DRIZORO® Construction Products

MAXRITE® 700

NORMAL SETTING-TIME, POLYMER-MODIFIED, SILICA FUME-ENHANCED, FIBRE-REINFORCED STRUCTURAL REPAIR MORTAR WITH CORROSION INHIBITORS

CE

DESCRIPTION

MAXRITE® 700 is an one-component, cement-based, silica fume-enhanced, polymer-modified, fibre-reinforced restoration mortar with corrosion inhibitors. It is specially designed for high performance structural concrete repair exposed to an aggressive environmental ambient and provides an additional protection of the steel reinforcements. Its long open time and thixotropy allow the repair of new and old concrete in a simple way, without the need for using any form work, applied manually or by mechanical means. Meets Class R4 according to European Standard EN-1504-3.

APPLICATION FIELDS

- Restoration of structural concrete elements, recovering original shape and function. EN 1504-3 standard, Principle 3 (CR) – Method 3.1 Applying mortar by hand, and Method 3.3 Spaying mortar in:
  - Repair of concrete affected by corrosion of reinforcements in marine environment, bridges, harbours, dams, etc.
  - Repair of general structural concrete on vertical or overhead surfaces, without form works.
  - Repair of lines and shapes in pre-fabricated concrete elements and structures damaged by mechanical impacts, corrosion of reinforcements, freeze/thaw cycles, etc.
  - Repair of pillars, lintels, raincaps and architectural concrete exposed permanently to extreme weather condition.
  - Repair of concrete affected by repeated loads.
- Structural strengthening of concrete elements. EN 1504-3 standard, Principle 4 (SS) – Method 4.4 Adding mortar.
- Restoration of passivity for rebars on concrete elements. EN 1504-3 standard, Principle 7 (RP) – Method 7.1 Increasing cover to reinforcement with mortar, and Method 7.2 Replacing contaminated concrete in:
  - Repair of concrete structures subject to carbonation process.
  - Increasing cover for concrete structures.
- Maintenance of industrial areas damaged by aggressive environment, acid rain, atmospheric pollution, etc.
- Patching of cold joints and making of concave corners prior to waterproofing jobs in reservoirs, swimming-pools, basements, etc.

ADVANTAGES

- Normal setting-time allows the quick completion for the repair of large surfaces.
- Corrosion inhibitors protect and passive the steel reinforcement against chlorides and other aggressive corroding agents, considerably extending the service life of the structure.
- Good chemical resistances to aggressive environments due to the silica fume content.
- Low water absorption. Withstands freeze/thaw cycles.
- High resistance to carbonation penetration.
- High adhesion to concrete and reinforcements. No special bonding agent/primer is required. Loads are transmitted onto the repaired structure.
- High impact resistance and mechanical strengths. Long-lasting repairs.
- Good thixotropy. Application in successive layers without slump or the need to use form work. Allows high thickness per layer from 5 to 50 mm.
- Good workability.
- Odour-free: Suitable for poor ventilated areas, such as water tanks, shafts, sewers, etc.
- Easy to mix and use: just add water, and apply manually by trowel or mechanically by wet spraying equipments.
- Environmentally friendly: non-toxic, cement-base and solvent-free product.

APPLICATION INSTRUCTIONS

Substrate preparation

Concrete to be repair must be structurally sound, firm, without cement laitance and as uniform as possible, and preferably with a slight roughness. Remove all damaged and loose concrete until getting sound concrete and, sawcut the edges perpendicularly to the surface to a minimum depth of 5 mm.

Expose all corroded reinforcement, removing all concrete until the edges of the bars are not affected by rust. Remove concrete all around the reinforcement for an efficient cleaning and to surround it with a minimum thickness of at least 1 cm of ***MAXRITE® 700***.

Eliminate rust by wire brush, needle gun, sand or shot blasting, etc. For additional protection, an application of the oxide converter and protector ***MAXREST® PASSIVE*** (Technical Bulletin No. 12) can be used.

Surface must be clean and free of paints, coatings, efflorescence, loose particles, grease, oils, curing agents, form release agents, dust, gypsum plasters, organic growth or any other contaminants that may affect to adhesion of the product. For cleaning the substrate, use sand blasting or high pressure water cleaning methods, not being desirable aggressive mechanical means.

Once substrate has been prepared, dampen thoroughly the entire surface to be repaired with clean water, avoiding the formation of puddles. Allow excess water to drain away, and then start the application once the surface acquires a matte appearance. If it is dry, proceed to saturate it with water again.

Mixing

A 25 kg bag of ***MAXRITE®700*** requires from 3,75 to 4,25 litres (15-17%) of water, depending on existing ambient conditions and desired consistency.

