

FlexArmor[®]

*PTFE Lined
Metal Expansion Joints / Bellows*

DOUBLE CONTAINED



FLEXARMOR® FLEXIJOINT® Expansion Joints / Bellows

Ethylene Flexarmor Flexijoint expansion bellows combine the high pressure rating of a metallic expansion joint with the high temperature, near universal corrosion resistance of 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 285 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	PTFE
Max Pressure	285 psi
Max Temperature	400°F
Metal Bellows	Type 321 Stainless Steel (Other Alloys Available)
Flange Material	A105 or A516 Gr70
Tie Rods	A307 Gr.A Zinc Plated
Lock Nuts	Zinc Plated Carbon Steel
Flange Drilling	150lb Class ASME B16.5 DIN PN 10/16

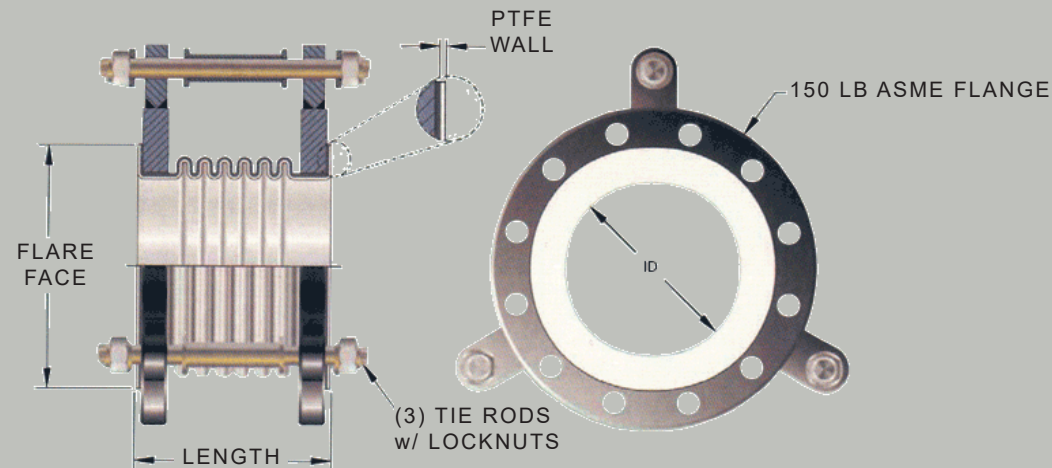


Table 1: Engineering Data

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)
1 1/2	1 13/16	0.016	0.090	2 7/8	5	11/16	4	5/8	3 7/8
2	2 9/16	0.018	0.095	3 5/8	6	3/4	4	3/4	4 3/4
3	3 5/16	0.024	0.100	5	7 1/2	15/16	4	3/4	6
4	4 1/4	0.024	0.110	6 3/8	9	15/16	8	3/4	7 1/2
6	6 1/16	0.036	0.120	8 1/2	11	1	8	7/8	9 1/2
8	8	0.042	0.131	10 5/8	13 1/2	1 1/8	8	7/8	11 3/4
10	10	0.048	0.141	12 3/4	16	1 3/16	12	1	14 1/4
12	11 15/16	0.060	0.152	15	19	1 1/4	12	1	17
14	13 1/8	0.072	0.160	16 1/4	21	1 3/8	12	1 1/8	18 3/4
16	15	0.072	0.175	18 1/2	23 1/2	1 7/16	16	1 1/8	21 1/4
18	16 7/8	0.072	0.191	21	25	1 9/16	16	1 1/4	22 3/4
20	18 13/16	0.072	0.198	23	27 1/2	1 11/16	20	1 1/4	25
24	22 5/8	0.072	0.222	27 1/4	32	1 7/8	20	1 3/8	29 1/2

Note: Dimensions shown are for 150 psi Class Flanges per ASME 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# ASME, 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.

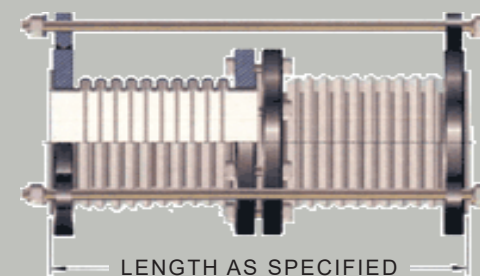
Neutral Length and Allowable Movement

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)

