MasterStrength™ ER 4000

Epoxy Based Adhesive for MasterStrength™ LAM System

Material Description

MasterStrength™ ER 4000 is epoxy based, solvent free, high strength adhesive developed for **MasterStrength™ LAM** System.

Areas of Application

Bonding of carbon fibre laminate on concrete, steel and wooden surfaces.

Characteristics and Benefits

- Pasty and easy to apply
- High strength
- Non-sag
- Solvent free

Processing Method

(A) Preparation of Substrate

The mineral based substrates (concrete, stone, brick, tile etc.) must be sound, clean and dry. It shouldn't be weakened by over-troweling and lack of curing. The concrete should be free of frost, curing membranes, waterproofing treatments, oil stains, laitance, friable material and dust. If there is a water leakage it must be drained or properly plugged. In case of low strength concrete (< 1.5 N/mm^2), the loosen parts of concrete must be broken and the surfaces should be reprofilled with structural repair mortars in **MasterCrete™ S** range. Before the adhesive application let the repair mortars cure at least 7 days at 20°C.
Steel surfaces should be cleaned from rust by sand blasting, or wire brushing. Plastic surfaces must be cleaned with proper cleaners before adhesive application.
FRP plates should be free of oil stains and dust. In porous substrates **MasterStrength™ PRI 3500** should be used as a primer and the adhesive application should be done in the following 24 hours.

(B) Mixing

MasterStrength™ ER 4000 has two parts in pails, produced according to right mixing ratio. Material temperature should be between 15 - 25°C before mixing. Part B should be added into the Part A without any remaining material in the pail. It should be mixed with using a proper mixer (~300 rpm) for polymer mixing. Mix the parts at least 3 minutes to have a homogenous mixture.

Technical Properties

Structure of the Material **MasterStrength™ ER 4000** Part A **MasterStrength™ ER 4000** Part B	 Epoxy Resin Epoxy Hardener	
Color	Grey	MK
Mixed Density	1,55 kg/liter	
Compressive Strength TS EN 196 (7 days)	>30 N/mm^2	
Flexural Strength TS EN 196 (7days)	>20 N/mm^2	
Bonding Strength (28 days) To concrete To steel	 >3,0 N/mm^2 >3,0 N/mm^2	
Application Temperature	+5^{0}C + 35^{0}C	
Pot Life	30 minutes	
Re-coatable Time (+20°C)	Min. 48 hours Max. 7 days	
Fully Cured (+20°C)	7 days	

Typical values are obtained from the test results of 4x4x16 mortar prism in 23^{0}C and 50% relative humidity conditions. High temperatures shortens the curing and working time, lower temperatures extends the durations

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Mixing Ratio

MasterStrength™ ER 4000	Part A	Part B
Quantity	3,00 kg	3,00 kg
Mixed Density	1,55 kg/liter	

(C) Processing

MasterStrength™ ER 4000 should be applied to the prepared surfaces and to FRP laminates by using a steel spatula or steel trowel. Application thickness should be between 1.0-2.0 mm. In the following 10 minutes (at 25°C) FRP laminates should be placed on to the substrate and push on to the laminates with a stiff roller (polyamide, steel etc.) for preventing possible air gaps between the laminate and substrate.

Consumption

3-4 kg for bonding 1m^2 laminate.

Point to Consider

- **MasterStrength™ FRP** application should be done by approved experts.
- During the application the substrate and ambient temperature should be between 5 - 35°C.
- Resinous materials' pot life and curing times vary depending on the relative humidity, substrate and ambient temperature. Reaction gets slow in low temperatures and it causes to extension on pot life and working time. On the other hand high temperatures speed up the reaction, which results to short pot life and working time. For full curing of material, both the substrate and ambient temperature shouldn't be under allowed application temperature.
- **MasterStrength™ ER 4000** is provided in ready to mix pails. Do not add any solvent etc. İnto the mixture during the application.
- The amount of mixed resin should be such that it may be applied within its useful workability time.
- Mixing should be made with proper mixers and do not allow mixing by hand.

Cleaning of Tools

After the application all tools should be cleaned with solvent. **MasterStrength™ ER 4000** can be cleaned with only mechanical abrasion after hardening.

Packaging

6 kg set
MasterStrength™ PRI 4000 Part A: 3 kg pail
MasterStrength™ PRI 4000 Part B: 3 kg pail

Shelf Life

18 months after the production date under appropriate storing conditions.Opened packages have to be stored by tightly sealing the bag/cover and must be used in one week.

Storage

It should be stored in its unopened original package, in a cool (+5°C - +25°C) and dry environment, protected from frost. In short-term storage, maximum 3 pallets should be placed on top of each other and shipment should be made with a first-in, first-out system. In long-term storage, pallets should not be placed on top of each other.

Health and Safety

It is dangerous to approach the application sites. During the application, a protective apparel, protective gloves, goggles and masks which comply with the Occupational Health and Safety Rules should be used. Due to the irritation effect of the uncured materials, the mixture should not come into contact with skin and eyes; in case of a contact, the affected area should be washed with plenty of water and soap; in case of swallowing, a physician should be consulted immediately. No food or beverages should be brought to the application area. The product should be stored and kept out of reach of children. For detailed information please consult the Material Safety Data Sheet.

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Disclaimer

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Contact

MBT Teknik Yapı Kimyasalları San. ve Tic. A.Ş.
Eyüp Sultan Mah. Sekmen Cad. Hayy 1000A
No:26/8 Sancaktepe, İstanbul
Tel: 0216 561 35 45 www.mbt-tech.tr