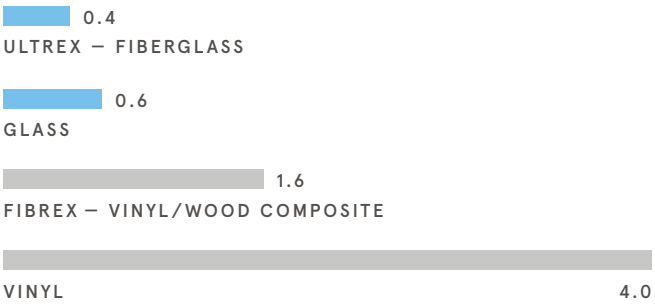
COMPETITOR

A FIT THAT NEVER QUITS

Material stability

- Ultrex expands and contracts at virtually the same rate as glass, so it stays stable across extreme hot and cold temperatures
- Ultrex resists swelling and warping so Infinity windows and doors will continue to easily open and close
- Resistant to seal failures, air leaks and stress cracks — all things that can affect energy efficiency

Expansion and contraction



x10^{-5} in/in/F — ASTM D696

Ultrex can take the heat

Ultrex is a **thermoset** material cured and hardened into a shape, like concrete, through an irreversible chemical reaction — this means Ultrex keeps its shape when exposed to extreme temperatures up to 285° F.

Vinyl can't take the heat

Vinyl and vinyl/wood composites, like Fibrex, are **thermoplastic. Starting** at temperatures of 163° F, vinyl has the potential to change shape, sag and deform. In the cold, vinyl could become brittle and break.

Ultrex® Performance

	VINYL	FIBREX® (VINYL/WOOD COMPOSITE)	ULTREX FIBERGLASS
THERMOPLASTIC/ THERMOSET	THERMOPLASTIC	THERMOPLASTIC	THERMOSET
REINFORCEMENT	NONE	WOOD FIBER	GLASS FIBER
HEAT DEFLECTION TEMPERATURE	163° F	173° F	285° F
TENSILE STRENGTH	7.0 ksi	5.675 ksi	40.14 ksi
FLEXURAL MODULUS	385 ksi	807.6 ksi	3000 ksi
CTE ($X10^{-5}$ in/in/F)	4.0	1.6	0.4
SURFACE FINISH	PVC	PVC, POLYESTER URETHANE, ACRYLICS	ACRYLIC (AAMA VERIFIED)
COATING HARDNESS	NA/SUBSTRATE	B (HARDNESS) 15.00 (BARCOL)	H (HARDNESS) 35.03 (BARCOL)
THERMAL CONDUCTIVITY[1]	.10	.13	.12
IMPACT RESISTANCE	NA	14 MFE (in * lb_f)	44 MFE (in * lb_f)

References: Stork Technimet/Testing Corporation: #0602-15293, #0512-14889, #0704-19702, #TCT006638P. Precision Measurements and Instruments Corpotation: #13043-DS. Tecton: #ESP010521P, "Test Results for Fibrex and Ultrex". Plastics Engineering Handbook of the Society of Plastics Industry, Inc. Fifth Edition. Andersen Fibrex Manual: "A High Performance, High Value Biofiber Polymer Composite Technology". Renewal by Andersen: "Fibrex Material: A Better Alternative, A Better Window".

1. Highest rate of thermal conductivity shown. Test results range from .10-.13 for vinyl/wood composite (Fibrex) and .09-.12 for Ultrex.

Call 1-888-206-1332 for the Infinity from Marvin local independent partner nearest you. In Canada, call 1-800-263-6161. Or visit us at infinitywindows.com

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