

Surfacing Non-Wovens for GRP (Glass Reinforced Polymer) Laminates

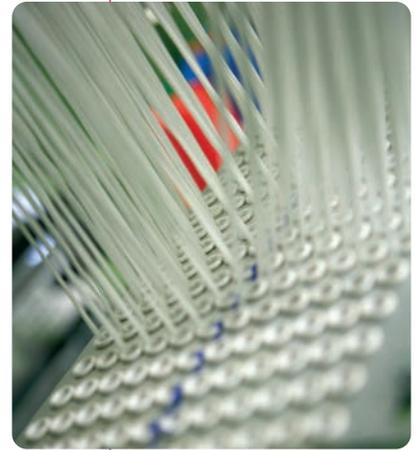


Owens Corning is redefining product performance to provide composite solutions that help our customers win.

As a world leader in glass science, Owens Corning developed many influential innovations in the history of glass fiber including E-glass, the Advantex® brand, and an array of high-performance glasses.

Spanning more than 30 facilities, our manufacturing platform ensures delivery of consistent, customer-inspired solutions in all regions and product forms, from continuous roving to non-woven glass chemistry.

This global footprint is enhanced by support from six research and development centers, which provide locally engineered and tailored solutions for our customers in a wide range of applications.



Furnace & glass science



Innovative chemistry



Reinforcement solutions



Global platform



Owens Corning is a leader in Non-Woven Technologies and provides customized glass-based non-woven solutions for construction and industrial applications made from randomly dispersed glass fibers, wet or dry laid and bonded into a thin sheet.

The company offers a wide variety of surfacing non-wovens for GRP (glass reinforced polymer) laminates. They add value as structural reinforcement and by providing a corrosion barrier, and their smooth surface and opacity make them aesthetically pleasing. The Advantex® E-CR corrosion-resistant glass wet-use products and C-glass dry-use products platforms serve multiple applications in several industries. They are based on several binder technologies (some are unique proprietary processes), which offer different processing capabilities.

E-CR glass non-woven veils strengthen the resin-rich corrosion barrier and create a strong bond with the underlying laminate. They also isolate the structural fibers from exposure to abrasion and corrosion, contributing to the structural integrity of the total composite. C-glass long fiber-based non-woven veils provide excellent wet out capability and conformability.

The closed or open structure of both our E-CR glass or C-glass non-wovens, combined with a wide range of weights (21 to 300 g/sqm) and roll widths (0.035 to 4.15 m) can fit multiple resin uses and applications.

NON-WOVENS AT YOUR FINGERTIPS

A New App for Specifiers, Fabricators, Designers and Engineers is now available.

- Almost 40 featured veil/weight products
- For 5 key GRP manufacturing processes
- Search for Tech Fabrics Guide



PRODUCT LIST

Product Nomenclature	Styrene Solubility	Fiber Type	Fibre Ø (micr.)	Binder %	Mat Weight (g/m ² /oz/ft ²)	Thickness (mm/in)	Thickness (mm/in)
CONTINUOUS PROCESSES							
FILAMENT WINDING							
M524-ECR30S	Very Soluble	Advantex® E-CR glass	13	11	31.5/0.10	0.33/0.013	3.5-210/1-85
M524-ECR50S	Very Soluble	Advantex® E-CR glass	13	9	50/0.17	0.50/0.020	3.5-210/1-85
M524-ECR20A	Slowly soluble	Advantex® E-CR glass	13	9	22/0.07	0.23/0.009	3.5-210/1-85
M524-ECR25A	Slowly soluble	Advantex® E-CR glass	13	10.5	25/0.08	0.27/0.011	3.5-210/1-85
M524-ECR30A	Slowly soluble	Advantex® E-CR glass	13	10	30/0.10	0.33/0.013	3.5-210/1-85
M524-ECR50A/3	Slowly soluble	Advantex® E-CR glass	13	10.5	50/0.17	0.50/0.020	3.5-210/1-85
M524-ECR70A/3	Slowly soluble	Advantex® E-CR glass	13	10.5	70/0.23	0.60/0.024	3.5-210/1-85
M524-PC25A	Slowly soluble	Advantex® E-CR glass	13	10.5	25/0.08	0.27/0.011	3.5-210/1-85
M524-C33	Slowly soluble	C-glass	12.5	6.5	30/0.10	0.33/0.013	3.5-210/1-85
M524-C64	Soluble	C-glass	12.5	7.5	30/0.10	0.29/0.011	3.5-210/1-85
M524-C114	Very Soluble	C-glass	12.5	9.0	30/0.11	0.31/0.012	3.5-210/1-85

