



# XStrand® S

High-Performance Reinforcements

## Stronger! Lighter! Affordable! Available!

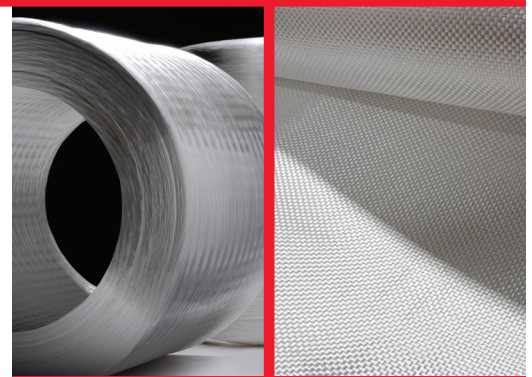
**XStrand® S** reinforcements provide significantly enhanced fiber properties for better finished part performance. *XStrand S* reinforcements have outstanding fatigue and impact performance, superior mechanical properties and offer significantly higher thermal performance and excellent corrosion resistance. These characteristics make *XStrand S* reinforcements ideal for a host of industrial, sports, and recreation applications, including use in the growing alternative fuel industry. Compared to traditional E-glass fibers, *XStrand S* Glass is up to 50% stronger, 20% stiffer and 80% tougher. Because of the critical importance of the synergy between the reinforcements and the matrix, special proprietary sizing systems have been developed for all major polymers. *XStrand S* roving also is available in fabric and prepreg forms either from OCV™ or from our selected converter customers.

*XStrand S* roving is part of a new generation of High-Performance Reinforcements from OCV™ enabling significantly stronger, stiffer and lighter composite parts than traditional E-glass reinforcements at a cost substantially lower than carbon or aramid fibers.

Owens Corning High-Performance Reinforcements *XStrand S* glass is made from a boron-free glass formulation that meets S glass standards, as defined by ASTM C-162, DIN 1259, ISO 2078, ASTM D578, and JIS R3410 standards. This glass formulation is designed for excellent mechanical properties (tensile strength and modulus) and offers significantly better thermal and corrosion resistance properties than conventional E Glass.

*XStrand S* glass meets the tensile strength requirements for MIL-R-60346 Type IV Class 1 and 2.

This document specifies properties for our standard high-performance reinforcement products; however, should you have other special requirements, please contact our dedicated and knowledgeable staff for assistance.





## USAGE AND PERFORMANCE

XStrand S roving consists of continuous filaments gathered in a single-end roving without mechanical twist and treated with specifically developed sizings. These rovings are characterized by a low level of catenary, excellent processing and handling characteristics; low fuzz, low static, complete run-out and fast wet-out. This results in less downtime and reduced cost during processing in the filament winding, weaving and knitting, and the pultrusion processes typically used in industrial applications such as CNG/LNG cylinders, cables, belts or clutch facings.

## TECHNICAL CHARACTERISTICS

LAMINATE PROPERTIES	XSTRAND® S FIBERS
Impregnated Strand Tensile (ASTM D2343) - 9 mic 360 tex	479 - 589 ksi (3.30-4.06 Gpa)
Impregnated Strand Tensile Modulus (ASTM D2343) - 9 mic 360 tex	13.3 MSI (92 Gpa)
PHYSICAL PROPERTIES	
Bulk Density	2.45 gr/cm <sup>3</sup>

## BENEFITS

### Structural Performance

- High strength, high modulus glass fiber
- Superior fatigue, improved impact performance
- Enables higher structural performance than Aramid and High Molecular weight polyolefins
- Unlike carbon, aramid, or polymers fibers, high strength S glass fibers will not burn,
- Excellent corrosion resistance – suitable for a wide range of demanding applications

### Superior Processing

- Low fuzz, low catenary, which means less downtime for the customer
- Fast wetting – epoxy, polyester, and vinyl ester resins

### Weight Savings

- Up to 40% when replacing aluminum and up to 50% when replacing steel, depending on the application

### Readily Available

- Large capacity production

## PRODUCT CHARACTERISTICS AND QUALITY CONTROL LIMITS

PRODUCT CHARACTERISTIC	PRODUCT NOMINAL BARE GLASS	TARGET (TEX WITH SIZING)	MINIMUM TEX	MAXIMUM TEX	METHOD
TEX (g/km)	300 TEX (1653 yd/lb)	302 (1643 yd/lb)	276 (1797 yd/lb)	327 (1517 yd/lb)	ISO 1889
	335 TEX (1480 yd/lb)	337 (1472 yd/lb)	310 (1600 yd/lb)	364 (1363 yd/lb)	ISO 1889
	360 TEX (1377 yd/lb)	362 (1370 yd/lb)	333 (1490 yd/lb)	391 (1269 yd/lb)	ISO 1889
	600 TEX (826 yd/lb)	604 (821 yd/lb)	551 (900 yd/lb)	655 (757 yd/lb)	ISO 1889
	660 TEX (752 yd/lb)	663 (748 yd/lb)	610 (813 yd/lb)	716 (693 yd/lb)	ISO 1889
	670 TEX (740 yd/lb)	675 (735 yd/lb)	621 (799 yd/lb)	729 (680 yd/lb)	ISO 1889
	1200 TEX (413 yd/lb)	1207 (411 yd/lb)	1107 (448 yd/lb)	1307 (379 yd/lb)	ISO 1889
	2400 TEX (207 yd/lb)	2414 (205 yd/lb)	2214 (224 yd/lb)	2614 (190 yd/lb)	ISO 1889
Strand Solids (LOI%)	EPX-S 10	0.65%	0.50%	0.80%	ISO 1887
	MCX-S 21	0.40%	0.25%	0.55%	ISO 1887
	EPX-S 15	0.67%	0.54%	0.80%	ISO 1887
	MCX-S 14	0.32%	0.22%	0.42%	ISO 1887
Moisture (%)	All	NA	0	0.15%	ISO 3344

