

MasterStrength FIB (formerly MasterBrace Fibres)

Unidirectional Carbon Fabric for structural strengthening and Retrofitting Applications

Material Description

MasterStrength FIB Carbon Fibre sheet reinforcement materials are enveloped in MasterStrength 4500 resin to yield a range of high performance composites with many features. MasterStrength FIB system is in compliance with AS 5100.8: 2017 .

Areas of Application

- Flexural and shear strengthening elements that may not be planar (flat)
- Increasing compressive strength via axial confinement of columns
- Seismic retrofitting of columns and piles for earthquake resistance
- Enhancement of fatigue resistance under repetitive loading conditions
- Walls, beams, slabs, silos, chimneys, tanks, pipes, tunnels, piles etc

Characteristics and Benefits

- High-Tensile Carbon Fiber- effectively resist tensile and shear forces, to enhanced load-bearing capacity and structural stability.
- Lightweight and durable - Improving service life and durability.
- High strength to thickness ratio – does not interfere with widths or thicknesses of members non-obtrusive
- Increased strength - for Flexure, Shear, Confinement & Fatigue enhancement and end anchoring of MasterStrength systems
- AS 5100.8 – 2017: Easy reference to Appendix A, Section A2. Individual Performance properties may be used for design purposes.

Properties

Performance Properties	AS5100.8 A2.2.2 CFS (I)	MasterStrength FIB [xxx]*/50 CFS
Tensile Strength MPa	4300	4900 (min.)
Tensile Modulus GPa	215	240 (min.)
Ultimate elongation (strain)	1.80%	2.1% (max.)
Fibre Aerial Weight g/m2	150	200-900GSM
Fibre Density g/cm ³	1.6	1.81 min
General Info		
Fabric Design Thickness (mm)	0.166	
Fabric length (m/roll)	25-100**	
Standard Fabric width (mm)	500± 10 mm	

*Areal Weight g/m²

**Standard Length is 100Lm

Note –

MasterStrength FIB fabrics are available in 200, 230 300, 400, 450, 600 and 900 GSM.

Specially designed fabric style, width and length to meet the specific project requirements are also available upon request. High Modulus fabrics type CLM are available as made to order and may be subject to minimum order quantities. Please contact your local Master Builders Solutions office for further details.

Other fabrics such as Aramid (for Impact resistance) as well as Glass (for Siesmic) fibres are available. Please contact your local Master Builders Solutions office for further details.

Application

For detailed instructions, refer to the “Fibre Reinforced Polymer Composite Strengthening MasterStrength systems” document.

MasterStrength FIB must be cut beforehand into prescribed sizes using appropriate scissors and/or cutters. The maximum size of sheet to be cut is preferably less than 3 m in length but may be longer if access allows.

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Fibres must be completely saturated in resin. Carry out work only under appropriate environmental conditions.

The system build-up and configuration as described:

Concrete substrate adhesive primer: **MasterStrength PRI 3500** @6m²/L whilst still tacky;

Apply a coat of MasterStrength 4500 (saturant) to the primed surface to approximately 500 - 750 microns wet film thickness (1.3-2 m²/litre) or sufficient to achieve a wet-out of the FRP Fabric.

After smoothing down by hand, a squeegee or hard roller may be used, over the outside surface.

Allow sufficient time between the application of FRP Fabric on the first coat of wet saturant and the application of the second coat of saturant.

In the case of outdoor applications, the work must be protected from rain, sand, dust, etc. by using protective sheeting and other barriers until fully cured. The curing rate of the adhered FRP is temperature dependent.

If there is to be a top-coat application of a UV-stable acrylic paint (MasterShield AC 150/160), provide a sand-seeding, broadcast onto the still-wet, last layer of saturant applied to the MasterStrength FIB.

Estimating Data

A standard Size roll is 50m² (Length: 100Lm , width: 500mm).
Estimated below coverage os Saturant : 0.7-1.0 L/m²
(depending on fabric)

200 ~ 350 gsm fibre sheet : 0.8 to 1.0 kg/m²

350 ~ 450 gsm fibre sheet : 0.9 to 1.2 kg/m²

750 ~ 900 gsm fibre sheet : 1.5 to 1.8 kg/m²

Packaging

MasterStrength FIB is normally delivered to site in rolls, which are wrapped in plastic and contained within cardboard boxes, loaded onto pallets.

Storage & Shelf Life

MasterStrength FIB requires protection against heat, sun and weather and must be stored on a solid, flat and dry surface, inside a ventilated shelter.

Rolls must be stored only in the horizontal position.

All MasterStrength Fabrics rolls may be delivered with a layer of plastic between successive layers of fibre. This shall be removed prior to bonding.

Specification Clause

Unidirectional carbonfibre fabric with high strength, complying with Type CFS (I) in table A2.2.2 of AS 5100.8: 2017; to Structural strengthening of reinforced concrete, masonry, brickwork and timber elements or structures, to increase flexural and shear loading capacity.

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Disclaimer

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