



SECTION 07210

BUILDING INSULATION

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Perimeter Fire Containment Systems.
- B. Building Insulation for Thermal and Acoustical Applications.
- C. Fire Resistive Joint Systems.
- D. Firestopping of Through Penetrations.
- E. Green Product Specifications

1.2 RELATED SECTIONS

- A. Section 02620 - Subdrainage: Insulated drainage panels.
- B. Section 04800 - Masonry Assemblies: Cavity wall and masonry cell insulation.
- C. Section 07100 - Dampproofing and Waterproofing: Insulation installed with waterproofing systems.
- D. Section 07480 - Exterior Wall Assemblies: Exterior Insulated Finish Systems EIFS.
- E. Section 07500 - Membrane Roofing: Insulation in low-slope roofing applications.
- F. Section 07810 - Fire and Smoke Protection: Insulation installed in conjunction with firestopping or smoke containment systems.
- G. Section 09200 - Plaster and Gypsum Board: Insulation installed in conjunction with interior wall and ceiling finish systems.
- H. Section 15810 - Ducts: Insulation to surround HVAC ductwork.

1.3 REFERENCES

- A. ASTM C 177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
- B. ASTM C 423 – Standard Test Method for Sound Absorption and Sound Absorption Coefficients by Reverberation Room Method

- C. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- D. ASTM C 553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
- E. ASTM C 612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
- F. ASTM C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- G. ASTM C 1104 – Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation.
- H. ASTM C 1338 – Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
- I. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- J. ASTM E 90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- K. ASTM E 96 – Standard Test Methods for Water Vapor Transmission of Materials.
- L. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
- M. ASTM E 136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C.
- N. ASTM E 814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
- O. ASTM E 1966 - Standard Test Method for Fire-Resistive Joint Systems.
- P. ASTM E 2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus.
- Q. ASTM E 2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers.
- R. ASTM E 96- Test Method for Water Vapor Transmission of Material.
- S. Federal Specification HH-I-521F: Insulation Blankets, Thermal (Mineral Fiber, For Ambient Temperatures).
- T. Federal Specification HH-I-558B: Insulation, Blocks, Blankets, Felts, Sleeving (Pipe and Tube Covering), and Pipe fitting Covering, Thermal (Mineral Fiber, Industrial Type)
- U. National Fire Protection Association (NFPA) Life Safety Code
- V. Underwriters Laboratories (UL) - UL 2079 Standard test method for fire resistance of Building Joint Systems.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- 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. Performance Data:
 - 1. Submit appropriate research reports or evaluation data for products listed in this section.
 - 2. Prior to project closeout, Contractor shall certify in accordance with section 01770 that all products installed pursuant to this section do not contain Asbestos or Polychlorinated Biphenyls (PCB).
- D. Sustainable Design Submittals:
 - 1. Submit certification/letter from material supplier(s) indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content for LEED Credit MR 4.1 and MR 4.2.
 - a. Include statement indicating cost for each product having recycled content.
 - 2. Submit product data and/or other documentation indicating location of material manufacturer for regionally manufactured materials.
 - a. Include statement indicating cost and distance from the manufacturer to project for each regionally manufactured material.
 - b. Include statement indicating cost and distance from point of extraction, harvest, or recovery to project for each raw material used in regionally manufactured materials.
- E. Shop Drawings: Submit manufacturers shop drawings describing the type and location of each product specified.
- 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. Manufacturer Qualifications: Single manufacturer with a minimum of ten years experience manufacturing or marketing products in this section shall provide all products listed.
- B. Installer Qualifications:
 - 1. Products listed in this section shall be installed by a single organization with at least two (2) years experience successfully installing insulation on projects of similar type and scope as specified in this section.
 - 2. If the installation of the curtain wall is the responsibility of a different installer, coordinate specified installations prior to commencement of work to ensure the complete system meets the specified ratings.
 - 3. Certification per FM 4991, Underwriters Laboratories, Intertek (OPL) Laboratories, or by the Firestop Contractors International Association (FCIA).
- C. Fire- Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by Underwriters Laboratories (UL), Intertek (OPL) or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Identify materials appropriate markings of applicable testing and inspecting agency.
 2. Surface-Burning Characteristics: ASTM E 84. Unfaced material will have a maximum flame spread 0 and smoke-developed of 0. Foil Faced material will have maximum flame spread 25 and smoke-developed of 0.
 3. Fire-Resistance Ratings:
 4. ASTM E 2307 pertains to perimeter fire containment. ASTM E 119 pertains to fire rated walls, floors and ceilings. ASTM E 814 pertains to poke-throughs and penetration assemblies. ASTM E 1966 pertains to fire resistive joint systems.
 5. Combustion Characteristics: Rated as non combustible as defined by NFPA standard 220 when tested in accordance with ASTM E 136.
- D. Manufacturer's identification tags or marks are not acceptable on surfaces where products are considered to be finish material.
1. Evidence of patching after removal of tags or marks is not acceptable.
- E. Field Inspection: Follow criteria outlined in ASTM E 2393 Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers.
- F. 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 is approved by Architect.
 3. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to the job site in original packages, containers, or bundles bearing the brand name and manufacturer's identification.
- B. Storage: Store materials in dry locations with adequate ventilation, free from water, and in such a manner to permit easy access for inspection and handling.
- C. Handling: Handle materials to avoid damage. When installing or otherwise handling these insulation products, wear a NIOSH approved dust mask or respirator, gloves and long sleeved, loose fitting clothing closed at the neck and wrists. Wear safety glasses when installing.