## PRODUCT OFFERINGS

XSTRAND® S ROVING	RESIN COMPATIBILITY	NOMINAL FIBER DIAMETER (μ)	BARE GLASS TEX (g/km)
EPX S 10	Epoxy	12μ (J/K fiber)	300 TEX (1654 yd/lb)
EPX S 10	Epoxy	17μ (N fiber)	600 TEX (826 yd/lbs)
EPX S 10	Epoxy	17μ (N fiber)	1200 TEX (413 yd/lb)
EPX S 10	Epoxy	17μ (N fiber)	2400 TEX (207 yd/lb)
EPX S 10	Epoxy	24μ (U fiber)	2400 TEX (207 yd/lb)
EPX S 15	Epoxy	9μ (G fiber)	360 TEX (1378 yd/lb)
EPX S 15	Epoxy	17μ (N fiber)	1200 TEX (413 yd/lb)
EPX S 15	Epoxy	17μ (N fiber)	2400 TEX (207 yd/lb)
MCX S 21	Polyester,VE, EP	12μ (J/K fiber)	300 TEX (1654 yd/lb)
MCX S 21	Polyester,VE, EP	12μ (J fiber)	660 TEX (752 yd/lb)
MCX S 21	Polyester,VE, EP	17μ (N fiber)	600 TEX (826 yd/lb)
MCX S 21	Polyester,VE, EP	17μ (N fiber)	1200 TEX (413 yd/lb)
MCX S 21	Polyester,VE, EP	17μ (N fiber)	2400 TEX (207 yd/lb)
MCX S 21	Polyester,VE, EP	24μ (U fiber)	2400 TEX (207 yd/lb)
MCX S 21	Polyester,VE, EP	12μ (J/K fiber)	660 TEX (751 yd/lbs)
EPX S 15	Epoxy	9μ (G fiber)	337 TEX (1472 yd/lb)
EPX S 15	Epoxy	9μ (G fiber)	675 TEX (735 yd/lb)
EPX S 15	Epoxy	13μ (K fiber)	735 TEX (675 yd/lb)
MCX S 14	Polyester,VE, EP	9μ (G fiber)	675 TEX (735 yd/lb)

## PRODUCT LABELING, PACKAGING AND PALLETIZING

XStrand S roving products are supplied on tubeless packages and are designed to be pulled from the inside of the package.

### Package - Inside Pull:

- Cylindrical bobbin without tube, Outside Diameter (OD) ± 270 mm, height 260 – 300 mm.
- Partial bobbins have smaller diameter.
- Max bobbin weight must not exceed 19 kg.
- A maximum of three partial bobbins between 4.5 - 11.3 kg are permitted on each tier on the pallet.
- Bobbin covered by a Tack-Pack® film.

### Pallet:

- Size: 1150 x 1150 mm, 4 ways entry.
- 16 bobbins (max OD) per layer, pallets are 4 tiers high.
- Pallet is stretch-wrapped.

### Package - Outside Pull:

- Outside pull assembled roving package – 15 lbs (6.8 kg) wound on a 3 inch ID, 10.9 inch long Rhino tube.
- 20 packages per layer, 3 tiers high, 60 packages per pallet

### Identification:

- Bobbin label (each bobbin).
- Five pallet labels, one on side of the pallet and one inserted in the first layer.

## VISUAL INSPECTION REQUIREMENTS AND DOCUMENTATION

- A certificate of conformity or analysis may be issued upon request.
- The bobbin shall be firmly and evenly wound with a uniform lay, equal traverse length. The roving shall be wound with even tension and exhibit no catenary. The flanges of the package may present a yellowish aspect which is inherent in the product and is not a cause for reject.
- A package that has (inside the build or on its surface) visible grease, oil, dirt or other foreign matter; 3mm or less in diameter; is rejectable if the total number of defects exceeds two (2). A package is also rejectable if it contains one (1) or more of such defects greater than 3 mm in diameter.
- Any package build deformity which interferes with the smooth and uniform runoff of the strand is a cause of rejection of the package.

## STORAGE AND USAGE CONDITIONS

- Glass fiber products must remain in the packaging material until just prior to use. It is recommended to bring material in the workshop place at least 24 hours prior to use. Optimal atmospheric processing conditions are: temperature between 20-22°C and relative humidity between 60-65%.
- The packaging system is designed to allow stacking of two pallets. When stacking two high, care should be taken to place the top pallet correctly and smoothly. Owens Corning is not responsible for any damage resulting from stacking pallets higher than two high.

## CONTACT INFORMATION

- Please contact your sales representative.

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### Contact

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## OCV™ Reinforcements

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