

MAPEQUICK AF 100 RP

Water re-dispersible alkali-free powder setting accelerator

DESCRIPTION

Mapequick AF 100 RP is a alkali-free setting accelerator in powder form to be re-disperse in water to obtain a liquid accelerator.

APPLICATION FIELD

Mapequick AF 100 RP once mixed with water is studied to be used both in dry and wet mix shotcrete in order to get quality accelerated shotcrete with high mechanical strength at very short (0-60 minutes), short (60 minutes to 24 hours) and long stages of curing (> 24 hours).

Mapequick AF 100 RP is studied to be supplied in all the job sites, even where storage and shelf life are the main issues: being a re-dispersible powder, only the powder active part is supplied reducing in this way transport and storage problems and extending the availability of the product longer than a standard liquid shotcrete accelerator, because the final liquid product can be easily obtained by mixing the powder with the proper amount of water.

Mapequick AF 100 RP once mixed with water, not only reacts on the hydration of silicates present in cement, resulting in rapid setting time, but it enables concrete to develop high mechanical strength only a few minutes after placing the mix with almost no loss of strength during long stages of curing when compared to concrete prepared without an accelerator.

Because of the absence of alkali, **Mapequick AF 100 RP** does not trigger alkali-aggregate reaction, furthermore concrete accelerated with this product is not subject to leaching, that can occur when using normal alkali accelerators. For this reason **Mapequick AF 100 RP** reduces the risk of obstructing water drainage.

Once the product is accelerated, it does not lose its capacity of self-maintenance and development of mechanical strength even in the presence of water.

Some application examples

- Securing surfaces during tunnelling.
- Consolidation of rock and cliff-faces.
- Shotcrete for structural tunnel repairs.
- Shotcrete applications with high mechanical performance.
- Shotcrete applications with high mechanical strength ($\geq 40 \text{ N/mm}^2$) for final tunnel lining.

TECHNICAL CHARACTERISTICS

Mapequick AF 100 RP is a powder which has to be mixed with water before the application starts.

It is recommended to mix the powder with water using a colloidal mixer with at least 1,400 rpm in order to get proper dispersion of the powder in the water. Steel parts of the mixer must be of stainless steel AISI 304 or AISI 316. It is necessary to fill the mixer with water and then slowly adding the right amount of powder to the water during continuous mixing, and after 2-3 minutes of mixing it is possible to fill the storage container. Mixing can be carried out up to 7 days before using the liquid, without any concern in term of product stability. Other mixing methods which may be used are:

- recycling pump placed at the bottom of a 1,000 liter IBC;
- hand drill mixer.

For above two mentioned systems it is recommended not to store the product in liquid form for longer than 24 hours. Tools in direct contact with the liquid must be made of stainless steel AISI 304 or AISI 316.

RECOMMENDATIONS

- Do not use **Mapequick AF 100 RP** with normal concrete.
- **Mapequick AF 100 RP** cannot be mixed with other spraying accelerators. When using another type of accelerator (especially if alkali-based), the entire dosage equipment must be thoroughly cleaned with water.

N.B. Do not add **Mapequick AF 100 RP** directly into the cement mixer.

HOW TO USE

Mix design to make approximately 1 m³ of shotcrete:

- 450-500 kg/m³ of cement (of a type and dosage to be determined depending on performance requirement);
- if necessary, the addition of 3-8% by weight of cement of microfine material with pozzolanic action: for example the silica fume based product **Mapeplast SF** compound for improving rheological properties, thixotropy, permeability and resistance to aggressive chemical agents;
- aggregate with maximum diameter between 8 and 12 mm;
- superplasticising admixture in a dosage of 1-1.5% in volume by weight of cement to ensure a low water-binder ratio.

LABORATORY TESTING

Our laboratory is available for evaluating the compatibility and dosage of with cements available on job-sites. To make the best use of **Mapequick AF 100 RP**, it is recommended to contact our Underground Technology Team technical services to verify and improve the properties of the concrete used, depending on the local application conditions.

COMPATIBILITY WITH OTHER PRODUCTS

- **Mapequick AF 100 RP** admixture is compatible with all the superplasticisers of the **Dynamon System** line.
- **Mapequick AF 100 RP** is compatible with all the superplasticisers of the **Mapefluid** line.
- **Mapequick AF 100 RP** is compatible with the retarding admixtures, such as **Mapetard D** and **Mapetard SD2000**.

We recommend carrying out preliminary lab tests beforehand to verify if the product is compatible with the type of cement to be used to make the shotcrete. If required, our R&D laboratories are available to check compatibility between the cement selected and the accelerating admixture.

CONSUMPTION

Mapequick AF 100 RP in powder form can be mixed with different water amounts according to the required performances, cement type and strength development requirements.

	A	B	C
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Amount of powder setting accelerator (weight %) to dissolve in water	43 wt %	47 wt %	50 wt %
Component weight for 1,000 liters of on liquid accelerator	powder: 582 kg water: 771 liter	powder: 657 kg water: 741 liter	powder: 718 kg water: 718 liter
Component weight for 1,000 kg of liquid accelerator	powder: 430 kg water: 570 liter	powder: 470 kg water: 530 liter	powder: 500 kg water: 500 liter
Specific gravity of liquid accelerator	1,353 t/m ³	1,398 t/m ³	1,435 t/m ³

For example to mix 1,000 kg of fluid C, it is necessary to add 500 kg of **Mapequick AF 100 RP** to 500 liters of water. The obtained fluid is ready to be used as a fluid accelerator.

Dosage during application

Under normal conditions, when there is no water present and layers less than 20 cm thick are applied in one go, the amount of liquid accelerator required in weight is from 3% to 8% of the weight of cement. For different application conditions it may be necessary to vary this amount, depending on actual site conditions.

PACKAGING

Mapequick AF 100 RP is available in 600 kg bags.

STORAGE

Store for maximum 12 months in original sealed containers and protect from humidity.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Instructions for the safe use of our products can be found on the latest version of the Safety Data Sheet, available from our website www.mapei.com.

PRODUCT FOR PROFESSIONAL USE.

TECHNICAL DATA (typical values)

PRODUCT IDENTITY

Consistency:

powder

Colour:

white

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

LEGAL NOTICE

The contents of this Technical Data Sheet ("TDS") may be copied into another project-related document, but the resulting document shall not supplement or replace requirements per the TDS in force at the time of the MAPEI product installation.

The most up-to-date TDS can be downloaded from our website www.mapei.com.

ANY ALTERATION TO THE WORDING OR REQUIREMENTS CONTAINED OR DERIVED FROM THIS TDS EXCLUDES THE RESPONSIBILITY OF MAPEI.

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