**SECTION 23 07 16**

**HVAC EQUIPMENT INSULATION**

**PART 1 GENERAL**

1. REFERENCES
   1. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
   2. ASTM C534 – Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form
   3. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation
   4. ASTM C1534 – Standard Specification for Flexible Polymeric Sheet Insulation Used as a Thermal and Sound Absorbing Liner for Duct Systems
   5. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
2. SUBMITTALS
   1. Submit under provisions of Section 23 05 00.
   2. Product Data: For each product used in this project, provide catalog data for insulation, jackets and accessories, and installation instructions.
   3. Samples: Not required
3. QUALITY ASSURANCE
   1. Materials: Flame spread/smoke developed rating of 25/50 or less in per ASTM E84.
   2. Applicator: A company specializing in performing the work of this section with minimum 3-years experience.
4. DELIVERY, STORAGE AND HANDLING
   1. Deliver materials to site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
   2. Store insulation in original wrapping, and protect from weather and construction traffic.
   3. Protect insulation against dirt, water, chemical, and mechanical damage.

**PART 2 PRODUCTS**

1. CELLULAR GLASS INSULATION
   1. Provide molded, impermeable, noncombustible, cellular glass equipment insulation, with a K-value of 0.35 at 75°F. ASTM C552
      1. For interior applications, provide vapor barrier mastic and reinforcing membrane or 5 ply self-adhesive vapor barrier mold inhibiting jacket (0.0000 perms)
      2. For exterior applications, provide vapor barrier mastic, reinforcing membrane and aluminum jacket or : eliminate the mastic and aluminum jacket and use one product 5 ply self-adhesive vapor barrier mold inhibiting jacket (0.0000 perms), UV stable; no additional mechanical attachments needed.
   2. Provide open mesh, synthetic membrane to reinforce mastic finishes, with a thread count of 6 strands by 6 strands per square inch and a thickness of 27 mils.
   3. Provide 18-ga, Type 304 stainless steel tie wire with twisted ends on maximum 12" centers.
   4. Provide flexible, acrylic latex coating for use with cellular glass insulation to provide a vapor barrier finish.
2. ALUMINUM JACKET
   1. Provide 20-mil thick, stucco embossed pattern finish, Type 1100 aluminum jacket, and on horizontal equipment, locate seams on bottom. ASTM B209
   2. Provide 0.5" wide, 20-mil thick, Type 3003 aluminum bands on maximum 24" centers.
3. 5 PLY SELF-ADHESIVE VAPOR BARRIER AND WEATHER BARRIER JACKET
4. For pipes, provide Self-Adhesive high performance Vapor Barrier and Weather Barrier Jacket 6mils thick with a perm rating of 0.0000 and is UV stable– finishes include; stucco embossed white, embossed black and smooth silver, with 10-year warranty.
5. High performance acrylic adhesive capable of installation with no further mechanical attachments
6. AMRAFLEX/ARMACELL – ELASTOMERIC THERMAL INSULATION
7. Fiber free, closed cell and low VOC
8. Provide built-in vapor barrier
9. 2” thickness with R-Value of R-8
10. Apply sheet insulation to unit with manufacturer’s recommended adhesive glue all joints.

**PART 3 EXECUTION**

1. EXAMINATION
   1. Before applying insulation, verify that equipment inspection, testing and approval are complete.
   2. Before applying insulation, verify that surfaces are clean (all foreign material removed) and dry.
2. INSTALLATION
   1. Install materials in accordance with manufacturer's instructions.
   2. Do not insulate factory-insulated equipment.
   3. On exposed equipment, locate insulation seams in least visible locations.
   4. Apply insulation as close as possible to equipment by grooving, scoring, and beveling insulation as necessary, then secure to equipment with studs, pins, clips, adhesive, wires, or bands.
   5. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor barrier cement.
   6. Finish insulation at support, protrusions, and interruptions.
   7. Do NOT insulate over nameplate or ASME stamps, bevel and seal insulation around such.
   8. Install insulation for equipment requiring access for maintenance, repair, or cleaning, in such a manner that allows easily removal and replacement without damage.
   9. Chilled Water Pumps: Provide 2" thick, cellular glass equipment insulation.
      1. Install block insulation around pump assembly in such a fashion that it can be removed without damage to each half and secure with stainless steel bands
   10. Chilled Water Air Separators: Provide 2" thick, cellular glass equipment insulation.
   11. Chilled Water Expansion Tanks: Provide 2" thick, cellular glass equipment insulation.
   12. Chilled Water Chemical Treatment Shot Feeder: Provide 2" thick, cellular glass equipment insulation.
   13. Chilled Water Strainers at each air handler: Provide 2” thick cellular glass around assembly in such a fashion that it can be removed without damage to each half and secure with stainless steel bands

END OF SECTION