

# MasterBrace ADH<sup>®</sup> 4000

Two-component epoxy adhesive for -MBRACE FRP LAMINATE System

## DESCRIPTION OF PRODUCT

**MasterBrace ADH 4000** is an epoxy adhesive for – **MasterBrace ADH** System.

**MasterBrace ADH** System is based on ready-to-use carbon fibre laminate strips that provide a high tensile strength and are suitable for supplemental, externally bonded reinforcement of concrete, timber and masonry elements.

## FIELDS OF APPLICATION

For use as a structural adhesive when used in conjunction with MBRACE FRP LAMINATE System

- Fixing **MasterBrace** Low Modulus Laminate
- Fixing **MasterBrace** High Modulus Laminate

## FEATURES AND BENEFITS

- Ready to use (no need to add filler)
- High strength
- Non-slump
- Convenient pot-life
- High adhesive and bond strength
- Thixotropic, does not run or drip
- High mechanical strength
- Good chemical resistance
- Impact-resistant
- Non-shrink
- Epoxy-based
- Solvent-free

Supplied in pre-weighed units

## TECHNICAL DATA/TYPICAL PROPERTIES

Performance of **MasterBrace ADH 4000**

Composition:	Two component epoxy-base
Colour:	Grey
Specific gravity at 20°C:	1.80
Glass transitional temperature:	>65°C
Modulus of elasticity:	10 GPa
Lap shear strength to CFRP:	>17 Mpa
Water absorption:	<0.3%
Tensile strength:	32 MPa
Compressive strength:	>60 MPa
Flexural strength:	>35 MPa
Full cure 25°C:	7 days
Bonding, ASTM D4541:	>3.5 MPa (concrete failure)
concrete	
steel	>5MPa
Pot life at	
25°C:	50 minutes
40°C	25 minutes
Cure rate at	
25°C:	5 hours
40°C	2 hours
Full cure at	
25°C:	5 days
40°C	3 days

## NOTE

Values above are typical mean values obtained from regular testing. Some variation may occur dependent 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.

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## APPLICATION DIRECTIONS (BRIEF INSTRUCTIONS)

For detailed instructions, refer to the MasterBrace ADH Application Guidelines” document.

Application of external reinforcement may only take place if the substrate has an inherent tensile strength of at least 1.5 MPa for laminates.

The surfaces of elements that are still in good condition or restored with repair mortar should be roughened sufficiently with grit blasting or similar. With degraded substrates, the whole damaged layer should be removed by scarifying, hydro-demolition or similar and then structural restoration carried out with suitable mortar, e.g. **MasterEmaco S488** or

**MasterProtect 2020**.

Angle grind, grit blast, or needle gun to remove smooth cement paste rich surface (laitance) and ensure aggregate is exposed and surface has sufficient profile.

Remove oils, grease, dust or any other loose material from the surface that may impair adhesion. Ensure a maximum substrate humidity of 4%.

Ensure substrate temperature is at least 3oC above dewpoint temperature.

Ensure surfaces are within allowable levelness and flatness tolerances.

Apply one coat of MasterBrace P 3500 (not normally required) by roller or brush.

If necessary, apply a levelling coat of **MasterBrace PUTTY** using a steel trowel, to fill any small offsets in the substrate. Re-check surface tolerances.

Clean any carbon dust or grease from the laminate surface with a white cloth and proper solvent.

Mechanically pre-mix component A of **MasterBrace ADH 4000**, using suitable slow speed drill fitted with a suitable paddle.

Add component B and continue mixing slowly for approximately 3 minutes until a homogeneous mix has been obtained, to minimize air inclusions.

Apply one layer of MasterBrace ADH 4000 of 1-1.5mm thick to both surfaces (substrate and laminate).

Place the **MasterBrace ADH** on the surface and using a hard roller, exert a constant pressure by moving the tool both ways in the direction of the fibres to expel the air.

Aim for a final layer thickness of 1-3mm of **MasterBrace ADH 4000**.

Clean up excess adhesive with solvent prior to hardening.

## PACKAGING

**MasterBrace ADH 4000** is available in 5kg packs.

## COVERAGE

A 5kg pack yields 2.78ltr, which is sufficient to cover approximately 26-28lm of 50mm wide laminate at 2 mm thickness.

## PRECAUTIONS

Only mix the material that may be applied within its workability time.

The climatic and operating conditions of the site and the complexity of the area to be treated should give an indication as to the quantities of product to be mixed.

Excessive vibration and oscillation of the structural component should be avoided during application of the adhesive and the curing phase. After the adhesive has hardened, check for bonding over the entire area by tapping.

Fire protection requirements must be complied with, as epoxy adhesives generally have limited fire resistance. The surface of the laminates may be painted over with **MasterSeal 300**, to ensure visual uniformity and ultraviolet protection.

## MasterBrace ADH® 4000

### SAFETY

READ ALL SAFETY DIRECTIONS AND WARNINGS AND REFER TO MATERIAL SAFETY DATA SHEETS FOR HANDLING PROCEDURES.

Store in cool, dry area 10 to 32°C away from direct sunlight, flame or other hazards. Do not bend laminates or they may break and become unusable.

**MasterBrace ADH** contain carbon fibres. During application of these materials, wear appropriate work clothing to minimise contact.

#### In particular:

Always wear gloves, goggles and suitable work clothes during mixing of epoxy resins and working with fibre materials, in order to avoid contact with the skin and eyes.

In the event of accidental contact, thoroughly wash the affected parts with water and soap or an appropriate detergent.

Do not add solvents or thinners to the epoxy resins. Do not inhale vapours, sprays or fibre dust; a continual change of air should be ensured for application in a closed environment.

Under no circumstances drink, eat or smoke during use.

Comply with safety regulations on the use of products that are inflammable or contain solvents. Use caution when handling flammable liquids and eliminate all sources of ignition from work area.

For applications to substrate surfaces, extreme climatic conditions or use other than those indicated in the product sheet contact, please contact our Technical Services Department for further information.

### NOTE

Field service, where provided, does not constitute supervisory responsibility. For additional information, contact your local Master Builders Solutions representative.

Master Builders Solutions reserves the right to have the true cause of any difficulty determined by accepted test methods.

### QUALITY STATEMENT

All products manufactured by Master Builders Solutions Egypt, or imported from Master Builders Solutions affiliate companies world-wide, are manufactured to procedures certified to conform to the quality, environment, health & safety management systems described in the ISO 9001:2015, ISO 14001:2015 & OHSAS 18001:2007 standards.

\* Properties listed are based on laboratory controlled tests.

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