

CHEMFIT SHOTPRO SC200

Polymer-Modified Shotcrete Admixture – Powder Form for Tunnel Linings, Structural Shells & High-Strength Gunitite

PRODUCT DESCRIPTION

ChemFit ShotPro SC200 is a high-performance, polymer-modified shotcrete admixture in convenient powder form, specifically formulated for tunnel linings, structural shells, and high-strength gunitite applications. This advanced dry-mix additive enhances cohesion, reduces rebound, improves adhesion, and increases flexural and bond strength of shotcrete. The polymer modification provides superior durability, reduced permeability, and enhanced resistance to aggressive groundwater and chemical attack. The powder form allows for easy batching in dry-mix shotcrete systems.

The unique polymer chemistry of **ChemFit ShotPro SC200** creates a three-dimensional polymer network within the shotcrete matrix, resulting in improved toughness, reduced cracking, and enhanced durability. It is specifically designed for dry-mix (gunitite) and wet-mix shotcrete processes where high early strength, low rebound, and excellent layer build-up are required.

PRIMARY APPLICATIONS

ChemFit ShotPro SC200 is recommended for use in conditions such as:

- Tunnel linings and underground excavations
- Structural shells for underground structures
- High-strength gunitite applications
- Rock stabilization and slope protection
- Mining and tunneling support systems
- Swimming pool shells and water features
- Retaining walls and embankment stabilization
- Concrete repair and rehabilitation
- Seismic retrofitting of structures
- Dome and curved structure construction
- Sewer rehabilitation and relining
- Marine and waterfront structure repair
- High-velocity water flow channels

KEY FEATURES AND BENEFITS

- **Polymer-modified** – Enhances adhesion, flexural strength, and durability
- **Convenient powder form** – Easy to batch and handle in dry-mix shotcrete systems
- **Reduces rebound** – Significantly reduces material waste during application (10-20% rebound reduction)
- **Improves cohesion** – Enhances mix stickiness for better layer build-up
- **Increases bond strength** – Provides superior bond to existing concrete and rock surfaces
- **High early strength** – Rapid strength gain for quick ground support
- **Reduces permeability** – Lowers water penetration and chemical attack resistance
- **Improves crack resistance** – Reduces plastic and drying shrinkage cracking
- **Enhanced durability** – Increases resistance to freeze-thaw, abrasion, and chemical attack
- **Compatible with accelerators** – Works with setting accelerators for rapid application
- **Chloride-free** – Safe for reinforced shotcrete applications
- **Cost-effective** – Reduces rebound waste and application time

PHYSICAL AND CHEMICAL PROPERTIES

Property	Specification
Appearance	Fine, free-flowing powder
Color	Off-white to light gray
Bulk Density	450 – 600 kg/m ³
pH Value (solution)	7.0 – 9.0
Chloride Content	Nil (≤ 0.05%) – Non-corrosive to rebar
Polymer Type	Proprietary redispersible polymer powder
Particle Size	< 600 microns (passes 30 mesh)
Glass Transition Temp	+5°C to +10°C
Film Formation Temperature	+5°C minimum
Shelf Life (unopened)	12 months

PACKAGING AND STORAGE

Packaging:

- 15 kg multi-layer paper bags (water-resistant liner)

Storage:

- Store in original sealed bags in a cool, dry location
- Protect from moisture, humidity, and direct sunlight
- Stack pallets off the ground on wooden pallets
- Keep bags intact and sealed until ready for use
- Do not store in areas with high humidity or risk of water damage

Shelf life: 12 months from date of manufacture when stored properly in unopened bags

DOSAGE AND COVERAGE RATES

The recommended dosage of ChemFit ShotPro SC200 is **4% to 10% by weight of cement**.

