



The Chemical Company

MBRACE[®] LAMINATE

UHM

Ready to use Ultra High Modulus Carbon Laminate for the Reinforcement of Metallic Structures with MBrace[®] FRP 'Laminate' System

Description of Product

MBRACE[®] UHM LAMINATE is a ready to use pultruded carbon LAMINATE that provides a high tensile strength and is indicated for flexural reinforcement (plate bonding) of metallic structures with MBRACE[®] FRP LAMINATE system.

Features and Benefits

To reinforce cast iron, steel and wrought iron elements in structures including bridges, buildings, marine structures, car parks, chimneys, silos etc in order to:

- Increase the load-bearing capacity (e.g. structural conversion following a change in capacity load).
- Accommodate heavy machinery and/or vibration
- Support change of use.
- Provide blast or seismic resistance.
- Restore strength to structures damaged by impact, fire or decay.
- Improve serviceability with reduced deflection, stress and fatigue.
- Allow structural alteration.
- Remedy design or construction defects.

Advantages

- Ideally suited for metallic structures.
- Manufactured to required dimensions.
- High corrosion resistance and durability.
- Lightweight.
- Tapered ends to minimise peel stresses.
- Fast, economical installation with minimum disruption.
- Minimum aesthetic impact.
- Can be sheathed in E-glass or Kevlar[®] to avoid any risk of steel corrosion.

Technical Data/Typical Properties

Performance of MBRACE [®] UHM LAMINATE	
Typical tensile strength	1500 MPa
Typical tensile modulus	460 GPa
Elongation at break %	0.34
Fibre content %	70
Density g/cm ³	1.82
Inter Laminar Shear Strength	50 MPa
Thermal Expansion m/mm/°C	0.4 x 10 ⁻⁶



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Note:

Width and thickness combinations are manufactured to order on a project basis.

Values above are typical mean values obtained from regular testing. Some variation may occur dependant on batch, size, and test method. Allowance should be made for this in the design process.

The designer is advised to satisfy himself, by prior testing if necessary, that the grade/size chosen will conform to the performance criteria for his specific design.

Application Procedure

Preparation of Substrate

Remove oils, grease, dust or any other loose material from the surface.

The surfaces of elements to be reinforced should then be prepared by grit blasting to Sa 2½. All surface dust must be removed. If the LAMINATE is not to be applied within four hours of preparation then the substrate should be protected with a coat of MBRACE PRIMER.

Application

Degrease the metallic surface using Solvent No 2 applied by light brushing.

Remove protective peel ply film from surface of LAMINATE to be adhered.

Apply one layer of MBRACE® LAMINATE ADHESIVE 1 – 1.5 mm thick on both the surfaces (metal and LAMINATE). Any surface defects or low spots in the substrate should be filled with additional adhesive as required to achieve a level application.

Apply MBRACE® LAMINATE and using the correct roller, exert a constant pressure by moving the tool both ways in the direction of the fibres. Full contact to both surfaces must be ensured.

Excess adhesive from the edges of the LAMINATE should be chamfered to a fillet of approximately 45°.

Temporary support should be provided until the adhesive cures sufficiently to support the LAMINATE.

Packaging

Available in rolls 30 Kg in weight

Storage

Store at ambient temperatures, out of direct sunlight, in cool, dry warehouse conditions.

Shelf Life

Up to 12 months if stored according to manufacturer's instructions.

Watchpoints

Design and detailed specification should be carried out by appropriately qualified and competent person(s).

Installation should only be carried out by trained and experienced specialist contractors. Site quality control should be the responsibility of an independent organisation appointed by the client or his representatives.

Surfaces exposed to U.V. rays should be protected within two days (maximum seven days) with a selected product from the MASTERSEAL® line in order to ensure perfect bonding between the protective layer and FRP.

Technical details of adhesives, primers and coatings can be found on the technical data sheets for the respective products.

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Health and Safety

*For full information on Health and Safety matters regarding this product the relevant Health and Safety Data Sheet should be consulted.

The following general comments apply to all products.

As with all chemical products, care should be taken during use and storage to avoid contact with eyes, mouth, skin and foodstuffs, (which may also be tainted with vapour until the product is fully cured and dried). Treat splashes to eyes and skin immediately. If accidentally ingested, seek medical attention. Keep away from children and animals. Reseal containers after use.

Solvent Based Products

Use in well ventilated areas; avoid inhaling. Suitable respiratory equipment may be needed, eg when spraying. Can cause skin, eye irritation. Wear protective eye shields and gloves during use. Do not smoke or allow sparks or naked lights when stored or in use.

Powder Products

Should be handled to minimise dust formation; use light mask if excessive dust unavoidable. Cement powders when wet or moistened can cause burns to skin and eyes which should be protected during use.

Resin Products

Can cause irritation, dermatitis or allergic reaction. Use protective equipment particularly for skin and eyes. Use only in well ventilated areas.

Spillage

Chemical products can cause damage; clean spillage immediately.

Disclaimer:

This information and all further technical advice is based on our present knowledge and experience. However, it implies no liability or other legal responsibility on our part, including with regard to existing third party intellectual property rights, especially patent rights. In particular, no warranty, whether express or implied, or guarantee of product properties in the legal sense is intended or implied. We reserve the right to make any changes according to technological progress or further developments. The customer is not released from the obligation to conduct careful inspection and testing of incoming goods. Performance of the product described herein should be verified by testing, which should be carried out only by qualified experts in the sole responsibility of a customer. Reference to trade names used by other companies is neither a recommendation, nor does it imply that similar products could not be used.