VELOSIT® SL 503

High Strength Self Leveling Overlayment

Application fields

VELOSIT SL 503 is a cementitious self leveling overlayment for concrete floors. It creates an abrasion resistant smooth surface. It may also be used as a high strength underlayment for coatings and floor coverings. Typical application fields besides others are as follows:

- Interior and exterior floors
- Leveling of concrete slabs and floors as a finished surface
- Repair of surface defects on concrete floors
- Application thickness from 3 mm (1/8”) to 38 mm (1 ½“)

Properties

VELOSIT SL 503 is a shrinkage compensated self leveling overlayment based on a special cement with very quick strength development. VELOSIT SL 503 binds the mixing water very fast allowing a very short wait time before it becomes trafficable or can be covered. VELOSIT SL 503 creates a well bonded and very smooth layer on the substrate.

VELOSIT SL 503 surpasses the requirements of EN 13813 and meets class CT-C60-F7.

VELOSIT SL 503 can be applied by rake or suitable pumping equipment.

- Minimal shrinkage/expansion under dry resp. wet curing conditions minimizing the risk of micro-cracking
- Resistant to freeze/thaw cycles
- Excellent flow with long slump life
- Smooth surface profile
- Fast air release with minimal requirement for agitation
- Ready for covering with ceramic tiles after 4 hours, for moisture sensitive floor coverings after 16 hours
- Ready for foot traffic after 3 hours, for forklift traffic after 16 hours
- 30 – 40 min. working time and 20 MPa (2900 psi) compressive strength after 4 hours

- Final strength of more than 60 MPa (8700 psi) after 28 days
- Excellent adhesion to properly prepared concrete
- Wear resistance according to BCA: AR1
- Good resistance against CO_2 and Chloride penetration due to a very tight pore structure
- Excellent water resistance, no strength loss under water
- Good weathering resistance
- Good sulfate resistance
- Light gray color close to concrete color

Application

1.) Substrate preparation

VELOSIT SL 503 is designed for concrete substrates. Steel may be coated with a suitable bonding bridge.

Rising components must be decoupled with the VELOSIT RD 800 edge insulation strip to prevent clamping. Movement and separation joints must be taken over, shrinkage must be excluded.

Any cracks in the substrate must be filled with VELOSIT GH 311 and sprinkled with suitable quartz sand 0.7 mm - 1.25 mm (see technical data sheet).

a.) Steel
must be prepared to a purity of SA 2.5 acc. SIS 05 5900.

b.) Concrete substrates
must be prepared with sand blasting, shot blasting or high pressure water blasting (> 100 bar/1450 psi) to remove all bond breaking substances.
Substrate must be rough, open porous and load bearing. The minimum requirement for adhesive strength is 2.0 MPa (290 psi) and for the compressive strength 30 MPa (4350 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.

Priming:

a.) Steel:
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 (suitable quartz sand 0.7 mm – 1.25 mm, see technical data sheet). 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.) Concrete substrates:
with a humidity of max. 4 % and a water vapor emission rate of less than 0.6 g/m²h (3 lbs./24h x 1000 ft²) can be primed with VELOSIT PA 911 (Acrylic Primer).

VELOSIT PA 911 is ready to receive the leveler usually after 2 – 3 h curing. At higher moisture levels or in case the moisture levels in the substrate are expected to increase, priming must be done with VELOSIT PR 303.
VELOSIT SL 503 can be applied into the tacky coating within 2 – 4 hours after application. Longer wait times require a full broadcast with suitable quartz sand ∅ 0.7 – 1.25 (see technical data sheet) into the primer.

2.) Processing

Mixing:
Mix VELOSIT SL 503 with 21 – 22 % potable water, i.e. 4.2 – 4.4 l (1.1 – 1.2 gal.) water per 20 kg (44 lb.) bag. Fill 21 % mixing water (4.2 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. Use a cage type mixing paddle to reduce the air entrainment into the mix.

