

November 2013, Rev 00

## **23 0713 – Ductwork Insulation**

### **PART 1. GENERAL**

#### 1.01 Section Includes

- A. Ductwork Insulation
- B. Insulation Jackets

#### 1.02 References

- A. IECC; International Energy Conservation Code 2012, C403.2.7
- B. ASHRAE Standard 90.1, 2010 – Energy Standard for Buildings; Tables 6.8.2A and 6.8.2B
- C. ANSI/ASTM C553 - Mineral Fiber Blanket and Felt Insulation.
- D. ANSI/ASTM C612 - Mineral Fiber Block and Board Thermal Insulation.
- E. ASTM E84 - Surface Burning Characteristics of Building Materials.
- F. ASTM E136 - Standard Test Method for the Behavior of Materials in a Vertical Tube Furnace at 750° C.
- G. ASTM E814 - Fire Tests of Through Penetrations Firestops.
- H. ASTM E2336-04 – Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems.
- I. National Commercial & Industrial Insulation Standards - 1999 Edition - as published by Midwest Insulation Contractors Association and endorsed by National Insulation Contractors Association.
- J. NFPA 96 - Standard for the Installation of Equipment for Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment.
- K. NFPA 255 - Surface Burning Characteristics of Building Materials.
- L. UL - XHEZ - Through Penetration Firestop Systems.
- M. UL 263 - Full Scale External Fire Tests with Hose Stream.
- N. UL 723 - Surface Burning Characteristics of Building Materials.

- O. UL 1479 - Fire Tests of Through Penetrations Firestops.
- 1.03 Quality Assurance
    - A. Applicator: Company specializing in ductwork insulation application with five years minimum experience. When requested, installer shall submit manufacturer's certificate indicating qualifications.
    - B. Materials: UL listed in Category HNKT; flame spread/smoke developed rating of 25/50 in accordance with ASTM E84, NFPA 255, or UL 723.
    - C. Adhesives: UL listed, meeting NFPA 90A/90B requirements.
  - 1.04 Submittals
    - A. Submit shop drawings including product description, list of materials and thickness for each service, and location.
    - B. Submit manufacturer's installation instructions.

## PART 2. PRODUCTS

- 2.01 Materials
  - A. Type A: Flexible Fiberglass - Outside Wrap; ANSI/ASTM C553; commercial grade; 0.28 maximum 'K' value at 75°F; foil scrim Kraft facing, 1.0 lb./cu. ft. density. Type 100, ASTM C 1136, Type II, AP (all Purpose) Facing, or FSK (Foil-Scrim-Kraft) Facing.
  - B. Type B: Semi-rigid Fiberglass Board Wrap – Outside Application; ANSI/ASTM C612, Class 1; 0.25 maximum 'K' value at 75°F; 3lb/cubic ft. density. FSK or ASJ as specified by A&E Services.
- 2.02 Jackets
  - A. Vapor Barrier Jackets: Kraft reinforced foil scrim vapor barrier with self-sealing adhesive joints. Beach puncture resistance ratio of at least 25 units. Tensile strength: 35 psi minimum. Single, self-seal acrylic adhesive on longitudinal jacket laps and butt strips.

## PART 3. EXECUTION

- 3.01 Installation
  - A. Install materials in accordance with manufacturer's instructions, codes, and industry standards.

- B. Install materials after ductwork has been tested.
- C. Clean surfaces for adhesives.
- D. Provide insulation with vapor barrier when air conveyed may be below ambient temperature.
- E. Exterior Duct Wrap - Flexible, Type A:
  - 1. Apply with edges tightly butted.
  - 2. Cut slightly longer than perimeter of duct to insure full thickness at corners. Do not wrap excessively tight.
  - 3. Seal butt joints with adhesive backed tape.
  - 4. Apply so insulation conforms uniformly and firmly to duct.
  - 5. Provide high-density insulation inserts at trapeze duct hangers and straps to prevent crushing of insulation. Maintain continuous vapor barrier through the hanger.
  - 6. Tape all joints with Royal Tapes #RT 350 (216-439-7229), Venture Tape 1525CW, or Compac Type FSK. No substitutions will be accepted without written permission from the Architect/Engineer.
  - 7. Press tape tightly to the duct covering with a squeegee for a tight continuous seal. Fish mouths and loose tape edges are not acceptable.
  - 8. All laps must be stapled or stitched and covered with tape.
  - 9. Vapor barrier must be continuous.
  - 10. Mechanically fasten on 12" centers at bottom of ducts over 24" wide and on all sides of vertical ducts.
- F. Continue insulation with vapor barrier through penetrations unless code prohibits.
- G. Provide 2" wide, 24" high, 26 gauge, galvanized sheet metal corner protection angles for all externally insulated ductwork extending to a floor or curb.

3.02 Duct and Plenum Insulation schedule, IECC C403.2.7

- A. Provide duct insulation on new and existing remodeled ductwork in the following schedule as approved by A&E Services:

Service	Insulation Type	Jacket	"R" Value	Insulation Thickness
Outside Air duct	Rigid fiberglass	FSK/ASJ	R-8	2"
Mixed Air duct	Rigid fiberglass	FSK/ASJ	R-6	2"
Exposed Supply duct	Rigid fiberglass	FSK/ASJ	R-6	2"
Concealed Supply duct	Rigid fiberglass	FSK/ASJ	R-6	2"
Exhaust and relief ducts	Rigid fiberglass	FSK/ASJ	R-6	2"

Heat Recovery units	Rigid fiberglass	FSK/ASJ	R-6	2”
Circular duct, hidden	Flexible	FSK only	R-6	2”

End of Division 23 0713

**This section of the NIU Design and Construction Standards establishes minimum requirements only. It should not be used as a complete specification.**