

1 **GENERAL**

1.1 **REFERENCES**

- .1 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE).
- .2 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM A 480/A480M-12, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip.
 - .2 ASTM A 635/A635M-09b, Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Carbon, Hot Rolled.
 - .3 ASTM A 653/A653M-11, Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
- .3 Department of Justice Canada (Jus).
 - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33 .
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).
- .5 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).
 - .1 SMACNA HVAC Duct Construction Standards – Metal and Flexible, 2nd Edition 2005 and Addendum No. 1, 1997.
 - .2 IAQ Guideline for Occupied Buildings Under Construction 2007, 1st Edition.

1.2 **SUBMITTALS**

- .1 Submit shop drawings and product data in accordance with Section 01 00 10 – General Instructions.
- .2 Product Data: submit WHMIS MSDS – Material Safety Data Sheets in accordance with Section 01 00 10 – General Instructions for the following:
 - .1 Sealants.
 - .2 Tape.

1.3 **QUALITY ASSURANCE**

- .1 Certification of Ratings:
 - .1 Catalogue or published ratings shall be those obtained from tests carried out by manufacturer or independent testing agency signifying adherence to codes and standards.
- .2 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 – Health and Safety Requirements.

2 **PRODUCTS**

2.1 **SEAL CLASSIFICATION**

.1 Classification as follows:

Maximum Pressure Pa	SMACNA Seal Class
500	A

.2 Seal classification:

- .1 Class A: longitudinal seams, transverse joints, duct wall penetrations and connections made airtight with sealant and tape.
- .2 All low pressure ductwork shall be sealed to SMACNA Seal Class A.

2.2 **SEALANT**

.1 Sealant: oil resistant, water borne, polymer type flame resistant duct sealant. Temperature range of minus 30 degrees C to plus 93 degrees C.

2.3 **TAPE**

.1 Tape: polyvinyl treated, open weave fiberglass tape, 50 mm wide.

2.4 **FITTINGS**

.1 Fabrication: to SMACNA.

.2 Radiused elbows.

- .1 Rectangular: standard radius.
- .2 Round: smooth radius.

.3 Mitered elbows, rectangular:

- .1 To 400mm: with single thickness turning vanes.
- .2 Over 400mm: with double thickness turning vanes.

.4 Branches:

- .1 Rectangular main and branch: with radius on branch 1.5 times width of duct.
- .2 Round main and branch: enter main duct at 45 degrees with conical connection.
- .3 Provide volume control damper in branch duct near connection to main duct.

.5 Transitions:

- .1 Diverging: 20 degrees maximum included angle.
- .2 Converging: 30 degrees maximum included angle.

.6 Offsets:

- .1 Full radiused elbows.

2.5 **FIRE STOPPING**

.1 Retaining angles around duct, on both sides of fire separation shall be in accordance with Section 07 84 00 – Fire stopping.

- .2 Fire stopping material and installation must not distort duct.

2.6 GALVANIZED STEEL

- .1 Lock forming quality: to ASTM A 653/A653M, Z90 zinc coating.
- .2 Thickness, fabrication and reinforcement: to SMACNA.
- .3 Joints: to SMACNA

2.7 HANGERS AND SUPPORTS

- .1 Hangers and Supports: in accordance with Section 23 05 29 – Hangers and Supports for HVAC Piping and Equipment.
 - .1 Strap hangers: of same material as duct but next sheet metal thickness heavier than duct.
 - .1 Maximum size duct supported by strap hanger: 200.
 - .2 Hanger configuration: to SMACNA.
 - .3 Hangers: black steel angle with black steel rods to following table:

Duct Size (mm)	Angle Size (mm)	Rod Size (mm)
up to 750	25 x 25 x 3	6
751 to 1050	40 x 40 x 3	6
1051 to 1500	40 x 40 x 3	10
1501 to 2100	50 x 50 x 3	10
2101 to 2400	50 x 50 x 5	10
2401 and over	50 x 50 x 6	10

- .4 Upper hanger attachments:
 - .1 For concrete: manufactured concrete inserts.

3 EXECUTION

3.1 GENERAL

- .1 Do work in accordance with SMACNA.
- .2 Do not break continuity of insulation vapour barrier with hangers or rods.
 - .1 Insulate strap hangers 100 mm beyond insulated duct.
- .3 Support risers in accordance with SMACNA.
- .4 Install breakaway joints in ductwork on sides of fire separation.
- .5 Install proprietary manufactured flanged duct joints in accordance with manufacturer's instructions.
- .6 Manufacture duct in lengths and diameter to accommodate installation of acoustic duct lining.

3.2 HANGERS

- .1 Strap hangers: install in accordance with SMACNA.

- .2 Angle hangers: complete with locking nuts and washers.
- .3 Hanger spacing: in accordance with SMACNA

3.3 SEALING AND TAPING

- .1 Apply sealant to outside of joint to manufacturer's recommendations.
- .2 Bed tape in sealant and recoat with minimum of one coat of sealant to manufacturers recommendations.