



## American Fiber Cement Corporation

SECTION 07450

### MINERAL-FIBER-REINFORCED CEMENTITIOUS PANELS

Display hidden notes to specifier. (Don't know how? [Click Here](#))

*Copyright 2012 - 2017 ARCAT, Inc. - All rights reserved*

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

- A. Fiber cement panels of the following types:
  - 1. Through color high density fiber cement panels: Patina (formerly Cembonit), Solid (formerly Zenit), Transparent (formerly True)
  - 2. Surface colored high-density fiber cement panels: Cover (formerly Metro)
  - 3. Natural color high density fiber cement panels: Minerit HD (Raw)
- B. Cladding attachment system.

### 1.2 RELATED SECTIONS

- A. Section 05400 - Cold-Formed Metal Framing.
- B. Section 06100 - Rough Carpentry.
- C. Section 07210 - Building Insulation.
- D. Section 07250 - Air Barriers.

### 1.3 REFERENCES

References are product specific.

- A. ASTM - ASTM International:
  - 1. ASTM C1185 - Standard Test Methods for Sampling and Testing Non-Asbestos Fiber-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards.
  - 2. ASTM C1186 - Standard Specification for Flat Fiber-Cement Sheets.
  - 3. ASTM E84 - Surface Burning Characteristics of Building Materials.
  - 4. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750-degree C. Determination of Non-Combustibility.
- B. CEN - European Committee for Standardization:
  - 1. EN 12467 - Fiber Cement Flat Sheets-Product Specifications and Test Methods.
  - 2. EN 13501 - Fire Test to Building Material.
  - 3. EN 20105 - Test for Color Fastness.
    - a. Part A02 Grey Scale.
- C. ULC - National Standard of Canada
  - 1. CAN/ULC S102 - Surface Burning Characteristics of Building Materials and Assemblies
  - 2. CAN/ULC S114 - Standard Method of Test for Determination of Non-Combustibility in Building Materials

- D. ICC - International Code Council
  - 1. ICC-ES Evaluation Report: ESR-3863 - Fiber-Cement Siding
- E. Materials and Equipment Acceptance (MEA) - New York City Department of Buildings Division.

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01300 - 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. Installation methods.
- C. Shop Drawings: Provide detailed drawings of non-standard applications of fiber cement materials which are outside the scope of the standard details and specifications provided by the manufacturer.
- D. Attachment System Engineered Drawings:
  - 1. Provide engineered design for attachment and back-up framing to support exterior cladding.
  - 2. Provide static calculations verifying sizing of members, attachment devices and fasteners to support the exterior cladding with a safety factor required by Authority Having Jurisdiction (AHJ).
  - 3. Provide Installation drawings and details.
- E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- F. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum of 2 years experience with installation of similar products.
- B. Color Evaluation: Insignificant change after 3000 hours of QUV test (EN 20105).
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
  - 3. Remodel mock-up area as required to produce acceptable work.

#### 1.6 FABRICATION, DELIVERY, STORAGE, AND HANDLING

- A. All cladding materials to be finished and fabricated in the United States with backup inventory in residence in the United States to support job in-progress.
- B. Store products in manufacturer's unopened packaging until ready for installation in accordance with manufacturer's recommended guidelines.

#### 1.7 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.

## 1.8 WARRANTY

- A. Warranty: Manufacturer warrants that its products are manufactured in accordance with its applicable material specifications and are free from defects in materials and workmanship.
  - 1. Only products that are installed and used in accordance with applicable manufacturer's instructions and specifications are warranted.
  - 2. The warranty is applicable only to claims made in writing and received by the manufacturer within thirty days after the defect was discovered and within ten years after the date of the shipment of the product by the manufacturer.

## PART 2 PRODUCTS

### 2.1 MANUFACTURER/SUPPLIER

- A. Basis of Design: AFC Cladding Fiber Cement Panels by American Fiber Cement Corp.; 6901 S. Pierce St. Suite 180, Littleton, CO 80128. ASD. Toll Free Tel: (800) 688-8677 ext. 102. Tel: (303) 978-1199. Fax: (303) 978-0308. Email: danglada@afclcladding.com. Web: <http://www.americanfibercement.com>.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600 - Product Requirements.

