

## **SECTION 15082**

### **Sheet Metal Ducts – Thermal Insulation Wrap Commercial/Residential Duct Systems**

#### **PART 1.00 - GENERAL**

##### **1.01 Scope**

###### **1.02**

A. The work covered by this specification consists of furnishing all labor, equipment, materials and accessories, and performing all operations required, for correct fabrication and installation of fibrous glass thermal insulation wrap on commercial or residential air duct systems of sheet metal, in accordance with applicable project drawings and specifications, subject to terms and conditions of the contract:

1. All air duct systems operating at internal air temperatures not exceeding 250°F (121°C).

B. The finished duct system shall meet the requirements of NFPA 90A and 90B.

C. Duct wrap insulation shall meet the requirements of ASTM C 1290, Type III, to maximum service temperature of 250°F (121°C). Facing material shall meet the requirements of ASTM C 1136, Type II, when surface burning characteristics are determined in accordance with ASTM E 84 with the foil surface of the material exposed to the flame as it is in the final composite.

Note to specifiers – Federal Specification HH-I-558B (Amendment 3), Form B (covering the duct wrap), and Federal Specification

HH-B-100B (covering the facing), are obsolete. These are replaced by the above referenced ASTM specifications.

D. Dimensions shown on the plans are finished inside dimensions.

E. Duct wrap shall be installed in accordance with manufacturer's instructions in such a manner that the insulation will provide the installed R-value as published for the product and printed on the facing, thus assuring specified in-place thermal performance.

##### **1.02 Delivery and Storage of Materials**

A. Deliver all insulation materials and fabricated duct sections and fittings to the job site and store in a safe, dry place.

B. Use all means necessary at the job site to protect materials from dust, dirt, moisture and physical abuse before and during installation.

#### **PART 2.00 - PRODUCTS**

##### **2.01 Insulated Duct System**

A. All supply ducts, return ducts and related fittings shall be insulated with one of the following as designated on project plans and specifications:

1. Owens Corning Fiberglas All-Service Duct Wrap

a. Type 75, 0.75 lb./cu.ft. (12 kg/m<sup>3</sup>) density: 1 1/2", 2", 2.2" or 3" (38mm, 51mm, 56mm or 76mm) thick

b. Type 100, 1.0 lb./cu.ft. (16 kg/m<sup>3</sup>) density: 1 1/2" or 2" (38mm or 51mm) thick

c. Type 150, 1.5 lb./cu.ft. (24 kg/m<sup>3</sup>) density: 1 1/2" or 2" (38mm or 51mm) thick

The duct wrap insulation shall consist of a blanket of glass fibers factory-laminated to a reinforced foil/kraft (FRK) vapor retarder facing with a 2" (50mm) (min.) stapling and taping flange on one edge.

When installed in accordance with recommended installation procedures, duct wrap insulation shall provide installed R-values as shown in Table 1 below.

#### **PART 3.00 - EXECUTION**

##### **3.01 Inspection**

A. Verify that the duct wrap may be installed in accordance with project drawings and operating performance parameters and limitations.

##### **3.02 Insulation of Straight Duct and Fittings**

A. Before applying duct wrap, air ducts shall be clean, dry and tightly sealed at all joints and seams.

B. All portions of duct designated to receive duct wrap shall be completely covered with duct wrap.

C. To ensure installed thermal performance, duct wrap insulation shall be cut to "stretch-out" dimensions as shown in Table 2 below.

D. A 2" (50mm) piece of insulation shall be removed from the facing at the end of the piece of duct wrap to form an overlapping stapling and taping flap.

E. Install duct wrap insulation with facing outside so that the tape flap overlaps the insulation and facing at the other end of the piece of duct wrap. Adjacent sections of duct wrap insulation shall be tightly butted with the 2" (50mm) stapling and taping flap overlapping. If ducts are rectangular or square, install so insulation is not excessively compressed at corners. Seams shall be stapled approximately 6" (150mm) on center with 1/2" (13mm) (min.) steel outward clinching staples.

