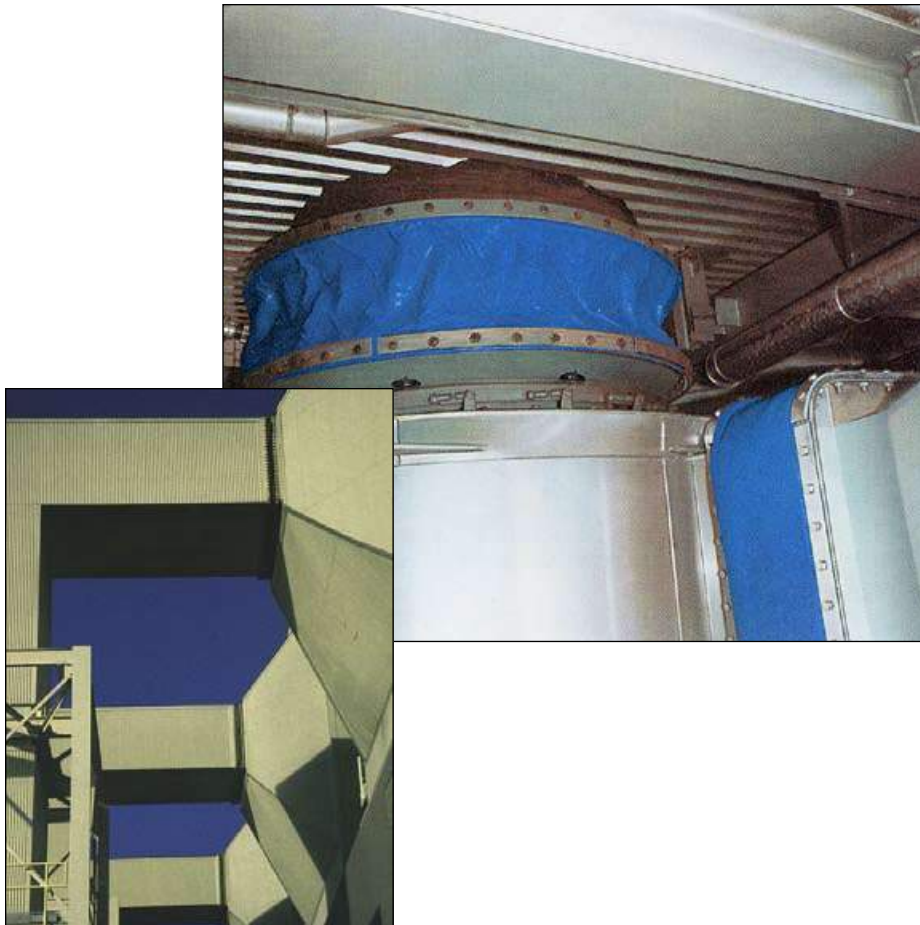

GARLOCK 8400-HT

Custom Flue Duct & Flexible Bellow Expansion Joints



Garlock
SEALING TECHNOLOGIES®

an EnPro Industries company

Garlock Style 8400-HT / High Temperature Flue Ducts

The Garlock Expansion Joint Division takes great pride in being able to offer one of the most versatile lines of sealing solutions in the industry. For over 55 years we have been solving application problems within the industrial marketplace by manufacturing custom engineered, elastomeric expansion joints. Garlock is now pleased to announce the addition of the 8400-HT style to our existing flue duct family of products.

As one of the first in the industry to manufacture and supply flue ducts to the industrial segment, specifically power generation, we understand the uniqueness that each application may bring. In typical Garlock fashion, the 8400-HT will be custom designed to meet or exceed the individual requirements of each application or system design specifications. The 8400-HT is available in a multitude of configurations and material combinations, complimenting our existing 8400 family of lower temperature products (8400-250, 8400-300, 8400-400). The 8400-HT is able to accommodate operating temperatures as low as -75°F (-60°F) up to 2200°F (1200°C).

Due to the unlimited number of designs and material combinations, each expansion joint will be custom manufactured. A customer drawing will be forwarded for approval to insure compatibility and functionality based on the system design requirements.