Pour the required amount of water in a clean container, and then slowly add ***MAXRITE®700*** to the liquid and mix, using a slow speed electric drill (400-600 rpm) fitted with a disc mixer for about 2-3 minutes until achieving a smooth, lump-free and homogeneous mortar of dry consistency. Do not mix for prolonged period nor use high-speed mixer, which may introduce air bubble. Allow the mixture to rest for 3 to 5 minutes to fully wet out all the powder, and remix briefly before applying.

For applications using spraying equipments the mixing water can by increased up to 4,5 litres per bag. In any case these quantities are only indicative and should be checked depending on the desired consistency and the existing ambient conditions.

Application

For an optimum adhesion prepare bonding slurry by mixing 5 parts of ***MAXRITE® 700*** with 1 part of water, until achieving a homogeneous consistency without any lumps. Apply the bonding slurry using a ***MAXBRUSH*** type brush on the surface to be repaired and on the reinforcement bars. Bonding coat must be thoroughly worked into the prepared substrate to fill and cover all micro-pores and other small voids.

When bonding slurry begins to lose brightness but is still fresh, start application of repair mortar. If slurry dries up, or the previous layer is completely set, apply a new slurry coat to continue the job.

Apply layers between 5 mm and 50 mm thick. Put special attention in pressing the mortar with the trowel to prevent any air from being trapped.

For application by spraying methods, it is only necessary to dampen the surface with clean water until saturation, but without puddling. Wait until the surface begins to lose brightness and start placing by projecting ***MAXRITE®700*** in layers of thickness between 5 mm and 50 mm. Adjust the spraying pressure to minimize the rebound and ensure proper adhesion of structural repair mortar on the substrate.

For applications of several lifts, scratch the surface of each previous layer with a trowel to improve the adhesion of the following one. If a quick drying is observed, damp the surface with cold water. Successive layers should be applied when the previous one is completely set.

Surface can be finished with a sponge, wood, plastic float or trowel, depending on the desired texture. Do not overwork the mortar; minimize trowelling. Shape the last layer as desired before the final setting time.

Once the repair is finished it can be coated with cement-based coating such as ***MAXSEAL® -/ FLEX*** (Technical Bulletins Nos. 1 and 29), or acrylic-based coatings such as ***MAXSHEEN® -/ ELASTIC*** (Technical Bulletins Nos. 17 and 142) available in a wide range of colours.

Application conditions

Do not apply in rain or when rain, contact with water, condensation, dampness and dew is expected within the first 24 h after the application.

The optimum temperature range for application is from 10 ºC to 30 ºC. Do not apply with substrate and/or ambient temperature is at or below 5°C, or when temperatures are expected to fall bellow 5 °C within 24 h after application. Do not apply to frozen or frost-covered surfaces.

For applications at hot temperatures, low relative humidity and/or windy conditions, i.e. summer time,

surface must be wet thoroughly with plenty of water prior to application. Avoid applications in areas exposed directly to the sunlight with high temperatures.

Curing
Prevent rapid drying of the ***MAXRITE® 700*** application, and protect it from extreme heat and direct sunlight exposure to maintain its moisture for at least 24 hours after the application, spraying a fine mist of water, without causing the washing or by using polyethylene sheeting or damp burlaps. A quality curing compound such as ***MAXCURE®*** (Technical Bulletin No. 49) can also be used. Curing procedures should be observed mainly with high temperature (>30 °C), direct exposure to sunlight, and wind or low humidity (<50%) conditions.

Cleaning
All mixing and application tools, and equipment must be cleaned immediately with water after use. Once product hardens, this can only be removed by mechanical means.

CONSUMPTION

Estimated consumption for ***MAXRITE® 700*** is 1,85 kg/m^2·mm with a thickness from 5 mm to 50 mm per layer. A 25 kg bag fills approximately 13,1 litres (0,52 litres per 1,0 kg of product).

These figures are for guidance only and may vary depending on porosity, texture and conditions for substrate, and application method. Perform a preliminary test on-site to ascertain the total consumption exactly under jobsite conditions

IMPORTANT INDICATIONS

- Do not apply on substrates vitrified or enamelled, or treated with water repellent agents. Do not apply on bituminous materials, metals, wood, plasters or paints.
- Do not apply over weak substrates.
- Do not add cements, additives, aggregates or other compounds.
- Use the recommended mixing ratios.
- Do not use leftovers from previous mixes.
- To restore the workability, remix the mortar but never add more water.
- Observe the recommended consumptions and thickness per layer.
- Setting time data is measured at 20 ºC. Lower temperatures and/or higher R.H. values increase this value.
- With low temperatures keep the product in a warm place and use clean warm water to accelerate the setting time.
- With hot temperatures keep the product in a cool place and use fresh clean water for the mix. Wet the different layers. Mix small batches of material and apply immediately.
- Do not use in contact with very soft water, acid water and/or carbonic water. When sulphates are present, i.e., groundwater, seawater or wastewater, use the ***MAXRITE® 700 ANTISULFAT*** sulphate-resisting version.
- For other uses not specified in this Technical Bulletin, further information or questions regarding the application of the product, consult the Technical Department.

