



TEKAMAL ALTEKS 0-7 M

Fibre-reinforced non-shrinking mortar

SIST EN 1504-3: CC mortar for structural repair, class R4



Viaduct Črni Kal - pouring of structural bearings

 1404	
TKK Proizvodnja kemičnih izdelkov, Srpenica ob Soči d.d. Srpenica 1, 5224 Srpenica, Slovenija 09 1404-CPD-1407	
EN 1504-3 Mortar for structural repair of concrete, CC (hydraulic cement based mortar)	
Pressure strength:	Class R4
Chloride ion content:	≤ 0,05 %
Tear strength:	≥ 2,0 MPa
Resistance to carbonatisation:	Adequate
Elastic modulus:	≥ 20 GPa
Thermal compatibility:	
Freezing-thawing	≥ 2,0 MPa
Capillary absorption:	≤ 0,5 kgm ⁻² h ^{-0,5}
Harmful substances:	Meets requirement 5.4.
Inflammability class:	Euroclass A1

PROPERTIES

Tekamal Alteks 0-7 M is a one-component dry mixture of cement, special sands, polymer fibres and chemical admixtures which, if mortar is properly mixed, applied and handled, compensate the shrinkage of mortar and in this way reduce the risk of the cracks formation, improve workability of fresh mortar as well as its physical and mechanical properties and durability in hardened state. Mortar develops its expansive properties during the hardening process.

It is recommended that an individual layer of **Tekamal Alteks 0-7 M** be 20-110 mm thick. When applying thicker layers, approx. 25-35 weight parts of large-particle sand (e.g. 8-16 mm) can be added. To determine the right quantity of mixing water in order to achieve the required properties of fresh and cured mortar, preliminary tests should be done for each application method!

FIELD OF APPLICATION

Tekamal Alteks 0-7 M is used wherever non-shrinking properties are important or where high initial and final strengths are required (faster progress of work and faster removal of formworks) and/or high durability or where a greater risk exists for the formation of cracks due to drying (overlying or larger and exposed surfaces):

- Grouting machines, cranes,
- Anchoring,
- Protecting and repairing concrete constructions (e.g. pilots and pillars of concrete plants, bridges, viaducts, chimneys, cooling towers, treatment plants, etc.),
- Sealing rigid joints between concrete elements,
- Patching and thin overlying of concrete floors,
- Filling passive joints in stone walls,
- Filling rigid joints between concrete paving units, granite cubes, etc.

ADVANTAGES

Fresh mortar:

- Ready-to-use mixture: only the required amount of water is to be added at the construction site,
- Excellent workability: from plastic to cast consistency depending on the quantity of water added,
- Easy to apply,
- Highly reduced risk of developing cracks due to plastic shrinkage.

Hardened mortar:

- Cement-based: excellent compatibility with substrate and high alkaline reinforcement protection,
- High initial and final strengths: adhesive, bending and compressive,
- Compensates or reduces shrinkage significantly,
- Resistance to carbonation,
- Low capillary water absorption,
- High resistance to water penetration,
- High resistance to:
 - changes in temperature,
 - the effects of cold and salt,
- High abrasion resistance,
- Durability.

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**TECHNICAL DATA**

Property	Test	Unit	Standard requirement SIST EN 1504-3	Declared
Dry mixture				
Colour and appearance	Visual	-	-	Grey powder
Maximum size of aggregate particles	-	mm	-	7
Recommended thickness of a single layer:	-	mm	-	
- Min.				20
- Max.				110
Chloride ion content	SIST EN 1015-17	%	≤ 0,05	≤ 0,05
Fresh mixture				
Mixing water	-	l	-	approx. 3.0 – 3.8 per 25 kg, depending on the desired workability
Workability	SIST EN 13395-2	mm	-	350 ± 20 %
Workability time	-	min	-	approx. 30 – 45, depending on the quantity of mixing water and the temperature
Working temperature mortar, substrate, environment	-	°C	-	+ 5°C do + 30°C, optimal: + 15°C do + 25°C