Application Overview

Generally speaking, fabric or rubber flue duct style expansion joints are comprised of one or more layers of materials – fabric, rubber, wire reinforcement, and/or vapor barriers or sealing films. Depending on the application requirements, the sealing films or vapor barriers may need to be protected against thermal and mechanical influences – this is done by using a variety of composite layers including rubber, fabric, wire mesh, insulation, etc.

Specific combinations of fluorine based hydrocarbon polymers and reinforcing materials offer an unusually high resistance to corrosive substances at high temperatures, ideal for most operating conditions in flue gas desulfurization systems (FGD);

- Very good rebound characteristics that help resist permanent deformation
- Special resistance to SO_2 , H_2SO_4 and other corrosive chemical substances
- Continuous operating temperature in excess of 400°F

In addition to FGD systems non metallic, flue duct style expansion joints, are commonly used in gaseous medias such as hot air, chemical vapors, engine exhaust, etc. For example:

- Steam boiler systems
- Gas Turbine Exhausts
- Industrial furnace & chimney construction
- Refuse incinerators
- Ventilation and aeration systems
- HPI, CPI emissions control
- Pulp & Paper industry

Application Data Submittal

The constant operating temperature, to a large extent, dictates the selection of suitable materials of construction for a Garlock fabric expansion joint. These components can be designed for temperatures ranging from -75°F (-60°C) to 2200°F (1200°C). When dealing with temperatures in excess 930°F (500°C), often times internal insulation is necessary to protect the expansion joint.

Application data is critical towards insuring optimum service life of the products. It is imperative to pay attention to detail when gathering such information as installation dimensions, pressure & temperature fluctuations, fluid chemistry and dynamics, anticipated movements or thermal cycling, etc. (Contact Garlock for data submittal sheet)



Design Fundamentals, Configurations, & Ancillary Equipment

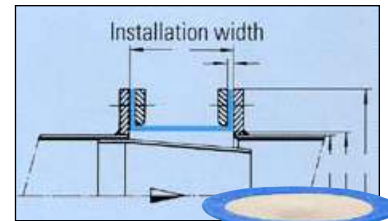
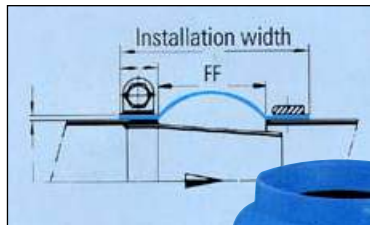
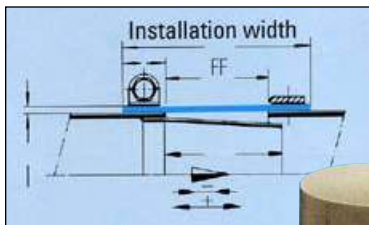
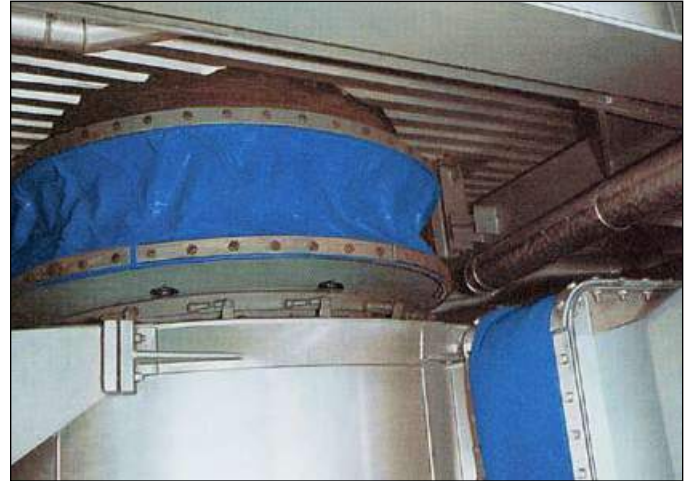
The required movements of a flue duct style expansion joint depend mainly on the overall length of the duct work and the position of the corresponding anchoring or fixed points within the ducting system. Depending on what type of expansion joint is chosen, it is possible to absorb large amounts of axial movement and/or lateral displacement.