1.7 PROJECT CONDITIONS

- A. Protect adjacent work of other trades from damage. Clean substrates of substances harmful to insulation or vapor retarders, including removal of projections which might puncture vapor retarders. In cold weather, during installation of smoke sealant material, temperatures within the building shall be maintained above 55°F. Provide adequate ventilation to carry-off excess moisture.

1.8 WARRANTY

- A. At project closeout, provide to the owner or owners representative an executed copy of the manufacturer's warranty document outlining the terms, conditions, and exclusions of their Standard Limited Warranty against Manufacturing Defect.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Thermafiber, Inc., which is located at: 3711 Mill St. ; Wabash, IN 46992; Toll Free Tel: 888-834-2371; Tel: 260-563-2111; Fax: 260-563-8979; Email: [request info](#); Web: www.thermafiber.com
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01630.

2.2 PERIMETER FIRE CONTAINMENT

- A. General: Where indicated for gaps between the perimeter edge of fire-resistance-rated floor assemblies and non-fire-resistance-rated exterior curtain walls, provide a perimeter fire-containment system with the fire test response characteristics indicated, as determined by testing identical systems per the Underwriters Laboratories or Intertek (OPL) Laboratories, or another testing and inspecting agency accountable to authorities having jurisdiction. If no tested system exists, an engineering judgment as specified by the International Firestop Council must accompany the design.
- B. Curtain Wall Insulation:
 - 1. Thickness as noted in tested and listed design.
 - 2. Type: Thermafiber FireSpan 90 Insulation.
 - a. R-Value: 4.2 per inch.
 - b. Facing: Unfaced.
 - c. Facing: Foil Faced.
 - d. Density: 8.0 pcf (nominal).
 - e. Surface-Burning Characteristics: ASTM E 84. Unfaced material will have a maximum flame spread 0 and smoke-developed of 0. Foil Faced material will have maximum flame spread 25 and smoke-developed of 0.
 - f. Recycled Content Options:

<u>Pre-consumer recycled content:</u>	
Special "Green" Fiber.....	90%
Dark Fiber Mineral Wool Products.....	84%
EPA Choice Fiber (US Government Buildings).....	75%
Standard Mineral Wool Products.....	70%
<u>Post-consumer recycled content</u>0%	
 - 3. Type: Thermafiber FireSpan 40 Insulation.
 - a. R-Value: 4.2 per inch.
 - b. Facing: Unfaced.
 - c. Facing: Foil Faced.
 - d. Density: 4.0 pcf (nominal).
 - e. Surface-Burning Characteristics: ASTM E 84. Unfaced material will have a maximum flame spread 0 and smoke-developed of 0. Foil Faced material will have maximum flame spread 25 and smoke-developed of 0.
 - f. Recycled Content Options:

<u>Pre-consumer recycled content:</u>	
Special "Green" Fiber.....	90%
Dark Fiber Mineral Wool Products.....	84%
EPA Choice Fiber (US Government Buildings).....	75%
Standard Mineral Wool Products.....	70%
<u>Post-consumer recycled content</u>0%	
- C. Safing Insulation:

1. Type: Thermafiber Safing Insulation.
 - a. R-Value: 4.2 per inch.
 - b. Facing: Unfaced.
 - c. Facing: Foil Faced.
 - d. Standard Density: 4.0 pcf (actual).
 - e. Density: 6.0 pcf (actual).
 - f. Density: 8.0 pcf (actual).
 - g. Surface-Burning Characteristics: ASTM E 84. Unfaced material will have a maximum flame spread 0 and smoke-developed of 0. Foil Faced material will have maximum flame spread 25 and smoke-developed of 0.
 - h. Recycled Content Options:

<u>Pre-consumer recycled content:</u>	
Special "Green" Fiber.....	90%
Dark Fiber Mineral Wool Products.....	84%
EPA Choice Fiber (US Government Buildings).....	75%
Standard Mineral Wool Products.....	70%
<u>Post-consumer recycled content.....</u>	<u>0%</u>

- D. Safing Clips: Z-Shaped galvanized steel clips formed from 1 inch (25mm) wide strips of 20 gauge galvanized steel. 3 inches (76mm) high with 2 inch (51mm) and 3 inch (76mm) upper and lower horizontal legs. See specific UL or OPL/Intertek design to verify if safing clips are required.

- E. Hardware:
 1. Thermafiber Impasse hardware for attaching curtain wall insulation.
 2. Mechanical Fasteners as approved by the Architect and Manufacturer.

- F. Mullion Covers:
 1. 1 inch (25 mm) Thermafiber FireSpan 90 Insulation for protection of mullions.
 2. 2 inch (51 mm) Thermafiber FireSpan 90 Insulation for protection of mullions.

- G. Backer / Reinforcement Member: Thermafiber Impasse T-Bar or other light gauge steel channel or angle approved by the primary manufacturer. Place horizontally at the safe-off line to support the curtain wall insulation to prevent bowing of curtain wall insulation caused by compression fitting of the Safing insulation.

- H. Smoke Barrier: Smoke sealant as listed in the appropriate fire tested assembly and approved by the Architect and Manufacturer.

- I. Vapor Retarder Tape: Compatible with specified facer and comparable perm rating. For taping insulation joints and repairing tears.

2.3 THERMAL AND ACOUSTICAL INSULATION

- A. Exterior Thermal / Acoustical Insulation:
 1. Thickness: As noted on contract drawings.
 2. Type: Thermafiber FireSpan 90 Insulation.
 - a. R-Value: 4.2 per inch.
 - b. Facing: Unfaced.
 - c. Facing: Foil Faced.
 - d. Density: 8.0 pcf (nominal).
 - e. Surface-Burning Characteristics: ASTM E 84. Unfaced material will have a maximum flame spread 0 and smoke-developed of 0. Foil Faced material will have maximum flame spread 25 and smoke-developed of 0.