Property	Test	Unit	Standard requirement SIST EN 1504-3		Declared
Hardened mortar			Razred		
Compressive strength,	SIST EN 12190	MPa	R4	-	≥ 25
- 1 day				-	≥ 50
- 7 days				-	≥ 60
- 28 days				≥ 45	≥ 60
Density	SIST EN 12190	kg/m ³	-	-	2200 ± 5 %
Adhesive bond, 28 days	SIST EN 1542	MPa	R4	≥ 2,0	≥ 2,0
Carbonation resistance	SIST EN 13295	-	R4	d _k ≤ reference concrete (MC (0,45))	d _k ≤ reference concrete (MC (0,45))
Elastic modulus, 28 days	SIST EN 13412	GPa	R4	≥ 20	≥ 20
Capillary absorption	SIST EN 13687-1	kgm ⁻² h ^{-0.5}	R4	≤ 0,5	≤ 0,5
Thermal compatibility, Part 1: Adhesive bond, after freezing and thawing in the presence of salt (50 cycles) (1)	SIST EN 13057	MPa	R4	≥ 2,0	≥ 2,0

(1) When a product satisfies Part 1 it is deemed to satisfy Part 2: Thunder shower, 30 cycles and Part 4: Dry cycling, 30 cycles.

APPLICATION GUIDELINES

- SUBSTRATE PREPARATION**

The areas on which **Tekamal Alteks 0-7 M** will be applied must be solid and free of dust, greasy spots, corrosion by-products, mould and other impurities. Any loose materials and remainings of old coatings must be removed mechanical by grinding, grit blasting or water blasting. The best way to prepare larger areas is to wash them with high pressure water jet. **The cleaned surface should be as rough as possible and well soaked - water saturated - but without any standing water or water film which would prevent Tekamal Alteks 0-7 M to adhere well to the old substrate.**

- MORTAR PREPARATION**

The most appropriate way of preparing the mortar is by adding dry mortar into water during constant mixing. Depending on its quantity, the mortar mixture can be mixed using a slow speed drill and a paddle, special mortar mixer or a forced action concrete mixer. Free-fall mixers are less suitable. However, they can be

used in order to ensure the mixer is wet prior to adding dry mortar, to add dry mortar slowly and to ensure the mortar is being mixed long enough.

Mix for 3-5 minutes or until a uniform mixture is obtained. Try to entrain as little air as possible. Leave mortar to rest for approx. 5-10 minutes, then remix it and apply. Workability time is 30-45 minutes; it depends on the quantity of mixing water used, the consistency of the obtained mixture and temperature. Remix from time to time.

- APPLICATION**

The method of applying **Tekamal Alteks 0-7 M** depends on the type of works (grouting, anchoring, repairs, etc.) and on the quality of the surface the mortar is being applied to (roughness, cavities,...). With regard to the method chosen, we adapt mortar workability by adding a sufficient amount of water. The mortar is then being applied either manually by means of ordinary masonry tools or mechanically by means of grouting or spraying machines. In any of these cases we must ensure the mortar covers all surfaces being repaired or to fill all cavities that are being

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grouted. When mortar is being poured into formworks, these should be of high quality and should provide good stability and tightness in order to prevent leakages. Prior to mortar application, formworks should be covered with a thin layer of **Unimaz O** oil or with **Unimaz E** emulsion. Mortar is always applied/poured slowly and from one side in order to fill in all the space and to prevent the formation of air »pockets«.

When repairing smaller surfaces (patching), the damaged areas should be cut at a minimum angle of 90° and maximum angle of 135° to reduce the possibility of debonding with the top surface of the adjacent sound surface as this leads to an uneven curing of mortar and to the formation of cracks on the contact between the old substrate and mortar.

When repairing concrete blocks (thin-layer overlaying), dilatation, working and border joints should be taken into account! To seal dilatation joints, the use of TKK permanent elastic sealants such as **Tioelast KVZ**, **Tioelast KOS**, **Tekasil Neutral PROFI** and **Tekafleks MS 15** is recommended.

Surfaces repaired with **Tekamal Alteks 0-7 M** can be easily coated with dispersion- or polymer-based protective coatings (acrylic, epoxy etc.) However, be careful the repaired surfaces are sufficiently dry. In any case, we recommend you consult the coating producer.

