Nordfab Ducting Asia
General Specifications

NORDFAB Ducting

Structural Integrity and General Engineering Specification for Quick-Fit Ducting

Applications

Nordfab's Quick-Fit® Ducting System has been used in many different industrial applications, and under various negative static pressures.

The typical design range we see in our applications range from -500 Pa to - 7,000 Pa; however, we have some systems operating at vacuums of -8,000 Pa to -10,000 Pa under normal operating parameters.

Our straight duct comes in 1500 mm lengths with a rolled lip on each end, thus providing reinforcement every 1500 mm, which presents a sound structural design that should be as strong or stronger than any straight duct in its class.

Structural Integrity

All fit-together ducting systems allow for some degree of leakage where they are joined. QF® ducting is no exception and is not sold as an airtight system.

Nordfab's QF duct has leak-resistant longitudinal groove seams. Application of sealants to the individual rolled ends can enhance the tightness of the system. However, the QF system is sold as a quick way of installing and modifying ductwork while at the same time retaining the usability of each component. In short, QF is designed with the capability to be taken apart, re-assembled, stored or moved. Completely eliminating the possibility for leakage jeopardizes the inherent benefits of the duct.

While Nordfab is currently unaware of any method of evaluating dust collection piping alone, the following data is presented using the criteria for all duct, including HVAC. This data is presented only for the purpose of indicating acceptability of the QF in dust/fume removal in a negative pressure situation and should not be confused with the ducting that uses tape or gaskets as sealant in the positive conveyance of air.

Leakage Rate

Standard QF ductwork is designed to provide tight sealing and efficient airflow under negative pressures. To that end, we are providing the following information for ducting situations where fan sizing is of extreme importance. The following data was obtained using standard components and was performed in accordance with the SMACNA, "HVAC AIR DUCT LEAKAGE TEST MANUAL". The information gives the leakage rate per joint of duct at various pressures. To utilize the chart, count the number of clips (this equals the number of pieces) per size and multiply by the number given beside the corresponding diameter and under the applicable pressure. These numbers assume that the product is correctly installed, free of dents in the joining ends, and that the gasket is in place. Special gasket material and sealants will increase the sealing capabilities.

Manufacturing Profile

Nordfab Asia manufactures Quick-Fit Ducting in Chonburi, Thailand. Nordfab QF duct is a clip-together design using a rolled edge design

Leakage Class Determined In Accordance With SMACNA Class 3

Ø mm	Avg. leakage per 30 M	
	127 mm WG	254 mm Wg
100 - 160	8.4 CMH	10.1 CMH
180 - 125	4.2 CMH	5.9 CMH
315 - 500	3.3 CMH	6.7 CMH

Leakage Rate In CFM Per QF Joint

Ø mm	762 Pa	1270 Pa	1905 Pa	2540 Pa	3810 Pa	5080 Pa	6350 Pa	7620 Pa
100	0.34	0.43	0.51	0.51	0.60	0.85	1.02	1.36
125	0.34	0.43	0.51	0.51	0.60	0.85	1.02	1.36
140	0.34	0.43	0.51	0.51	0.60	0.85	1.02	1.36
160	0.34	0.43	0.51	0.51	0.60	0.85	1.02	1.36
180	0.34	0.43	0.51	0.51	0.60	0.85	1.02	1.36
200	0.34	0.43	0.51	0.51	0.60	0.85	1.02	1.36
250	0.34	0.43	0.51	0.51	0.60	0.85	1.02	1.36
315	0.51	0.51	0.68	0.68	0.68	1.02	1.19	1.53
350	0.51	0.51	0.85	1.19	1.36	1.36	1.53	1.87
400	0.51	0.68	1.02	1.19	1.70	1.87	2.04	2.38
450	0.68	0.68	1.19	1.36	1.87	2.21	2.55	2.88
500	0.68	1.02	1.36	1.53	2.04	2.55	2.88	3.40

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with a single lever clip. The ducting and clips are constructed from similar materials.
All clips contain a standard gasket made of Nitrile which is suitable for most applications, including oil mist, as long as high temperatures are not an issue. Silicone and ePTFE gasket options are available for higher temperature applications.

