**DESCRIPTION**

Mapequick AF1000 is a liquid accelerator based on alkali-free inorganic salts developed for shotcrete with very rapid setting time.

**WHERE TO USE**

Mapequick AF1000 is formulated to be used both in dry-mix as well as wet-mix shotcrete spray systems. Due to its high accelerating action and the absence of alkali, it is particularly suitable for preparing quality 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 AF1000, however, 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 AF1000 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 AF1000 reduces the risk of obstructing water drainage.

Mapequick AF1000 is particularly suitable for shotcrete in the presence of water seepage during the tunnelling phase.

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.

Mapequick AF1000 can also be used on rocky surfaces with temperatures near 0°C, in so far as these particular conditions, which usually penalise the ability of placing shotcrete with alkali accelerators, do not represent a limited use of this product.

**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 (≥ 40 N/mm²) for final tunnel lining.

**TECHNICAL CHARACTERISTICS**

Mapequick AF1000 is a water solution of aluminium complexes to be added in the nozzle during the spraying phase.

The acceleration of the setting time and the development of mechanical performance vary according to the dosage of the additive, the type and content of cement, the ageing of the cement, and the water-binder ratio. The temperature of the shotcrete influences the rate of setting and early performance.

As far as the water-binder ratio is concerned (cement-fly ash, silica fume or blast furnace slag, etc.), it is essential that the water-binder ratio should be lower than 0.5 to...
promote durability and final mechanical performance. For this reason the addition of a superplasticising admixture is strongly recommended.

**Mapequick AF1000** can be used for spraying 25 cm layers in one application. Better adhesion to the rock surface of shotcrete is another property of **Mapequick AF1000**. There is reduced loss caused by rebound, therefore good penetration ability between layers. The compaction degree of shotcrete, which is measured by coring, is approx. 95% of standard shotcrete not accelerated and fully compacted.

**RECOMMENDATIONS**
Do not use Mapequick AF1000 with normal concrete.

Mapequick AF1000 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 AF1000 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 Mapequick AF1000 with cements available on job-sites.
To make the best use of Mapequick AF1000, 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 AF1000 admixture is compatible with all the superplasticisers of the Dynamon System line.
- Mapequick AF1000 is compatible with all the superplasticisers of the Mapefluid line.
- Mapequick AF1000 is compatible with Mapecure CCI 2000 and Mapecure SRA, curing compounds.
- Mapequick AF1000 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**

**Dosage by weight:**
Under normal conditions, when there is no water present and layers less than 20 cm thick are applied in one go, the amount 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 AF1000 is available in 25 kg buckets, 274 kg drums and 1350 kg tanks. Also available in bulk on request.

**STORAGE**
Store the product in closed containers at a temperature between +5°C and +35°C, protected from frost and direct sunlight. If the product has been stocked for a long period, it is suggested to shake and homogenise it by using mechanised mixers and/or recirculation pumps. It is strongly suggested not to shake the product by means of compressed air. Please contact our technical service Underground Technology Team if the product is used after its expiring date (3 months) or after freezing.

Even if the product is exposed to long elevated storage temperature or to rapid temperature changing, it does not change its characteristic which remains the same, it can only assume a different colour.

The product cannot be stored in metallic containers, except those INOX AISI 316.

**SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION**
Mapequick AF1000 is corrosive and it may cause burns and damage to eyes. It is recommended to wear protective gloves and goggles and to take the usual precautions for handling chemicals. If the product comes in contact with the eyes or skin wash immediately with plenty of clean water and seek medical attention.

For further and complete information about the safe use of our product please refer to the latest version of our Safety Data Sheet.

**PRODUCT FOR PROFESSIONAL USE.**

**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.

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All relevant references for the product are available upon request and from www.mapei.com