VELOSIT® RM 203

Rapid Setting Vertical and Overhead Repair Mortar For 1 – 100 mm

Application fields

VELOSIT RM 203 is a rapid setting cementitious repair mortar for various types of construction substrates. It creates a good surface for coatings and overlays. Typical application fields besides others are as follows:

- Repair of surface defects on concrete, masonry, many natural stones and steel
- Application on horizontal and vertical incl. overhead areas
- Filling of blow holes, honeycombs and surface roughness
- Application thickness from feather-edge to 100 mm (4”)
- Re-modeling of architectural features requiring a moldable mortar that can be shaved into shape

Properties

VELOSIT RM 203 is a shrinkage compensated cementitious repair mortar with extremely fast strength development. VELOSIT RM 203 binds the mixing water very fast reducing or completely eliminating the need for water curing and protection. VELOSIT RM 203 creates an extremely well bonded, rigid, abrasion resistant layer on the substrate.

VELOSIT RM 203 surpasses the requirements of EN 1504-3 class R3 for concrete repair (CR) and can be used according to the principles 3.1 and 3.2 acc. to EN 1504-9.

VELOSIT RM 203 is applied by trowel and is workable for approx. 10 min.

- Minimal shrinkage/expansion under dry resp. wet curing conditions minimizing the risk of micro-cracking
- Excellent workability especially overhead

- Fiber reinforced
- 10 min. working time and 14 MPa (2030 psi) compressive strength after 2 hours
- Final strength of more than 50 MPa (7250 psi) after 28 days
- Open to foot traffic after 1 – 1 ½ hours
- Very good adhesion to properly prepared concrete and masonry
- Water curing only under hot and dry conditions required for 3 – 4 hours
- Good resistance against CO_2 and Chloride penetration due to a very tight pore structure
- Good resistance against aggressive media with a pH range of 3-12 and against soft water with low ion content
- Good weathering resistance
- Good sulfate resistance
- Light gray color close to concrete color

Application

1.) Substrate preparation

VELOSIT RM 203 is designed for mineralic substrates like concrete, masonry or absorptive natural stones. Steel may be coated with a suitable bonding bridge.

a.) Steel must be prepared to a purity of SA 2.5 acc. SIS 05 5900. Apply a corrosion protection coat on rebar with VELOSIT CP 201. Other steel areas can be primed with VELOSIT PR 303 with a full broadcast. Steel may expand and contract differently under temperature changes than a cementitious mortar. Thus steel application is only recommended if steel is embedded in larger concrete bodies or the temperature is not subject to major changes.

b.) Mineralic substrates (concrete, masonry, cement compatible natural stones) must be prepared with sand blasting, shot blasting or ideally high pressure water blasting (> 100 bar/1450 psi) to remove all bond breaking substances.

On reinforced concrete remove all carbonated concrete. Test with Phenolphthalein or other suitable indicator until concrete with sufficient alkalinity for rebar protection is reached. If rebar is exposed remove concrete at least 6 mm (1/4”) behind rebar to fully embed the steel into VELOSIT RM 203.
Substrate must be rough, open porous and load bearing. The minimum requirement for adhesive

strength is 1.5 MPa (218 psi) and for the compressive strength 25 MPa (3625 psi). Lower strength values can be accepted if lower adhesive strength is acceptable. Active water leaks must be treated and fully stopped with VELOSIT PC 221. Leaking cracks need to be sealed with a PU injection material. Before the application of VELOSIT RM 203, dampen the substrate with clean water to a saturated surface dry (SSD) condition.

c.) Concrete repair acc. EN 1504-9 principle 3.1 or 3.2 requires a prime coat with VELOSIT CP 201 on concrete and rebar surface to ensure best adhesion strength results. The prime coat must have set before the application of VELOSIT RM 203.

2.) Processing

Mixing: Mix VELOSIT RM 203 with 15 – 18 % potable water, i.e. 3.8 – 4.5 l (1.0 – 1.2 gal.) water per 25 kg (55 lb.) bag. Fill the 15 % mixing water (3.8 l per bag) into a suitable bucket and mix the powder with a slow speed drill (300 – 600 rpm) into the water until a lump-free mix is achieved. Add more water (max. 3 %) under stirring until the desired consistency is achieved. Only mix as much material as can be used in 10 min. Clean mixing paddle immediately after mixing.
The product is workable for 10 min. at 23 °C.