• CURING

Freshly applied mortar should be protected against excessive evaporation (sun, high temperatures, wind, and draught) for at least 7 days. In more unfavourable conditions the protection should be prolonged up to 10 days. The most adequate way of protection is periodic wetting or covering with a wet cloth made of felt or jute and polyethylene film, etc. In case the protection with water is not possible the use of **Kontrasol 22 V** - curing and protection agent, suitable for fresh concrete and mortar - is recommended.

• CLEANING THE TOOLS AND OTHER ACCESSORIES

Tools and other accessories used during work should be thoroughly cleaned immediately after use!

ADDITIONAL RECOMMENDATIONS AND WARNINGS

- Do not apply mortar at temperatures below +5°C and above + 35°C!
- Temperature affects workability, setting and hardening time. To achieve optimal results it is recommended the temperature of the concrete and/or metal substrate/formwork before and during the application and 48 hours after the application be 15-25°C.
- Low temperatures (below +10°C) prolong the setting and hardening time. Thus, it is recommended to store the mortar in heated places, to use warm mixing water (approx. 20-40°C) and to execute works during the warmest time of a day.
- In order to accelerate the setting time, **Cementol Omega P** - set accelerating admixture - can be added (approx. 1 % per mortar weight) or, to accelerate the setting time and ensure additional protection against potential freezing at the same time, a hardening accelerating admixture with the effect of antifreeze - **Cementol B NOVI** - can be added (approx. 1 % per mortar weight).
- High temperatures (above +30°C) prolong the setting and hardening time. Thus, it is recommended to store the mortar in cooled places, to use cold mixing water and to execute works during the coldest time of a day.
- Setting time can also be prolonged by adding a set retarding admixture **Cementol Retard R2** (approx. 0.2 % per mortar weight).
- Large surfaces exposed to more unfavourable conditions (high temperatures, wind, draught, low air humidity) and to a risk that

insufficient protection is/will be provided, can be additional protected against the formation of cracks due to plastic shrinkage by adding a shrinking reducing admixture **Cementol Antikontrakt T** (approx. 0.25-0.5 % per mortar weight).

- Technical characteristics indicated in the table apply for the original, prepacked **Tekamal Alteks 0-7 M** and **NOT for Tekamal Alteks 0-7 M** with sand or one of the admixtures added during mixing. In cases when contractors decide to add sand or chemical admixtures to the mortar, they should do some preliminary tests in order to find out, if mortar changed in this way still meets the requirements for fresh and cured mortar.
- Use only originally packed, closed, non-damaged and adequately stored packs of mortar!
- Never apply mortar onto smooth, insufficiently roughened substrates!
- Never apply mortar onto dry substrates!
- Never add water, dry mortar or sand to over-thickened mortar. Such mortar should be thrown away.
- During works follow the requirements of standard SIST EN 1504-10: Products and systems for the protection and repair of concrete structures - Part 10: Site application of products and systems and quality control of the works.
- For any additional information and explanations please contact our technical service.

CONSUMPTION

- approx. 20 kg/m²/cm or 2 kg of dry mortar per 1 L of wet mortar depending on the quantity of water added and on the smoothness of the surface.

PACKAGING

- 25 kg sacks

STORAGE

- Store the product in tightly closed package in a dry and well ventilated space in order to protect it against potential damage and damp.
- If stored in a dry place, in tightly closed and undamaged packaging the shelf life of the product is min. 1 year from the production date.
- The product may still be used after the date of expiry, but the characteristics important for the intended use have to be examined.

SAFETY PRECAUTIONS

- Because it contains cement, irritates the skin and eyes and may cause allergic reactions if it comes into contact with skin.
- When handling the product, protective gloves and goggles should be used.
 - Do not breathe in dry powder.
 - Use a protection mask when handling dry powder.
 - Eating, drinking or smoking during work is prohibited.
 - After finishing work, hands should be thoroughly washed with water.

WARNING

Instructions are given on the basis of examinations and technical experience of the firm. However, due to specific conditions and work methods, preliminary tests are advised for every type of use. Since we cannot influence the course of work, we cannot be held responsible for its quality.

Tekamal Alteks 0-7 M complies with the requirements of standard SIST EN 1504-3: Products and systems for the protection and repair of concrete structures - Part 3: Structural and non-structural repair: CC mortar for structural repair, class R4 (for methods based on principles: 3.1, 3.2, (3.3), 4.4, 7.1, 7.2).