- f. Recycled Content Options:
Pre-consumer recycled content:
Special "Green" Fiber.....90%
Dark Fiber Mineral Wool Products.....84%
EPA Choice Fiber (US Government Buildings).....75%
Standard Mineral Wool Products.....70%
Post-consumer recycled content.....0%
3. Type: Thermafiber FireSpan 40 Insulation.
- a. R-Value: 4.2 per inch.
 - b. Facing: Unfaced.
 - c. Facing: Foil Faced.
 - d. Density: 4.0 pcf (nominal).
 - e. Surface-Burning Characteristics: ASTM E 84. Unfaced material will have a maximum flame spread 0 and smoke-developed of 0. Foil Faced material will have maximum flame spread 25 and smoke-developed of 0.
 - f. Recycled Content Options:
Pre-consumer recycled content:
Special "Green" Fiber.....90%
Dark Fiber Mineral Wool Products.....84%
EPA Choice Fiber (US Government Buildings).....75%
Standard Mineral Wool Products.....70%
Post-consumer recycled content.....0%
4. Type: Thermafiber FS 15 Insulation.
- a. R-Value: 4.0 per inch for thickness of > 1". R-Value of 4.2 per inch for thickness of 1".
 - b. Facing: Unfaced only.
 - c. Density: 4 pcf (nominal) for 1" thick material.
 - d. Density: 3.0 pcf (nominal) for thicknesses greater than 1".
 - e. Surface-Burning Characteristics: ASTM E 84. Unfaced material will have a maximum flame spread 0 and smoke-developed of 0.
 - f. Recycled Content Options:
Pre-consumer recycled content:
Special "Green" Fiber.....90%
Dark Fiber Mineral Wool Products.....84%
EPA Choice Fiber (US Government Buildings).....75%
Standard Mineral Wool Products.....70%
Post-consumer recycled content.....0%
5. Type: Thermafiber FS 25 Insulation.
- a. R-Value: 4.0 per inch.
 - b. Facing: Foil Faced only.
 - c. Density: 3.0 pcf. (nominal).
 - d. Surface-Burning Characteristics: ASTM E 84. Foil Faced material will have maximum flame spread 25 and smoke-developed of 0.
 - e. Recycled Content Options:
Pre-consumer recycled content:
Special "Green" Fiber.....90%
Dark Fiber Mineral Wool Products.....84%
EPA Choice Fiber (US Government Buildings).....75%
Standard Mineral Wool Products.....70%
Post-consumer recycled content.....0%

- 6. Type: Thermafiber Sound Attenuation Fire Blanket (SAFB).
 - a. Facing: Unfaced only.
 - b. Density: 4 pcf (nominal) for 1" thick material.
 - c. Density: 2.5 pcf (nominal) for thicknesses greater than 1".
 - d. Surface-Burning Characteristics: ASTM E 84. Unfaced material will have a maximum flame spread 0 and smoke-developed of 0.
 - e. Recycled Content Options:
 - Pre-consumer recycled content:
 - Special "Green" Fiber.....90%
 - Dark Fiber Mineral Wool Products.....84%
 - EPA Choice Fiber (US Government Buildings).....75%
 - Standard Mineral Wool Products.....70%
 - Post-consumer recycled content.....0%

B. Rain Screen / Cavity Wall Continuous Insulation

- 1. Description: Non-combustible, semi-rigid mineral wool insulation board that is water repellent and resists temperatures above 2,000° F, meets ASTM C 612, IVA.
- 2. Thickness: As noted on contract drawings.
- 3. Type: Thermafiber RainBarrier 45 Insulation
 - a. R-value of 4.2 per inch.
 - b. Facing: Unfaced.
 - c. Density: 4.5 pcf.
 - d. Surface Burning Characteristics: Unfaced- Flame Spread 0 and Smoke Developed 0
 - e. Moisture Resistance: Absorbs less than 0.03% by volume, ASTM C 1104
 - f. Non-corrosive, ASTM C 665.
 - g. Recycled Content Options:
 - Pre-consumer recycled content:
 - Special "Green" Fiber.....90%
 - Dark Fiber Mineral Wool Products.....84%
 - EPA Choice Fiber (US Government Buildings).....75%
 - Standard Mineral Wool Products.....70%
 - Post-consumer recycled content.....0%
- 4. Type: Thermafiber RainBarrier HD Insulation
 - a. R-value of 4.2 per inch.
 - b. Facing: Unfaced.
 - c. Density: 6.0 pcf.
 - d. Surface Burning Characteristics: Unfaced-Flame Spread 0 and Smoke Developed 0
 - e. Moisture Resistance: Absorbs less than 0.03% by volume, ASTM C 1104.
 - f. Non-corrosive, ASTM C 665.
 - g. Recycled Content Options:
 - Pre-consumer recycled content:
 - Special "Green" Fiber.....90%
 - Dark Fiber Mineral Wool Products.....84%
 - EPA Choice Fiber (US Government Buildings).....75%
 - Standard Mineral Wool Products.....70%
 - Post-consumer recycled content.....0%

5. Hardware: RainBarrier Insulation Retaining Clip for securing RainBarrier continuous insulation to exterior substrate. This clip is recommended by manufacturer as it is compatible with multiple types of masonry and façade tie systems it is compatible with multiple types of masonry and façade tie systems.