### 2.2 THROUGH COLOR HIGH DENSITY FIBER CEMENT PANELS

- A. Through Color High Density Fiber Cement Panels:
  - 1. Product: Patina (formerly Cembonit) as manufactured/supplied by American Fiber Cement Corp.
    - a. Application: Exterior.
    - b. Application: Interior.
    - c. Thickness: 5/16 inch (8 mm).
    - d. Finish: Through-colored, muted, matte finish with a unique weather-proof treatment which makes it resistant to staining and surface dirt.
    - e. Color: P 020 (967 Granite).
    - f. Color: P 050 (922 Graphite).
    - g. Color: P 070 (921 Flint).
    - h. Color: P 222 (901 Pearl).
    - i. Color: P 313 (915 Tufa).
    - j. Color: P 323 (941 Magma).
    - k. Color: P 333 (946 Adobe).
    - l. Color: P 343 (942 Ruby).
    - m. Color: P 545 (911 Sand).
    - n. Color: P 565 (935 Amber).
    - o. Color: P 626 (951 Emerald).
    - p. Physical Characteristics: EN 12467 'Fiber-cement flat sheets'.
      - 1) Density Dry: 1500 kg/m<sup>3</sup>.
      - 2) Bending strength at with grain: 32.0 MPa.
      - 3) Bending strength at across grain: 22.0 MPa.
      - 4) Modulus of elasticity at with grain: greater than 16 GPa.
      - 5) Modulus of elasticity at across grain: greater than 14 GPa.
      - 6) Hygric movement wet-dry-wet (max), mean: 2.60 mm/m.
      - 7) Durability classification (EN 12467): Category A.
      - 8) Strength classification (EN 12467): Class 4.
      - 9) Fire reaction (EN 13501-1): A2-s1-d0.

- 10) Warm water test: Ok.
- 11) Soak dry test: Ok.
- 12) Freeze thaw test: greater than 100 cycles.
- 13) Thermal conductivity e: 0.4 W/mK.
- q. Fire Testing:
  - 1) ASTM E84
  - 2) ASTM E136
  - 3) CAN/ULC S102
  - 4) CAN/ULC S114
  - 5) EN 13501
- 2. Product: Solid (formerly Zenit) as manufactured/supplied by American Fiber Cement Corp.
  - a. Application: Exterior.
  - b. Application: Interior.
  - c. Thickness: 5/16 inch (8 mm).
  - d. Finish: Through-colored, baseboard fully covered with matching acrylic coating.
  - e. Color: S 030 (509 Mercury).
  - f. Color: S 070 (507 Orcus).
  - g. Color: S 101 (508 Pluto).
  - h. Color: S 191 (510 Erebus).
  - i. Color: S 212 (504 Luna).
  - j. Color: S 282 (512 Saturn).
  - k. Color: S 334 (506 Jupiter).
  - l. Color: S 353 (502 Mars).
  - m. Color: S 515 (501 Venus).
  - n. Color: S 525 (514 Triton).
  - o. Color: S 606 (511 Rhea).
  - p. Color: S 616 (513 Ceres).
  - q. Color: S 656 (505 Terra).
  - r. Color: S 676 (516 Castillo).
  - s. Color: S 747 (503 Neptune).
  - t. Color: S 757 (515 Mimas).
  - u. Physical Characteristics: ASTM C1185/C1186, EN 12467 'Fiber-cement flat sheets'.
    - 1) Density Dry: 1700 kg/m<sup>3</sup>.
    - 2) Bending strength at with grain: 24.0 MPa.
    - 3) Bending strength at across grain: 18.0 MPa.
    - 4) Modulus of elasticity at with grain: greater than 8 GPa.
    - 5) Modulus of elasticity at across grain: greater than 7 GPa.
    - 6) Hygric movement wet-dry-wet (max), mean: 3 mm/m.
    - 7) Durability classification (EN 12467): Category A.
    - 8) Strength classification (EN 12467): Class 4.
    - 9) Fire reaction (EN 13501-1): A2-s1-d0.
    - 10) Warm water test: Ok.
    - 11) Soak dry test: Ok.
    - 12) Freeze thaw test: greater than 100 cycles.
    - 13) Thermal conductivity e: 0.4 W/mK.
  - v. Fire Testing:
    - 1) ASTM E84
    - 2) EN 13501
  - w. ICC-ES Evaluation Report:
    - 1) ESR-3863: Cembrit Fiber-Cement Façade Panel System
- 3. Product: Transparent (formerly True) as manufactured/supplied by American Fiber Cement Corp.
  - a. Application: Exterior.

