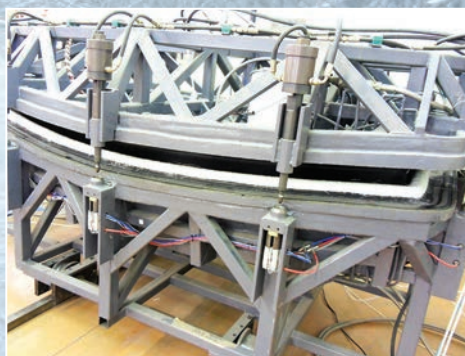


Unifilo[®] and Glass Reinforcements

RTM and Preforming Solutions



PREFORMING – KEY DRIVERS

A preform is the rigid reinforcement shaped in the form of a composite injected part. Preforms replace manual mold dressing with a single step operation and exactly fit the shape of the injection mold.

Preform layup could be composed of different types of materials such as:

- UNIFILO® CFM Continuous Filament Mats
- UNICONFORM® mat
- Fabrics
- Core material
- Surfacing glass veil



PREFORMING APPLICATIONS

- Medium size series, approx. 1.000 to 20.000 pcs/y
- Heavy and large size reinforcement
- Complex shapes
- Quality consistency and standardization specifications
- High glass content up to 4 kg/sqm vs. conventional reinforcements

INDUSTRY APPLICATIONS

- Heavy truck
- Automotive, small series
- Industrial tanks, chemical components



PREFORMING BENEFITS

A simplified closed mold process

- Self positioning, several layers possible
- High repeatability
- Reduced premold dressing and tailoring
- Reduced finishing time
- Reduced training requirements

An efficient closed mold process

- Increased productivity enabling high production rate
- Reduced risks of dressing mistakes and inconsistencies
- Reduced capital investment vs. SMC type operation
- Minimized glass waste as preforms replicate mold form
- Efficient use of material and labor cost

High quality closed mold parts

- Inherently more consistent with respect to glass distribution/resin content

MULTI MATERIAL PREFORM ALTERNATIVES

Customized for specific applications



UNIFILO® glass product



UNICOMPLEX® product = UNIFILO® CFM+ PEVEIL stitched with synthetic yarn



Veil + UNICONFORM® mat + UNIFILO® product
Picture shows UNICONFORM® mat only



Veil + fabric 0°/90° + UNIFILO® product
Picture shows fabric 0°/90° only

RTM-PREFORMING – OWENS CORNING MATERIAL SOLUTIONS

Product	Applications and Benefits
UNIFILO® CFM BASED	Preforming
U720	Provides stronger and more durable preforms For automated processes
S740, S750 series	Provide extra stretch for high deformation applications High resin flow
U760 series	Provides extra stretch and very good resin flow For multi-layer applications



Product	Applications and Benefits
UNIFILO® CFM BASED	RTM – Drapability
U801	High drapability
U810 – 820 series	Low – Medium – High drapability
U850 series	Higher strand tex core for highly filled resins High permeability

LOWER BINDER
MORE CONFORMABLE

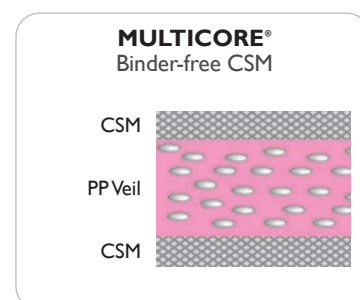
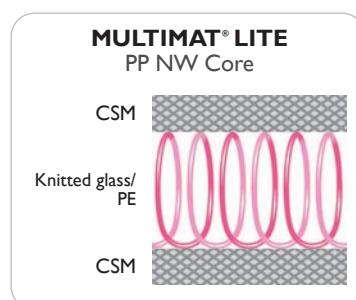
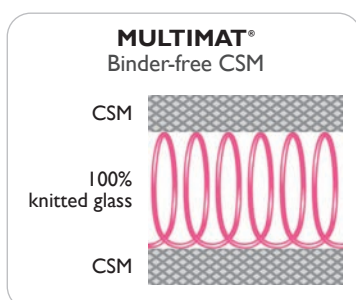
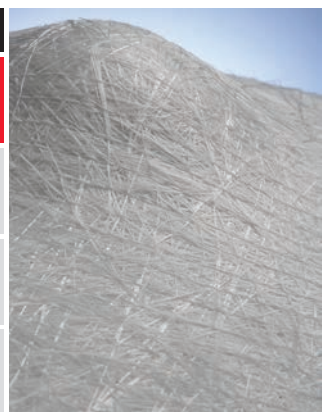


HIGHER BINDER
BETTER BONDING
EASIER HANDLING

Product	Applications and Benefits
UNIFILO® CFM BASED	RTM – Drapability
UNICONFORM® MAT	Soft handling (no binder), high conformability Very good translucency in panel application or good surface appearance behind gel coat



Product	Applications and Benefits
CORE BASED FABRICS	RTM – Thickness – Drapability
MULTIMAT®	Outstanding stretchability, helps fast wet out and high mechanical properties
MULTIMAT® LITE	For RTM Light, good stretchability High compression resistance core for fast wet out
MULTICORE®	For RTM Light, good permeability, high conformability Helps surface aspect, enables various part thickness



RTM-PREFORMING – WHICH REINFORCEMENT FOR WHICH APPLICATION?



Tank image courtesy of CEMO GmbH, Germany.
Preform image courtesy of Brandolph, Italy.

CASE STUDIES

Owens Corning experts can help preform solution evaluation/development and have customer's RTM process start with preform use.



TECHNOLOGY:
Light RTM and preform

APPLICATION:
Residential Oil Tank –
Monocoque composite design

GLASS PRODUCT:
Unifilo® 700 Series CFM

CUSTOMER NEED:
Alternative to corroding steel material

BENEFITS:
50% weight saving vs steel –
Lifetime no leak warranty

Picture and data courtesy
of Aylward Fiberglass, CAN



TECHNOLOGY:
RTM

APPLICATION:
Translucent water slides

GLASS PRODUCT:
Uniconform® reinforcement

CUSTOMER NEED:
Translucent parts

BENEFITS:
Soft (no binder) handling, highly
conformable glass reinforcement.

Good mechanical properties.
High Translucency.

Picture courtesy of Polin Waterparks, Turkey

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