Add max. 1 % additional water under stirring until the desired consistency is achieved. Do not over water the product! VELOSIT SL 503 may be extended with up to 50 % clean and dried silica sand 1 – 2 mm for large application thickness.
Product properties may change.
VELOSIT SL 503 can be colored within organic pigments. Add dry pigments together with the product to the mixing water and stir until a streak-free mix is achieved. Do not add more than 3 % pigments.
The product is workable for 30 – 40 min. at 23 °C.

a.) Rake application:
Pour VELOSIT SL 503 onto the primed substrate and rake to the desired thickness. Make sure there are

no bond breaking substances on the primer. The product can be applied up to 38 mm (1 ½ ”) in one application. Make sure to work in sections that can be finished within 30 min. Immediately after pouring use gauge rake to achieve thickness and force entrapped air to the surface. Alternatively a spiked roller can be used to help air to the surface at larger application thickness. Higher temperatures shorten the pot life. Lower temperatures increase the pot life.

b.) Pump application:
Suitable mortar pumps are for example:
- PFT GmbH: PFT G4
- HighTech GmbH: HighComb Big
- Wagner GmbH: PC 25
- Putzmeister GmbH: SP11 or MP 25
- m-tec duo mix 2000

With mixing pumps, the powder is filled into the product hopper and adjust the water to the specified rate. The correct water dosage is set by measuring the consistency using the VELOSIT flow and flow ring (height 4.3 cm / ⌀ 7.2 cm).
The flow of SL 503 must be between 25 and 28 cm. If the flow is outside this range, segregation may occur.
Control the flow with a flow cone every 5 to 10 min.

With mortar pumps add the mixed product as described under „Mixing“ into the feed hopper of the pump and pump continuously.
Rake and smooth the material as described under section a.).

Long pump interruptions may result in clogging of the pump hose. The product may cure a lot faster if the hose is exposed to direct sunlight. Always empty and flush the machine after pumping or before long spray interruptions. VELOSIT SL 503 is a fast curing material and may be hard to remove if left in the machine.

Never overcoat joints or untreated cracks as this will most likely result in surface cracks!

If used as an underlayment, VELOSIT SL 503 is ready to receive a coating after 16 hours. For use as a wear surface a clear sealer, a surface hardener or VELOSIT FH 921 (silicone enhanced floor hardener) is recommended to improve resistance against penetrating liquids like oil, grease or cleaning agents. As well as to strengthen the surface.

3.) Curing

VELOSIT SL 503 does not require curing. Protect the applied product for 24 hours against direct sun light, wind and temperature changes exceeding 5 °C (9 °F).

Estimating

Approx. 1.75 kg (3.9 lbs.) powder VELOSIT SL 503 per 1 mm dry film thickness on 1 m² surface on smooth surfaces. On rough substrates, the consumption may be considerably higher.

Cleaning

VELOSIT SL 503 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 : 21
Mixing ratio by volume:	100 : 34
Density:	1.6 kg/l
Substrate temperature:	10 – 35° C (50 – 95 °F)
Initial set (typical):	80 min.
Final set (typical):	100 min.
Compressive / flexural strength:	
4 hours:	20 / 4 MPa (2900/580 psi)
24 hours:	43 / 7 MPa (6235/1015 psi)
7 days:	51 / 8 MPa (7395/1160 psi)
28 days:	65 / 9 MPa (9427/1305 psi)
Chloride ions:	< 0.05 %
Carbonation resistance:	passed
Capillary water absorption:	0.1 kg/m² x $h^{0.5}$
Adhesive strength*:	
- primed with PR 303:	2.3 MPa (334 psi)
- primed with PA 911:	1.6 MPa (232 psi)
Restrained shrinkage:	2.0 MPa (290 psi)
Length change after 56 days:	
- dry storage:	- 0.4 mm/m (- 0.04 %)
- water storage:	+ 0.0 mm/m (+ 0.00 %)
Fire rating EN13501-1:	Class A1

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

Packaging

VELOSIT SL 503 is available in 20 kg (44 lb.) watertight plastic bags.

Storage

VELOSIT SL 503 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.

Recommendations

VELOSIT SL 503 is only available for professional applicators.

Never add water to VELOSIT SL 503 when it has started to set. Stiffened material must be disposed.

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.

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VELOSIT SL 503

EN 13813
Cementitious screed material for use internally in buildings
CT-C60-F7-AR1

Reaction to fire	A1
Release of corrosive substances	CT
Compressive strength	C60
Flexural strength	F7
Wear resistance	AR1