



WOVEN ROVING & COMBINATIONS (COMPLEXES) REINFORCEMENTS

OUR CURIOSITY FUELS YOUR POSSIBILITY

Strong, lightweight, and versatile. Owens Corning® composite solutions have transformed industries. From construction to transportation to energy — there's no telling where our next innovation will reach.

We aren't just a world leader in glass science — we innovate productivity, performance, durability, and design flexibility. Our influential innovations are a powerful combination of understanding emerging needs and responsibly creating next-generation solutions.

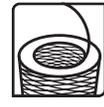
Advances in glass-based technical fabrics provide a full range of woven, knitted, and nonwoven technologies to the global composites industry. A powerful combination of expertise in glass science and state-of-the-art facilities empowers our team to partner with customers for the development of glass-specific, custom technical fabric products. Supported by a worldwide manufacturing platform that spans three dozen manufacturing facilities and research and development centers, we deliver locally engineered, customized solutions.



**FURNACE &
GLASS SCIENCE**



**INNOVATIVE
CHEMISTRY**



**REINFORCEMENT
SOLUTIONS**



**GLOBAL
PLATFORM**

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Woven Roving

Woven roving is a reinforcement made from direct, assembled, or texturized fiberglass roving woven into a fabric or a tape. Typically, the glass fiber content is a suitable sizing for multiple resin systems such as unsaturated polyester and epoxy resins; however, a special customized sizing for thermoplastic or phenolic resins is available upon request.

Great for multilayer hand lay-up applications, woven roving fabrics provide the most economical solution for raising glass content of laminates and increasing overall laminate flexural and impact resistance without adding thickness, weight, or other non reinforcing materials.

Combinations

Combinations of woven roving (WR) and chopped glass fibers (commonly known as CSM) are called complexes and are assembled by stitching or needling. The combined individual benefits and features of the two main products, WR and CSM, address both a mechanical function (WR) and an aesthetic function (CSM) in a single layer.

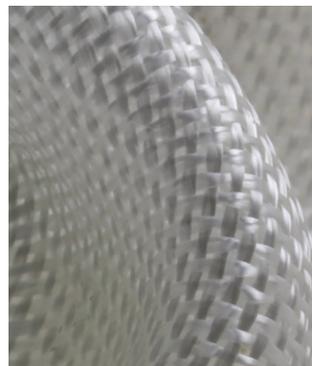
Methods of Use & Processes

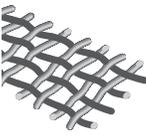
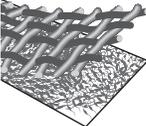
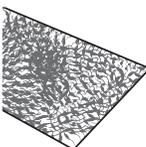
WOVEN ROVING

- Hand lay-up
- Winding
- Pultrusion
- Pre prepping
- Scrimp
- Vacuum molding
- Compression molding
- Centrifugal casting
- RTM

COMBINATIONS

- Hand lay-up
- Winding
- Pre prepping
- RTM
- Pultrusion
- Centrifugal casting
- Continuous laminating