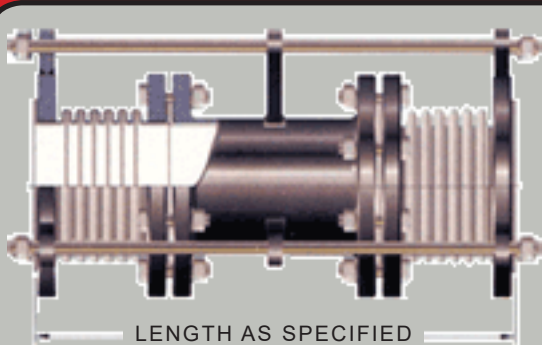
Nominal Diameter	Number of Convolutions																	
	4	5	6	7	8	9	10	11	12									
1 1/2	Consult Factory																	
2	Consult Factory																	
3	Consult Factory																	
4	Consult Factory																	
6	Consult Factory																	
8	6 1/2	+ 1/4 - 19/32	7 9/16	+ 11/32 - 9/8	8 3/4	+ 7/16 - 29/32	8 19/16	+ 17/32 - 15/8	9 3/4	+ 9/8 - 1 3/32	10 10/16	+ 23/32 - 1 1/4	11 3/8	+ 13/16 - 1 13/32	12 3/16	+ 29/32 - 1 9/16	13	+ 1 - 1 3/4
10	7	+ 9/32 - 1/2	7 7/8	+ 3/8 - 21/32	8 3/4	+ 19/32 - 13/16	9 9/16	+ 9/16 - 31/32	10 1/2	+ 21/32 - 1 1/8	11 3/8	+ 3/4 - 1 1/16	12 1/4	+ 27/32 - 1 1/2	13 3/8	+ 19/16 - 1 11/16	14	+ 1 1/16 - 1 1/8
12	7 3/4	+ 5/16 - 9/16	8 3/4	+ 13/32 - 3/4	9 3/4	+ 1/2 - 19/16	10 3/4	+ 5/8 - 1 1/8	11 3/4	+ 3/4 - 1 1/16	12 3/4	+ 7/8 - 1 1/2	13 3/4	+ 1 - 1 11/16	Note: Flexarmor bellows cannot be subjected to simultaneous full-rated axial, lateral and angular misalignments. Consult Ethylene LLC for specific information.			
14	8 3/4	+ 3/16 - 9/16	9 19/16	+ 13/32 - 3/4	11 1/8	+ 1/2 - 19/16	12 5/16	+ 5/8 - 1 1/8	13 1/2	+ 3/4 - 1 1/16	14 11/16	+ 7/8 - 1 1/2	15 3/8	+ 1 - 1 11/16				
16	9 1/4	+ 3/8 - 11/16	10 1/2	+ 1/2 - 19/16	11 3/4	+ 5/8 - 1 1/8	13	+ 29/32 - 1 1/8	14 1/4	+ 19/16 - 1 11/16	15 1/2	+ 1 3/32 - 1 19/16	16 3/4	+ 1 1/4 - 2 3/16				
18	9 3/4	+ 3/8 - 11/16	11	+ 1/2 - 19/16	12 1/4	+ 5/8 - 13/16	13 1/2	+ 29/32 - 1 1/8	14 3/4	+ 19/16 - 1 11/16	16	+ 1 3/32 - 1 19/16	17 1/4	+ 1 1/4 - 2 3/16				
20	10 1/2	+ 7/16 - 3/4	11 7/8	+ 9/16 - 1	13 3/4	+ 11/16 - 1 1/4	14 5/8	+ 27/32 - 1 1/2	16	+ 1 - 1 3/4	17 3/8	+ 1 9/32 - 2	18 3/4	+ 1 9/16 - 2 1/4				
24	11 1/4	+ 7/16 - 3/4	12 11/16	+ 9/16 - 1	14 1/8	+ 13/16 - 1 1/4	15 1/8	+ 27/32 - 1 1/2	17	+ 1 - 1 3/4	18 1/2	+ 1 9/32 - 2	19 3/8	+ 1 9/16 - 2 1/4				



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 Flexijoint 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 LLC for additional information and assistance.

LENGTH AS SPECIFIED



Hinged Expansion Bellows

Hinged expansion bellows are useful when support of an adjacent pipe spool by the expansion bellow's 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®
Expansion Bellows

Flexijoint® PTFE Expansion Joints



FLO-VU® Sight Flow Indicators

FACTORY MUTUAL APPROVED FLO-VU® Sight Indicators With Safety Shield



EthylArmor® & pHampler® Dip Tubes, Spargers & Sampling

Fluoropolymer-Lined
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Durcor® Flanged Flexijoint® Advanced Composite Flanges

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