

ARMORTUF® HIGH IMPACT LINER

SMOOTH WITH CONTINUOUS WOVEN ROVING FIBERGLASS

PRODUCT CODE: ARMT

PRODUCT

ArmorTuf® Smooth Liner, ARMT, is a lightweight, high-impact resistant fiberglass reinforced plastic (frp) panel. ArmorTuf® is comprised of continuous woven roving fiberglass along with random chopped fiberglass and polyester resin.

PURPOSE

ArmorTuf® Smooth Liner, ARMT, is specifically designed and formulated for use as a high-impact liner panel for refrigerated and dry van trailers, truck bodies, seagoing containers, and rail cars.



DESIGN PROPERTIES

PRODUCT CODE	NOMINAL THICKNESS	NOMINAL WEIGHT	FINISH	MAXIMUM LENGTH	MINIMUM WIDTH	MAXIMUM WIDTH	COLOR
ARMT	0.06" 1.5 mm	0.46 lbs/ft ² 2.25 kg/m ²	Smooth	Available up to 700' 213 m	11" 0.3 m	106" 2.7 m	White 85
	0.075" 1.9 mm	0.59 lbs/ft ² 2.88 kg/m ²					

TYPICAL PHYSICAL PROPERTIES

PROPERTY	ARMT 0.06"	ARMT 0.075"	TEST METHOD
FLEXURAL STRENGTH	30 x 10 ³ psi 207 MPa	42 x 10 ³ psi 290 MPa	ASTM - D790
FLEXURAL MODULUS	0.7 x 10 ⁶ psi 4826 MPa	1.3 x 10 ⁶ psi 8963 MPa	ASTM - D790
TENSILE STRENGTH	45 x 10 ³ psi 310 MPa	48 x 10 ³ psi 331 MPa	ASTM - D638
TENSILE MODULUS	2.0 x 10 ⁶ psi 13,790 MPa	2.3 x 10 ⁶ psi 15,858 MPa	ASTM - D638
BARCOL HARDNESS	35	35	ASTM - D2583
COEFFICIENT OF LINEAR THERMAL EXPANSION	0.80 x 10 ⁻⁵ in/in/°F 14 µm/m/°C	0.80 x 10 ⁻⁵ in/in/°F 14 µm/m/°C	ASTM - D696
THERMAL CONDUCTIVITY	0.4 Btu•in/hr•ft ² °f 5.0 cal•cm/hr•m ² °C	0.4 Btu•in/hr•ft ² °F 5.0 cal•cm/hr•m ² °C	ASTM - C177
WATER ABSORPTION	0.2%/24hrs@77°F 25°C	0.2%/24hrs@77°F 25°C	ASTM - D570
SPECIFIC GRAVITY	1.75	1.75	ASTM - D792
GARDNER IMPACT STRENGTH	105 in-lb 11.9 J	130 in-lb 14.7 J	ASTM - D5420
PUNCTURE STRENGTH	370 lb 167.8 kg	460 lb 208.7 kg	Internal





SPECIFICATIONS

Crane Composites, Inc. (CCI) panels are manufactured in lengths and widths as required.

COMPOSITION

Reinforcement: Random chopped fiberglass and continuous woven carbon fiberglass.

Resin Mix: Modified polyester copolymer, inorganic fillers, and pigments

FINISHED PANEL QUALITY

- The frontside of the panel shall have a smooth finish. The backside of the panel shall have a smooth finish. The backside surface may have some variations which do not affect functional properties and are not cause for rejection. The backside of the panel is comprised of a polyester copolymer surface that is commonly bonded with adhesives or to foam in lamination processes. Typically, no additional preparation is required as long as the surface is dirt and oil free.
- Physical properties shall be as set forth on Page 1.
- Dimensions shall be as specified on purchase order, subject to the following tolerances:
 WIDTH: ±1/8" (±3.2 mm)
 LENGTH: ±1/8" (±3.2 mm) up to 12' (3.7 m)
 SQUARENESS: ±1/8" (3.2 mm) in 48" (1.2 m) of width
- Average thickness: For thickness ≤ 0.100", ±0.010"
 For thickness > 0.100", ±10%
- Bulk Coil policy #6207

CERTIFICATIONS

- Meets USDA/FSIS requirements. Reference document #6776 for conformance statement.
- Meets FMVSS 302 requirements.

