DESCRIPTION
Mapequick AFK 777 J is a new liquid accelerator, based on inorganic salts developed for shotcrete having very rapid setting time.

WHERE TO USE
Mapequick AFK 777 J is formulated to be used both in dry-mix as well as wet-mix shotcrete systems. Because of its high accelerating action and absence of alkali, it is especially suitable for preparing quality shotcrete with high mechanical strength at very short (0-60 minutes), short (60 minutes to 24 hours) and long curing time (> 24 hours).

Mapequick AFK 777 J, however, not only reacts on the hydration of silicates present in cement, resulting in rapid setting time, but enables concrete to develop high mechanical strength only a few minutes after placing. The mix has almost no loss of strength during long curing times when compared to concrete prepared without an accelerator.

Because of its formulation, Mapequick AFK 777 J does not promote alkali-aggregate reaction, furthermore concrete accelerated with this product is not subject to leaching, that can occur when using normal alkali accelerators. Consequently Mapequick AFK 777 J reduces the risk of obstructing water drainage.

Mapequick AFK 777 J is especially suitable for the projection of shotcrete in the presence of water seepages.

Once accelerated, Mapequick AFK 777 J does not lose its capacity of self-maintenance and mechanical strength development even in the presence of water.

Mapequick AFK 777 J can also be used on rocky surfaces with temperatures near 0°C. These conditions usually penalise the ability of placing shotcrete with normal accelerators, but in this case the use of this product is not limited.

Some applications examples
• securing surfaces during tunnelling;
• shotcrete for structural tunnel repairs;
• shotcrete applications with high mechanical performance;
• shotcrete applications with high mechanical strength (40 N/mm²) for final tunnel lining.
• consolidation of rock and cliff-faces.

TECHNICAL CHARACTERISTICS
Mapequick AFK 777 J is a water solution of aluminium complexes to be added to the nozzle during the shotcreting.

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 setting rate and early performance.

The water-binder ratio (cement + fly ash, silica fume,
blast furnace slag, etc.) should obviously be as low as possible to guarantee durability and final mechanical performance.

The addition of a super-plasticising admixture is imperative. Mapequick AFK 777 J can be used for spraying 25 cm layers in one application. Better adhesion to the rock surface of shotcrete is another property of Mapequick AFK 777 J. 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 AFK 777 J with normal concrete.

Mapequick AFK 777 J cannot be mixed with other setting accelerators. When using another type of accelerator, the whole dosage equipment must be cleaned with water.

**Stability**
The product stored in large tanks must be mixed continuously. It is also recommended to clean the storage tanks periodically.

N.B. Do not add Mapequick AFK 777 J directly into the cement mixer.

**HOW TO USE**

**Typical shotcrete**

- 450-500 kg/m³ of cement (type and dosage to be determined depending on performance requirement).
- If necessary, the addition of 5-10% 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.
- Super-plasticising admixture in a dosage of 1-1.5% in volume by weight of cement to ensure a low water-binder ratio.

**TECHNICAL DATA (typical values)**

<table>
<thead>
<tr>
<th>PRODUCT IDENTIFICATION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance:</td>
</tr>
<tr>
<td>Density ISO 758 (g/cm³):</td>
</tr>
<tr>
<td>Dry solid content EN 480/8 (%):</td>
</tr>
<tr>
<td>pH ISO 4316:</td>
</tr>
<tr>
<td>Principal action:</td>
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<tr>
<td>Classification according to EN 934-5:</td>
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<tr>
<td>Chlorides EN 480/10 (%):</td>
</tr>
<tr>
<td>Alkali content (EN 480/12) (%):</td>
</tr>
<tr>
<td>Dosage:</td>
</tr>
<tr>
<td>Storage:</td>
</tr>
<tr>
<td>Hazard classification according to EC 1999/45:</td>
</tr>
<tr>
<td>Custom class:</td>
</tr>
</tbody>
</table>
- Mapequick AFK 777 J in a dosage of between 4 and 10% by weight to be added to the shotcrete.

**LABORATORY TESTING**
Our laboratory is available for evaluating the compatibility and dosage of Mapequick AFK 777 J with cements available on job-sites.

To make the best use of Mapequick AFK 777 J, it is recommended to contact our Underground Technology Team technical service to verify and improve the characteristics of the concrete used, depending on the local application conditions.

**COMPATIBILITY WITH OTHER PRODUCTS**
Mapequick AFK 777 J is compatible with all the super-plasticisers of the Mapefluid line that enable the water-binder ratio to be reduced, increase fluidity and reduce loss of workability.

**DOSEAGE**
By weight: between 4 and 10 kg per 100 kg of cement.

**PACKAGING**
Mapequick AFK 777 J is available in 286 kg drums and 1430 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 homogenize 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 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 THE PREPARATION AND APPLICATION**
Mapequick AFK 777 J contains aluminium complexes which are hazardous when swallowed and irritating and skin. Serious damage may occur if it comes into contact with the eyes. It also contains inorganic fluorides: avoid contact with strong acids. Avoid contact with eyes and skin. In case of contact with eyes, rinse immediately with plenty of running water and seek medical advise. Use suitable protective gloves, goggles and face masks.
For further and complete information about a safety use of our product please refer to our latest version of the Material Safety Data Sheet.

**FOR PROFESSIONAL USERS.**

**WARNING**
Although the technical details and recommendations contained in this product report 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 applications: 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 web site www.mapei.com

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