SECTION 07 21 50 - SPRAYED THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Provide the work of this Section in accordance with requirements of the Contract Documents.

B. This Section includes but is not limited to sprayed thermal insulation **INS-03**.

C. Related Work:

1. Division 03, Section 03 30 00 "Cast-In-Place Concrete".
2. Division 05, Section 05 12 00 "Structural Steel Framing".
3. Division 05, Section 05 31 00 "Steel Decking".
4. Division 07, Section 07 21 00 "Thermal Insulation ".
5. Division 07, Section 07 81 00 "Applied Fire Protection".

1.2 ACTION SUBMITTALS

A. Manufacturer's Product Data: Submit manufacturer's specifications, including certification to show compliance with requirements of the Contract Documents. Submit literature, clearly indicating conditions of acceptance and methods of applications shall be available on site before, and during, period of application of Work of this Section.

B. Sustainable Design Submittals:

1. Building Product Disclosure and Optimization - Sourcing of Raw Materials:
    a. Leadership Extraction Practices
        1) Extended Producer Responsibility (EPR): Submit documentation indicating that manufacturers have a take back or recycling program for the product purchased.
        2) Recycled Content: For products having recycled content, indicate percentages by weight of post-consumer and pre-consumer recycled content.
            a) Include statement indicating costs for each product having recycled content.
    b. Sourcing of Raw Materials: For products that are required to comply with requirements for regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material.
        1) Include statement indicating distance to Project, cost for each regional material and the fraction by weight that is considered regional.
2. Indoor Environmental Quality, Low Emitting Materials:
    a. Building Products must be tested and compliant with the California Department of Public-Health (CDPH) Standard Method V1.1-2010, using the applicable exposure scenario.
    b. Adhesives and Sealants: For wet applied on site products, submit printed statement showing compliance with the applicable chemical content requirements of SCAQMD Rule 1168, effective July 1, 2005 and rule amendment date of January 7, 2005.

c. Alternative tests for VOC above include ASTM D2369-10; ISO 11890 part 1; ASTM D6886-03; or ISO 11890-2.
d. Methylene Chloride and perchloroethylene may not be added to paints, coating, adhesive or sealants
e. For Insulation products, submit documentation of VOC emissions testing compliance in the form of GreenGuard Gold certification, SCS Indoor Advantage Gold certification or CDPH Standard Method v1.2 compliance verification.

C. Samples: Provide samples, minimum 12" x 12" of sprayed insulation bonded to a piece of rigid board.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sustainable Design Submittals:

1. Building Product Disclosure and Optimization - Environmental Product Declarations

a. Submit product specific type III EPDs or Industry wide (generic) EPDs, USGBC approved program declaration or products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope.

2. Building Product Disclosure and Optimization - Material Ingredients

a. Material Ingredient Reporting: Submit documentation confirming chemical inventory of products to at least 0.1 % (1000pm) with at least one of the following:

1) Submit published manufacturer inventory of ingredients identified by name and Chemical Abstract Service Registration Number (CASRN)
2) Submit documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
3) Submit Declare product label indicating that all ingredients have been disclosed down to 1000 ppm or designated as Red List Free or Declared
4) Living Product Challenge
5) Product Lens Certification
6) USGBC approved program.

b. Material Ingredient Optimization: Submit documentation confirming chemical inventory of products to at least 0.01 % (100pm) and/or that has a compliant material ingredient optimization report with at least one of the following:

1) Submit GreenScreen V1.2 Benchmark: Third party report prepared by a licensed GreenScreen List Translator, or a full GreenScreen Assessment.
2) Submit third-party verified documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
3) Submit third-party verified Cradle to Cradle v3 Material Health certificate at the Bronze Level or better
4) Submit third-party verified Declare product label indicating that all ingredients have been disclosed down to 100 ppm
5) Submit third-party verified documentation that product is Living Product Challenge certified with a Red List Free or LBC Red List Free Declare label.
6) Submit documentation that product has a manufacturer prepared action plan with material inventory to at least 1000 ppm.

C. Product Test Reports: For each product, for tests performed by a qualified testing agency, indicating compliance with performance criteria.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Installers performing the Work of this Section must be approved by the manufacturers of the sprayed thermal material and shall also have been in business for a minimum period of (3) years. Firms shall have expertise in installation of thermal insulation system specified.

B. Manufacturer's Representative: Manufacturer's technical representative that will be on site to attend the preconstruction meeting, train applicators in installation techniques, accept existing substrate conditions and witness the first installation.

