Very
High
Durability
Repair &
Prevention
System

VHDRS

ISO 9001 BUREAU VERITAS Certification

Certified Quality System since **FEBRUARY 1993**

From Project to Jobsite

BS39/MC MuCis® sra

SHRINKO-tec®

MuCis®

FIB-energy®

EN 1504-3 R4 NORMA EUROPEA

CAPITOLATO AUTOSTRADE PER L'ITALIA MT1 SPEA

FIBRE REINFORCED THIXOTROPIC TWO-COMPONENT REPAIR MORTAR ANTI-CORROSION, ANTI-SHRINKAGE MORTAR WITH SUPER ADHESION WITH OPTIMAL PROTECTION AND DURABILITY FOR THE STRUCTURAL REPAIR OF REINFORCED CONCRETE

CE approved – Certificate n. 1305 - CPD - 0808
EN 1504-3 Classe R4

type MT1: ***"mortar, premixed, thixotropic, compensated expansion expansion opposed in air, with liquid humidity retainer, containing polyacrylonitrile fibers and reinforced with flexible inorganic fibers featuring length 12 mm, diameter 14 µm, tensile strength of 1700 MPa ,elastic modulus 72,000 Mpa***
corresponding to the SPECIFICATIONS FOR MOTORWAYS IN ITALY "thixotropic mortars type MT1"

Descrpition

BS 39/MC MuCis® sra is a specially modified cement based formulation consisting in the powder component, with maximum aggregate size 2.5 mm and the liquid **RMB/MC** (water dispersion of special non-toxic polymers).
The product is formulated with the SHRINKO-tec® technology and has auto-expansive capacity in air of more than 400µ/m in 24 hours, followed by a very reduced or zero shrinkage. The product contains MuCis® multiple corrosion inhibiting synergies, in contact and by migration towards the steel reinforcement, and contains polymer fibres with very high elasticity modulus FIB-energy® (Modulus of Elasticity 42000 MPa, tensile strength 1600N/mm^{2})
After mixing the two components a mortar with excellent workability is obtained, applied by trowel and other normal tools for rendering, including the spray rendering machine. Once applied and cured, this product will have excellent adhesion properties, be durable, with high impermeability to water and against carbon dioxide penetration, good water vapour permeability. The mortar has high physical-mechanical strengths, in combination with low modulus of elasticity.

Advantages and characteristics

- Being highly thyxotrophic means that the required number of layers can be applied in a short time, and that the repaired surface can be rapidly finished in all seasons.
- The thyxotrophic qualities of the product give excellent adhesion; make it easy to spread on vertical surfaces, the lower parts of beams, shelves or slabs. Often it can be applied to structures that are subject to dynamic stress from traffic.
- The volumetric stability ensures minimal or zero shrinkage, with, consequently the reduction or elimination of cracking
- Solves the problem of difficult reconstructions or repair work, at a wide range of thicknesses: from a minimum of 3 mm to a maximum of 30 mm for each layer.
- For very thick layers and large areas it is advisable to use contrasting steel net supported on steel slump prefixed into the support.
- Normally does not require wetting before or anti-evaporation protection after application
- Exceptionally strong adhesion to the support and maximum durability to carbonation and damaging acid rain and salt water
- Has excellent waterproofing properties, but good permeability to water vapour
- The product guarantees optimal protection of the concrete reinforcement steel against corrosion.

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Fields of use

- For any type of repair or restoring of degraded concrete
- General structural repairs, both of concrete and masonry

Method of use

Note: The adhesion on the support is a fundamental characteristic for the durability and structural upgrade of a repair mortar.
It is recommended to consult the Technical sheet at the end of the manual: *"Validation and preparation of substrates for an optimal adhesion of the repair mortar – recommendations for a correct finishing"*

A decent substrate preparation by scabbing, sandblasting is essential to achieve maximum adhesion to the substrate. High pressure water cleaning is the most suitable method for optimal preparation. Eliminate the concrete to reach clean steel rebars in case of rust or deep carbonation. Eliminate all rust of the exposed rebars (if possible by sandblasting). Treat the rebars with Mucis® Protezione Ferro (see technical datasheet) before any further treatment.

- Add the powder to the liquid, stirring until the required consistency is achieved. The pre-packed proportions (25 kg bag of powder and 4 kg can of liquid) give a rather fluid consistency. Should the mixture need to be particularly thyxotrophic and cohesive, slightly reduce the quantity of liquid. If, on the other hand, it should be more fluid, the proportion of the liquid **RMB/MC** may be slightly increased.
- Prepare the amount of mixture that can be used within 30 minutes. Do not re-use the product or thin with further liquid when it has already thickened.
- Apply the mortar directly on compact and consistent support. In the case the substrate is rather weak, it is advisable to install additional structural reinforcement to accommodate the dynamic and hydrothermal movements, before the application of the repair mortar. Fix stubs in specially drilled holes. Then fix a suitable steel net to these stubs.
- Before applying the product to particularly incoherent surfaces, or with low roughness to get grip, we recommend "brushing" the surface with a slightly more fluid version of the mixer mortar, using a stiff brush. This will improve adhesion.
- It should naturally be avoided to work at extreme temperatures and especially temperatures lower then 5°C.
- It is not necessary, in normal conditions, to provide curing membranes or protection against evaporation, nor wetting of the fresh application.

