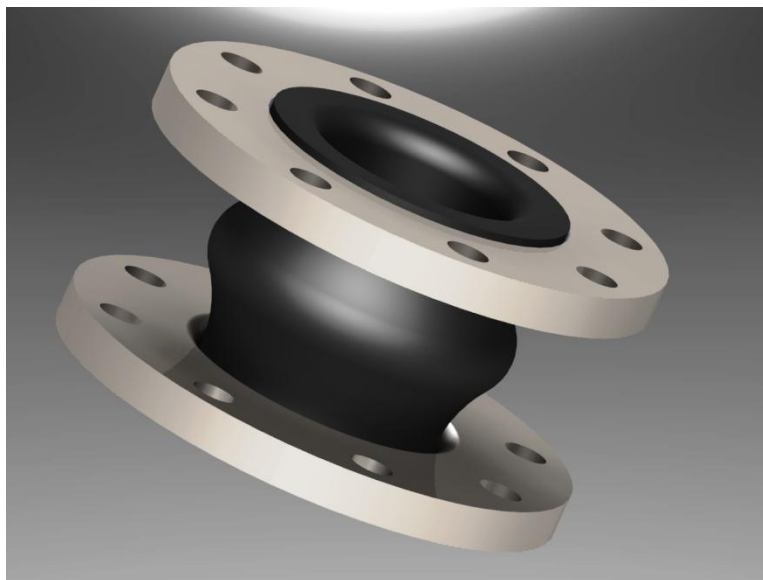


### TITLE OF SPECIFICATION Garflex Style 8100, Molded Rubber, Floating Flange Expansion Joint

#### 1.0 Application

Product used in rigid piping systems to compensate for lateral, torsional, angular, as well as axial movement due to thermal expansion and contraction. The product can be specially designed and built to compensate for permanent piping misalignment. The floating flange accommodates torsional mis-alignment in the pipe flanges.



#### 2.0 Construction

Product construction is to include a nitrile rubber inner liner and consistent layers of tire cord reinforcement bonded together with neoprene rubber exterior cover. The flanges shall be steel with a corrosion-resistant coating.

#### 2.1 Inner Elastomeric Liner

Liner shall be a layer of homogenous, elastomeric compound (1/16" minimum thickness) which is leak proof and compatible with media conveyed. Standard elastomer is to be nitrile (NBR) per ASTM specification D-2000 (ref table for compound requirements).

#### Nitrile (NBR) Elastomer

Test Requirement	Value	Tolerance
Durometer (Shore A)	60	+/- 5
Specific Gravity	1.25	+/- 0.050
Tensile	1015 psi min.	N/A
Elongation @ Break	250% min.	N/A
Compression Set (22 hours @ 100°C)	50% min.	N/A
Volume Change in ASTM Oil # 3 (70 hours @ 100°C)	+25% max.	N/A
Heat Aging (70 hrs. @ 100°C)		
Change in Hardness	+/- 15	N/A
Change in Tensile	+/- 30% max.	N/A
Change in Elongation	- 50% max	N/A

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**2.2 Fabric/Metal Reinforcement**

A minimum of 4 plies of high quality tire cord, impregnated with compatible elastomers are to be utilized to provide flexibility as well as durability. Recommended tire cord shall meet the following specifications:

Specification	Method
<b>Thread Count - EPI-1 Direction: 25 min.</b>	ASTM D3775
<b>Gauge: .040 ± .005</b>	ASTM D1777
<b>Tensile Strength, (lbs): 1000 lbs. min.</b>	ASTM D5034

**2.3 Exterior Elastomeric Cover**

- 2.3.1 Shall be a homogeneous layer of elastomeric compound 1/16” minimum thickness to protect against atmospheric conditions or mechanical damage. Standard elastomer is to be neoprene meeting ASTM Specification D2000 (ref. table for compound requirements).
- 2.3.2 Material shall be flame-resistant and meet the requirements of MSHA CFR Title 30, Section 18.65.

