

NON-FIBROUS CLOSED CELL OUTDOOR DUCTWORK SYSTEM

NON-FIBROUS CLOSED CELL OUTDOOR DUCTWORK SYSTEM PART 1 – GENERAL

1.01 WORK INCLUDED

A. Section includes pre-manufactured ductwork system consisting of inner foam liner for thermal efficiency, exterior pre-coted galvanized shell for low leakage and weather resistance.

1. Basis of Design: Pacific Shield Duct

1.02 GENERAL

- A. Inner Liner: System shall incorporate a fortified inner liner with included testing and passing the following:
1. ASTM C 423 noise reduction
 2. ASTM C 518: 2004, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
 3. ASTM C 1071 for erosion
 4. ASTM E 84 tested, Tunnel Test, Does not exceed 25 flame spread, 50 smoke developed.
 5. ASTM E 96/E 96M Procedure A for permeability
 6. ASTM E2257 Standard Test Method for Room Fire Test of Wall and Ceiling Materials and Assemblies
 7. NFPA Compliance:
 - a. NFPA 90A, "Installation of Air Conditioning and Ventilating Systems"
 - b. NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems"
 - c. NFPA 255, "Standard Method of Test of Surface Burning Characteristics of Building Materials"
 8. NRTL product approval, (Subpart S of 29 CFR Part 1910, OSHA)
 9. UL 181 Standard for Factory-Made Air Ducts and Air Connectors
 10. UL 723 Test for Surface Burning Characteristics of Building Materials
- B. Exterior Shell: System shall incorporate a UV stable, pre-coated galvanized exterior shell.
1. .20-.30 mill primer baked on finish
 2. .70-.80 mill polyester top coat

1.03 DUCTWORK CLASSIFICATION

A. Duct systems are to be classified and constructed per the SMACNA Velocity-Pressure classification system as follows:

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PART 2 - PRODUCTS

2.01 RECTANGULAR DUCTWORK AND FITTINGS

- A. The inner liner panel shall be manufactured of CFC-free closed cell rigid thermoset resin thermally bonded on both sides to a factory applied minimum 0.001" (25 micron) aluminum foil facing reinforced with a fiberglass scrim. The outer panel shall be a per-coated galvanized sheet metal jacket, with a .20-.30 mil primer baked on finish with a .70-.80 mill polyester UV stable topcoat.
- B. Materials:
1. The density of the inner foam liner shall not be less than 3.43 pcf (55 Kg/m³) with a minimum compressive strength of 28 psi.
 2. Maximum Temperature: Continuous rating of 185 degF to -15 degF inside ducts or ambient temperature surrounding ducts.
 3. Maximum Thermal Conductivity: 0.146 Btu-in./h-sqft.-degF at 75 degF mean temperature.
 4. Antimicrobial Agent: Additive for antimicrobial shall not be used but instead, raw product must pass UL bacteria growth testing
 5. Required Markings: All interior duct liner shall bear UL label and other markings required by UL 181 on each full sheet of duct panel.
 6. All insulation materials shall be closed cell with a closed cell content of >90%.
 7. Internal Tape: 3M high temperature, high strength, UL181A-P foil tape with coated cold weather acrylic adhesive.
 8. Outer Sealant: Novagard, NovaFlex Metal Roof Adhesive Sealant.
 9. Outer Jacket: galvanized steel pre-coated with a UV stable 20-.30 mil primer baked on finish with a .70-.80 mill polyester top coat.
 - a. Standard gray finish with custom colors available
 10. Duct Connections: TDC (SMACNA Figure 2-1, Page 2.9, T-25a) a.
 11. Connection Cover:
 - a. Connections are field sealed airtight before the cover is installed. (Optional: Any closed-cell, mold-resistant, elastomeric thermal insulation tape may be used to cover TDC connections prior to metal connection cover installation.)
 - b. Pacific Shield Connection covers and corners are manufactured using galvanized steel pre-coated with a UV stable 20-.30 mil primer baked on finish with a .70-.80 mill polyester top coat.

PART 3 – EXECUTION

3.01 FABRICATION

- A. Fabrication:
1. Pre-fabricated joints, seams, transitions, taps, elbows, tees, and access doors according to Manufacturer's instructions.

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2. Pre-fabricated radius heel 45 degree throat elbow (SMACNA Figure 4-2, page 4.4).
3. Pre-fabricated ductwork shall include 5 inches of straight on the end of each connecting piece, leaving room to install the connection cover.
4. Fabricated duct segments utilizing internal and external sealed Pittsburgh seams. Internal seams will be sealed with VOC silicone. Each duct segment will be factory supplied with either 4-bolt TDC or slip-on flange in accordance with manufacturer's submittal package.
5. Applied internal and external duct reinforcement to prevent swelling and narrowing of duct based on positive and negative pressure guidelines provided by the manufacturer.
6. Designed and fabricated duct segments and fittings will be in compliance with latest edition SMACNA HVAC Duct Construction Standards.
7. Both positive and negative ductwork and fittings shall be constructed to incorporate a UL Listed – Class 1 air duct to Standard for Safety UL 181 liner with an exterior pre-coated galvanized shell
8. Duct shall be constructed to meet requirements for rain, snow and wind load.

3.02 DUCT INSTALLATION

- A. Duct segments shall be installed per standard TDC installation guidelines provided by the Manufacturer.
- B. Duct air leakage to comply with the latest version of "SMACNA HVAC Air Duct Leakage Test Manual" in accordance with the applicable pressure class.

3.03 HANGER AND SUPPORT INSTALLATION

- A. Contractor to ensure ductwork is properly and adequately supported per the SMACNA HVAC Duct Construction Standards.
- B. Supports on straight runs of ductwork shall be spaced 6-8 feet apart and shall not exceed 12 feet in spacing.
- C. Ductwork shall be supported at changes of direction, branch connection pieces, tees, parallel to elbow turning vanes, and duct accessories.

3.04 DUCT SCHEDULE

- A. Exterior Duct and Fittings:

1. Pacific Shield Rectangular
 - a. Minimum Panel Thickness: 22 mm
 - b. Galvanized Steel Outer Shell: 0.0336 inch