

FlexArmor[®]

*PTFE Lined
Metal Expansion Joints*

DOUBLE CONTAINED



E ETHYLENE

FLEXARMOR® FLEXIJOINT® Expansion Bellows

Ethylene Corporation's Flexarmor Flexijoint expansion bellows combine the high pressure rating of a metallic expansion joint with the high temperature, near universal corrosion resistance of Teflon® PTFE. They are designed for services where the unreinforced Flexijoint PTFE bellows is unsuitable.

Seamless, heavy walled, isostatically molded PTFE liners provide excellent resistance to permeation. This high integrity liner offers a superior alternative to the conventional PTFE spray coated or seamed liner. They are subjected to uncompromising quality control before and after lining of the bellows.

Pressure ratings for Flexarmor bellows are as high as 200 psig. The metallic outer bellows features uniform wall thickness and multiple ply construction for increased flexibility. These bellows are available in most nickel alloys including Monel, Inconel and various

types of stainless steels. Available designs include: universal joints, hinged, hinged-pinned and slotted, and gimbal types. Versatile manufacturing techniques accommodate customization of the Flexarmor bellows flanging, overall length, movements and spring rates.

Specification:

Wetted Surfaces Teflon® PTFE
 Pressure Rating 200 psi@ 300°F (1"-3")
 Metal Bellows Type 321 Stainless Steel
 Flange Material A105 or A516 Gr70
 Tie Rods C1040
 Lock Nuts Zinc Plated Carbon Steel
 Flange Drilling 150lb Class ANSI 16.5

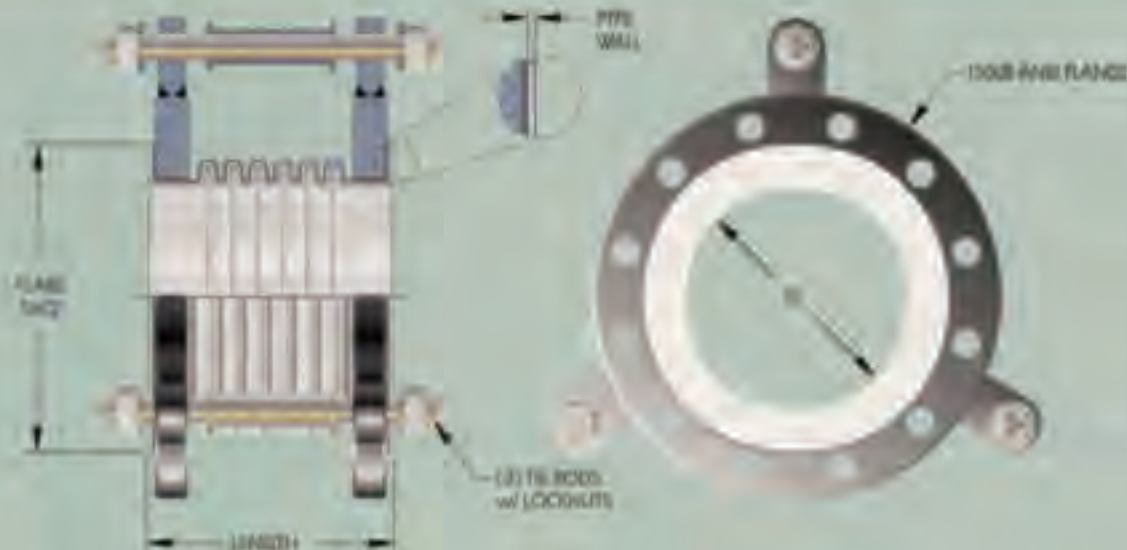


Table 1: Engineering Data

Nominal Diameter	Bellows Inside Diameter (in)	Metal Bellows Wall (in)	PTFE Liner Thickness (in)	Flare Face (in)	Flange Outside Diameter (in)	Flange Thickness (in)	Number of Holes	Hole Diameter (in)	Bolt Circle Diameter (in)	Maximum Allowable Working Pressure
1½	1 7/8	.016	.090	2 ½	5	7/8	4	¾	3 ¾	200 psi
2	2 5/8	.018	.095	3 ¾	6	¾	4	¾	4 ¾	
3	3 5/8	.024	.100	5	7 ½	¾	4	¾	6	
4	4 ¾	.024	.110	6 ¾	9	¾	8	¾	7 ½	175 psi
6	6 5/8	.036	.120	8 ¾	11	1	8	¾	9 ¾	
8	8	.042	.131	10 ¾	13 ½	1 ½	8	¾	11 ¾	
10	10	.060	.141	12 ¾	16	1 5/8	12	1	14 ¾	
12	11 1/4	.072	.152	15	19	1 ¾	12	1	17	150 psi
14	13 ¾	.072	.160	16 ¾	21	1 ¾	12	1 ½	18 ¾	
16	15	.072	.175	18 ¾	23 ½	1 5/8	16	1 ½	21 ¾	
18	16 ¾	.072	.191	21	25	1 5/8	16	1 ½	22 ¾	125 psi
20	18 1/4	.072	.198	23	27 ½	1 7/8	20	1 ¾	25	
24	22 ¾	.072	.222	27 ¾	32	1 ¾	20	1 ¾	29 ¾	