- b. Application: Interior.
- c. Thickness: 5/16 inch (8 mm).
- d. Finish: Through-colored, fiber cement board with a semi-transparent surface treatment.
- e. Color: T 030 (309 Olympus).
- f. Color: T 111 (307 Kilimanjaro).
- g. Color: T 171 (308 Etna).
- h. Color: T 242 (304 Antarctic).
- i. Color: T 262 (310 Sahara).
- j. Color: T 383 (302 Vesuv).
- k. Color: T 515 (301 Gobi).
- l. Physical Characteristics: ASTM C1185/C1186, EN 12467 'Fiber-cement flat sheets'.
  - 1) Density Dry: 1550 kg/m<sup>3</sup>.
  - 2) Bending strength at with grain: 30.0 MPa.
  - 3) Bending strength at across grain: 21.0 MPa.
  - 4) Modulus of elasticity at with grain: greater than 15 GPa.
  - 5) Modulus of elasticity at across grain: greater than 13 GPa.
  - 6) Hygric movement wet-dry-wet (max), mean: 1.5 mm/m.
  - 7) Durability classification (EN 12467): Category A.
  - 8) Strength classification (EN 12467): Class 4.
  - 9) Fire reaction (EN 13501-1): A2-s1-d0.
  - 10) Warm water test: Ok.
  - 11) Soak dry test: Ok.
  - 12) Freeze thaw test: greater than 100 cycles.
  - 13) Thermal conductivity e: 0.5 W/mK.
- m. Fire Testing:
  - 1) ASTM E84
  - 2) EN 13501
- n. ICC-ES Evaluation Report:
  - 1) ESR-3863: Cembrit Fiber-Cement Façade Panel System

## 2.3 SURFACE COLORED AND TEXTURED HIGH DENSITY FIBER CEMENT PANELS

- A. Surface Colored and Textured High Density Fiber Cement Panels:
  - 1. Product: Cover (formerly Metro) as manufactured/supplied by American Fiber Cement Corp.
    - a. Application: Exterior.
    - b. Application: Interior.
    - c. Thickness: 5/16 inch (8 mm).
    - d. Finish: Classic, natural gray baseboard fully covered with an opaque, water-based acrylic coating which is resistant to moss, algae, staining and surface dirt.
    - e. Color: C 010 (117 Stockholm).
    - f. Color: C 020 (125 Vilnius).
    - g. Color: C 040 (126 Sofia).
    - h. Color: C 050 (108 Berlin).
    - i. Color: C 060 (110 Helsinki).
    - j. Color: C 160 (118 London).
    - k. Color: C 210 (109 Nuuk).
    - l. Color: C 300 (124 Milan).
    - m. Color: C 360 (113 Copenhagen).
    - n. Color: C 380 (106 Lyon).
    - o. Color: C 390 (114 Istanbul).
    - p. Color: C 450 (112 Amsterdam).
    - q. Color: C 530 (123 Rome).

- r. Color: C 540 (122 Kiev).
- s. Color: C 550 (105 Athens).
- t. Color: C 560 (120 Bonn).
- u. Color: C 570 (104 Barcelona).
- v. Color: C 600 (119 Prague).
- w. Color: C 610 (121 Lisbon).
- x. Color: C 630 (103 Geneva).
- y. Color: C 640 (101 Hamburg).
- z. Color: C 650 (102 Madrid).
- aa. Color: C 670 (111 Dublin).
- bb. Color: C 730 (107 Oslo).
- cc. Color: C 760 (116 Naples).
- dd. Color: C 770 (115 Riga).
- ee. Physical Characteristics: ASTM C1185/C1186, EN 12467 'Fiber-cement flat sheets'.
  - 1) Density Dry: 1700 kg/m<sup>3</sup>.
  - 2) Bending strength at with grain: 24.0 MPa.
  - 3) Bending strength at across grain: 18.0 MPa.
  - 4) Modulus of elasticity: 8 GPa.
  - 5) Maximum water absorption: 12%.
  - 6) Moisture movement (30-90%, mean): 3.0 mm/m.
  - 7) Thermal expansion coefficient: 0.008 mm/m degree C.
  - 8) Thermal conductivity coefficient: 0.4 W/mK.
  - 9) Frost resistance: Frost resistant greater than 100 cycles.
  - 10) Reaction to fire according to EN13501-1: A2; ASTM E84-Zero Flame Spread, and smoke developed of < 5
- ff. Fire Testing:
  - 1) ASTM E84
  - 2) EN 13501
- gg. ICC-ES Evaluation Report:
  - 1) ESR-3863: Cembrit Fiber-Cement Façade Panel System

