



ALKALI-FREE SHOTCRETE ACCELERATOR

Description: ALKALI-FREE SHOTCRETE is a high-performance liquid setting accelerator specially developed for wet-mix shotcrete systems. The product provides extremely rapid setting, high early strength and improved long-term durability without the negative effects associated with high alkali content.

Technical Properties:

Chemical Content	Aluminum salts
Appearance	Liquid
Color	Light yellow
pH	3±1
Density (20 °C)	1.42 ± 0,02 g/cm ³
Chloride Content (%)	< 0.1
Alkaline Content (%)	< 1
Freezing	-5 °C

Advantage:

- Very rapid setting and early strength development.
- Low alkali content (<1%) improves long-term strength retention.
- Reduced rebound and material waste.
- Improved adhesion to substrate.
- Suitable for permanent structural shotcrete.
- Enhanced durability performance.
- Better compatibility with modern PCE superplasticizers.
- Safer working environment compared to alkaline accelerators.
- Maintains 28-day strength compared to high-alkali systems.
- Contributes to lower permeability and improved durability.
- Reduced cracking risk in hardened concrete.
- Enables rapid build-up thickness on vertical and overhead surfaces.
- Supports long service-life concrete structures.

Area of Use:

- NATM tunnel construction.
- Underground metro projects.
- Permanent tunnel linings.
- Mining galleries.
- Slope stabilization.
- Repair and strengthening works.

Dosage: Recommended dosage: 4 – 10 % by weight of cement. Typical dosage range for tunnel applications: 5 – 8 % , Do not exceed 12 % without laboratory verification. Final dosage must be determined by laboratory and on-site trials. When required, the Polystar Co. Technical Support Unit should be consulted.

Method of Application:

- Shotcrete mix (dry or wet) is prepared according to project specifications.
- The accelerator must be added at the nozzle using a calibrated dosing pump.
- The dosing rate should be adjusted according to required setting time and ground conditions.
- Continuous and uniform injection must be ensured during spraying.
- Nozzle distance (approx. 1–2 meters) and spraying angle should be optimized to reduce rebound.
- Conduct trial applications before full-scale operation.

- Do not mix directly into the concrete truck.
- Ensure compatibility with cement and other admixtures.
- Protect dosing lines from clogging and backflow.
- Flush the dosing system with water after application.

Standards: - EN 934-5 - ASTM C 1141



Compatibility: ALKALI-FREE SHOTCRETE admixture is compatible with other POLYSTAR plasticizer admixtures used in the same concrete mix.

Precautions in Application:

- Do not pre-mix with concrete.
- Product must be injected at the nozzle.
- Overdosing may cause significant reduction in 28-day strength.
- Excess dosage may increase shrinkage and cracking risk.
- High alkali content may negatively affect long-term durability.
- Always verify compatibility with cement and other admixtures before use.
- Calibrate dosing equipment regularly.
- Protect dosing system from clogging and back pressure.
- Avoid application below +5°C unless trial tests are performed.
- Ensure proper ventilation in underground applications.
- After prolonged storage, product should be stirred and checked before use.
- Use appropriate PPE (gloves, goggles, protective clothing).
- Avoid direct skin and eye contact (highly alkaline product).

Cleaning:

- Do not allow product residues to dry inside hoses or pumps.
- In case of hardened deposits, use mechanical cleaning methods.
- Avoid long-term contact with metal surfaces.
- Flush the system thoroughly before extended shutdown periods.
- Continuous water flushing is recommended after each application cycle.
- Dried residues may cause blockage and dosing inaccuracies.
- Regular inspection of non-return valves and injectors is advised.

Packing: - 30 kg plastic drum - 250 kg drum - 1000 kg container

Storage and Shelf Life: Must be stored at temperatures between +5°C and +35°C. Under proper storing conditions, the product's shelf life is 12 months from production date if kept in original packaging unopened and undamaged. Packaged products must be shaken before use.

Security Information: Use protective clothes, gloves, glasses and mask compatible with Health and Safety regulations during the application. It should not contact skin and eyes. In case it contacts to skin and eyes, rinse it with water and if swallowed ask for medical help. Food and beverage should not be allowed in the application area. It should be stored at the reach out of the children. The Material Safety Data Sheet (MSDS) should be read for detailed information.

