



ShieldStrand® R

High-Performance Reinforcements

Delivering Performance.
Enabling Possibilities.
Readily Available.

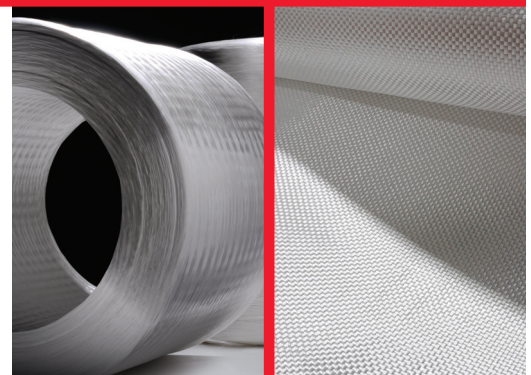
Owens Corning High-Performance ShieldStrand® R roving is part of a new generation of High-Performance Reinforcements from Owens Corning enabling significantly stronger, stiffer and lighter composite parts than traditional E-Glass reinforcements.

Developed for composite hard armor, *ShieldStrand R* can increase protection, payload and performance at an affordable price. *ShieldStrand R* can reduce weight up to 37% when replacing aluminum and up to 48% when replacing steel depending on the application. *ShieldStrand R* provides higher structural performance than aramid, polyethylene and polypropylene and meets all the fire, smoke and toxicity (FST) requirements for military vehicles. *ShieldStrand R* reinforcements are produced on a large scale using OCV™ innovative breakthrough glass fiber technology, making it available and affordable.

ShieldStrand R is approved for MIL-DTL-64154B Class B ballistic performance requirements.

Owens Corning High-Performance Reinforcements are made from a boron-free glass formulation that can be classified as a High-Strength R-glass, as defined by the ASTM C-162, DIN 1259 and ISO 2078 standards. This glass formulation is designed for excellent mechanical properties (tensile strength and modulus) and offers significantly better thermal and corrosion resistance properties than E-Glass. Because of the critical importance of the synergy between the reinforcements and the matrix, *ShieldStrand R* has a proprietary sizing that makes it ideal for ballistic and blast protection applications using phenolic, polyester, vinyl ester and thermoplastic resin systems.

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

ShieldStrand R roving consists of continuous filaments gathered in a single-end roving without mechanical twist and treated with specifically developed chemical size or finish. These rovings have a low level of catenary, good processing and handling characteristics such as low fuzz, low static, good run-out and fast wet-out for weaving and knitting, prepreg and the resin infusion processes typically used in the ballistic armor plate or spall liner kit manufacturing industry. With the strain energy properties similar to S-glass, the ballistic V50 resistance is typically similar with weight, depending on the application, up to 5% heavier. ShieldStrand R reinforcements meet MIL-PRF-64154 fiber strength requirements not less than 2758 MPa.

TECHNICAL CHARACTERISTICS

THERMAL PROPERTIES	SHIELDSTRAND® R FIBERS	
Softening Point (log 7.6)	1760°F	960°C
Annealing Point (log 13)	1382°F	750°C
Strain Point (log 14.5)	1290°F	699°C
PHYSICAL PROPERTIES		
Bulk Density	2.567 gr/cm ³	
Estimated 18µm Fiber Density	2.555 gr/cm ³	

PRODUCT OFFERINGS

SHIELDSTRAND® R ROVING	END USE APPLICATION	RESIN COMPATIBILITY	NOMINAL FIBER DIAMETER (µm)	BARE GLASS LINEAR DENSITY TEX (g/km)
EPS I I	Ballistics	Phenolic, Polyolefin, Polyester, VE	12	600
EPS I I	Structural	Epoxy	12	600

PRODUCT CHARACTERISTICS AND QUALITY CONTROL LIMITS

PRODUCT CHARACTERISTIC	PRODUCT NOMINAL BARE GLASS	TARGET (TEX WITH SIZING)	MINIMUM	MAXIMUM	METHOD
Linear Density (g/km)	600	604	551	655	ISO 1889
Strand Solids (LOI%)	EPSII	0.67%	0.54%	0.80%	ISO 1887
Moisture (%)	All	N/A	0	0.15%	ISO 3344

PRODUCT LABELING, PACKAGING AND PALLETIZING

ShieldStrand R roving products are supplied on tubeless packages and are designed to be pulled from the inside of the package. If the customer requires outside unwinding, we would gladly provide advice on these options.

Package:

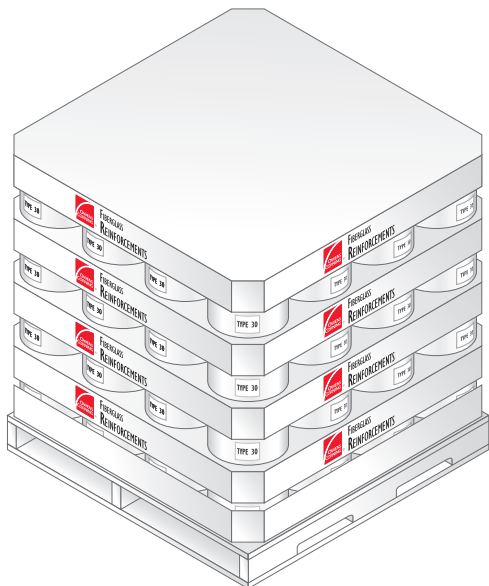
- Cylindrical bobbin without tube, Outside Diameter (OD) ± 270 mm, height 260 - 300mm.
- Partial bobbins have smaller diameter.
- Max bobbin weight must not exceed 19kg.
- A maximum of three partial bobbins between 4.5 - 11.3kg are permitted on each tier on the pallet.
- Bobbin covered by a Tack-Pack®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

Pallet:

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

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 3mm 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.



OCV™ Reinforcements

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