



SECTION 03 24 00
FIBROUS REINFORCING

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Alkali-resistant, natural cellulose concrete reinforcing fiber. (UltraFiber 500).
- B. Alkali-resistant, natural cellulose fiber blend with steel fibers. (UltraFiber 302 Blend).

1.2 RELATED SECTIONS

- A. Section 03 30 00 - Cast-in-Place Concrete.
- B. Section 03 41 16 - Precast Concrete Slabs.

1.3 REFERENCES

- A. ASTM A 820 - Standard Specification for Steel Fibers for Fiber-Reinforced Concrete.
- B. ASTM C 94 - Standard Specification for Ready-Mixed Concrete.
- C. ICC Evaluation Service (ICC-ES) AC217 - Acceptance Criteria for Concrete with Virgin Cellulose Fibers.
- D. ICC Evaluation Service ESR-1032.
- E. ACI 544 Fiber Reinforced Concrete.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Submit manufacturer's product data, including mixing instructions, dosage rate, and fiber dispersion assessment procedure.
 - 4. Installation methods.
- C. Manufacturer's Certification:
 - 1. Submit manufacturer's certification that reinforcing fibers comply with specified requirements.
 - 2. Submit manufacturer's ISO 9001:2000 certification.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
 - 1. Manufacturer shall have ISO 9001:2000 certification.
 - B. Installer Qualifications: Minimum 2 year experience installing similar products.
- 1.6 PRE-INSTALLATION MEETINGS
- A. Convene minimum two weeks prior to starting work of this section.
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Delivery: Deliver bagged reinforcing fibers in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, and weight of fibers.
 - B. Storage: Store reinforcing fibers in dry area in accordance with manufacturer's instructions.
 - 1. Bagged Reinforcing Fibers: Keep bags sealed until ready for use.
 - 2. Bulk Packaged Reinforcing Fibers: Install manufacturer's dispensing system in accordance with manufacturer's instructions to provide dry, watertight environment, when bulk packaged reinforcing fibers are loaded into dispensing system.
 - C. Handling: Protect reinforcing fibers during handling to prevent contamination.
- 1.8 PROJECT CONDITIONS
- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
- 1.9 SEQUENCING
- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Solomon Colors, which is located at: 4050 Color Plant Rd.; Springfield, IL 62702-1060; Toll Free Tel: 800-624-0261; Tel: 217-522-3112; Fax: 800-624-3147; Email: [request info \(sgs@solomoncolors.com\)](mailto:request info (sgs@solomoncolors.com)); Web: www.solomoncolors.com
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 FIBROUS REINFORCING

- A. Fibrous Reinforcing: "Solomon UltraFiber 500" concrete reinforcing fiber.
 - 1. Material: Alkali-resistant, natural cellulose fibers.
 - 2. Average Length: 2.1 mm (0.083 inch).
 - 3. Average Denier: 2.5 g/9,000 m.
 - 4. Average Diameter: 18 i (0.63 x 10-3 inch).
 - 5. Count: 1,590,000 fibers/g (720,000,000 fibers/pound).
 - 6. Density: 1.10 g/cm³.
 - 7. Surface Area: 25,000 cm²/g (12,200 ft²/pound).
 - 8. Average Tensile Strength: 750 N/mm² (110 ksi).

9. Average Elastic Modulus: 8,500 N/mm² (1,200 ksi).
 10. Fiber Spacing: 550 mm at 0.9 kg/m³ dosage rate (0.026 inch at 1.5 pounds/cubic yard dosage rate).
- B. Fibrous Reinforcing: "Solomon UltraFiber 302 Blend" concrete reinforcing fiber.
1. Material: Alkali-resistant, natural cellulose fibers with CFS cold drawn steel fibers, ASTM A 820.
 2. Average Length: 2.1 mm (0.083 inch).
 3. Average Denier: 2.5 g/9,000 m.
 4. Average Diameter: 18 μ (0.63 x 10⁻³ inch).
 5. Count: 1,590,000 fibers/g (720,000,000 fibers/pound).
 6. Density: 1.10 g/cm³.
 7. Surface Area: 25,000 cm²/g (12,200 ft²/pound).
 8. Average Tensile Strength: 750 N/mm² (110 ksi).
 9. Average Elastic Modulus: 8,500 N/mm² (1,200 ksi).

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 MIXING

- A. Add reinforcing fibers into concrete mixture in accordance with manufacturer's instructions and ASTM C 94.
- B. Add reinforcing fibers at a dosage rate of 1.5 pounds/cubic yard (0.6 kg/m³) of concrete directly into concrete mixer at beginning of batch cycle. Higher dosage rates of 2 -4 pounds can be used for replacement of welded wire or mild temperature steel. Please refer to manufacturer's recommendations.
- C. Add reinforcing fibers at a dosage rate of 16.5 pounds (7.48 kg) per cubic yard of concrete directly into concrete mixer at beginning of batch cycle. Higher dosage rates of 2 -4 pounds can be used for replacement of welded wire or mild temperature steel. Please refer to manufacturer's recommendations.
- D. Allow a minimum of 5 minutes at mixing speed in concrete mixer for full reinforcing fiber dispersion.
- E. Concrete shall be as specified in Section 03 30 00 - Cast-in-Place Concrete.

3.4 FIELD QUALITY CONTROL

- A. Confirm uniform fiber dispersion throughout concrete in accordance with manufacturer's instructions.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION