

MBrace[®] Laminate

Ready to use Carbon laminates (Fibre Reinforced Polymer) for the reinforcement of concrete, metal and wood elements with MBrace FRP Laminate System

Description

MBrace Laminate is a ready to use pultruded carbon fibre laminate that provides high tensile strength (that is higher than steel bars used in precast industry) and is indicated for flexural reinforcement (plate bonding) of concrete, metal and wood members with MBrace FRP Laminate system.

Uses

To reinforce structures with strong elements in tension, MBrace Laminate enables the traditional technique of plating with steel plates to be replaced with extremely light materials that are easy to install and to:

- Increase the load-bearing capacity (e.g. structural conversion following a change in capacity load).
- Reduce deformation to the working loads (increase in rigidity).
- Increase the fatigue strength.
- Limit or cover the fissuring (cracking) states (increase in durability)

Advantages

- Enables the amount of reinforcement to be calculated and placed in relation to the performance required or the stress flow.
- Enables less and faster maintenance, thereby reducing costs
- Increases the durability of the structures by protecting it against the aggressive action of chlorides and freezing and thawing cycles.

Typical properties

Colour : Black

Base : Carbon fibre composite in epoxy matrix

Carbon fibre content by volume : ≥ 68%

Glass transition temperature of epoxy: ≥ 80°C

MBrace Laminates - Mechanical properties

Grade of Laminate	MBrace Laminate 165/2500	MBrace Laminate 170/3100	MBrace Laminate 210/3300	MBrace Laminate 260/2500	MBrace Laminate 460/1500
Density, gm/cm ³	1.61	1.61	1.56	1.61	1.82
Tensile modulus, typical value** (GPa)	165	170	210	260	460
Tensile strength, mean value** (MPa)	2,500	3,100	3,300	2,500	1,500
Tensile strength, minimum value (MPa)	2,200	2,800	2,900	2,000	1,200
Elongation at break, %	1.3	1.6	1.4	0.77	0.27

** Values above are typical mean values obtained from regular testing as per EN-2561. Some variation may occur depending on batch, size, and test method sensitivity. 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 chosen will conform to the performance criteria for his specific design.

- All laminates are supplied with peel ply to both faces which gives better adhesion to the substrate and to subsequent coatings.

Specification Clause

The CFRP laminates, shall be MBrace Laminate ^{***}, a pultruded carbon fibre composite in epoxy matrix with minimum carbon fibre content of 68% by volume. The laminates shall have peel ply on both the side to facilitate best adhesion with substrate as well as the top coating. Laminate surface shall be free of silicone and de-moulding wax. ^{***} The grade of the laminate shall be as per the design requirement for the specific element in the project.

Directions for use

Surface preparation

The surfaces of elements that are still in good condition or restored with CONCRETSIVE 2200 should be sanded down. With degraded structures, the whole damaged area should be removed by scarifying, hydro-demolition or such like and then structural restoration carried out with mortar of the CONCRETSIVE or EMACO range products.

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



Application

Apply one coat of MBrace PRIMER by roller or brush and wait until dry to apply the second coat.

If necessary, apply a coat of CONGRESIVE 2200 using a putty knife, to fill any blow holes or imperfections to the concrete or timber surfaces.

Remove protective peel ply film from the surface of Laminate to be adhered. If the grade of laminate being used does not have a peel ply then clean the laminate surface with Solvent No. 2.



Apply one layer of MBrace Laminate Adhesive 1 – 2 mm thick on both the surfaces (substrate & laminate).

Apply MBrace Laminate and using a roller, exert a constant pressure by moving the tool both ways in the directions of the fibres.

Packaging

MBrace Laminate is available in 50m & 100m rolls with the following width/thickness (mm/mm):

MBrace Laminate (all grades except 460/1500):

Reference	Width (in mm)	Thickness (in mm)	Section (in mm ²)
15x2.5*	15	2.5	37.5
20x2*	20	2	40
20x3*	20	3	60
50x1.2	50	1.2	60
50x1.4**	50	1.4	70
80x1.4	80	1.4	112
100x1.4**	100	1.4	140
150x1.4	150	1.4	210

* supplied in 1000 m packing

**50x1.4 and 100x1.4 are regular fast moving grades.

MBrace Laminate 460/1500:

Reference	Width (in mm)	Thickness (in mm)	Section (in mm ²)	Weight (gm/m)
50x2	50	2	100	182
50x4	50	4	200	364
100x2	100	2	200	364
100x4	100	4	400	728

MBrace Laminate is also available in other customer sizes based on the project requirement. Please consult your local BASF representative for such requirements.

Storage

Store under cover, out of direct sunlight and protect from extremes of temperature. In tropical climates the product must be stored in an air-conditioned environment. Failure to comply with the recommended storage conditions may result in premature deterioration of the product or packaging. For specific storage advice please consult BASF's Technical Services Department.

Shelf Life

No degradation, if stored as per the storage instruction.

Safety precautions

As with all chemical products, care should be taken during use and storage to avoid contact with eyes, mouth, skin and foodstuffs (which can also be tainted with vapour until product fully cured or dried). Treat splashes to eyes and skin immediately. If accidentally ingested, seek immediate medical attention. Keep away from children and animals. Reseal containers after use. Do not reuse containers for storage of consumable item. For further information refer to the material safety data sheet. MSDS available on demand or on BASF construction chemicals web site.

Note

All BASF Technical Data Sheets are updated on regular basis; it is the user's responsibility, to obtain the most recent issue. Field services where provided, does not constitute supervisory responsibility, for additional information contact your local BASF representative.

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