C. Preconstruction meeting: provide agenda for preconstruction meeting one week in advance for review by Contractor and AOR.

1.5 DELIVERY AND STORAGE

A. Deliver materials to the site in manufacturer's original, unopened packaging, labeled as to trade name, and other identifying date.

B. Storage Materials to be stored on site above ground, in a warm, dry place and either on a concrete floor or a wood platform, protected from weather. Reject and remove from site damaged packages found unsuitable for use.

C. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

1.6 ENVIRONMENTAL CONDITIONS

A. Comply with manufacturer' written instructions regarding proper temperature, humidity and ventilation during application and curing of sprayed thermal insulation. Perform work only under the conditions stated in the manufacturer's printed application instructions.

B. Provide natural ventilation to properly dry the insulation material during and subsequent to its application.

C. Environmental Limitations: Do not apply sprayed thermal insulation when ambient or substrate temperature is 34 deg F., or lower, unless temporary protection and heat are provided to maintain temperature at or above this level prior to, during, and a minimum of 24 hours after application of sprayed insulation.

D. Ventilation: Ventilate building spaces during and after application and provide complete air exchanges in accordance with manufacturer's instructions. Provide ventilation to allow proper curing of the sprayed insulation during and subsequent to its application.

1. In enclosed areas, ventilation shall not be less than 4 complete air changes per hour.

1.7 SEQUENCING/SCHEDULING.

A. Complete sprayed insulation work on a floor before proceeding to the next floor. Coordinate the scheduling of fire protection work to avoid delays in job progress.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Regional Materials: Provide a minimum of 20 percent of building materials (by cost) that are regionally extracted, processed and manufactured materials within a radius of 100 miles.

B. Recycled Content: Building materials shall have an averaged recycled content such that postconsumer recycled content plus one-half of preconsumer recycled content for Project constitutes the following percentages of material:

1. Building Insulation,

    a. Mineral wool batt or board; 75%
    b. Fiberglass Batt or board: 25%

C. VOC Limits for Specialty Applications shall have a maximum VOC content as follows:

1. Special Purpose Contact Adhesive: 250 g/L

D. Low-Emitting Materials:

1. Adhesives and Sealants wet-applied inside the weather-proofing system must meet the VOC general emissions testing criteria of CDPH Standard Method v1.2.
2. All adhesives and sealants wet-applied inside the weather-proofing system must have VOC content in compliance with the applicable VOC limits (g/L) found in tables in Division 01 Section 01 81 13.14 "Sustainable Design Requirements - LEED v4 BD+C."
3. All insulation products must meet the VOC general emissions testing criteria of CDPH Standard Method v1.2.

2.2 MANUFACTURER

A. Sprayed Thermal Insulation Type **INS-03**: Spray-applied fiber glass materials held together with cementitious binders, formulated from inorganic fiberglass with minimum 25% recycled glass (20% post-consumer) content, tested for application over sprayed fireproofing materials. Provide the following

1. Basis of Design: Monoglas Incorporated, “Monoglass Spray-On White Fiber” conforming to ASTM E136 using “Monoglass Liquid Bonding Adhesive”.
2. Alternates:

    a. ThermaCoustic Industries International Limited; "TC-417 white glass using TC-417 adhesive
    b. Isolatek, "Cafco Heat-Shield.

B. Spray-applied materials shall not contain asbestos, and shall exhibit the following properties:

1. Fire Hazard Classification ASTM E84

    a. Flame Spread - 0
    b. Smoke Developed - 10

2. Non-Combustibility: ASTM E136 (passes)
3. Smoulder Resistance: CGSB 51-GP-36P
4. Dry Density: ASTM D1622- 2.8 pcf.
5. Thermal Conductivity: ASTM C518 K-Factor 0.25 R-Value = 4.00/in.
6. Fire Gas Toxicity: University of Pittsburgh ProtocolAir Erosion ASTM E859: No Weight Loss
7. Adhesion/Cohesion: ASTM E736: Passed
8. Fungus & Bacterial Resistance: ASTM G21.

C. Substrate Primers: Manufacturer approved, spray applied, stain blocking primers

D. Bonding Adhesive: Manufacturer's Bonding Adhesive shall be mixed with fresh, clean water to the exact proportions recommended by the manufacturer.

