



Very
High
Durability
Repair &
Prevention
Systems



Certified Quality System since **FEBRUARY 1993**

From Project to Jobsite

BS 37 GLASS MuCis® sra

SHRINKO-tec®

MuCis®

FIB-energy®

EN 1504-3

R4

NORMA EUROPEA

**FIBRE-REINFORCED TWO-COMPONENT THIXOTROPIC ANTI-SHRINKAGE
ANTI-CORROSION MORTAR WITH FLEXIBLE INORGANIC FIBRES
FOR STRUCTURAL REPAIRS ON DETERIORATED CONCRETE**

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



type MT1: "mortar, premixed, thixotropic, contrasted expansion, with liquid humidity retainer, containing poly-acrylonitrile fibres and reinforced with flexible inorganic fibres featuring length 13 mm, diameter 14 µm, tensile strength of 1700 MPa, elastic modulus 74,000 MPa "corresponding to ITALIAN HIGHWAYS SPECIFICATIONS "thixotropic mortar type MT1"

Description BS 37 GLASS MuCis® SRA is a product, formed by the comp. A special cement premix powder with a maximum aggregate size of 2.5 mm, and the liquid component B SRA *Shrinkage Reducing Agent*.

The product is formulated with the technology **SHRINKO-tec®** and has the ability of self-expansion in air above 400 µm in 24 hours followed by strongly reduced or zero shrinkage; contains multiple anti-corrosion synergy **MuCis®** which has the anti-corrosion efficiency by contact and by migration towards the reinforcement steelbars. The product contains a very high polymer fibers **FIB-energy® FPC** with very high modulus and inorganic fibers **FIB-energy® GLASS 13** (ℓ = 13 mm, Ø = 14 µm, ME = 74,000 N/mm²).

After mixing the two components, the mortar is perfectly workable with by trowel and normal tools for the application of the renders, including the mortar spray equipment. The applied and cured mortar will have high adhesion, high impermeability to water and carbon dioxide, good water vapor permeability, high physical and mechanical strengths accompanied by low elasticity modulus.

Advantages and characteristics

- The high thixotropy allows the application in a short time of thick layers and the fast finish of the repairs, in all seasons.
- The thixotropic characteristics of the product guarantee excellent adhesion, easy application on the vertical substrates like on the undersides of beams, boards or slabs, also when apply on structures indirectly subjected to slight vibration or dynamic loads from traffic.
- Volumetric stability results in zero or limited shrinkage, next resulting in reduction or even elimination of cracks.
- The problem solves the problems of difficult reconstructions or repairs, even on substrates with little grip or wide variations in thickness, from a minimum of 3 mm to a maximum of 30 mm for each repair.
- For large thicknesses and large areas the Project Manager may provide contrasting steel net fixed with steel stubs into the substrate.
 - Normally requires no wetting or anti-evaporation protection after application.
- Very strong adhesion to the substrate and maximum resistance to carbonation and aggression from acid rain and salt water.
- High water resistance to water penetration and good permeability to water vapor diffusion.
- The product allows for maximum protection of reinforcement steel inside, even not in direct contact with the repair mortar.
- High resistance to sulphates.



Very
High
Durability
Repair &
Prevention
Systems



Certified Quality System since **FEBRUARY 1993**

From Project to Jobsite

- Indicated use**
- For each type of repair or restoration of deteriorated concrete.
 - Structural repairs in general, both on concrete and on masonry.

Method of use Note: the adhesion on the support is a fundamental characteristic for the durability and structural properties of a repair mortar.

It is therefore recommended to consult the paper: *“Valuation and preparation of supports for the best adhesion and structuration with a repair mortar – recommendations for a good finish”*

- A decent substrate preparation by grinding. Remove spalled and carbonated concrete, expose the rusted steel bars, remove rust and friable parts high pressure water jetting or sandblasting. In order to provide additional protection to the reinforcement steel, apply MuCis® PROTEZIONE FERRO, a two-component passivation and protective anti-corrosion slurry by brush, immediately after the preparation of the steel (see Technical Datasheet).
- Add during mixing the powder component **A** in the mixing water (about 13.5% = about 3.38 kg per 25 kg bag) and add while mixing also the liquid component **B** (0.25 kg per 25 kg bag). The proportions will result in a mortar with thixotropic consistency and good workability. In case the application requires particularly consistent and cohesive repair mortars, the amount of water can be slightly decreased. If the case very fluid mixes are required, add some extra water.
- Prepare amount of mortar that can be used within 30 minutes of the mixing. Do not reuse or diluted with water if the product has started to set.
- Apply the mortar directly onto the substrate, which shall have sufficient strength and consistency. In the case of weak walls or substrates, or always when there is a need for structural reinforcement or when subjected to special mechanical stresses or temperature changes, prior to application of the mixture, install stumps of steel in previously drilled holes in the substrate; then fix on these stumps a steel net.
- In the case the substrates is cling partially inconsistent or with difficult adhesion, apply first a brush coat of the product with some extra water, as key coat for the consecutive mortar application. This will guarantee better adhesion.
- Applications in hot conditions or below +5°C are dis-advised.
- Under normal conditions it is not required to provide any anti-evaporation protection or wetting.

