Monomix WS

Class R3 General Purpose Spray Applied Repair Mortar

Product Overview

High strength, low density, fibre reinforced, shrinkage compensated waterproof mortar applied by the wet spray method for the structural repair and reinstatement of concrete. CE-marked in accordance with BS EN 1504-3 Class R3.

Uses

Structural repair, rendering and profiling of reinforced concrete in vertical, horizontal and overhead situations. Suitable for repair methods 3.1, 3.3, 7.1, 7.2 as defined by BS EN 1504-3.

Advantages

- Incorporates the latest proven cement chemistry, microsilica, fibre and styrene acrylic copolymer technology.
- Pre-packaged material that only requires mixing with clean water on-site to give an easily trowelable mortar with a maximum application thickness of 80mm in vertical, horizontal and overhead situations.
- High bond strength exceeds tensile strength of concrete, ensuring monolithic performance of the repair.
- Dense matrix offers low permeability to water, even at 10 bar pressure, and very high diffusion resistance to acid gases and chloride ions.
- Improved tensile and impact strength. Excellent low sag properties.
- Non-toxic when cured and listed as authorised under Regulation 31 for use in the supply of drinking water.
- Economic mortar generally requiring no substrate or inter-layer priming. Part bags can be mixed.
- Easily overcoated with specialist membranes to provide further protection and aesthetic quality.

Description

MONOMIX WS is a single component cementitious mortar which is rapid hardening, low density and high strength with enhanced polymer properties. The thixotropic nature of the product enables easy high build trowel application for the structural repair of voids and the rendering and re-profiling of vertical, horizontal and overhead surfaces. It is supplied as a single component system ready for on-site mixing and use, requiring only the addition of clean water.

Compliance

- CE-marked in accordance with BS EN 1504-3 Class R3. Suitable for repair methods 3.1, 3.3, 7.1, 7.2 as defined by BS EN 1504-3.
- Listed under Regulation 31 - England and Wales: Regulation 33 – Scotland: Regulation 30 – NI: for use with potable water.
- WRAS Approved for use with potable water.
- Compliant with Highways Agency Standard BD27/86 for the repair of Highway Structures.
- BBA Approved, Certificate No. 05/4276.

Specification Clause

The repair mortar shall be a single component cementitious mortar, incorporating microsilica, fibre and styrene acrylic copolymer technology, and shall be CE-marked in accordance with BS EN 1504-3 Class R3. It shall be BBA Certified and comply with the following performance specification:

- 5-80mm application thickness in a single layer even overhead.
- Impermeable to water under 10 bar hydrostatic pressure such that 5.7mm of mortar is equivalent to 1000mm of concrete.
- Compressive strength at 20°C of at least 20MPa in 1 hour and 40MPa in 28 days.
- Oxygen diffusion coefficient to be no greater than 2.72 x 10-4 cm2/sec.

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EN1504-3: Concrete repair product for structural repair
PCC mortar (based on hydraulic cement polymer modified)

Compressive Strength	:	Class R3 ≥ 25MPa
Adhesive Bond	:	Class R4 ≥ 2.0MPa
Chloride Ion Content	:	≤ 0.05%
Carbonation Resistance	:	Passes
Elastic Modulus	:	18.2 GPa
Thermal Capability Part 1	:	Class R4 ≥ 2.0MPa
Capillary Absorption	:	0.077 $kg.m^{-2}.h^{-0.5}$
Dangerous Substances	:	Complies with 5.4
Reaction to Fire	:	Euroclass A2-s1, d0

Technical Data / Mechanical Characteristics

Property	Standard	BS EN 1504 R3 Requirement	Result
Compressive Strength	EN 12190	≥ 25MPa	28 days: 38.8 MPa
Compressive Strength Development @ 20°C	BS4551		1 day 20.0 MPa 7 days 30.0 MPa 28 days 40.0 MPa
Adhesive Bond	EN 1542	≥ 1.50 MPa	2.20MPa Class R4 ≥ 2.0 MPa
Chloride Ion Content	EN 1015-17	≤ 0.05%	0.016%
Carbonation Resistance	EN 13295	≤ ref concrete	Passes
Elastic Modulus	EN 13412	≥ 15GPa	18.2GPa
Capillary Absorption	EN 13057	≤ 0.5 kg/m^{-2}/h^{-05}	0.077kg/m^{-2}/h^{-05}
Freeze/Thaw Cycling	EN 13687-1	≥ 2.0MPa	2.28MPa
Water Permeability Coefficient Equivalent Concrete Thickness	Taywood Test	-	9.65 x 10^{-15} m/sec 5.7mm of MONONMIX WS = 1000mm of concrete
Oxygen Diffusion Coefficient	Taywood Test	-	2.72 x 10^{-4}2cm^{2}/sec
Flexural Strength	EN196-1	-	6.5MPa
Tensile Strength	BS 6319: 7	-	2.67MPa
Shrinkage	BS EN 12617-4	-	0.031% after 7 days
Mixed Density		-	1750kg/m³ at 0.14 water: powder ratio
Mixed Colour		-	Concrete grey
Min Application Thickness Max Application Thickness		-	5mm 80mm per layer
Min Application Temperature Max Application Temperature		-	5°C 40°C
Working Life (approx.)		-	60 minutes at 20°C 30 minutes at 40°C
Reaction to Fire	EN 13501-1	Euroclass	Euroclass A2 – s1, d0

The properties given above are obtained from laboratory tests: results obtained from on-site testing may vary according to site conditions

Application Instructions

Preparation

Mechanically remove all damaged concrete or failed repairs back to a sound core. Wherever possible, the full circumference of the steel reinforcement should be exposed to at least 25mm behind the bars and 50mm beyond the point at which corrosion is visible.