E. Spray Applied Sealer: Spray applied, water soluble, liquid copoly emulsion. Subject to compliance with requirements, provide Monoglass Inc., "InsulSeal" or comparable product.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine all surfaces and conditions to which the Work of this Section is to be applied, with applicator present, for compliance with requirements for bonding, installation clearances and other conditions affecting performance of the Work. Ensure they are adequate to provide a satisfactory application of the specified materials. Report any deficiencies to the Architect.

B. Do not begin work until surfaces to receive sprayed insulation have been inspected by the applicator and are acceptable to receive spray applied insulation.

C. Do not apply spray applied insulation on the underside of metal decks prior to completion of concrete work on the deck. Do not install spray applied insulation to the underside of roof deck until roofing is completely installed and tight, penthouses are complete and mechanical units have been placed and after construction roof traffic has ceased.

3.2 PREPARATION

A. Comply with manufacturer's recommendations for cleaning substrates and sprayed fire resistive materials (SFRM) to receive sprayed thermal insulation. Coordinate with Division 07, Section 07 81 00 "Applied Fire Protection" to ensure that materials in this section are compatible with and can be bonded to spray fireproofing.

B. Clean surfaces of substances harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, and that interfere with insulation attachment or impair adhesive bonding. Verify surface bonding and compatibility.

1. Surfaces to receive sprayed thermal insulation shall be free of all petroleum base greases and oils, loose mill scale, rust, poorly adhered paint and other foreign materials that could impair bonding to the surface.
2. Remove dust, loose dirt, foreign material on surfaces to which the Work is to be applied, which could otherwise create a false bond.
3. Contact manufacturer for procedures for handling primed/painted substrates. Verify bond requirements and compatibility of all surfaces to receive thermal insulation materials.

C. Coordinate application with Work of other trades, including ductwork, piping and equipment.

1. Ensure that clips, hangers, supports, sleeves and other attachments are placed prior to application of sprayed insulation.
2. Ensure that ducts, piping, equipment, or other items which would interfere with application of thermal insulation are not positioned until thermal insulation work is completed.

D. Ensure that proper temperature and ventilation is maintained in spaces to receive sprayed on fireproofing.

E. Provide adequate protection to adjacent surfaces from being sprayed by means of drop cloths, polyethylene sheets, or other suitable coverings to prevent overspray from coming into contact with unintended fixtures and surface. Overlap, seal and tape protection at edges to provide continuous protection of surfaces.

1. Close off and seal any duct work in areas where sprayed insulation is being applied.

3.3 APPLICATION

A. Mix and apply thermal insulation in strict accordance with manufacturer's published recommendations.

B. Spray apply insulation to envelope entire area indicated to receive sprayed thermal insulation. Apply insulation to substrate in sufficient thickness to achieve the required thermal value.

1. Use manufacturer recommended powered spray equipment that produces water-based adhesive to fibers as they discharge from the spray nozzle and produce a uniform thickness insulation layer free of starved spots or other evidence of thin applications of application patterns.
2. Apply insulation to substrate in sufficient thickness to achieve the required thermal value.
3. Use a one pass application procedure. Do not layer application.

C. Board tamp surface and apply a clear over spray sealer to the tamped sprayed insulation surface, in accordance with manufacturer's written instructions.

D. Apply spray sealer to the tamped sprayed insulation surface, in accordance with manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Representative. Engage manufacturer's field representative to attend preconstruction meetings, be at the site during installation, to approve substrate and first installation. Engage representative to train installer in installation of product.

B. Engage an independent testing inspection agency to inspect and verify the application of coating system.

1. Verify installed thickness to determine if thickness of installed material complies with requirements.
2. Perform pull test to determine if material meets bond strength specified.

C. Inspection shall be performed at least 24 hours after completion of final application coat.

D. Test results shall be made available to all parties at the completion of each pre-designated area and approval.

3.5 PATCHING

A. Patch and repair spray applied insulation damaged by the work of other trades, at no cost to the Owner.

3.6 CLEANING AND PROTECTION

A. Remove sprayed thermal insulation overspray from surfaces not required to be insulated.

B. Remove overspray from equipment, materials and surfaces not specifically required to be insulated. Perform all removal work while installed product is still wet. Ensure cleaning is up to industry standards.

C. Broom clean working areas affected by the Work of this Section.

D. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

1. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation
2. Apply protective coating to thickness indicated in manufacturer's coverage chart to tamped insulation after cleaning.
3. Apply vapor barrier to tamped insulation surface in accordance with manufacturer's written instructions.

END OF SECTION