

Ultra-High Performance Self-Consolidating Fiber-Reinforced Concrete System

PRODUCT SPECIFICATION

Petra Ufire+ is an engineered multi-component ultra-high performance concrete (UHPC) system incorporating self-consolidating properties and high-tensile PVA fiber reinforcement. The formulation features enhanced performance characteristics, including exceptional compressive strength and long-term durability. This specialized system is optimized for applications requiring creative architectural projects, cost-effective public and private buildings, to façade cladding

TARGET APPLICATIONS

- Fire-rated structural applications and fire endurance requirements
- Creative architectural projects
- Cast-in-place applications requiring ultra-high strength parameters
- Low-permeability barrier systems and protective coatings
- Cost-efficient public buildings
- Cost-efficient private buildings

PERFORMANCE CHARACTERISTICS

Fire Resistance Properties:

- Enhanced fire resistance, preventing explosive spalling under elevated temperature exposure
- Maintains structural integrity during fire events

Mechanical Properties:

- Ultra-high compressive, flexural, and tensile strength enabling reduced reinforcement requirements
- Potential for lightweight and optimized structural geometries
- Strain-hardening behavior providing post-crack energy absorption capacity
- Superior impact and abrasion resistance

Application Properties:

- Self-consolidating formulation eliminating mechanical vibration requirements
- Excellent workability and placement characteristics

Durability Performance:

- Superior crack resistance against shrinkage, thermal stress, and environmental loading
- High energy absorption capacity under dynamic loading
- Dense matrix structure achieving minimal porosity and permeability
- Exceptional freeze-thaw and de-icing salt resistance
- Enhanced sulfate and chemical attack resistance

Bond Characteristics:

- Superior interfacial bond strength with existing concrete substrates
- Compatible with both sound and deteriorated concrete surfaces

Chemical Stability:

- Non-reactive aggregate system eliminating alkali-silica reaction potential
- Engineered aggregate gradation for optimal performance

TECHNICAL INFORMATION

Compressive Strength

Tested in accordance with CSA A23.2-9C and Clause U4.1.5 Annex U With 2% PVA Fiber

4 Day Strength >80 MPa
28 Day Strength > 120 Mpa

Tensile Strength (Flexure)

Flexural/Tensile strength-ASTM C 1609

> 15 Mpa (Peak Strength)

Shrinkage

Standard test method for length change of hardened hydraulic-cement mortar and concrete (CSA A23.2-21C)

28 Day (< 0.04)
90 Day (< 0.06)

Chemical Resistance

Chloride Ion Permeability ASTM C1202

< 100 Coulombs

Freeze-thaw Resistance

ASTM C666 - Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing: Procedure A

300 cycles - Durability factor > 98%

PRODUCT DATA DISCLAIMER

Performance specifications are subject to variability due to multiple factors, including but not limited to:

Process Variables:

- Mixing methodology and equipment specifications
- Temperature conditions during preparation and application
- Application techniques and procedures

Testing and Environmental Factors:

- Analytical test methodologies employed
- Site-specific conditions at point of use
- Curing parameters and environmental conditions during cure cycle

Statistical Considerations:

Results represent typical values and may exhibit statistical variation within acceptable ranges. Actual performance characteristics should be validated under specific use conditions.

Note: This data serves as a technical baseline. End-users should conduct application-specific testing to confirm suitability for intended use parameters.

ENVIRONMENTAL, HEALTH, AND SAFETY INFORMATION

Mandatory Documentation Review:

Prior to product use, users must consult the current Safety Data Sheets (SDS) which contain comprehensive safety information including:

- Physical and chemical properties
- Environmental impact data
- Toxicological profiles
- Safety-related parameters

Regulatory Compliance:

Users are required to review current SDS documentation before handling, applying, or disposing of this product to ensure compliance with applicable regulations and safe work practices.

Operational Guidelines:

For detailed protocols regarding:

- Transportation requirements
- Handling procedures
- Storage specifications
- Disposal methods

Refer to the applicable SDS documentation specific to each chemical component.

Emergency Response: Domestic:

Petra precast 1(416) 871-6993

Disclaimer: This information supplements but does not replace the comprehensive safety data contained in the official Safety Data Sheets. Current SDS documentation supersedes all other safety references.