PULTRUSION							
M524-ECR70A/3	Slowly soluble	Advantex® E-CR glass	13	10.5	70/0.23	0.60/0.024	3.5-210/1-85
VL 8101	Insoluble	Advantex® E-CR glass	16	11	115/3/8	0.40/0.015	91.4-134.6/36-53
VL 8101	Insoluble	Advantex® E-CR glass	16	11	150/1/2	0.50/0.020	91.4-134.6/36-53
VL 8101	Insoluble	Advantex® E-CR glass	16	11	190/5/8	0.60/0.025	91.4-134.6/36-53
VL 8101	Insoluble	Advantex® E-CR glass	23	11	225/3/4	0.75/0.030	91.4-134.6/36-53
VL 8101	Insoluble	Advantex® E-CR glass	23	11	300/1	1/0.040	91.4-274.3/36-108
VL 9202	Insoluble	Advantex® E-CR glass	16	11	115/3/8	0.51/0.02	91.4-134.6/36-53
VL 9202	Insoluble	Advantex® E-CR glass	16	11	150/1/2	0.51/0.02	91.4-134.6/36-53

VL8101 and 9202: Listed US metric rolls are 4 inch (101.6 mm) inside Ø cardboard cores and OD outside Ø as 22" or 24" (55.9 or 61 cm).

FLAT GRP PANELS CONTINUOUS LAMINATION							
S20 FA16	Insoluble	Advantex® E-CR glass	11	12	21/0.07	0.27/0.011	60-315/24-127
W25 FA17	Insoluble	Advantex® E-CR glass	11	12	25/0.08	0.30/0.012	60-415/24-168
W35 FA8	Insoluble	Advantex® E-CR glass	11	12	35/0.12	0.39/0.015	60-415/24-168
C1035 KA06	Insoluble	Advantex® E-CR glass	13	30*	60/0.20	1/0.039	60-415/24-168
C2035 KA05	Insoluble	Advantex® E-CR glass	11	50*	260/0.86	3/0.118	60-415/24-168

LOW/MEDIUM SERIES PROCESSES							
HAND LAY-UP							
M524-ECR30S	Very Soluble	Advantex® E-CR glass	13	11	31.5/0.10	0.33/0.013	3.5-210/1-85
M524-ECR50S	Very Soluble	Advantex® E-CR glass	13	9	50/0.17	0.5/0.020	3.5-210/1-85
M524-C33	Slowly soluble	C-glass	12.5	6.5	33/0.11	0.33/0.013	3.5-210/1-85
M524-C64	Soluble	C-glass	12.5	7.5	30/0.10	0.29/0.011	3.5-210/1-85
M524-C114	Very soluble	C-glass	12.5	9	30/0.10	0.31/0.012	3.5-210/1-85
M524-C30S	Very soluble	C-glass	12.5	6.5	30/0.10	0.32/0.013	3.5-210/1-85
M524-C50S	Very soluble	C-glass	12.5	9	50/0.17	0.5/0.020	3.5-210/1-85
M524-C50	Soluble	C-glass	12.5	11	50/0.17	0.5/0.020	3.5-210/1-85
M524-C55	Soluble	C-glass	12.5	11	55/0.18	0.5/0.020	3.5-210/1-85

RESIN TRANSFER MOLDING AND RESIN INFUSION							
M524-ECR20A	Slowly soluble	Advantex® E-CR glass	13	9	22/0.07	0.23/0.009	3.5-210/1-85
M524-ECR25A	Slowly soluble	Advantex® E-CR glass	13	10.5	25/0.08	0.27/0.011	3.5-210/1-85
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M524-ECR70A/3	Slowly soluble	Advantex® E-CR glass	13	10.5	70/0.23	0.6/0.024	3.5-210/1-85
M524-C33	Slowly soluble	C-glass	12.5	6.5	33/0.11	0.33/0.013	3.5-210/1-85

*LOI 30 and LOI 50 resp. The figures 30 and 50% do not represent the binder percentage but the Loss on Ignition here.

APPLICATIONS AND BENEFITS

CONTINUOUS PROCESSES

FILAMENT WINDING



Applications

- Filament winding is an automated open molding – continuous and discontinuous – process, which consists of winding rovings of fiber onto a rotating mandrel that is used as the mold.
- Used for high-strength, hollow and generally symmetric cylindrical composite products such as pipe, tanks and pressure vessels.
- UPE, VE, EP resins are generally used.
- To provide an inner, corrosion-resistant, smooth surface, the mandrel can initially be covered with a non-woven veil around which roving glass strand is spun in predetermined patterns. Outer surface veils are used for corrosion resistance and for external surface finish and aesthetics.