Note: Dimensions shown are for 150 psi Class Flanges per ANSI B16.5

Construction

Each Flexarmor Flexijoint can be engineered to fit specific applications: pressure/temperature rating, spring rate, movement (axial, lateral & angular), material of construction (stainless, Hastelloy, Monel, etc.) and neutral length. Special flanging such as 300#

ANSI, DIN, JIS or any other special configuration can be easily accommodated. Flanges can be supplied in carbon steel, stainless steels and other nickel alloys such as Hastelloy C276.

Neutral Length and Allowable Movement

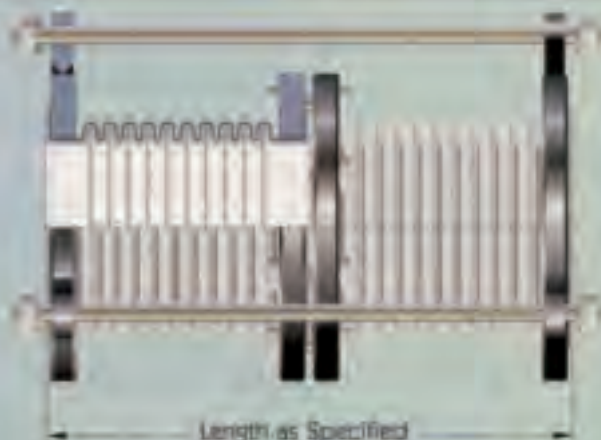
The neutral, face to face length and the maximum allowable axial movements for Flexarmor Flexijoints are given in Table 2 below. The numbers listed in Table 2 represent the normal overall length of bellows as shipped. The axial extension and compression are

the maximum movements from the neutral position. A Flexarmor bellows can be supplied to your exact neutral length and/or movement specifications. Please consult the factory with your unique requirements.

Table 2: Neutral Lengths and Allowable Axial Movements (+Extension / -Compression)

