

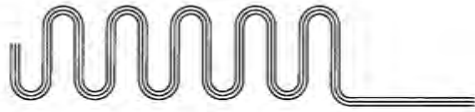
# Standard Metal Expansion Joints



**Triad**  **Bellows**  
DESIGN + MANUFACTURING

## MULTI-PLY BELLOWS CONSTRUCTION PROVIDES LONGER CYCLE LIFE

### SERIES-1



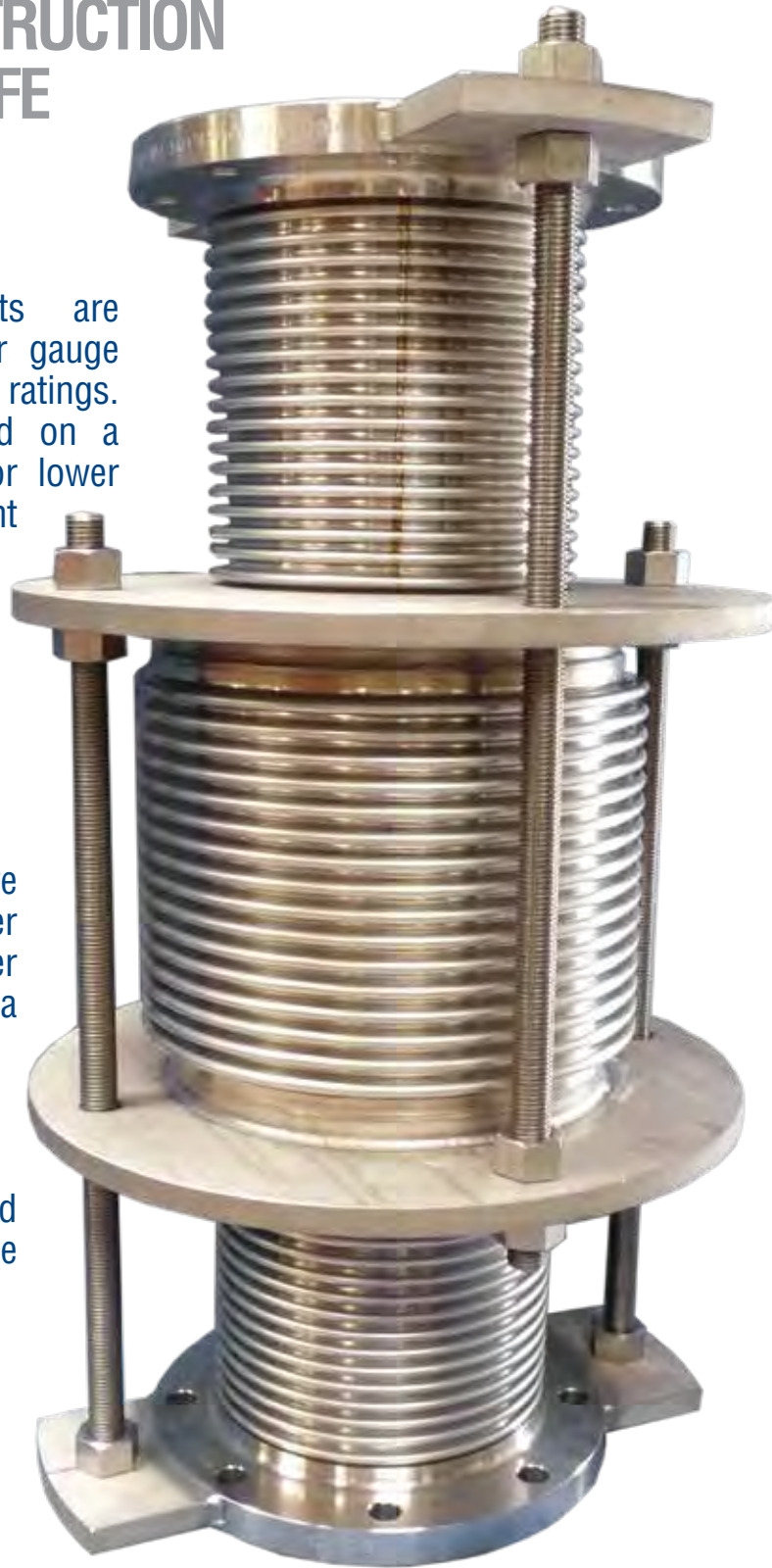
Triad Bellows Series-1 expansion joints are manufactured with multiple layers of heavier gauge T-321 s/s material to achieve higher pressure ratings. The allowable movements shown are based on a minimum of 3000 non-concurrent cycles. For lower pressure applications a Series-2 expansion joint will provide increased movement capability. When a standard expansion joint is not the right fit we will design and build a custom metal bellows expansion joint at a standard price.

### SERIES-2



Triad Bellows Series-2 expansion joints are manufactured with multiple layers of lighter gauge T-321 s/s material to achieve greater movement capability while still maintaining a minimum of 3000 life cycles. When an even higher cycle life is required let us know and we will go to work on the perfect design for your application. Our EJMA 10 design software allows us to combine just the right thickness and number of bellows plies needed to balance performance and cost savings.

- ▶ All expansion joints are 100% leak tested.
- ▶ All domestic material available on request.
- ▶ Stainless steel fittings available on request.
- ▶ Flow liners, tie rods and covers available on request.
- ▶ Contact our sales engineers for custom lengths, fittings and pressures.



