

Drafted below is a sample specification for Knauf KoolDuct® Pre-Insulated Ductwork. While fairly comprehensive, the document may not address all related subjects to the level of detail desired, but can be used as the basis for an actual product specification and modified as required.

### PART 1: PRODUCTS

#### 1.0 PHENOLIC FOAM PRE-INSULATED DUCTWORK

- A. Ductwork System materials, including the panel, adhesive, tape, sealant, flanges and gasket to be supplied as a matched system by Knauf Insulation, with the entire system listed by Underwriters' Laboratory to the UL-181 standard as a Class 1 air duct.
- B. The panel shall be manufactured of CFC-free phenolic foam thermobonded on both sides to a factory applied .001" (25 micron) aluminum foil facing reinforced with a fiberglass scrim. The thermal conductivity shall be no greater than 0.13BTU•in/Hr•ft<sup>2</sup>•°F (.018W/m•°C), and the density of the phenolic foam shall not be less than 3.5 pcf (56 Kg/m<sup>3</sup>) with a minimum compressive strength of 28psi (.2 MPa). The standard panel is 3/8" (22 mm) thick with an R-6.7 (1.2 RSI). For installations requiring higher insulation performance per energy code, a 13/32" (28 mm) thickness panel with R-8.5 (1.5 RSI) shall be utilized.

#### PART 2: LOW AND MEDIUM PRESSURE DUCT CONSTRUCTION (4 in. w.g.)

##### 2.0 PHENOLIC FOAM PRE-INSULATED DUCT CONSTRUCTION

- A. The contractor responsible for the fabrication and installation of phenolic foam pre-insulated ductwork shall be authorized with Knauf Insulation and shall have successfully completed Knauf Insulation's specialized training seminar.
- B. All duct construction shall strictly adhere to the following requirements:
  1. All duct segments to be fabricated, handled and installed in accordance with the "Knauf KoolDuct System Design Guide."
  2. Duct segments are to be constructed utilizing the V-groove method of fabrication. All external seams shall be taped, and all internal seams shall be fully sealed with an unbroken layer of silicon. Each duct segment shall be flanged with either

aluminum grip profile or Tiger connectors in accordance with the "Knauf KoolDuct System Design Guide." Duct reinforcement shall be applied to protect against side deformation from both positive and negative pressure per the "Knauf KoolDuct System Design Guide" based on ductwork size and system pressure.

3. All fabricated duct segment fittings shall be designed in accordance with "SMACNA HVAC Duct Construction Standards" latest edition.

### PART 3: DUCT INSTALLATION

#### 3.0 PHENOLIC FOAM PRE-INSULATED DUCT INSTALLATION

- A. Handling: Care shall be exercised in the handling and transport of duct segments in order to prevent objectionable aesthetic damage to the outer surface. Storage of duct segments shall be under cover and all material protected from the environment.
- B. Installation: Duct segments shall be installed by authorized contractors of Knauf Insulation, and in accordance with the "Knauf KoolDuct System Design Guide." It is the responsibility of the contractor to ensure that the ductwork system is properly and adequately supported. A number of support systems are outlined in the "Knauf KoolDuct System Design Guide" including 2" (51 mm) channel or uni-strut, and other proprietary supports. It shall be the responsibility of the contractor to ensure that the chosen method is compatible with the specific ductwork system. Supports on straight runs of ductwork shall be positioned at centers not exceeding 13' (3.96 m) for duct sections when fabricated in 13' (3.96 m) lengths with sides up to 46" (1168 mm). Larger duct sizes and short segments (4' long) (1220 mm) are supported at 6' centers or less, in accordance with the "Knauf KoolDuct System Design Guide." Additionally, ductwork shall be supported at changes of direction, at branch duct connections, tee fittings, and all duct accessories such as dampers, etc. The load of such accessories to the ductwork shall be neutralized by the accessory support.

- C. Air Leakage: Duct air leakage rates to be in compliance with "SMACNA HVAC Duct Construction Standards" latest version per applicable leakage class based on pressure.
- D. Outdoor Installations: The selection of the appropriate panel as listed in Section 1(b) shall be determined by the relevant Energy Code. All externally mounted duct-work shall be protected against the elements with a weatherproof finish per the "Knauf KoolDuct System Design Guide." The finish shall be either aluminum clad or coated.

1. Aluminum Clad: Duct segments shall incorporate 0.032" (22 gauge, 0.8 mm) minimum thickness aluminum or aluzinc sheet which is introduced during the fabrication process as detailed in the "Knauf KoolDuct System Design Guide." All external seams and joints shall be fully sealed with clear silicon. Subsequent to the curing, a 6" (152 mm) strip of self-adhesive, aluminum faced, rubberized bitumen membrane of 60 mil minimum thickness (as supplied by Knauf Insulation) shall be wrapped over all flanged joints, and a 4" (102 mm) strip shall be applied to all other seams on the outer surface of the aluminum duct segment shell if unsealed from the factory. Supports and reinforcement shall both be per SMACNA.
2. Coated: The ductwork shall be over-coated with two coats of trowel applied mastic with open weave #10 glass cloth embedded between the two coats as supplied. The coating is to be applied strictly to the Knauf Insulation's recommendations over all exposed ductwork including flanged connections. Supports shall be per SMACNA.
- E. Aluminum Clad Ductwork for Indoor Installations: Duct segments shall incorporate 0.025" (.6 mm) minimum thickness aluminum sheet which is introduced during the fabrication process as detailed in the "Knauf KoolDuct System Design Guide." Supports and reinforcement shall be per SMACNA.