Nominal Diameter	Number of Convolutions												
	4	5	6	7	8	9	10	11	12	13	14	15	
1 1/2			5 +1/8 -1/8	5 1/2 +1/32 -1/8	6 +1/8 -1/8	6 1/2 +1/32 -1/8	7 +1/8 -1/8	7 1/2 +1/16 -1/8	8 +1/8 -1/8	8 1/2 +1/16 -1/8	9 +1/8 -1/8	9 1/2 +1/16 -1/8	10 +1/8 -1/8
2			5 +1/8 -1/8	5 1/2 +1/32 -1/8	6 +1/8 -1/8	6 1/2 +1/32 -1/8	7 +1/8 -1/8	7 1/2 +1/16 -1/8	8 +1/8 -1/8	8 1/2 +1/16 -1/8	9 +1/8 -1/8	9 1/2 +1/16 -1/8	10 +1/8 -1/8
3	Not Available		5 1/2 +1/8 -1/8	6 1/4 +1/32 -1/32	7 +1/8 -1/8	7 1/2 +1/16 -1/8	8 +1/8 -1/8	8 1/2 +1/16 -1/8	9 +1/8 -1/8	9 1/2 +1/16 -1/8	10 +1/8 -1/8	10 1/2 +1/16 -1/8	11 +1/8 -1/8
4			6 1/2 +1/32 -1/8	7 +1/8 -1/32	7 1/2 +1/16 -1/16	8 +1/8 -1/16	8 1/2 +1/16 -1/16	9 +1/8 -1/16	9 1/2 +1/16 -1/16	10 +1/8 -1/16	10 1/2 +1/16 -1/16	11 +1/8 -1/16	11 1/2 +1/16 -1/16
6			7 1/2 +1/32 -1/8	8 +1/32 -1/8	8 1/2 +1/32 -1/8	9 +1/8 -1/8	9 1/2 +1/8 -1/8	10 +1/8 -1/8	10 1/2 +1/8 -1/8	11 +1/8 -1/8	11 1/2 +1/8 -1/8	12 +1/8 -1/8	12 1/2 +1/8 -1/8
8	6 1/2 +1/8 -1/16	7 1/2 +1/16 -1/8	8 +1/8 -1/32	8 1/2 +1/16 -1/16	9 +1/8 -1/16	9 1/2 +1/16 -1/16	10 +1/8 -1/16	10 1/2 +1/16 -1/16	11 +1/8 -1/16	11 1/2 +1/16 -1/16	12 +1/8 -1/16	12 1/2 +1/16 -1/16	13 +1/8 -1/16
10	7 +1/8 -1/8	7 1/2 +1/8 -1/32	8 +1/8 -1/16	9 +1/8 -1/16	9 1/2 +1/8 -1/16	10 +1/8 -1/16	10 1/2 +1/8 -1/16	11 +1/8 -1/16	11 1/2 +1/8 -1/16	12 +1/8 -1/16	12 1/2 +1/8 -1/16	13 +1/8 -1/16	13 1/2 +1/8 -1/16
12	7 1/2 +1/16 -1/16	8 +1/16 -1/8	9 +1/8 -1/16	10 +1/8 -1/16	10 1/2 +1/8 -1/16	11 +1/8 -1/16	11 1/2 +1/8 -1/16	12 +1/8 -1/16	12 1/2 +1/8 -1/16	13 +1/8 -1/16	13 1/2 +1/8 -1/16	14 +1/8 -1/16	14 1/2 +1/8 -1/16
14	8 +1/8 -1/16	9 1/4 +1/16 -1/8	10 +1/8 -1/16	11 +1/8 -1/16	12 1/4 +1/8 -1/16	13 +1/8 -1/16	14 1/4 +1/8 -1/16	15 +1/8 -1/16	16 +1/8 -1/16	17 +1/8 -1/16	18 +1/8 -1/16	19 +1/8 -1/16	20 +1/8 -1/16
16	9 1/2 +1/8 -1/16	10 1/2 +1/8 -1/16	11 +1/8 -1/16	12 +1/8 -1/16	13 1/2 +1/8 -1/16	14 1/2 +1/8 -1/16	15 1/2 +1/8 -1/16	16 1/2 +1/8 -1/16	17 1/2 +1/8 -1/16	18 1/2 +1/8 -1/16	19 1/2 +1/8 -1/16	20 1/2 +1/8 -1/16	21 1/2 +1/8 -1/16
18	9 +1/8 -1/16	11 +1/8 -1/16	12 +1/8 -1/16	13 1/2 +1/8 -1/16	14 1/2 +1/8 -1/16	16 +1/8 -1/16	17 +1/8 -1/16	18 +1/8 -1/16	19 +1/8 -1/16	20 +1/8 -1/16	21 +1/8 -1/16	22 +1/8 -1/16	23 +1/8 -1/16
20	10 1/2 +1/16 -1/8	11 1/2 +1/16 -1/8	13 1/2 +1/16 -1/8	14 1/2 +1/16 -1/8	16 +1/16 -1/8	17 +1/16 -1/8	18 +1/16 -1/8	19 +1/16 -1/8	20 +1/16 -1/8	21 +1/16 -1/8	22 +1/16 -1/8	23 +1/16 -1/8	24 +1/16 -1/8
24	11 1/2 +1/8 -1/8	12 1/2 +1/8 -1/8	14 1/2 +1/8 -1/8	15 1/2 +1/8 -1/8	17 +1/8 -1/8	18 1/2 +1/8 -1/8	19 1/2 +1/8 -1/8	20 1/2 +1/8 -1/8	21 1/2 +1/8 -1/8	22 1/2 +1/8 -1/8	23 1/2 +1/8 -1/8	24 1/2 +1/8 -1/8	25 1/2 +1/8 -1/8

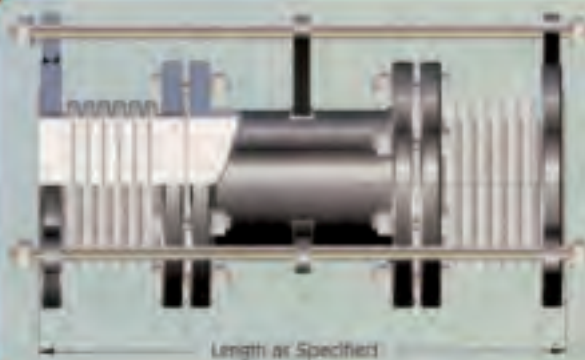
Note:
Flexarmor bellows can not be subjected to simultaneous full-rated axial, lateral and angular misalignments. Consult Ethylene Corporation for specific information.



Tandem Expansion Joint

Constructed from two Flexarmor bellows this unit is designed for application where extra long face to face dimensions are required to provide increased axial movement.

A custom overall length can be specified.



Universal Expansion Joint

Constructed from two Flexarmor Flexjoint bellows connected with a PTFE lined pipe section, these units are designed for use where large lateral displacements are encountered or where minimal lateral reaction forces are desired. This is critical when mating to glass, glass lined steel and graphite nozzles. The overall length of the unit is tailored to meet lateral, axial and angular displacement and load (i.e. spring rate) constraints.

Consult Ethylene Corporation for additional information and assistance.



Hinged Expansion Bellows

Hinged expansion bellows are useful when support of an adjacent pipe spool by the expansion bellows' flanges is required. These bellows allow angular movement of the adjacent piping while restricting axial and lateral displacement. A hinged, pinned and slotted expansion joint design is frequently used where large lateral or angular movements are expected.

Flexijoint® PTFE Expansion Joints



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