PULTRUSION



Applications

- Pultrusion is a continuous process for manufacturing glass reinforced full or hollow composite profiles with a constant cross-sectional shape. A fiber-reinforcing material is pulled through a resin impregnation bath and into a shaping die where the resin is subsequently cured.
- Used for many applications in the electrical, construction and consumer goods industries.
- The addition of non-woven veils are designed to create a high-quality, uniform surface layer of the pultruded part.
- It also enhances part structural strength and integrity.

FLAT GRP PANELS CONTINUOUS LAMINATION



Applications

- Flat GRP Panels produced using continuous lamination – a very fast resin curing process – results in relatively high shrinkage with print-through of the reinforcement fibers visible on the surface.
- For external skins of truck body and recreational vehicle (RV) lightweight panels.
- To improve the surface appearance and smoothness, and to enhance gloss, a surfacing veil is used either as an outer layer or directly under the gel coat.
- There are also non-woven products that can be used as a core layer. These are thick, voluminous lightweight products, which increase the stiffness of the laminate and help to reduce weight and resin consumption.

LOW/MEDIUM SERIES PROCESSES

HAND LAY-UP



Applications

- Hand Lay-up (or contact) open molding method consists of applying a release agent for easy de-molding, a gel coat for a cosmetic finish, a layer of UPE or VE liquid resin and one or more layers of glass reinforcement onto a mold tool.
- For parts of varying dimensions with relatively simple shapes that require only one face to have a smooth appearance.
- Surfacing veils strengthen the resin-rich gel coat exterior of glass fiber reinforced plastic components. They create a strong bond with the underlying laminate and enhance surface appearance by masking the reinforcing fiber pattern.

RESIN TRANSFER MOLDING AND RESIN INFUSION



Applications

- RTM (Resin Transfer Molding) is used to mold components with complex shapes, large surface areas with a smooth finish on both sides. This process consists of injecting a resin into a closed mold where one or several layers of reinforcement have been applied.
- Typical applications are truck cabins, electrical cabinet enclosures and seats.
- The use of glass veil helps provide a smooth surface.
- Resin infusion process consists of impregnating layers of dry reinforcement placed in a composite mold and covered by an airtight plastic film used as an upper mold.
- Typical applications are consistent, high-quality parts for products such as pleasure boats and wind turbine blades.
- Non-wovens can be laid on the top of the glass reinforcement layers to improve the surface resin flow before impregnating lower layers. Glass veil helps provide a smooth surface.

Benefits

- (Advantex® ECR-glass veils) Excellent corrosion resistance, smooth surfacing finish and multi-resin compatibility.
- (C-glass veils, long-fiber based) Excellent wet-out capability and conformability. Ideally suited for the fixtures-and-fittings market where a resin-rich surface is required to protect the external surface of the composite part from ultraviolet and chemical attack.

Benefits

- VL8101 non-woven product is uniform, with moderately closed veil-like appearance, and allows easy resin wet-out. In laminates that require high transverse structural properties, it can be used as an inner core mat to bulk out the laminate in combination with continuous filament mat or fabrics.
- VL9202 non-wovens provide all the properties like wet out, tensile strength processability and corrosion resistance as VL8101, and provide greater flexibility than VL 8101 for use in complex die structures.
- Multi-compatible with common resin systems. Advantex® E-CR corrosion-resistant glass provides long-term durability of the composite laminate.

Benefits

- Excellent wettability of liquid resins and high porosity for instant wetting with no voids or trapped air.
- High smoothness without any patterns or irregularities, enabling a perfect surface finish.
- High stiffness to resist the forces of shrinkage caused by resin curing.
- Excellent UV stability for uncompromised outdoor usage.
- C1035-KA06 and C3050-KA18 non-wovens are used as core layers and provide bulkiness (thickness at low weight), stiffness and reduced resin consumption.

Benefits

- Smooth surface, using typically 30 to 50g/m² glass veils.
- Advantex® E-CR corrosion resistant glass products help isolate substrate fibers from exposure to corrosion, abrasion and moisture.
- Compatible with PE, PP, EP,VE, UPE resins.

Benefits

- The addition of a veil helps the resin-rich surface to bond behind the gel coat.
- The products' low solubility binder prevents fiber washing during injection or infusion.
- Provides smooth surface and fast infusion speed.



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