

## 223 Woven Roving



**Overview:** Woven fabrics are strong reinforcements because the fibers are bundled into yarns oriented in just two directions. The warp and fill yarns run at 0 and 90 degrees respectively. Thus, fabrics are anisotropic, or strong in only two directions.

Fabrics need to be oriented so the fiber yarns run parallel to the expected loads. If extra strength is needed in a different direction, another ply must be added at an angle to the first. The most common angles are +/- 45 degrees.

Woven Roving is used in laminating large fiberglass parts such as boats and tanks where inexpensive, high impact, high strength reinforcement is required. Woven Roving should be used with mat whenever bonding to plywood or making repairs.

Available in 1, 3, and 5 yard packages, custom cuts starting at 10 yards, and full rolls.

### General Properties for 223:

- Crimp-free construction for improved fiber alignment and mechanical properties
- Optimized directional fiber content reduces resin usage and part weight
- High bi-directional strength, stiffness, and flex for improved performance from a lighter laminate
- Reduce print-through, which enhances aesthetics with material and labor savings

### General Properties for Woven Fabrics:

High Tensile Strength	Glass is one of the strongest textile fibers, having greater specific tensile strength than steel wire of the same diameter, at a lower weight
Dimensional Stability	Low elongation under load, generally 3% or less. Glass fibers produce fabrics with excellent dimensional stability under various types of conditions.
High Heat Resistance	Glass fabrics have excellent dimensional stability under various types of conditions.
Fire Resistance	Composed of inorganic materials, glass fabrics are noncombustible, a natural choice where flammability is a concern.
Chemical Resistance	Like glass itself, fiberglass fabrics are highly resistant to attack by most chemicals.
Durability	Being inert, glass fabrics are unaffected by sunlight, fungus, or bacteria.
Economical	Glass fabrics are lower in cost than many other fabrics for smaller applications.

### Mechanical Properties

	English Units	SI Units
<b>Tensile (ASTM D 638)</b> Strength Modulus	44.5 ksi 2.99 msi	307 MPa 20.6 GPa
<b>Compression (ASTM D 695)</b> Strength Modulus	45.7 ksi 3.31 msi	315 MPa 22.8 GPa
<b>Flexural (ASTM D 790)</b> Strength Modulus	58.8 ksi 2.29 msi	405 MPa 15.8 GPa

**Physical Properties:**

Fabric Style	Total Weight (oz/yd <sup>2</sup> )	0°	90°	+45°	-45°	Mat	Dry Thickness (inches)
WR18 - 5x4	18.0	9.9	8.1	0	0	0	0.025

**Weave Pattern Rankings:**

	Thickness	Weight	Strength	Porosity
Plain	3	1	3	1
Twill	2	1	4	2
4-Harness Satin	3	1	4	2
8-Harness Satin	1	1	7	4
Leno	7	7	1	7
Mock Leno	6	1	2	4

This was a scale from 1 to 7, with 1 being the lowest and 7 being the highest

**Resin Compatibility:**

Part Number	Polyester Resin	Vinyl Ester Resin	System 2000 Epoxy
217	x	x	x
218	x	x	x
219	x	x	x
220	x	x	x
221	x	x	x
222	x	x	x
223	x	x	x
224	x	x	x
241	x	x	x
243	x	x	x
244	x	x	x
245	x	x	x
247	x	x	x
254	x	x	x
259	x	x	x
262	x	x	x
271	x	x	x