B. Multi-Purpose Thermal and Acoustical Insulation Product Used Where Fire Rated Assembly is NOT REQUIRED:

1. Description: Non-combustible, semi-rigid mineral wool insulation board that is water repellent and resists temperatures above 2,000° F, meets ASTM C 612, Type IA (VersaBoard 35), Type IA, IB, II, III, IVA (VersaBoard 40) and Type IA, IB, II,III, IVA (VersaBoard 60 & 80). VersaBoard provides fire resistive characteristics, sound control, thermal insulation, and energy conservation for various commercial applications. VersaBoard is ideal for parking garage under decking, mechanical rooms, and other areas where insulation is required.
2. Thickness: As noted on contract drawings.
3. Type: Thermafiber VersaBoard 35:
 - a. R-Value: 4.0 per inch.
 - b. Facing: Available in unfaced, ASJ Facing, Black Mat Facing, and White Mat Facing.
 - c. Density: 3.5 pcf (actual).
4. Type: Thermafiber VersaBoard 40:
 - a. R-Value: 4.2 per inch.
 - b. Facing: Available in unfaced, ASJ Facing, Black Mat Facing, and White Mat Facing.
 - c. Density: 4.0 pcf (actual).
5. Type: Thermafiber VersaBoard 60:
 - a. R-Value: 4.2 per inch.
 - b. Facing: Available in unfaced, ASJ Facing, Black Mat Facing, and White Mat Facing.
 - c. Density: 6.0 pcf (actual).
6. Type: Thermafiber VersaBoard 80:
 - a. R-Value: 4.2 per inch.
 - b. Facing: Available in unfaced, ASJ Facing, Black Mat Facing, and White Mat Facing.
 - c. Density: 8.0 pcf (actual).
7. Physical Properties of VersaBoard 35, 40, 60 and 80:
 - a. Surface Burning Characteristics: Unfaced- Flame Spread 0 and Smoke Developed 0, Foil Faced- Flame Spread 25 and Smoke Developed 0. ASJ Faced- Flame Spread 10 and Smoke Developed 5. Black and White Mat Faced: Surface Burning Characteristics unknown.
 - b. Moisture Resistance: Absorbs less than 0.03% by volume, ASTM C 1104.
 - c. Non-corrosive, ASTM C 665.
 - d. Recycled Content Options:
 - Pre-consumer recycled content:
 - Special "Green" Fiber.....90%
 - Dark Fiber Mineral Wool Products.....84%

EPA Choice Fiber (US Government Buildings).....	75%
Standard Mineral Wool Products.....	70%
<u>Post-consumer recycled content</u>	0%

- C. Interior Partition Walls and Ceilings:
 - 1. Thickness: As noted on contract drawings.
 - 2. Type: Thermafiber Sound Attenuation Fire Blanket (SAFB).
 - a. Facing: Unfaced only.
 - b. Density: 4.0 pcf (nominal) for 1” thick material.
 - c. Density: 2.5 pcf (nominal) for thicknesses greater than 1”.
 - d. Surface Burning Characteristics: Unfaced- Flame Spread 0 and Smoke Developed 0.
 - e. Minimum Recycle Content: 70% (Pre-Consumer).
 - 3. Type: Thermafiber Creased Sound Attenuation Fire Blanket (SAFB).
 - a. Density: 2.5 pcf (nominal) Creased SAFB available in 2.5 pcf only.
 - b. Surface Burning Characteristics: Unfaced- Flame Spread 0 and Smoke Developed 0.
 - c. Minimum Recycle Content: 70% (Pre-Consumer).

1.2 FIRE RESISTIVE JOINT SYSTEMS IN RATED ASSEMBLIES

- A. Insulation:
 - 1. Type: Thermafiber Safing Insulation for construction joint application.
 - 2. Type: Thermafiber Top-Stop Insulation for head of wall applications.
 - a. Thickness: As noted on contract drawings.
 - b. Facing: Unfaced.
 - c. Surface Burning Characteristics: Unfaced- Flame Spread 0 and Smoke Developed 0.
 - d. Recycled Content Options:
 - Pre-consumer recycled content:
 - Special “Green” Fiber.....90%
 - Dark Fiber Mineral Wool Products.....84%
 - EPA Choice Fiber (US Government Buildings).....75%
 - Standard Mineral Wool Products.....70%
 - Post-consumer recycled content.....0%
- B. Smoke Barrier: Smoke sealant as listed in the appropriate fire tested assembly and approved by the Architect and Manufacturer.