Priming: Apply a prime coat of VELOSIT RM 203 with a wet sponge to the pre-dampened substrate. Work approximately 0.5-1 kg per m^2 (1-2 lbs. per 10 ft^2) into the surface pores.
If working acc. to EN 1504-9 the prime coat must be applied with VELOSIT CP 201!

a.) Trowel application:
Trowel VELOSIT RM 203 fresh in fresh into the prime coat of VELOSIT RM 203. The product can be applied up to 100 mm (4”) on vertical areas. Larger overhead areas may limit the thickness to max. 50 mm (2”). Make sure to work in sections that can be finished within 10 min. Rebars and other penetrations must be fully embedded into the mortar.

b.) Re-modeling of architectural features:
Once VELOSIT RM 203 has started to set it can be sculpted as needed. Shave off material in thin layers to achieve desired form. If needed finish surface with a slightly wet sponge to remove surface imperfections and air voids.

3.) Curing

VELOSIT RM 203 does not require long term curing as it reacts relatively fast with water. Only under hot weather or very dry conditions water curing for 3 – 4 hours is required.

Estimating

Repair of surface defects:

25 kg (55 lbs.) VELOSIT RM 203 result in approx. 15.6 liter (0.55 ft^3) cured mortar.

Surface Overlay:
10 kg (22 lbs.)* VELOSIT RM 203 per m^2 (10.7 ft^2) for 6 mm (1/4”) dry mortar thickness on smooth substrates. Depending on surface roughness application rates can be significantly higher. Only use on areas that can be covered in 10 min. For larger areas use VELOSIT RM 202 or concrete repair mortars VELOSIT RM 204 and VELOSIT RM 205.
* 10 kg VELOSIT RM 203 powder + 1.7 kg water, i.e. 11.7 kg mixed material per 6 mm and m^2

Cleaning

VELOSIT RM 203 can be removed in the fresh state with water. Once it has cured acidic cleaners like muriatic acid and mechanical cleaning are required.

Quality features

Color:	gray
Mixing ratio by weight:	100 : 17
Mixing ratio by volume:	100 : 27
Density:	1.6 kg/l
Substrate temperature:	5 – 35 °C (40 – 95 °F)
Initial set:	15 min.
Final set.	40 min.
Compressive / flexural strength:	
2 hours:	14 / 2 MPa (2030/290 psi)
24 hours:	36 / 6 MPa (5220/870 psi)
7 days:	48 / 8 MPa (6690/1160 psi)
28 days:	54 / 9 MPa (7830/1305 psi)
Chloride ions:	< 0.05 %
Carbonation resistance:	passed
Capillary water absorption:	0.1 $kg/m^2 \times h^{0.5}$
Adhesive strength*:	
- primed with RM 203:	1.6 MPa (218 psi)
- primed with CP 201:	1.6 MPa (218 psi)
Restrained shrinkage*:	1.6 MPa (218 psi)
Length change after 56 days:	
- dry storage:	- 0.4 mm/m (- 0.04 %)
- water storage:	+ 0.1 mm/m (+ 0.01 %)

*acc. EN 1542. Adhesion depends very much on proper surface preparation!

Packaging

VELOSIT RM 203 is available in 25 kg (55 lb.) watertight plastic bags.

Storage

VELOSIT RM 203 can be stored in unopened original packs for 12 months at 5 – 35 °C (40 – 95 °F) in a dry storage place protected against sunlight.

Safety

Please observe the actual valid material safety data sheet and follow the described safety measures for handling of the product.

Used product containers must be emptied completely after use. They can be returned to VELOSIT GmbH & Co. KG on request.

Recommendations

VELOSIT RM 203 is only available for professional applicators.

Never add water to VELOSIT RM 203 when it has started to set. Stiffened material must be disposed.

VELOSIT RM 203 creates a significant heat of hydration. Avoid thick layers in hot temperatures as the product may create cracks. Work in layers.

All described product features are determined under controlled laboratory conditions according to the relevant international standards. Values determined under job site conditions may deviate from the stated values.

Please always use the latest version of this data sheet available from our website www.velosit.de.

CE

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VELOSIT RM 203

DIN EN 1504-3

Product for Structural and non structural repair for concrete

Compressive strength	R3
Chloride ion content	≤ 0,05 %
Adhesive bond	≥ 1,5 MPa
Restrained shrinkage/ expansion	≥ 1,5 MPa
Thermal compatibility	NPD
Capillary absorption	NPD
Carbonation resistance	passed
Brandverhalten	E

Manufacturer

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