FABRICATING RECOMMENDATIONS

NOTE: Protect your eyes with goggles; cover your nose and mouth with a filter mask; cover exposed skin when cutting CCI panels.

HAND FABRICATING: Drilling—High speed drill bit (60° cutting angle, with 12°-15° clearance) or hole saw.

STAPLING: Standard pneumatic stapler.

CUTTING: Sheet metal shears or circular saw with reinforced carborundum or carbide-tipped blade.

PRODUCTION FABRICATING: Use carbide-tipped tools. Straight cuts can be sheared (90° cutting edge with 0.002" [0.05 mm] clearance) or sawed. For irregular cuts, use die punch or band saw.

PAINTING PREPARATION: You should always test and validate the selected paint system with the frp panel prior to application. To properly prepare the panel surface for painting, make sure the surface is clean, dry, and free from all oils, grease, silicones, dust, and other contaminants. Common practices for preparation before painting include using alkaline detergents or clean water. Sanding or roughening of the panel surface is recommended to promote paint adhesion. 600 grit or finer sand paper or a 3M "Ultrafine" Scotch-Brite® pad are commonly used to roughen the surface.

CLEANING INSTRUCTIONS: Available from CCI.

SDS: Prior to working with our products, see our most current SDS at cranecomposites.com/sds.html.

DESIGN DATA NOTES

- Bulk coil may be ordered in long lengths or in specific cut-to-size pieces. Standard coil sizes are 250' and 500', custom sizes are available. Crane Composites reserves the right to manufacture and ship total linear footage of long length bulk coils ordered within the following parameter lengths per piece:
 Min. 200' | 61.0 m
 Max. 700' | 210 m
- Cut-to-size lengths 12' (3.7 m) and over of the same width will be interlapped (18"-36" [457.2 mm-914.4 mm] interlap per panel) into a coil for ease of handling and shipping. Total length tolerance – 0" and +6" (-0 mm and +152.4 mm).

STAINING STATEMENT

Some staining/discoloration may occur to frp liner panels after they have been in service for several years. This is a normal wear condition. As long as acceptable cleaning methods (i.e., steam cleaning) are used, the surface should remain sanitary and acceptable.

STORAGE REQUIREMENTS

Crane Composites panels are designed for peak performance prior to and after the panels have been applied. Careful handling during the manufacturing process is important. Avoid excessive clamping, dropping and scraping. Keep contents dry. Store indoors in a well ventilated area. When outside storage is necessary, cover and protect from the weather and exposure to sunlight.

PLEASE NOTE THE FOLLOWING PRODUCT USE INFORMATION:

Products manufactured by CCI will provide a clean, aesthetically pleasing finished installation. However, by nature, fiberglass reinforced plastic panels may occasionally have small areas that are aesthetically unacceptable for use. Panels should be inspected on-site prior to installation or lamination and original CCI skid tag/ticket number removed and retained. If any portion of material will not provide an acceptable appearance, CCI should be notified at once. Please report the non-conforming product utilizing the retained skid tag/ticket number. Upon verification of unacceptability, CCI will replace or refund the purchase price of the non-conforming product.

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Crane Composites is a recognized industry leader in fiberglass reinforced plastic (frp) panel applications. Kemlite® was established in 1954 and the company changed its name to Crane Composites in 2007. Crane Composites is headquartered in Channahon, IL and all our products are manufactured in the United States. We work with hundreds of distributors and OEM's, ensuring our products are easily accessible and readily available to our customers.

We believe all information given is accurate. It is offered in good faith, but without guarantee. Since conditions of use are beyond our control, all risks are assumed by the user. Nothing herein shall be construed as a recommendation for uses which infringe on valid patents or as extending a license under valid patents.

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For Spanish, please refer to Form 65113S.