PRODUCT	DESCRIPTION	DESCRIPTION	FEATURES	BENEFITS
<p>Balanced Woven</p>  <p>Subproduct Woven Roving (WR)</p>	<ul style="list-style-type: none"> The input rovings are designed to give controlled wet-out and excellent laminate properties. The construction gives bi directional (0°/90°) reinforcement and the strength of continuous filaments. Woven roving fabrics are designed to be compatible with multiple resin systems and can be customized to meet specific product requirements. 	<ul style="list-style-type: none"> Economical, multuse fabric. Consistent glass loading. Excellent dimensional stability. Regular porosity. Assorted weave patterns and preferential fiber loading. Crimp engineered for end use. 	<ul style="list-style-type: none"> Lower finished part cost. Excellent laminate properties and cost-effective reinforcement. Ease of handling and drapability. Rapid wet-out and fast application. Design flexibility and engineered strain values. High-impact response. 	<ul style="list-style-type: none"> Delivers cost-effective solutions for particularly large parts such as boat hulls and high-durability laminates such as underground storage vessels.
<p>Woven UD</p> <p>Subproduct Warp UD (WRx) Weft UD (WRy)</p>	<ul style="list-style-type: none"> The input rovings are designed to give controlled wet-out and excellent laminate properties. Provides good wrapability and resistance to skewing. Woven UD fabrics are a composite reinforcement designed for applications requiring a high concentration of additional strength and reinforcement in only one direction by placing continuous fibers in either a 0° (warp) or 90° (weft) axis. 	<ul style="list-style-type: none"> Can be combined with a CSM (stitched or needed to a glass fiber mat). Narrow width with edge stabilization. Can be very unbalanced – up to 95/5 – with different numbers of fiber bundles or different-sized fiber diameters in the warp and fill directions. 	<ul style="list-style-type: none"> High-oriented mechanical properties. Drapability. 	<ul style="list-style-type: none"> Delivers cost-effective solutions for applications such as boats and hull ribs, trailers, light poles, flagpoles, and for recreational end use such as skis and snowboards.
<p>Complexes</p>  <p>Subproduct Stitched WR + CSM (WR/S)</p>	<ul style="list-style-type: none"> Complexes are typically a combination of woven roving (WR) and chopped glass fibers (CSM) assembled by stitching or needling – see below. 	<ul style="list-style-type: none"> Guarantees a regular reinforcement of both woven roving (WR) and CSM. Is easy to slit without raveling out, especially when powder bonded. 	<ul style="list-style-type: none"> Conformability. Surface aesthetics. Cost-effective solution for nondemanding parts. 	<ul style="list-style-type: none"> Complexes are very versatile and suitable for a wide range of applications such as boats, swimming pools, pipes, recreational vehicles, panels, profiles, and storage tanks.
<p>Subproduct Needed WR + CSM (WR/N)*</p>	<ul style="list-style-type: none"> Needle-punched complex products offer distinct advantages by volumizing the threads in the Z-axis, which is perpendicular and between the outer layers, greatly enhancing the interlaminar shear strength and offering delamination resistance and improved impact performance. It also allows for specific surface aspects. 	<ul style="list-style-type: none"> Guarantees a regular reinforcement of both WR and CSM. Is easy to slit without raveling out. 	<ul style="list-style-type: none"> High ILSS (interlaminar shear strength performance). Surface aesthetics. 	<ul style="list-style-type: none"> Needle punched complexes are suitable for structural and semistructural parts such as truck panels, boats, profiles, sections of wind turbine blades, pipes, and infrastructure end use applications. When used with appropriate resins, thermoplastic (TP) yarn-free complexes are suitable for fire-resistant and chemically exposed applications.
<p>Stitched/Needed CSM*</p>  <p>Subproduct Stitched CSM (S) (known as Stitchmat in EU)</p>	<ul style="list-style-type: none"> Stitched chopped fibers from the wide range of multi-end roving from Owens Corning® can provide a tailored CSM to fit a particular end use application specification and even a manufacturing process. Advantages range from translucency to low resin consumption with impregnation speed adapted to the processing conditions. Variable stitching parameters of the fabric design allow adaptability for appropriate processing such as handling, draping, and adequate filling of the mold cavity. 	<ul style="list-style-type: none"> Available from 300 gsm up to 2000 gsm. Can be combined with veil for improved surface finish. Adaptable conformability. Easy handling and cutting. Multi-compatible. 	<ul style="list-style-type: none"> Easily conforms to mold contours and easy to slit. One product for multiple parts. Can be used in polyester (PE), vinyl ester (VE), and epoxy (EP). Reduces lay-up time and handling costs. 	<ul style="list-style-type: none"> Pultruded and closed-mold applications such as truck panels. Stitched CSM enables the build-up, in a single layer, of thick laminates with good surface finish and higher glass content than core-based products, with good drapability properties when needed. In flat laminates, stitched CSM can replace multiple combinations of more standard fabric lay-up.
<p>Subproduct Needed CSM* (N)</p>	<ul style="list-style-type: none"> Needle punched chopped fibers. Chopped fibers are mechanically interlocked with each other, and due to this fiber entanglement, the product can be used to increase impact and delamination properties when needed. 	<ul style="list-style-type: none"> 100% glass. Soft touch. Interlocked fibers. Higher interface bonding with other composite layers than standard CSM. 	<ul style="list-style-type: none"> Easy to slit. Acceptable drapability. 	<ul style="list-style-type: none"> Needed CSM is a versatile product for profiles, boats, panels, and storage tanks. When used with appropriate resins, thermoplastic (TP) yarn-free needed CSM is suitable for fire-resistant and chemically exposed applications.

* Only available in Europe.



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