PACKAGING

MAXRITE® 700 is supplied in 25 kg bags and 25 kg metal drums. It is available in standard grey colour.

STORAGE

Twelve months in its unopened and undamaged original sealed packaging. Store in a cool, dry and covered place, protected from moisture, freezing and away from direct exposure to sunlight at temperatures above 5 °C.

SAFETY AND HEALTH

MAXRITE® 700 is not a toxic product but is an abrasive composition. Avoid direct contact with skin and eyes, and breathing dust. Use rubber gloves and safety goggles when handling, mixing and applying the product. In case of contact with skin, wash affected area with soap and water. In case of contact with eyes, rinse immediately thoroughly with clean water but do not rub. If the irritation persists, seek medical assistance.

Consult the Material Safety Data Sheet for ***MAXRITE® 700***.

Disposal of the product and its packaging should be carried out according to the current official regulations and it is the responsibility of the final user of the product.

TECHNICAL DATA

Product characteristics	
CE Marking, EN 1504-3. Description. Structural repair mortar for concrete structures in building and civil engineering works. Type PCC and Class R4. Principles / Methods. Concrete restoration by applying mortar by hand (Principle 3-CR/3.1) and by spraying mortar (Principle 3-CR/3.3). Structural strengthening by adding mortar (Principle 4-SS/4.4). Preserving or restoring passivity by increasing cover to reinforcement with mortar (Principle 7-RP/7.1), and by replacing contaminated concrete (Principle 7-RP/7.2)	
General appearance and colour	Grey powder
Maximum aggregate size, (mm)	0,8
Density for powder, (g/cm^3)	1,15 ± 0,1
Mixing water, (%, by weight)	16 ± 1
Application and curing conditions	
Minimum application temperature for substrate and ambient, (ºC)	> 5
Pot life at 20 ºC & 50 % R.H., (min)	60
Initial / Final setting time at 20 ºC & 50 % R.H., (min)	75 / 120
Cured product characteristics	
Density for cured and dry mortar, EN 1015-10 (g/cm^3)	2,1 ± 0,1
Requirement for repair products, EN 1504-5 (Class)	R4 / Structural
Compressive strength, EN 12190 (MPa) At 7 days At 28 days	 43,3 56,4
Flexural strength, EN 1015-11 (MPa) At 7 days At 28 days	 6,8 10,3
Chloride ion content, EN 1015-17 (%, by weight)	≤ 0,05
Adhesive bond on concrete at 28 days, EN 1542 (MPa)	≥ 2,0 (2,1)
Carbonation resistance, EN 13295, d_k (mm). Control concrete 4 mm	≤ 4,0
Elasticity modulus, EN13412 (GPa)	> 20 (26,7)
Thermal compatibility. Bond strength after 50 cycles (MPa) Part 1. Freeze-thaw, EN 13687-1 Part 2. Thunder shower, EN 13687-2 Part 4. Dry cycling, EN 13687-4	 ≥ 2,0 (2,2) ≥ 2,0 (2,1) ≥ 2,0 (2,3)
Capillary absorption, EN 13057. w (kg/m^2·h^{0,5})	≤ 0,5 (0,01)
Reaction to fire, EN 13501-1 (Euroclass)	A1
Thickness / Consumption*	
Thickness per layer (mm)	5 – 50
Consumption (kg/m^2·mm thickness)	1,85

* These figures are for guidance only and may vary depending on porosity, texture, substrate conditions and application method. Perform a preliminary test on-site to ascertain the total consumption exactly .

GUARANTEE

The information contained in this leaflet is based on our experience and technical knowledge, obtained through laboratory testing and from bibliographic material. ***DRIZORO®, S.A.U.*** reserves the right to introduce changes without prior notice. Any use of this data beyond the purposes expressly specified in the leaflet will not be the Company's responsibility unless authorised by us. We shall not accept responsibility exceeding the value of the purchased product. The data shown on consumptions, measurement and yields are for guidance only and based on our experience. These data are subject to variation due to the specific atmospheric and jobsite conditions so reasonable variations from the data may be experienced. In order to know the real data, a test on the jobsite must be done, and it will be carried out under the client responsibility. We shall not accept responsibility exceeding the value of the purchased product. For any other doubt, consult our Technical Department. This version of bulletin replaces the previous one.

DRIZORO Construction Products

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