Remarks

Information according to 2003/53/CE.
Storage: The product remains protected and keeps 12 months in a unopened bag that is kept dry and well protected at temperatures between +5°C and +35°C.
Do not use the contents of already opened sacks if they seem to have turned lumpy. Avoid freezing of the liquid component B.

Packaging

Powder Component : bag of 25 kg MuCis® BS 38/39-2,5
Liquid Component : can of 4,5 kg. RMB/MC

BS 39/MC MuCis® **sra** SHRINKO-tec® MuCis® FIB-energy®

Safety indications

Read carefully the safety indications on the packaging, or consult the relevant safety datasheet of this product.
Adapt the same safety procedures as when working with a regular cement based material

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COMPARISON PERFORMANCE AND REQUIREMENTS

BS 39/MC
MuCis® sra

SHRINKO-tec®
MuCis®
FIB-energy®

Standard EN 1504-3

Performance characteristics	Reference substrate (EN 1766)	Testing method	requirements Structural Classe R4	RESULT (typical values)
Compressive strength	None	EN 12190	≥ 45 MPa (28 days)	62 MPa (28 days.)
Ionic chloride content	None	EN 1015-17	≤ 0,05%	≤ 0,03%
Adhesive bonding (adhesion to concrete)	MC(0,40)	EN 1542	≥ 2,0 MPa	2,4 MPa
Restrained shrinkage/expansion	MC(0,40)	EN 12617-4	Adhesion strength after test ≥ 2,0 Mpa	≥ 2,0 MPa
Carbonation resistance	None	EN 13295	d_k ≤ reference concrete [MC(0,45)]	Exceeds the requirement
Modulus of elasticity	None	EN 13412	≥ 20.000 MPa (28 days.)	26500 MPa (28 days)
Thermal compatibility ✱ Part 1, frost-thaw resistance	MC(0,40)	EN 13687-1	Adhesion strength after 50 cycles ≥ 2,0 MPa	≥ 2,0 MPa
Thermal compatibility ✱ Part 2, thunder shower	MC(0,40)	EN 13687-2	Adhesion strength after 30 cycles ≥ 2,0 MPa	≥ 2,0 MPa
Thermal compatibility ✱ Part 4, dry cycle	MC(0,40)	EN 13687-4	Adhesion strength after 30 cycles ≥ 2,0 MPa	≥ 2,0 MPa
Coefficient of thermal expansion	None	EN 1770	No requirements for this test ✱, otherwise declared values	• test✱ exceeds • declared value = $15,1 \times 10^{-6}$ ($1/K^{-1}$)
Capillary absorption	None	EN 13057	≤ 0,5 Kg $\cdot m^{-2} \cdot h^{-0,5}$	≤ 0,3 Kg $\cdot m^{-2} \cdot h^{-0,5}$

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Other technical characteristics (typical values)

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• Initial setting time		about 1h at 20°C
• Bleeding		none
• Consumption		2,0 Kg/m^2/mm
• Compressive strength UNI EN 12190	1 day. 28 days.	20÷28 MPa 54÷64 MPa
• Flexural strength UNI EN 196/1	1 day. 28 days.	5÷7 MPa 11÷13,5 MPa
• MODULUS OF ELASTICITY	28 days.	26.500 MPa
• Pull-out of reinforcement bar	28 days.	23÷28 MPa
• Impermeability to water UNI EN 12390/8	28 days.	2÷5 mm
• Expansion when ageing in open air	1 days.	> 450 µ/m
• Curling/golfing test		Golfing
• Restrained shrinkage test (ring)		Stable, no cracks
• Corrosion test in presence of chloride salts ASTM G109	5 years	≤ 10 µA no corrosion
• Resistance frost-thaw SIA /62/ 1/ 91 < 600 gr/m²		~ 150 gr/m²
• Permeability to chlorides FHWA/ RD/ 81 100÷1000 Coulomb		165 Coulomb
• Depth of carbonation in time (laboratory simulation)	8 years 18 years 25 years	0,8 mm 2,0 mm 3,9 mm
• Resistance to CO_2 penetration		11.500 µ
• Water vapour diffusion resistance		40 µ

Aesthetic and protective systems

In order to achieve optimal performance after the structural repair and restoration, it is recommended to use an aesthetic and protective system from our Protection Systems VHDRS®.
Consult our Technical Department (U.A.P.P.) or our website **www.tecnochem.it**.

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