1.3 FIRESTOPPING OF THROUGH PENETRATIONS IN RATED ASSEMBLIES

- A. Safing Insulation:
 - 1. Type: Thermafiber Safing Insulation.
 - a. Thickness: As noted in tested designs.
 - b. Facing: Unfaced.
 - c. Standard Density: 4.0 pcf (actual).
 - d. Density: 6.0 pcf (actual).
 - e. Density: 8.0 pcf (actual).
 - f. Surface Burning Characteristics: Unfaced- Flame Spread 0 and Smoke Developed 0.
 - g. Recycled Content Options:
 - Pre-consumer recycled content:
 - Special “Green” Fiber.....90%
 - Dark Fiber Mineral Wool Products.....84%
 - EPA Choice Fiber (US Government Buildings).....75%
 - Standard Mineral Wool Products.....70%
 - Post-consumer recycled content.....0%

- B. Smoke Barrier: Smoke sealant as listed in the appropriate fire tested assembly and approved by the Architect and Manufacturer.

PART 2 EXECUTION

2.1 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.

2.2 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.

2.3 BACKER REINFORCEMENT MEMBERS

- A. Install backer reinforcement member in accordance with manufacturer's instructions.
- B. Install Thermafiber Impasse T-Bar or an approved light steel angle or channels, placed horizontally at the safing line, attached to the vertical mullions either within the insulation at a horizontal splice, or behind the insulation and mechanically attached to vertical mullions. This detail prevents the bowing of the curtain wall insulation due to the compression fit of the safing insulation.

2.4 CURTAIN WALL INSULATION

- A. Install curtain wall insulation in accordance with Underwriters Laboratories / Intertek (OPL) Laboratories listed system and manufacturer's instructions.
- B. Install backer bar assembly in accordance with the tested design. Not applicable when the Thermafiber No Backer Bar™ system is specified.
- C. Retain insulation in place with mechanical fasteners within the mullions and transoms (spandrel area), spaced at intervals recommended by tested assembly to hold insulation securely in place without touching the exterior wall. Maintain cavity width of dimension indicated between insulation and exterior wall.

2.5 SAFING INSULATION

- A. Install safing insulation in accordance with manufacturer's instructions.
- B. Install safing insulation of proper size in safe off area between curtain wall insulation and floor slab as prescribed by the listed and tested assembly.
- C. Safing insulation direction and compression as well as the absence of safing Z-clips are prescribed by the listed and tested assembly.
- D. Install Safing insulation of proper density and size into construction joints (head-of-wall, floor-to-floor, floor-to-wall, etc.) as prescribed by the listed and tested assembly.
- E. Install Safing insulation of proper density and size into poke-throughs and

penetrations as prescribed by the listed and tested assembly.

2.6 SMOKE BARRIER SYSTEM

- A. Install smoke barrier system in accordance with manufacturer's instructions.
- B. Utilize foil faced FireSpan curtain wall Insulation with Thermafiber safing Insulation. Apply approved smoke sealant in accordance with the tested assembly.
- C. Install Safing insulation of proper density and size as prescribed by the tested assembly. Apply approved smoke sealant in accordance with the tested assembly.
- D. Install Safing insulation of proper density and size into poke-throughs and penetrations as prescribed by the tested assembly. Apply approved smoke sealant in accordance with the tested assembly.

2.7 VAPOR RETARDER INSTALLATION

- A. Seal all joints in curtain wall insulation or exterior wall insulation with vapor retarder tape. Apply vapor retarder tape at intersection of insulation with framing, adjacent pieces and similar intersections to insure a vapor tight seal. Repair all tears in insulation foil facing with vapor retarder tape.

2.8 PROTECTION

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

2.9 CLEAN-UP

- A. Prior to project closeout, remove all related rubbish, excess material, scaffolding, tools and equipment from the site. Dispose of waste material in a manner approved by applicable jurisdictions.

END OF SECTION