- **Low dosage (4% – 6%):** Provides polymer modification for general shotcrete applications with moderate durability requirements
- **Medium dosage (6% – 8%):** Delivers enhanced polymer modification for tunnel linings and structural shells requiring high durability and low permeability
- **High dosage (8% – 10%):** Produces maximum polymer modification for high-strength gunite, aggressive chemical environments, and extreme durability requirements
- **Per 50 kg cement bag:** Dosage ranges from 2.0 to 5.0 kg per bag
- **Yield per 15 kg bag:** Covers approximately 3.0 to 7.5 bags of cement (150 to 375 kg of cement), depending on dosage
- **Coverage per 15 kg bag (at 6% dosage):** Approximately 250 kg of cement or 0.5 – 0.7 m³ of shotcrete (depending on mix design)

NOTE: Concrete trial mixes shall be carried out to confirm optimal dosage for specific project requirements. For tunnel linings requiring low permeability ($k < 10^{-11}$ m/s), a medium to high dosage (7% – 9%) is recommended. For structural shells requiring high flexural strength, a dosage of 6% – 8% is typical.

APPLICATION GUIDELINES

ChemFit ShotPro SC200 should be blended with the dry cement and aggregates before being introduced to the shotcrete equipment. For dry-mix (gunite) applications, thoroughly mix the powder admixture with the dry cement and aggregates in a mixer or at the batching plant to ensure uniform distribution before feeding into the shotcrete gun. For wet-mix applications, the powder can be added at the concrete batch plant along with other dry ingredients. The shotcrete should be mixed for a minimum of 3 to 5 minutes to ensure uniform dispersion of the polymer powder. This product is compatible with all standard Portland cements and most supplementary cementitious materials such as silica fume, fly ash, and slag. **ChemFit ShotPro SC200** is compatible with most shotcrete admixtures including setting accelerators (liquid or powder), air entrainers, and water reducers. For rapid setting and early strength, use in combination with a non-chloride setting accelerator. When used in combination with liquid accelerators, add the liquid accelerator at the nozzle for dry-mix processes. For best results in tunnel applications, maintain a minimum application temperature of +5°C. For high-strength gunite (above 50 MPa), use a dosage of 7% – 9% in combination with silica fume. Proper curing (wet burlap, plastic sheeting, or curing compound) is essential to maximize polymer film formation and durability benefits.

HEALTH AND SAFETY

ChemFit ShotPro SC200 may cause mild to moderate eye, skin, and respiratory tract irritation. Avoid inhalation of dust. If eye contact occurs, rinse thoroughly with water for 15 minutes and seek medical advice if irritation persists. For skin contact, wash with soap and water. If inhaled, move to fresh air and seek medical advice if breathing difficulties occur. If swallowed, do not induce vomiting; instead rinse the mouth and drink water, then seek medical advice. Use safety glasses, gloves, dust mask, and protective clothing during handling. Ensure adequate ventilation when using in enclosed spaces. Standard shotcrete safety precautions apply (use respiratory protection during application). Refer to the Safety Data Sheet for detailed information.

CLEANG OF TOOLS

Clean all batching equipment, measuring containers, shotcrete gun, hoses, and nozzles with water immediately after use. Dried or cured material may require mechanical removal. Do not allow shotcrete to harden in equipment as removal will be difficult.

APPROVALS AND STANDARDS

ChemFit ShotPro SC200 conforms to the following standards:

- Meets industry standards for polymer-modified shotcrete and guniting
- Suitable for use in tunnel linings per international tunneling guidelines
- Complies with requirements for structural shotcrete shells

LEGAL NOTES

All technical data provided in this Product Data Sheet is based on laboratory testing under controlled conditions. Actual field performance may vary due to differences in substrates, application methods, site conditions, and environmental factors. ChemFit makes no warranty of merchantability or fitness for a particular purpose. Users shall conduct their own trials to validate product suitability for the intended application. ChemFit reserves the right to modify product specifications without prior notice. For the most current documentation, request the latest Product Data Sheet and Safety Data Sheet from ChemFit.

CHEMFIT CONSTRUCTION CHEMICALS AND SERVICES LIMITED

Office No. 8, 1KM Near Gaey Soap, Sargodha Road, Faisalabad

Tel: +923364544837

Web: www.chemfitchemicals.com

Email: chemfit.pro@gmail.com