

# MasterRoc<sup>®</sup> SA 167

**High performance alkali-free set accelerator (AFA) for durable sprayed concrete applications**

## Product description

MasterRoc SA 167 is a high performance alkali-free set accelerator for sprayed concrete. It is a liquid admixture whose dosage can be varied to the desired setting and hardening times.

## Fields of application

MasterRoc SA 167 is suitable for all applications, where exceptionally high early strength, good final strength and extremely thick layers of sprayed concrete are required.

- Temporary and permanent rock support in tunnels
- Rock support in mining
- In poor and wet ground conditions
- Slope stabilization
- Also suitable for acceleration of cementitious grouts, such as used in TBM tunnel linings, cement ground injection and foam concrete backfill operations.

## Packaging

MasterRoc SA 167 is supplied in 210 liter drums, 1000 liter containers or in bulk

## Features and benefits

MasterRoc SA 167 is ideally suited for wet mix sprayed concrete for rock support:

- The quick setting property allows rapid work progress and the ability to construct thick sprayed concrete linings via layered application during one construction sequence.
- The unique product formulation provides extremely fast setting coupled with continual early-age strength development.
- Good long-term strength and durability are also achieved.
- MasterRoc SA 167 is a liquid product and thus provides easy handling as well as facilitating accurate addition to the concrete.

- Very low dust production and therefore a safe and suitable working environment.
- Possibility of low rebound applications when using the correct nozzle angle and distance.
- Since the product is non-aggressive it provides improved working safety, reduced environmental impact and lower handling costs.

## Technical data

Form	suspension
Color	beige to white
Density (+20 °C)	1.47 ± 0.03 g/ml
pH value	2.0 ± 1.0
Viscosity <sup>1)</sup>	750 ± 250 mPa.s
Thermal stability	+5 °C to +35 °C
[Na <sub>2</sub> O] EQV. (% bw)	<1%
Chloride free	

<sup>1)</sup> Brookfield, + 20 °C. Viscosity is dependent on degree of product agitation and temperature.

## Application procedure

The substrate should be clean and free from loose particles and preferably damp.

It is recommended to use only fresh cement as the age of the cement can influence the setting characteristics of the mix.

MasterRoc SA 167 has a low sensitivity to the type of cement. However, with some cements high dosages are necessary for a fast setting. We recommend the use of Portland cements (PC/HPC), which often give faster setting than blended or sulphate resistant cement types. However, MasterRoc SA 167 also works well with composite cement types (blended cements, fly-ash/slag). In all cases, it is strongly recommended to carry out preliminary tests to check setting times and the 24 h strength of the cements planned for use in a project.

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Evaluation of setting and 24 h strength (without addition of a slump killing system) should be carried out on a test mortar in accordance with

EFNARC European Specification for Sprayed Concrete (1996), Appendix 1, clause 6.3.

The following results should be taken as a performance guide only:

Initial set	Final set	24 h strength	Rating
2 min.	6-8 min.	18-20 N/mm <sup>2</sup>	good
5 min.	8-12 min.	12-15 N/mm <sup>2</sup>	OK
>10 min	>15 min.	<10 N/mm <sup>2</sup>	poor

Remark: Compared to most other set accelerators MasterRoc SA 167 uniquely combines fast setting with high early and final strength (when applied correctly and concrete mix optimized).

## Mixing

When MasterRoc SA 167 is used for wet mix spraying, the w/c+b ratio should be below 0.5 and preferably less than 0.45. When targeting extremely high early strength 0.40 or lower it is recommended. The lower w/c+b ratios provide faster setting; higher early strength, improved durability, lower accelerator dosage and thicker layers can be applied overhead.

Maximizing the efficiency of mixing AFA's into the wet-mix concrete stream (and therefore performance), is achieved at the nozzle using twin compressed air/AFA feeds to the nozzle injector.

## Dosing system

MasterRoc SA 167 is added in the nozzle. To ensure a constant and accurate dosage to ensure quality sprayed concrete, it is crucial to follow the pump selection guideline given below:

### Works very well with:

- Mono-pumps (screw pumps)
- Squeeze pumps (Bredel)

### Should not be used with:

- Piston-pumps
- All pumps with ball and seat valves
- Pressure tanks
- Gear pumps

**Do not use a filter on the suction hose as this causes obstructions. Preferably draw the material from the bottom of the drum/container.**

## Compatibility with other accelerators

MasterRoc SA 167 can be interchanged with most of Master Builders Solutions's alkali-free

accelerators. For advice please contact your local Master Builders Solutions representative.

**Do not mix MasterRoc SA 167 with any type of accelerator produced by another manufacturer, as this could cause immediate clogging of dosing pumps and hoses.**

## Consumption

The dosage of MasterRoc SA 167 depends on the temperature conditions, reactivity of cement used and on required thickness of layers, setting time and early strength development. The consumption of MasterRoc SA 167 is normally in the range of 3 to 10 % of binder weight. Overdosing (>10 %) may result in decreased final strengths.

## Cleaning of dosing pump

Prior to the use of MasterRoc SA 167, the dosing pump and other parts of the system **must be thoroughly cleaned** with plenty of water. Failure to do so provokes blockages in the dosing system. Make sure that all operators involved in testing and application are fully informed.

## Storage

- MasterRoc SA 167 must be stored at minimum +5°C and maximum +35 °C (optimum temperature for storage and performance +20°C).
- MasterRoc SA 167 has to be kept in closed containers made of plastic, glass fiber or stainless steel, with periodical remixing and agitation of the product.
- MasterRoc SA 167 **must not** be stored in normal steel containers as the pH can cause corrosion that might affect the performance of the product.
- After prolonged storage we recommend that MasterRoc SA 167 be always fully agitated prior to use by mechanical stirring or recirculation pumping.
- If stored under the above given conditions, MasterRoc SA 167 has a shelf life of 6 months.
- It is recommended to consult your local Master Builders Solutions representative prior to the use of any product that has been frozen.
- After prolonged storage, performance testing should always be carried out before use.

## Safety precautions

The same precautions as with handling and use of cementitious products should be observed:

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Avoid eye and skin contact and wear rubber gloves and safety glasses. If contact occurs, rinse with plenty of water. In case of eye contact seek medical advice.

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