**Neoprene Elastomer**

Test Requirement	Value	Tolerance
Durometer (Shore A)	65	+/- 5
Specific Gravity	1.40	+/- 0.10
Tensile	1015 psi min.	N/A
Elongation @ Break	300% min.	N/A
Compression Set (22 hours @ 100°C)	50% min.	N/A
Volume Change in ASTM Oil # 3 (70 hours @ 100°C)	+120% max.	N/A
Heat Aging (70 hrs. @ 100°C)		
Change in Hardness	+/- 15	N/A
Change in Tensile	+/- 25% max.	N/A
Change in Elongation	- 45% max	N/A

**2.4 Exterior Coating**

There shall be no exterior coating on the bellow of the expansion joint. The joint will be marked with the manufacturer and the quarter and year of manufacture.

**3.0 Floating Flange**

Metal flanges shall be provided with the expansion joint. It should mate with the expansion joint and shall have no sharp corners that may cut into the rubber material. The flange shall have a rust resistant coating to prevent corrosion.

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**4.0 Operating Capabilities**

All expansion joints shall conform to (but may exceed) the requirements as stated below:

**4.1 Standard face-to-face lengths are as follows<sup>1</sup>:**

I.D. Size											
Face-Face (in)	2"	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"
5"	X	X	X	X	X	X	X	X	X	N/A	N/A
6"	X	X	X	X	X	X	X	N/A	N/A	N/A	N/A
8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	X	X	X	X

**4.2 Pressure capabilities are as follows:**

Operating Temperature	Max. Allowable Working Pressure (4:1 Burst Ratio)	
	2" – 12" ID	14" – 16" ID
Up to 122°F (50°C)	232 psi (16 bar)	100 psi (7 bar)
123°F (50°C) to 158°F (70°C)	174 psi (12 bar)	100 psi (7 bar)
159°F (70°C) to 176°F (80°C)	139 psi (9.5 bar)	100 psi (7 bar)
177°F (80°C) to 194°F (90°C)	139 psi (9.5 bar)	87 psi (6 bar)
195°F (90°C) to 210°F (100°C)	70 psi (5 bar)	45 psi (3 bar)
211°F (100°C) to 230°F (110°C)	25 psi (1.7 bar)	20 psi (1.5 bar)

**4.3 Vacuum capabilities are as follows:**

Pipe Size		Max. Hg	
Inches	mm	Inches	mm
2 – 2.5	50 - 63	23	575
3	75	20	500
4	100	17	425
5 – 6	125 – 150	11	275
8	200	8	200
10 – 12	250 - 300	5	125
14 – 16	250 – 400	3	75

**4.4 Movement capabilities are as follows:**

Type of Movements	Amount of Movement	
	Inches	mm
Compression	1	25
Elongation	1	25
Lateral Deflection	1	25

<sup>1</sup> Larger ID joints are available upon request, however ratings and dimensions must be confirmed and will be handled based on a custom basis.

## **TITLE OF SPECIFICATION** Garflex Style 8100, Molded Rubber, Floating Flange Expansion Joint

### **5.0 Product Qualifications**

#### **5.1 Shelf Life/Storage Life**

All expansion joints shall be newly manufactured exhibiting no prior loss of shelf life. Acceptable shelf life is five (5) years from date of manufacture under ideal storage conditions. Garlock references its internal documentation which states that joint will be shipped within 3-3/4 years from date of manufacture.

#### **5.2 Burst Ratio**

Burst ratio for all Style 8100 expansion joints is 4:1 minimum.

#### **5.3 Drawings**

Manufacturer shall provide a certified drawing upon request.

### **6.0 Testing**

#### **6.1 Elastomer Testing**

Every six (6) months, the neoprene cover material shall be tested to ensure its fire resistance properties meet MSHA CFR Title 30, Section 18.65 Flammability Testing requirements.

#### **6.2 Hydrostatic Testing**

Manufacturer shall be capable of performing hydrostatic testing in house, allowing end-user to witness said test when required.

#### **6.3 Burst Testing**

Manufacturer shall be capable of performing burst testing in house, allowing end-user to witness said test when required.

### **7.0 Manufacturer Qualifications**

7.1 Manufacturer must have a Quality Assurance Program in place with documentation available for review upon request.