MasterFlux® ER 402

Epoxy Based Ultra High Strength Grout

Material Description

MasterFlux® ER 402 is epoxy based grout and repair mortar with three parts including well graded quratz aggregate.

Complies with EN 1504-3 and EN 1504-6

Areas of Application

- Repair of runways and track in airports
- Repair of concrete pavements
- Fixing of prefabricated beams in bridge joints
- Mounting heavy machines to the foundations
- Machine foundations under heavy dynamic loads
- Repair of crane runways and high strength required mountings
- Column-beam connections in the reinforced concrete bridge structures
- Mounting the steel columns to the reinforced concrete foundations
- Repair and maintenance of reinforced concrete marine structures
- Repair of underground reinforced concrete structures
- Repair and insulating of wide cracks on vertical structural elements, beams and ceilings

Characteristics and Benefits

- Can be applied without primer
- Pourable

Technical Properties

Structure of the Material MasterFlux® ER 402 Part A MasterFlux® ER 402 Part B MasterFlux® ER 402 Part C	 Epoxy Resin Epoxy Hardener Quartz Aggregate
Color	Grey
Mixed Density	1,90 ± 0,1 kg/liter
Compressive Strength TS EN 196 1 day 7 days	 >35 N/mm^2 >80 N/mm^2
Flexural Strength TS EN 196 1 day 7 days	 >20 N/mm^2 >30 N/mm^2
Bondingl Strength (7 days) To concrete To steel	 >2,0 N/mm^2 >3,0 N/mm^2
Application Thickness	Min. 4 mm Max. 50 mm
Elasticity Modulus	≥ 8 GPa
Application Temperature	+5°C +35°C
Service Temperature	-15°C +80°C
Pot Life	30 minutes
Recoatable after	18-24 hours
Fully Cured at 20^{0}C	7 days

Typical values are obtained from the test results in 23°C and 50% relative humidity conditions. High temperatures shortens the curing and working time, lower temperatures extends the durations.

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- Resists to chemicals
- High mechanical strengths
- High abrasion and impact resistance
- High bonding strength to the concrete and steel
- Long pot life
- Non-shrink
- Solvent free

Processing Method

(A) Preparation of Substrate

The concrete surfaces must be sound, clean and dry. It shouldn't be weakened by overtroweling 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. Steel surfaces should be cleaned from rust by sand blasting and if needed new reinforcement should be installed. The edges of the broken surfaces should be saw cut.

Preparation of Machine Foundation

Before the mounting of the machine the loose particles should be removed from the surface and concrete surfaces should be roughened before grouting. Steel base plates of the machine should be dry and cleaned from oil, grease, rust and dust, which cause de-bonding of the grout. Proper holes should be drilled on to the steel base plates for draining the air under the machine during grouting. After these steps machine should be mounted and fixed to the foundation. Apply proper release agent to the shims before application.

Formwork

Forms should be made of tough materials and well mounted for resisting to fresh grout pressures. There should be min. 5 cm between the formwork and machine base plate in the grouting direction for casting the material into the form. For ensuring the filling of the spaces under machine base plate, forms should be elevated in the casting side and enough hydrostatic pressure obtained. In some cases, forms should be elevated up to 1.5m in the casting side, using custom shaped pipes etc. Should be required for grouting under huge plates. For preventing the leakage and loose of hydrostatic pressure the formwork should be done properly.

(B) Mixing

MasterFlux® ER 402 has three parts in two pails and in one bag, 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 (400-600 rpm) for polymer mixing. Mix the parts at least 3 minutes to have a homogenous mixture. Then the mixture should be put in to a clean, dry, mixing bucket and the Part C should be added into the bucket. Mix the parts at least 3 minutes to have a homogenous mixture.

Mixing Ratio

MasterFlux® ER 402	Part A	Part B	Part C
Quantity	2,00 kg	1.125 kg	12,50 kg
Mixed Density	2,00 kg/litre		

(C) Processing

Repair

MasterFlux® ER 402 should be applied to the prepared surface by using a steel spatula or steel trowel. Application thickness should be between 4-50 mm. Open areas should be protected from the rain, wind, and similar aggressive whether conditions during the first 24- 48 hours after finishing repair.