In addition to movement, flue duct expansion joints can be designed for pressure and/or vacuum. Pressure capabilities are influenced heavily by the temperature of the media being transferred. By using unique combinations of high-grade composite materials, it is possible to manufacture lightweight designs that can still withstand consistent pressures at elevated temperatures.

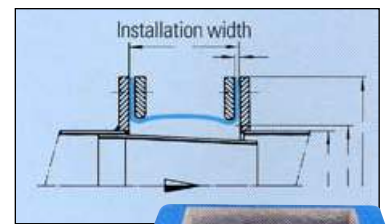
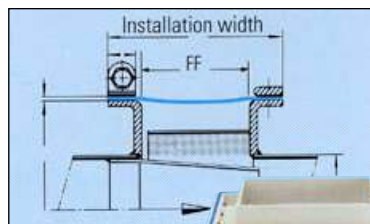
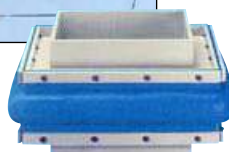
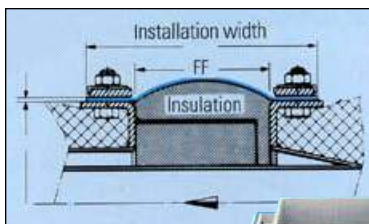
Metal deflector plates should be fitted to protect the expansion joint from abrasion and from direct contact with hot media. Further, deflector plates help to minimize the pressure loss in the duct system. Where internal insulation is necessary due to elevated temperatures, the metal deflector plate simultaneously retains the insulation material.

Circular and oval configurations without flanges can be fixed into position with pipe clamps while flanged components typically utilize steel backing flanges, clamp bars or retaining rings. Three-eighth inch thick carbon steel is common, but dimensions will vary dependant upon the material selection and thickness of the expansion joint.

Spacing between the bolt holes and the diameter of the fasteners are dependent on operating pressures, thickness of the expansion joint flange and dimensions of the customized clamping bars or back-up flanges. (See back chart)



The illustrated types can be used in different applications with different material make-up, but with the same design and movement absorption.



Attachment Guidelines for Back Up Flanges and Clamping

American Standard (inches)												
Width	1-3/16		1-1/2		2		2-3/8		2-3/4		3-1/8	
thickness	1/4	5/16	5/16	3/8	5/16	1/2	3/8	1/2	3/8	1/2	1/2	
bolt spacing	2-3/8		3-1/8		4		4		4-3/4		4-3/4	
bolts	5/16	3/8	3/8	1/2	1/2	5/8	5/8	3/4	5/8	3/4	5/8	3/4

Recommended Tightening Torque in ft lbs												
fabric expansion joint	15	22	30	37	44	59	74	88	85	103	96	118
elastomer expansion joint	15	22	22	30	37	44	55	66	66	81	74	92

Metric (mm)												
width	30		40		50		60		70		80	
thickness	6	8	8	10	8	10	10	12	10	12	12	
bolt spacing	60		80		100		100		120		120	
bolts	M8	M10	M10	M12	M12	M16	M16	M20	M16	M20	M16	M20

Recommended Tightening Torque in Nm												
fabric expansion joint	20	30	40	50	60	80	100	120	115	140	130	160
elastomer expansion joint	20	30	30	40	50	60	75	90	90	110	100	125

AUTHORIZED REPRESENTATIVE

WARNING:

Properties/applications shown throughout this brochure are typical. Your specific application should not be undertaken without independent study and evaluation for suitability. For specific application recommendations consult Garlock. Failure to select the proper sealing products could result in property damage and/or serious personal injury.

Performance data published in this brochure has been developed from field testing, customer field reports and/or in-house testing.

While the utmost care has been used in compiling this brochure, we assume no responsibility for errors. Specifications subject to change without notice. This edition cancels all previous issues. Subject to change without notice.

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