F. Seams and joints shall be sealed with pressure-sensitive tape matching the insulation facing (either plain foil or FRK backing stock) or glass fabric and mastic. Cloth duct tape of any color or finish using reclaimed rubber adhesives is not recommended for use on duct wrap insulation. Adjacent sections of duct wrap shall be tightly butted with the 2" (50mm) tape flap overlapping.

G. Where rectangular ducts are 24" (600mm) in width or greater, duct wrap insulation shall be additionally secured to the bottom of the duct with mechanical fasteners such as pins and speed clip washers, spaced on 18" (425mm) centers (maximum) to prevent sagging of insulation.

H. Where a vapor retarder is required, seal all tears, punctures and other penetrations of the duct wrap facing using one of the above methods to provide a vapor tight system.

### 3.03 Inspection

A. Upon completion of installation of duct wrap and before operation is to commence, visually inspect the system and verify that it has been correctly installed.

B. Open all system dampers and turn on fans to blow all scraps and other loose pieces of material out of the duct system. Allow for a means of removal of such material.

C. Check the duct system to ensure that there are no air leaks through joints.

### 3.04 Safety Precautions

A. Contractor's employees shall be properly protected during installation of all insulation. Protection shall include proper attire when handling and applying insulation materials, and shall include (but not be limited to) disposable dust respirators, gloves, hard hats and eye protection.

B. The contractor shall conduct all job site operations in compliance with applicable provisions of the Occupational Safety and Health Act, as well as with all state and/or local safety and health codes and regulations that may apply to the work.

## APPENDIX

**Table 1: Installed Thicknesses and R-Values**

	Nominal Thickness, in. (mm)	Installed Out-of-Package R-Value*	Thickness,** in. (mm)	Installed R-Value*
TYPE 75 - 0.75 pcf (12 kg/m3)	1 1/2 (38)	5.0 (0.88)	1 1/8 (29)	4.2 (0.74)
	2 (51)	6.7 (1.18)	1 1/2 (38)	5.6 (0.99)
	2.2 (56)	7.4 (1.30)	1 5/8 (41)	6.0 (1.06)
	3 (76)	10.0 (1.76)	2 1/4 (57)	8.3 (1.46)
TYPE 100 - 1.00 pcf (16 kg/m3)	1 1/2 (38)	5.6 (0.99)	1 1/8 (29)	4.5 (0.79)
	2 (51)	7.4 (1.30)	1 1/2 (38)	6.0 (1.06)
TYPE 150 - 1.50 pcf (24 kg/m3)	1 1/2 (38)	6.0 (1.06)	1 1/8 (29)	4.8 (0.85)
	2 (51)	8.0 (1.41)	1 1/2 (38)	6.4 (1.13)

\* hr•ft<sup>2</sup>•°F/Btu (m<sup>2</sup>•°C/W) at 75°F (24°C) mean temperature.

\*\* Assumes 25% compression of insulation.

**Table 2: Material Requirements to Achieve Installed R-Value**

Nominal Thickness, in. (mm)	Installed Thickness, in. (mm)	Stretch-out Dimensions, in. (mm)		
		Round and Oval Ducts	Square Ducts	Rectangular Ducts
1 1/2 (38)	1 1/8 (29)	P + 9 1/2 (P + 240)	P + 8 (P + 205)	P + 7 (P + 180)

2	11/2	P + 12	P + 10	P + 8
(51)	(38)	(P + 305)	(P + 255)	(P + 205)
2.2	15/8	P + 13	P + 11	P + 8 1/2
(56)	(41)	(P + 330)	(P + 280)	(P + 215)
3	21/4	P + 17	P + 14 1/2	P + 11 1/2
(76)	(57)	(P + 430)	(P + 370)	(P + 290)

P = measured duct perimeter