On cutting back, feather edges must be avoided. The perimeter of the repair area should be stepped to a depth of 10mm by means of saw, disc cutting or preferably using a power chisel.

The areas to be repaired must be free from all unsound material, dust, oil, grease, corrosion by-products and organic growth.

Smooth surfaces should be roughened, all loose material and surface laitance removed and reinforcement cleaned to bright steel using wet grit blasting techniques or equivalent approved methods.

If chlorides are absent from the concrete and environmental constraints preclude the use of blasting then hand held power tools such as a needle gun, angle grinder or power wire brush can be used to remove all loose corrosion by-products back to bright metal.

The strength of the concrete sub-base should be a minimum of 20MPa.

The prepared substrate should be thoroughly soaked with clean water until uniformly saturated without any standing water.

Treatment of Steel Reinforcement

All exposed steel reinforcement should be treated with 2 x 1mm coats of **STEEL REINFORCEMENT PROTECTOR 841** applied by brush (See separate Data Sheet for full details). NB: When carrying out repairs in new construction, it is not necessary to fully expose any reinforcing bars.

Priming of Concrete

MONOMIX WS is highly polymer modified and as a result concrete surfaces do not generally require a primer. Highly porous substrates should be primed with **BONDING BRIDGE 842** prior to the application of the repair mortars (See separate Data Sheet for full details).

Mixing

MONOMIX WS should be mechanically mixed using a forced action pan mixer or in a clean drum using a slow speed (240 rpm) drill and paddle. A normal concrete mixer is **NOT** suitable.

For normal applications, use between 3.3-3.7 litres of clean water per 25kg bag depending upon the desired consistency. For part bags, this equates to 5.0-6.0 volumes of powder to one volume of water. Typically, for high build applications, use 3.5 litres of clean water per bag which gives a water: powder ratio of 14%. Normal mixing time depends on the type of mixer used, 2-3 minutes is average. Mix so as to entrain as little air as possible. Use without delay.

Please Note: It is vital to the success of the application that these instructions are strictly adhered to. Flexcrete cannot be held responsible for any product failures due to incorrect mixing.

Placing

MONOMIX WS can be applied using wet process spray techniques, resulting in application thicknesses of 80mm, even in soffit situations. If necessary, support with shuttering to allow for compaction if working to reveals, etc. The application thickness achievable is dependent upon the substrate and care must be taken to ensure that an initial thickness of mortar, typically 5-10mm, is applied to the area before building up to larger depths.

For repairs which require multi-layer applications, it is important to ensure that previous layers are well keyed and stable, but not fully set, prior to the application of subsequent layers. No inter-layer priming is required. Final profiling of a high quality is easily achieved with a steel float.

MONOMIX WS can also be applied using dry spray methods. Please contact Flexcrete Technical Department for more details.

Curing

Normal concreting procedures should be strictly adhered to. It is important that the surface of the mortar is protected from strong sunlight and drying winds with **FLEXCRETE CURING MEMBRANE WB**, polythene sheeting, damp hessian or similar (See separate Data Sheet for full details).

Cleaning and Storage

All tools should be cleaned with water immediately after use.

Materials can be stored for 12 months in dry, frost free conditions with unopened bags at 20°C.

Packaging

MONOMIX WS is supplied in 25kg bags.

Yield and Coverage

16.25 litres per 25kg bag.

A 25kg bag covers 1.63m² at 10mm thickness.

Limitations

Do not use **MONOMIX WS** when the temperature is below 5°C and falling. Do not use **MONOMIX WS** on waterproof concrete without contacting the Flexcrete Technical Department. Not suitable for use on trafficked areas.

Health and Safety

Safety Data Sheets are available on request.

Application Top Tips

1. **DO NOT WET OUT OR PRIME** between layers.
2. If mortar thickens, remix but **DO NOT ADD EXTRA WATER.**
3. Use a screed bar to achieve a final level and finish with a steel float.
4. **DO NOT OVER TROWEL.** If the mortar begins to slump, allow to stabilise and refinish.
5. When finishing, trowel from centre out towards the perimeter working into the edges of the repair.
6. Use **MONOMIX HD** for areas subject to vehicular traffic.
7. Cold Weather Working (See separate Guide)
   - ≥3ºC. on a rising thermometer.
   - ≥5ºC. on a falling thermometer.
8. Hot Weather Working (See separate Guide)
   - Store material in cool conditions to maximise working life.
   - Shade applied material from strong sunlight.
   - Spray apply a second coat of **CURING MEMBRANE WB.**
   - If possible, avoid extreme temperatures by working at night.

CONCRETE REPAIR ASSOCIATION

FM 41091 Quality
EMS 597350 Environmental
OHS 597351 Health & Safety