## 2.4 NATURAL COLOR HIGH DENSITY FIBER CEMENT PANELS

- A. Natural Color High Density Fiber Cement Panels:
  - 1. Product: Minerit HD (Raw) as manufactured/supplied by American Fiber Cement Corp.
    - a. Application: Exterior.
    - b. Application: Interior.
  - 2. Finish: Factory stained per exterior finish schedule.
  - 3. Finish: Field painted per exterior finish schedule.
  - 4. Finish: Raw.
  - 5. Thickness: 5/32 inch (4 mm). For interior applications only.
  - 6. Thickness: 1/4 inch (6 mm). For interior applications only. Requires minimum order.
  - 7. Thickness: 5/16 inch (8 mm).
  - 8. Thickness: 3/8 inch (10 mm).
  - 9. Physical Characteristics: Properties based on 1/4 inch (6 mm) material. ASTM C1185/ASTM C1186, EN12467 12467 'Fiber-cement flat sheets'.
    - a. Density Dry: 961 kg/m<sup>3</sup>(105 lbs/ft<sup>3</sup>).
    - b. Normal Moisture Content: 5%.
    - c. Modulus of Rupture, psi, MD: 3200 (22063 kPa).
    - d. Modulus of Rupture, psi, CMD: 2500 (17237 kPa).
    - e. Modulus of Elasticity, psi: 1.4 x 10<sup>6</sup>(9.7 kPa x 10<sup>6</sup>).
    - f. Tensile Strength, psi, MD: 2300 (15858 kPa).
    - g. Tensile Strength, psi, (Parallel to surface) CMD: 1600 (11032 kPa).
    - h. Compressive Strength, psi: 11,600 (79979 kPa).

- i. Impact Strength, lb-ft/sf: 230 (1156 kgf/sq. m).
- j. Water Absorption, %, oven dry - saturation: 6 to 18.
- k. Thermal Conductivity, BTU-in/sf, hr, degree F: 2.1. (0.390 W/mK).
- l. Coefficient of Thermal Expansion, in/in, degree F,  $5.0 \times 10^{-6}$  (68 degree F to 212 degree F (20 degree C to 100 degree C)).
- m. Moisture Movement: 0.4% (3.3 mm/m) (Oven dry - saturation).
- n. Surface Burning Characteristics, Class I.
- o. Flame spread - 0.
- p. Smoke developed < 5.
- q. Continuous Maximum Temperature: 250 degree F (121 degree C).
- r. Fire Testing:
  - 1) ASTM E84
  - 2) ASTM E136
  - 3) CAN/ULC S102
  - 4) CAN/ULC S114
  - 5) EN 13501

## 2.5 MISCELLANEOUS CLADDING MATERIALS

- A. Building Wrap: AFCC Building Wrap complying with local codes for product and installation requirements.
- B. Aluminum Joint Closures and Decorative Corner Profiles: Manufacturer's standard products as detailed. Maximum thickness of finishing profile to be 0.8 mm or 21-gauge.