Remarks Information according to 2003/53/CE:

Storage: 12 months in original, unopened packaging, kept dry and protected, at temperatures between +5°C and +35°C. Do not use the contents of opened bags if the powder has gone into lumps. Avoid freezing of the B component.

| Packaging | For small jobsite : | For big jobsite: |
|----------------------------|---------------------|--|
| Component powder A: | Kg. 25 bag | Kg. 25 bag |
| Component liquid B: | Kg. 0,25 bottle | Concentrate to be weighed 0,1 Kg (20 Kg can or 1000 kg IBC) |

Safety indications Use the usual protective systems for cement-based compounds.
Carefully read the instructions on the packaging or consult the MSDS for the product.

From Project to Jobsite

COMPARISON PERFORMANCE AND REQUIREMENTS

STANDARD 1504-3

BS 37 GLASS MuCis®
sra

SHRINKO-600[®]
MuCis[®]
FIB-energy[®]

| Performance characteristics | Reference substrate (EN 1766) | Testing method | Requirements | RESULT (Typical values) |
|--|-------------------------------|----------------|---|--|
| | | | Structural | |
| | | | Class R4 | |
| Compressive strength | None | EN 12190 | ≥ 45 MPa (28 days) | 64 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 | 2,3 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 | $d_k \leq$ reference concrete [MC(0,45)] | Exceeds the requirement |
| Modulus of elasticity | None | EN 13412 | ≥ 20.000 MPa (28 days) | 28000 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 | <ul style="list-style-type: none"> • test* exceeds • declared value=15,1x10⁻⁶ (°K⁻¹) |
| Capillary absorption | None | EN 13057 | ≤ 0,5 Kg · m ⁻² · h ^{-0,5} | ≤ 0,3 Kg · m ⁻² · h ^{-0,5} |



Very
High
Durability
Repair &
Prevention
Systems



Certified Quality System since **FEBRUARY 1993**

From Project to Jobsite

Other technical characteristics (typical values)

BS 37 GLASS MuCis® sra

SHRINKO-tec®
MuCis®
FIB-energy®

| | | |
|---|----------|---------------------------|
| • Initial setting time about 1h at 20°C | | |
| • Mixing water | | 13,5 % |
| • Bleeding | | none |
| • Consumption | | 2,0 Kg/m ² /mm |
| • Compressive strength UNI EN 12190 | 1 day | 22 MPa |
| | 3 days | 35 MPa |
| | 7 days | 49 MPa |
| | 28 days | 64 MPa |
| • Flexural strength UNI EN 196/1 | 1 day | 5 MPa |
| | 3 days | 7 MPa |
| | 7 days | 10 MPa |
| | 28 days | 12 MPa |
| • MODULUS OF ELASTICITY | 28 days | 28.000 MPa |
| • Pull-out of reinforcement bar | 28 days | 26 MPa |
| • Impermeability to water UNI EN 12390/8 | 28 days | 3 mm |
| • Expansion when ageing in open air | 1 days | > 460 µm |
| • Arching/bending test | | arching |
| • 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/m ² | | ~ 150 gr/m ² |
| • Permeability to chlorides FHWA/RD/81 100÷1000 Coulomb | | 165 Coulomb |
| • Depth of carbonation in time (laboratory simulation) | 8 years | 1 mm |
| | 18 years | 2 mm |
| | 25 years | 3,5 mm |
| • Resistance to CO ₂ penetration | | 12.000 µ |
| • Water vapour diffusion resistance | | 45 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.

The above data are based on our actual and most experienced practical and laboratory knowledge and the results are collected from application of the product in different situations. Tecnochem Italiana does not assume any responsibility regarding inadequate or negative performance as a result of improper use of the product or for defects deriving from factors or elements other than the quality of the product including improper storage. The technical characteristics and performance mentioned in this datasheet are updated periodically. The revision dates and number of revision of the datasheets are listed in the table below. Eventual variations are traceable on our website www.tecnochem.it where the most updated datasheets can be retrieved.

Edition: 04/2009
Date revision : 09/2013

Nr. rev: 10

BS 37 GLASS MuCis® sra
pag. 4/4