

# CHEMFIT SHOTFAST AF SC300

**Alkali-Free, High Performance Liquid Accelerator – For Wet & Dry Spray Processes – Tunnel Heading Stabilization, Rock/Slope Stabilization & Underground Linings**

## PRODUCT DESCRIPTION

**ChemFit ShotFast AF SC300** is a high-performance, alkali-free liquid accelerator specifically formulated for wet and dry spray shotcrete processes. This advanced accelerator provides rapid setting and early strength development without the health and safety risks associated with alkaline accelerators. The alkali-free formulation significantly reduces rebound, improves final concrete strength, and eliminates the risk of alkali-aggregate reaction. It is the ideal solution for tunnel heading stabilization, rock and slope stabilization, and underground linings where fast setting, high early strength, and long-term durability are critical.

## PRIMARY APPLICATIONS

**ChemFit ShotFast AF SC300** is recommended for use in conditions such as:

- Tunnel heading stabilization and advance support
- Tunnel linings (primary and secondary linings)
- Rock and slope stabilization (cut slopes, embankments)
- Underground mining ground support
- Shaft sinking and raise boring support
- Seismic retrofitting of tunnels and underground structures
- Emergency repairs and rock fall protection
- Swimming pool shells and curved structures
- Retaining walls and steep embankments
- Natural cave stabilization and tourist access tunnels
- Hydroelectric power plant tunnels and penstocks
- Sewer and water tunnel rehabilitation

## KEY FEATURES AND BENEFITS

- **Alkali-free formulation** – No health or safety risks associated with alkaline accelerators; safe for applicators
- **Rapid setting** – Achieves initial set in 1-3 minutes and final set in 5-15 minutes (depending on dosage and temperature)
- **High early strength** – Develops 0.5 – 1.5 MPa at 5 minutes and 4 – 8 MPa at 1 hour
- **Reduces rebound** – Lowers material waste by 15-25% compared to alkaline accelerators
- **Improves final strength** – Achieves 28-day strengths 90-100% of control concrete vs. 60-80% with alkaline accelerators
- **Eliminates alkali-aggregate reaction risk** – Safe for all aggregate types
- **Low dust generation** – Improves working environment in tunnels
- **Excellent layer build-up** – Allows for thicker applications without sagging or sloughing
- **Compatible with wet and dry processes** – Versatile for all shotcrete applications
- **Good pumpability** – Does not cause line blockages or accelerated setting in delivery lines
- **Chloride-free** – Safe for reinforced shotcrete applications
- **Reduces long-term durability issues** – No strength retrogression observed with aging

## PHYSICAL AND CHEMICAL PROPERTIES

Property	Specification
Appearance	Clear to slightly hazy liquid
Color	Colorless to light straw
Specific Gravity	1.35 – 1.45 at 25°C
pH Value	2.5 – 4.5 (acidic)
Chloride Content	Nil ( $\leq 0.05\%$ ) – Non-corrosive to rebar
Alkali Content	< 1.0% (alkali-free)
Freezing Point	-5°C (protect from freezing)
Initial Set (at 20°C, 7% dosage)	1 – 3 minutes
Final Set (at 20°C, 7% dosage)	5 – 15 minutes
Compressive Strength (1 hour)	4 – 8 MPa (depending on dosage and temperature)
Compressive Strength (28 day)	90 – 100% of control concrete
Rebound Reduction	15 – 25% vs. alkaline accelerators

## PACKAGING AND STORAGE

### Packaging:

- 1000 L IBCs (Intermediate Bulk Containers)

### Storage:

- Store in original sealed containers at +5°C to +30°C
- Protect from direct sunlight, frost, and extreme heat
- Keep container tightly closed when not in use
- If frozen, thaw completely and agitate before use (product quality may be affected by repeated freeze-thaw cycles)

**Shelf life:** 6 months from date of manufacture (due to acidic nature; shorter than other admixtures)

## DOSAGE AND COVERAGE RATES

The recommended dosage of **ChemFit ShotFast AF SC300** is **3% to 7% by weight of binder (cement + supplementary cementitious materials)** .

