

Marine



Solutions that make a difference

© Itrock 2008



OCV[™] Reinforcements



OCV[™] Technical Fabrics



OCV[™] Non-Woven Technologies

OCV™ SOLUTIONS FOR BOAT BUILDING

Leader in glass reinforcement solutions, OCV™ business offers the widest range of technical reinforcements to meet all your boat building needs, whatever the process you use.

www.owenscorning.com/composites

Composite materials used in the marine industry deliver high strength, reduced weight, excellent corrosion resistance, dimensional stability and improved cost performance. Composites materials also surpass traditional materials in offering enhanced aesthetics and reduced maintenance/replacement costs.

Composites for boat building can be made through several processes:

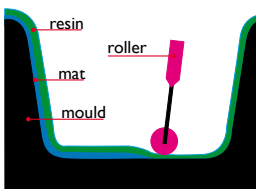
- Open Mould process: Spray-Up and Hand Lay-up
- Closed Mould process: Light RTM and Infusion



©Cemmar Holdings, Inc. (USA)

HAND LAY-UP

The Hand Lay-Up molding method is done by applying a release agent such as wax or semi permanent mold release to the mold surface, a gel coat for surface finish, skin coat of chop roving or chop strand mat combined with a high grade resin for cosmetic finish, followed by one or several layers of glass reinforcement combined with a bulk laminating resin.



PROCESS CHARACTERISTICS

REINFORCEMENT	Glass veils Chopped Strand Mats Woven Roving fabrics Multiaxial fabrics Stitch Mats
SERIES (pieces/year/mold)	< 1000
COMPOSITE PIECE SIZE	1 to 180 yd ²
LEVEL OF INVESTMENT	Low
MANPOWER INDEX	High
MECHANICAL PROPERTIES	Low to medium

OCV™ PRODUCT RANGE USED IN HAND LAY-UP FOR BOAT BUILDING

OC® Surfacing Veils are designed to add reinforcement at the surface of a laminate and provide a smooth, durable finish. Veils give a consistent glass to resin ratio allowing for uniform shrinkage and a barrier between your skin coat and gel coat which is capable of producing a high quality class A finish.

OC® (dry process) C-Veils are lightweight and are used where corrosion resistance is critical. As with all OC veils they will provide enhanced surface properties and aesthetics to your finished parts.

OC® (wet laid) ECR-Veils are made with Advantex® glass fiber reinforcements, which combine the electrical and mechanical properties of E-Glass with the corrosion resistance of ECR-glass.

OC® VL 8101 Reinforcement Mat is an Advantex® glass fiber reinforcement mat designed to add bulk while providing uniform reinforcement. The structure of OC® VL 8101 consists of uniformly dispersed individual filaments which ensure a smooth surface appearance.

Chopped Strand Mats: they are easy to process and allow to increase quickly the laminate thickness

- M723A: medium-fine fiber, rapid wetting chop strand mat. Superior mechanical properties and resin compatibility
- M720: Lofted, softer version of M723A.

Multiaxial Knit Fabrics: allow the boat builder to reach a higher glass content with reduced resin consumption and to increase mechanical properties.

Woven Roving Fabrics: basic fabrics used in boat construction today

- WR18-24-36/3010 are some reference examples of Woven Rovings of 18-24-36 oz-sq-yd respectively. Woven Rovings are available in different widths.

Stitch mats: those products allow to have (in one layer only) a Woven Roving and a Chopped Strand Mat stitched together. Stitch mat fabrics offer high mechanical properties and allow to increase quickly the laminate thickness

- SM1810 is a 18 oz-sq-yd Woven Roving stitched with a 9 oz-sq-yd Chopped Strand Mat
- SM2415 is another example of the combination fabrics available in different widths.

SPRAY-UP

The *Spray-Up* process consists in simultaneously spraying chopped glass strands from a Multi-End roving along with the resin necessary for their impregnation. Then, hand-rolling is necessary to thoroughly flatten and compact the glass-resin mixture. Glass fiber strands must have a good choppability and adaptability to the shape of the mold and also for impregnation and rolling.



PROCESS CHARACTERISTICS

REINFORCEMENT	Multi-End rovings
SERIES (pieces/year/mold)	<1000
COMPOSITE PIECE SIZE	1 to 120 yd ²
LEVEL OF INVESTMENT	Low
MANPOWER INDEX	High
MECHANICAL PROPERTIES	Low

OCV™ MULTI-END ROVINGS USED IN SPRAY-UP FOR MARINE

- ME3021: Premium, fast wet out gun roving designed for use in polyester and vinylester resins. Great conformability to mold surfaces and radius with minimal trapped air in laminate.

INFUSION

Vacuum Infusion Process (VIP) is an acronym to describe a technology for closed molding of fiberglass reinforced plastics. The VIP concept uses vacuum pressure for pushing liquid resin into dry reinforcements that have been laid in a sealed mold. The mold can be a one sided hard shell with a vacuum bag, a two sided hard shell with a vacuum seal or an all around soft bag.