Grouting

The vibration caused by the surrounding machines should be observed and if necessary all the machines shut down until the grout sets (10-12 hours in +20°C).
Grout should be cast in only one side of the form continuously and the grout thickness should be between 4-50mm in single layer. For preventing air gaps do not cast material in two side of the machine. Do not use vibrator. For compacting the grout a steel or plastic hooked bar should be used. Do not release the formwork before 18-24 hours (in +20°C). Open

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areas should be protected from the rain, wind and similar aggressive whether conditions during the first 2 days after finishing repair.
In the case of unneeded excessive mortar outside of the machine plate, the grout can be broken after removing the formwork. Don't move the shims in two days after grouting. After starting the machine all the bolts should be checked and re-fixed if needed.

Consumption

2.0 kg/m^2 for obtaining 1 mm thick layer.

Point to Consider

- 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.
- MasterFlux® ER 402 is provided in ready to mix pails. Do not add any solvent etc. İnto the mixture during the application.
- Mixing should be made with proper mixers and do not allow mixing by hand.
- Open areas should be protected from the rain, wind, etc. Aggressive whether conditions during the first 24 hours after finishing repair.
- Do not use vibrator for compacting the grout.

Cleaning of Tools

All the tools and equipments must be cleaned by solvent after the application. After MasterFlux® ER 402 is hardened, it can only be removed from the surface mechanically.

Packaging

15.625 kg set
Part A: 2.000 kg pail
Part B: 1.125 kg pail
Part C: 12.500 kg bag

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

Must be stored in unopened original packing, and in cool (+5 - +25°C) and dry environment protected from freezing. In short-term storing, maximum 3 palettes can be stowed on top of each other and delivery has to be according to first in first out system. In long-term storing, the palettes must not be stowed 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.

Disclaimer

The technical information given in this publication is based on the present state of our best scientific and practical knowledge. MBT Teknik Yapı Kimyasalları Sanayi ve Ticaret A.Ş. is only responsible for the quality of the product MBT

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Teknik Yapı Kimyasalları Sanayi ve Ticaret A.Ş. is not responsible for results that may occur because the product is used other than advised and/or out of instructions regarding the place and the method of use. This technical form is valid only till a new version is implemented and nullifies the old ones.

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DOP NO 2103011

2184-CPR-0462

MasterFlux® ER 402

TS EN 1504-3:2005
Yapısal olan ve yapısal olmayan tamir *(Structural and Non-Structural Repair Mortar)*
Structural Repair Mortar (Yapısal olan Tamir)
Sınıf R4 *(Class R4)* 3.1 Elle harç uygulaması *(Concrete restoration by applying mortar by hand)*
3.2 Yeniden beton dökülmesi *(Concrete restoration by recasting with concrete)*
7.2 Bozunmuş betonun yenilenmesi *(Replacing contaminated or carbonated concrete)*

Basınç Dayanımı (Compressive Strength)	≥ 45 N/mm²
Klorür içeriği (Chloride ion Content)	≤ % 0,05
Adezyon Dayanımı (Adhesive Bond)	≥ 2 N/mm²
Kontrollü Büzülme / Genleşme (Restrained shrinkage/expansion)	≥ 2 N/mm²
Yangına tepki (Reaction to fire)	D-s2,d0
Tehlikeli maddeler (Dangerous substances)	Madde 5.4'e uygun (Comply with clause 5.4)

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DOP NO 2106003

2184-CPR-0453

MasterFlux® ER 402

TS EN 1504-6:2006
Çelik Donatı Çubuğunun Ankrajlanması
(Anchoring of reinforcing steel bar)

Çekip Çıkma Dayanımı : 75kN yük etkisiyle yerdeğiştirme (Pull out strength displacement: at load of 75kN)	≤ 0,6 mm
Klorür İçeriği (Chloride ion Content)	≤ % 0,05
Camsıya geçiş sıcaklığı (Glass transition temperatures)	≥ 45°C
Çekme yükü etkisiyle sünme (Creep under tensile load displacement)	≤ 0,6 mm
Yangına karşı tepki (Reaction to fire)	D-s2,d0
Tehlikeli maddeler (Dangerous substances)	Madde 5.3 'e uygun (Comply with clause 5.3)