

PART 1 - GENERAL

1.1 SUMMARY

- .1 Section Includes:
 - .1 Materials and installation of high-pressure metallic ductwork, joints and accessories.
- .2 Related Sections:
 - .1 Section 01 33 00: Submittal Procedures.
 - .2 Section 01 35: Health and Safety Requirements.
 - .3 Section 01 74: Construction/Demolition Waste Management and Disposal.
 - .4 Section 23 05: Bases, Hangers and Supports

1.2 REFERENCES

- .1 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE).
- .2 American Society for Testing and Materials (ASTM).
 - .1 ASTM A 653/A 653M-15e1, 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.
 - .2 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).
- .5 Sheet Metal Air Conditioning Contractors' National Association (SMACNA).
 - .1 SMACNA 1966-2006, HVAC Duct Construction Standards, Metal and Flexible.
 - .2 SMACNA 016-2012, HVAC Air Duct Leakage Test Manual.
 - .3 SMACNA 008-2008, IAQ Guideline for Occupied Buildings under Construction.

1.3 SUBMITTALS

- .1 Submit shop drawings and product data in accordance with Section 01 33 00 - Submittal Procedures.

1.4 QUALITY ASSURANCE

- .1 Certification of Ratings: catalogue or published ratings to be those obtained from tests carried out by manufacturer or independent testing agency signifying adherence to codes and standards.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Protect on site stored or installed absorptive material from moisture damage.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21- Construction/Demolition Waste Management and Disposal.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .3 Collect and separate for disposal paper plastic, polystyrene, corrugated cardboard and packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
 - .4 Place materials defined as hazardous or toxic in designated containers.
 - .5 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
 - .6 Seal emptied containers and store safely.
 - .7 Fold up metal and plastic banding, flatten and place in designated area for recycling.

PART 2 - PRODUCTS

2.1 CLAMP TOGETHER DUCTWORK FOR WELD EXHAUST SYSTEM

- .1 Clamp Together Duct:
 - .1 The clamp together duct system manufacturer, to offer a full line of duct and components as part of their regular business. All parts to be of standard sheet metal construction with a rolled lip applied to the each end of the component. An all-stainless steel over-center locking clamp is used to encompass the rolled lips, pull them together and then securely join them. Adapters to enable connection to virtually any machine or existing duct must be available from the same manufacturer as part of their clamp together duct system.

- .2 Duct Clamps:
 - .1 Provide duct clamps from the clamp duct system manufacturer complete with a lifetime guarantee. The lifetime guaranteed clamp is fitted with a 'winged- O-ring' gasket made of ePTFE. The gasket is designed to fully encompass the entirety of the rolled lips including the area formed by the 'v' between the rolled lips.
- .3 Ducting:
 - .1 Provide the clamp together straight duct in nominal 5' lengths. Adjustable sleeves and adjustable components must be available as part of the duct system. In addition to the adjustable sleeves, all components such as elbows, tees, reducers, branch take-offs & any part with a collar, must have the ability to also provide adjustability without the use of flanges to enable the installer to quickly make odd lengths and to adjust for a proper fit.
- .4 Ducting Material:
 - .1 Duct and Components are to be 304 or 316 stainless. Standard gauges for the duct to be 26 ga for 75mm, 24 ga for 100mm-150mm, 22 ga for 125mm-300mm and 20 ga for sizes 330mm-620mm. Elbows are to be one gauge heavier than standard duct gauge. All components (reducers, branches, etc) are to be 18 ga material. Elbows to have a radius of 2 ½ times the diameter.
 - .2 The rolled lip on the duct and fittings are to act as a stiffing ring and therefore allow the product to withstand much higher pressures than normally associated with spiral or other rolled duct. Ducting to be designed to operate at pressure applications up to 40" negative water column pressure. Higher pressure guarantees to be are available from manufacturer.
- .5 Acceptable Materials:
 - .1 Kirk & Blum.
 - .2 Nordfab

2.2 HANGERS AND SUPPORTS

- .1 Hangers and Supports: in accordance with Section 23 05 29 – Bases, Hangers and Supports.
 - .1 Band hangers: use on round and oval ducts up to 500 mm diameter, of same material as duct but next sheet metal thickness heavier than duct.
 - .2 Trapeze hangers: ducts over 500 mm diameter or longest side, to ASHRAE and SMACNA.
 - .3 Hangers: black steel angle with galvanized steel rods to ASHRAE and SMACNA following table:

Duct Size	Angle Size	Rod Size
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<u>(mm)</u>	<u>(mm)</u>	<u>(mm)</u>
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 steel joist: manufactured joist clamp or steel plate washer.
 - .2 For steel beams: manufactured beam clamps:

PART 3 - EXECUTION

3.1 GENERAL

- .1 Do work in accordance with ASHRAE, ACGIH and SMACNA as indicated.
- .2 Do not break continuity of insulation vapour barrier with hangers or rods.
 - .1 Insulate band hangers 100 mm beyond insulated duct.
 - .2 Confirm diffuser is fully seated.
- .3 Support risers in accordance with ASHRAE and SMACNA and as indicated.
- .4 Install breakaway joints in ductwork on sides of fire separation.
- .5 Ensure installation of firestopping does not distort duct.

3.2 HANGERS

- .1 Band hangers: install in accordance with SMACNA.
- .2 Angle hangers: complete with locking nuts and washers.
- .3 Hanger spacing: in accordance with ASHRAE SMACNA and as follows:

<u>Duct Size</u> <u>(mm)</u>	<u>Spacing</u> <u>(mm)</u>
to 1500	3000
1501 and over	2500

3.3 LEAKAGE TESTS

- .1 In accordance with SMACNA HVAC Duct Leakage Test Manual.
- .2 Perform leakage tests in sections.
- .3 Perform trial leakage tests, as instructed to demonstrate workmanship.
- .4 Do not install additional ductwork until trial tests have been achieved.
- .5 Test section minimum of 30m long with not less than three branch takeoffs and two (2) 90 degrees elbows.
- .6 Complete tests before performing insulation or concealment Work.

END OF SECTION