## 2.6 ATTACHMENT SYSTEMS

- A. Attachment System for Ventilated Rain Screen Construction of Exterior Cladding Panels:
  - 1. Product: R-TEC CI System as manufactured/supplied by American Fiber Cement Corp. for compliance with ASHRAE 90.1 continuous insulation definitions and requirements.
    - a. Material: Aluminum.
  - 2. Accessories:
    - a. R-TEC CI Bracket.
    - b. Aluminum "L," "T," "Hat" or "Z" profiles as indicated on engineered design submittal.
    - c. Fixing: As selected and engineered by attachment manufacturer to conform with the specified cladding and the exterior insulation in both thickness and type. i.e. Foam (high or low density) or mineral wool.
  - 3. UV Protective Membrane: As supplied by American Fiber Cement Corp.
    - a. For open joint ventilated rain screen systems.
    - b. For exterior insulation requiring UV protection.
- B. Attachment System, Steel Supporting Members:
  - 1. Product: "Hat" or "Z" profiles supplied by others.
    - a. Material: Steel, minimum 16-gauge, minimum G90 coating.
  - 2. UV Protective Membrane: As supplied by American Fiber Cement Corp.
    - a. For open joint ventilated rain screen systems.
- C. Attachment System, Aluminum Supporting Members:
  - 1. Product: "Hat" or "Z" profiles supplied by others.
    - a. Material: Aluminum - min. 2mm thickness.
  - 2. UV Protective Membrane: As supplied by American Fiber Cement Corp.
    - a. For open joint ventilated rain screen systems.
- D. Attachment System, Wood Supporting Members:
  - 1. Product: Wood profiles supplied by others.

- a. Material: Pressure treated wood.
2. UV Protective Membrane: As supplied by American Fiber Cement Corp.
  - a. For open joint ventilated rain screen systems.

## 2.7 FIXING ACCESSORIES FOR ATTACHMENT SYSTEMS

- A. Rivets: Stainless steel Astro rivets (for use with metal supporting members).
  1. As supplied by American Fiber Cement Corp.
- B. Rivets: Color-matched stainless-steel Astro rivets (for use with metal supporting members).
  1. As supplied by American Fiber Cement Corp.
- C. Screws: Stainless steel screws (for use with wood supporting members).
  1. As supplied by American Fiber Cement Corp.
- D. Screws: Color-matched stainless-steel screws (for use with wood supporting members).
  1. As supplied by American Fiber Cement Corp.
- E. Concealed Attachment, Epoxy Adhesive System: For concealed fastening of exterior cladding panels on ventilated rain screen constructions.
  1. Product: Dynamic Bond as manufactured by Dynamic Bonding Systems and supplied by American Fiber Cement Corporation.
    - a. Material: Structural adhesive and sealant based on MS-hybrid-polymer.
    - b. Physical Characteristics:
      - 1) Density: 1.54 g/cm<sup>3</sup>.
      - 2) Tensile strength: 2.3 N/mm<sup>2</sup>.
      - 3) Shear strength: 2.1 N/mm<sup>2</sup>.
      - 4) Fire reaction (EN 13501-1): B-s1-d0.
  2. Accessories:
    - a. Dynamic Clean: For use in conjunction with Dynamic Bond.
    - b. Dynamic Tape: For use in conjunction with Dynamic Bond.
    - c. Dynamic Protect: For impregnation of wood surfaces.
    - d. Dynamic SI Epoxy: For impregnation of porous (fiber) cement panels.

## 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 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved submittals.
- B. For exterior applications, comply with local codes and structural engineer's fastening calculations along with manufacturer's recommendations for fastener spacing.

### 3.4 EXTERIOR CLADDING FOR RAINSCREEN APPLICATIONS



- A. Detailing Requirements:
  - 1. Air space at top and bottom of building or wall termination shall be 3/4 inch (20 mm) to facilitate airflow from behind the panels. Do not block vertical airflow at windows, doors, eaves, or at the base of the building. Airflow shall be continuous from bottom to top so there is air movement behind each panel. For walls over 60 feet high (18 m), the ventilated cavity between rear of panels and exterior wall shall be increased to 1-5/8 inches (40 mm). Air flow behind the cement fiber panels is critical to the performance of the rain screen constructions.
  - 2. Fasteners in profile shall accommodate thermal expansion/contraction of metal and not interfere with panel application.
  - 3. Install panels from top of building to bottom.
  - 4. For straight walls, start panel installation in center and work outward.
  - 5. For walls with inside corners, start installation at corner and work across wall.
  - 6. Pattern: Straight pattern with vertical panels. Panel size as indicated.
  - 7. Pattern: Straight pattern with horizontal panels. Panel size as indicated.
  - 8. Pattern: Semi pattern with horizontal panels. Panel size as indicated.
- B. Rain Screen Installation: Comply with manufacturer's installation requirements.
  - 1. Attachment System: Comply with manufacturer's engineered design for cladding support framing.

### 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