- **Low dosage (3% – 4%):** Provides moderate acceleration (initial set 5-8 minutes) for general shotcrete applications where ultra-fast setting is not required
- **Medium dosage (4% – 5.5%):** Delivers standard acceleration (initial set 2-5 minutes) for tunnel linings and rock stabilization applications
- **High dosage (5.5% – 7%):** Produces maximum acceleration (initial set 1-3 minutes) for tunnel heading stabilization, overhead applications, and rapid ground support
- **Per 100 kg of binder:** Dosage ranges from 3 to 7 liters per 100 kg of binder
- **Yield per 1000 L IBC:** Covers approximately 14,000 to 33,000 kg of binder (14 to 33 tons of binder), depending on dosage
- **Shotcrete coverage (approximate):** At 5% dosage, one 1000 L IBC covers approximately 70 – 100 m<sup>3</sup> of shotcrete (assuming 400-450 kg/m<sup>3</sup> binder content)

**NOTE:** Concrete trial mixes shall be carried out to confirm optimal dosage for specific project requirements. Dosage requirements vary with cement type, concrete temperature, and application requirements (overhead vs. vertical vs. horizontal). Higher dosages (6-7%) are recommended for

overhead applications and tunnel headings to minimize rebound and sagging. Lower dosages (3-4%) are sufficient for vertical and horizontal applications.

## APPLICATION GUIDELINES

**ChemFit ShotFast AF SC300** should be added at the nozzle for wet-mix shotcrete processes and in the mixing water or at the nozzle for dry-mix processes. For wet-mix shotcrete (most common), the accelerator is injected into the concrete stream at the nozzle using a specialized dosing pump calibrated to deliver the required percentage based on the concrete flow rate. For dry-mix shotcrete, the accelerator can be added either to the mixing water at the batching plant (for pre-accelerated mix) or injected at the nozzle (preferred method for better control). The accelerator dosage must be adjusted based on the concrete flow rate and ambient conditions. This product is compatible with all standard Portland cements (CEM I, CEM II, CEM III, CEM IV) and most supplementary cementitious materials including silica fume, fly ash, and slag. However, higher dosages may be required when using cements with high C3A content or blends with significant slag or fly ash. **ChemFit ShotFast AF SC300** is compatible with most shotcrete admixtures including superplasticizers, retarders, and air entrainers; but do not premix with other admixtures in concentrated form. For tunnel heading stabilization, a high dosage (6-7%) is recommended for immediate ground support. For rock and slope stabilization, a medium dosage (4-5.5%) typically provides adequate performance. For cold weather applications (below 10°C), higher dosages (6-7%) may be required to achieve desired setting times. For hot weather applications (above 30°C), lower dosages (3-4%) may be sufficient due to faster natural setting. Always test setting times at the nozzle before full-scale application and adjust dosage accordingly.

## HEALTH AND SAFETY

**ChemFit ShotFast AF SC300** is an acidic liquid (pH 2.5-4.5) and can cause serious eye irritation and skin burns. If eye contact occurs, rinse immediately with plenty of water for 15-20 minutes and seek medical attention immediately. For skin contact, wash immediately with soap and water; remove contaminated clothing. If swallowed, do not induce vomiting; rinse mouth and drink water or milk, then seek medical attention immediately. Use chemical-resistant gloves (nitrile or neoprene), chemical splash goggles, face shield, and protective clothing during handling. Ensure adequate ventilation when using in enclosed spaces. In tunnel applications, use appropriate respiratory protection to avoid inhalation of spray mist. Avoid contact with metals as product may cause corrosion. Do not mix with alkaline materials (cement, lime) in concentrated form as rapid heat generation will occur. Refer to the Safety Data Sheet for detailed information.

## CLEANG OF TOOLS

Clean all batching equipment, dosing pumps, nozzles, hoses, and spillages with water immediately after use. Dried or cured shotcrete may require mechanical removal. Do not allow accelerator to dry on equipment as it may cause corrosion. Regularly flush dosing lines with water after each shift.

## APPROVALS AND STANDARDS

ChemFit ShotFast AF SC300 conforms to the following standards:

- Alkali-free, high performance liquid accelerator for wet and dry spray shotcrete processes
- Meets international guidelines for tunnel heading stabilization and rock support
- Complies with health and safety requirements for low-alkali shotcrete accelerators
- Suitable for underground linings per international tunneling standards

## 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](http://www.chemfitchemicals.com)

Email: chemfit.pro@gmail.com