Engineering Specification

Ducting shall consist of the following:

a. Galvanized: JIS G 3302 with a G90 rating
   i. Recommended max. service temperature is 200° C. At temperatures ranging between 200° C and 248° C, the zinc-iron alloy layers in galvanized steel will continue to provide a high level of protection from corrosion. However, there may be some peeling, changes in mechanical properties, and reduction in the corrosion protection.
b. 304SS: Finish meets ASTM A240
   i. Temp rating is 200° C
c. 316SS: Finish meets ASTM A240
   i. Temp rating is 593° C

Ducting manufacturing techniques:

a. Diameters 80 mm to 710 mm QF Duct, Quick-Fit Slip Ducts, and collars attached to other components will have one or both ends die formed-rolled to provide a uniform edge around the circumference of the rolled end. The duct and slip ducts shall have the longitudinal seam lockformed to allow for a tighter slip joint and reduce system pressure losses. All lockformed seams will undergo a light test to ensure there are no voids or imperfections in the system. Duct lengths using longitudinal groove seams will not exceed a nominal 1500 mm length. The rolled end is used for clamping components together as well as offering reinforcement Rolled edges provide structural support at 1500 mm intervals or less and can be interpreted as a stiffener where SMACNA specifications are required.
   A Slip Duct is used for adjustment during the install process. Straight duct is cut to appropriate length and the Slip Duct secures the duct for install.
b. QF Duct and other QF components larger than 710 mm shall utilize either an angle flange or flat flange attached loosely and retained in place using a vanstone lip. The flanged pipe shall have a solid welded seam and not exceed nominal 1500 mm length. The angle or flat flanges provide structural support at 1500 mm intervals or less and are considered as stiffeners where SMACNA specifications are required.
c. Components which will be air direction sensitive will have an arrow label attached showing the proper flow direction.

Clamping rolled edged duct:

a. Clips shall be constructed with an over-center, spring-lever action for quick connecting of two pieces of ducting. A retaining pin shall be inserted in the handle and an eyelet on the clip as a safety feature to ensure the handle does not prematurely come undone.
b. When closing the clip, the internal seal shall be compressed in such a manner as to cover both rolled beads for optimum sealing capacity in a full 360° pattern.

Optional caulking and other materials governing system temperature ratings if applicable:

a. Approved caulk is 3M Scotch Seal Metal Sealant 2315 or 2084 or equivalent for system temperatures of 121°C or lower
b. Optional approved caulk is 3M Polyurethane Adhesive Sealant 540 or equivalent for system temperatures of 121°C or lower
c. Optional approved caulk is Rock River Silicone Sealant or equivalent for system temperatures of 204°C or lower
d. Optional approved caulk is Red Devil HVAC/R High Temperature-Silicone Sealant (red in color) or equivalent for system temperatures of 260°C or lower
e. Sealing o-rings
   i. Buna-N, ASTM D2000 MBC610, 60 Durometer Hardness, with a temperature rating of 121°C maximum and is black in color, used with the Quick-Fit Sleeve.
   ii. Silicone rubber, ASTM D2000 MGE705, FDA approved, 70 Durometer Hardness, and is red in color, used with the Slip Duct.
f. Sealing gaskets
   iii. Molded gaskets shall meet the material classification of ASTM D-2000 M2BG510 A24 B34 EO14 EO34 EF11 EF21 and used in systems where the temperature

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rating is 107°C or less and are black in color. This component shall be made using conductive materials for conductivity.

iv. Sponge o-ring shall meet the material classification of either ASTM D-1056-68 – SBE43 or ASTM D1056-85, 91, 98 – 2B3

g. Clip seals shall be made of one of the following:
   1. Nitrile to meet or exceed ASTM D1056 2B2 standards with a temperature rating not to exceed 70°C constant temperature (or intermittent temperature of 90°C).
   2. Silicone to meet or exceed ASTM D1056 2D2 standards with a temperature rating not to exceed 204°C
   3. ePTFE not degraded by any common chemicals in the 0-14 PH range. Temperature rating shall not exceed 315°C.

Conductivity:

Metal-to-metal contact shall be obtained at all joint connections. Die-formed rolled edges are uniform in shape which provides the most consistent contact. The ears of the Clip contact with the rolled edges and provide maximum conductivity. Conductivity shall be adhered to per NFPA 77 paragraph 8.4.1.1; states all parts of the continuous metal piping system should have a resistance level that does not exceed 10 ohms. Testing is the responsibility of the owner.

Collapsibility Strength of QF Piping

Each size of ducting has been tested for strength against collapsing. The ducting was exposed to constant positive pressure and constant vacuum. Each duct was exposed to a maximum capacity of the test equipment of 20,000 Pa of vacuum and positive pressure. None of the duct showed deformation during the test. Duct and fittings must be installed in accordance with Nordfab's standard specifications and normal good workmanship practices.

CERTIFIED ISO 9001 · ISO 14001 UKAS MANAGEMENT SYSTEMS 001

Nordfab is ISO 9001:2015 and ISO 14001:2015 certified.

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