PROCESS CHARACTERISTICS

REINFORCEMENT	Glass veils Unifilo® mat FlowRo® fabric FlowTex™ fabric UD/Multiaxials
SERIES (pieces/year/mold)	200 to 800
COMPOSITE PIECE SIZE	1 to 120 yd ²
LEVEL OF INVESTMENT	Low
MANPOWER INDEX	Medium
MECHANICAL PROPERTIES	High

OCV™ PRODUCT RANGE FOR INFUSION OF HULLS OR DECKS

Reinforcements used in infusion are mainly *Unidirectionals*, *Multiaxials* and *Unifilo®*, but some three-dimensional complexes can be used as well.

Glass veils: see the product description in page 2.

Unifilo® U813 or U614 are continuous filament mats used as a flow media and as a reinforcement material. They are available from 0.7 to 3 oz-sq-ft in rolls from 20 to 118 inches width.

FlowRo® fabric is a woven roving stitched to Unifilo® continuous filament mat. It offers an excellent handling, ease of use and unsurpassed resin impermeability.

FlowTex™ is a knitted fabric of unidirectional plies to greatly improve resin flow. Also available with Unifilo® mat.

Uni-Directionals and Multiaxials: mechanical properties can be optimized with fiber orientation. Various inputs of single end roving can be used in each direction to achieve optimal fabric weight and performance. XM1808, CM1808, TVM2408, and QM5608 are examples of +/- 45, 0/90, triaxial, and quadriaxial fabrics. These fabrics can be stitched with direct chop or continuous filament mat.

LIGHT RTM

Light Resin Transfer Molding (LRTM) process consists of injecting resin into a closed cavity mold where one or several dry layers of reinforcement have been applied. LRTM can be used to make parts such as hatches, swim platforms, hard tops, boxes, and consoles.



PROCESS CHARACTERISTICS

REINFORCEMENT	Glass veils Unifilo® mat Multicore® fabric
SERIES (pieces/year/mold)	200 to 2,000
COMPOSITE PIECE SIZE	0.6 to 25 yd ²
LEVEL OF INVESTMENT	Low to medium
MANPOWER INDEX	Medium
MECHANICAL PROPERTIES	Low to medium

OCV™ PRODUCT RANGE FOR LIGHT RTM

Glass veils: see the product description in page 2.

Unifilo® U813 or U614 are continuous filament mats both used as a flow media and as a reinforcement material. They are available from 0.7 to 3 oz-sq-ft in rolls from 20 to 118 inches width.

Multicore® fabric is a 3D complex with chopped strand mat stitched on both side of a non woven PP core. It is easy to handle and apply on a complex mould and very well suited for sandwich structure where the balsa or foam is placed between two layers of Multicore® fabric.

Multimat® fabric and preformable Unifilo® mat are other OCV™ products for closed mould process. They can be used with the standard RTM process. Please contact your OCV™ representative for more information.

*OCV™ Technical Fabrics products range is very wide.
Please contact your OCV™ representative to determine precisely the products that will meet your needs.*

www.owenscorning.com/composites

CONTACTS FOR AMERICAS:

OWENS CORNING
COMPOSITE MATERIALS, LLC
ONE OWENS CORNING
PARKWAY
TOLEDO, OHIO 43659
1.800.GET.PINK™

OCV FABRICS US, INC.
43 BIBBER PARKWAY
BRUNSWICK, ME 04011
U.S.A.
+1 888 284 2 667 opt. 3

ChoppedStrandMats.ocvamericas@owenscorning.com
MultiEndRovings.ocvamericas@owenscorning.com
Unifilo.ocvamericas@owenscorning.com
sales.na.ocvtf@owenscorning.com
nonwovensinfo@owenscorning.com



INNOVATIONS FOR LIVING™

OWENS CORNING COMPOSITE MATERIALS, LLC
ONE OWENS CORNING PARKWAY

TOLEDO, OHIO, USA 43659

1-800-GET-PINK™
www.owenscorning.com

Pub. N° 10010975. June 2009.
THE PINK PANTHER™ & ©1964–2009
Metro-Goldwyn-Mayer Studios Inc.
All Rights Reserved. The color PINK is a registered
trademark of Owens Corning. ©2009 Owens Corning.



This information and data contained herein is offered solely as a guide in the selection of a reinforcement. The information contained in this publication is based on actual laboratory data and field test experience. We believe this information to be reliable, but do not guarantee its applicability to the user's process or assume any responsibility or liability arising out of its use or performance. The user agrees to be responsible for thoroughly testing any application to determine its suitability before committing to production. It is important for the user to determine the properties of its own commercial compounds when using this or any other reinforcement. Because of numerous factors affecting results, we make no warranty of any kind, express or implied, including those of merchantability and fitness for a particular purpose. Statements in this publication shall not be construed as representations or warranties or as inducements to infringe any patent or violate any law safety code or insurance regulation.

Owens Corning reserves the right to modify this document without prior notice.

MARINE_OCV Range_americas_06 -2009_Rev0