# MULTI-PLY EXPANSION JOINTS

## Series 1 for Higher Pressure

### SERIES 1 - SHORT



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-36 C/S PLATE FLANGES (FF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-105 C/S FORGED FLANGES (RF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- STD. WALL A-53 C/S WELD ENDS
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX

BELLOWS			PLATE FLANGES A-36 C/S						FORGED FLANGES A-105 STEEL						BEVELED WELD ENDS A-53 STD.								
SIZE	BELLOWS LIVE LENGTH (IN)	EFFECTIVE AREA (SQ-IN)	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION ** (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET ** (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION ** (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET ** (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 600°F	AXIAL COMPRESSION ** (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET ** (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER
2"	3.00	5.78	4.75	175	0.50	1135	0.19	1397	50-20-S1S1	5.25	285	0.50	1135	0.19	1397	50-20-S1S2	11.00	300	0.50	1135	0.19	1397	50-20-S1S3
2-1/2"	3.00	9.51	4.75	175	0.75	624	0.19	1251	50-25-S1S1	5.50	285	0.75	624	0.19	1251	50-25-S1S2	11.00	275	0.75	624	0.19	1251	50-25-S1S3
3"	3.00	12.47	4.75	175	0.50	2520	0.13	6683	50-30-S1S1	5.63	285	0.50	2520	0.13	6683	50-30-S1S2	11.00	350	0.50	2520	0.13	6683	50-30-S1S3
3-1/2"	3.00	16.69	x	x	x	x	x	x	x	5.75	285	0.63	1824	0.13	6478	50-35-S1S2	11.00	350	0.63	1824	0.13	6478	50-35-S1S3
4"	4.50	20.51	6.25	175	1.00	1422	0.25	2751	50-40-S1S1	7.38	285	1.00	1422	0.25	2751	50-40-S1S2	12.50	300	1.00	1422	0.25	2751	50-40-S1S3
5"	4.50	30.63	6.25	175	0.88	2906	0.19	8396	50-50-S1S1	7.63	275	0.88	2906	0.19	8396	50-50-S1S2	12.50	275	0.88	2906	0.19	8396	50-50-S1S3
6"	4.50	41.83	6.25	175	1.00	2665	0.19	10729	50-60-S1S1	7.88	260	1.00	2665	0.19	10729	50-60-S1S2	12.50	260	1.00	2665	0.19	10729	50-60-S1S3
8"	4.50	69.07	6.75	175	1.00	3389	0.13	22073	50-80-S1S1	8.25	260	1.00	3389	0.13	22073	50-80-S1S2	12.50	260	1.00	3389	0.13	22073	50-80-S1S3
10"	6.00	107.9	8.25	175	1.50	2439	0.25	14126	50-100-S1S1	10.13	250	1.50	2439	0.25	14126	50-100-S1S2	14.00	250	1.50	2439	0.25	14126	50-100-S1S3
12"	6.00	148.6	8.25	175	1.50	2926	0.19	23045	50-120-S1S1	10.63	250	1.50	2926	0.19	23045	50-120-S1S2	14.00	250	1.50	2926	0.19	23045	50-120-S1S3
14"	6.00	181.1	8.13	150	1.75	2137	0.25	20560	50-140-S1S1	10.75	200	1.75	2137	0.25	20560	50-140-S1S2	14.00	200	1.75	2137	0.25	20560	50-140-S1S3
16"	6.00	231.7	8.25	150	1.88	2436	0.19	30016	50-160-S1S1	11.25	200	1.88	2436	0.19	30016	50-160-S1S2	14.00	200	1.88	2436	0.19	30016	50-160-S1S3
18"	6.00	289.4	8.38	150	2.00	1950	0.19	29908	50-180-S1S1	11.63	200	2.00	1950	0.19	29908	50-180-S1S2	14.00	200	2.00	1950	0.19	29908	50-180-S1S3
20"	6.00	352.8	8.50	150	1.75	3033	0.13	56766	50-200-S1S1	12.00	200	1.75	3033	0.13	56766	50-200-S1S2	14.00	200	1.75	3033	0.13	56766	50-200-S1S3
22"	6.00	422.6	8.63	150	1.75	3330	0.13	74,644	50-220-S1S1	x	x	x	x	x	x	x	14.00	195	1.75	3330	0.13	74,644	50-220-S1S3
24"	6.00	498.6	8.75	150	1.75	3625	0.13	95882	50-240-S1S1	13.00	195	1.75	3625	0.13	95,882	50-240-S1S2	14.00	195	1.75	3625	0.13	95,882	50-240-S1S3

- \*\* Movements are non-concurrent-minimum 3000 cycles
- Custom lengths and pressure available on request
- Stainless flanges available on request
- Tie rods available on request
- Flow liners may be required. See EJMA 10 guidelines
- T-316, T-304, C-276, Inconel 625 and other alloys available

# MULTI-PLY EXPANSION JOINTS

## Series 1 for Higher Pressure

### SERIES 1 - MEDIUM



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-36 C/S PLATE FLANGES (FF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-105 C/S FORGED FLANGES (RF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- STD. WALL A-53 C/S WELD ENDS
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX

BELLOWS			PLATE FLANGES A-36 C/S						FORGED FLANGES A-105 STEEL						BEVELED WELD ENDS A-53 STD.								
SIZE	BELLOWS LIVE LENGTH (IN)	EFFECTIVE AREA (SQ-IN)	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 600°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER
2"	4.50	5.78	6.25	175	0.75	757	0.38	414	50-20-S1M1	6.75	250	0.75	757	0.38	414	50-20-S1M2	12.50	250	0.75	757	0.38	414	50-20-S1M3
2-1/2"	4.50	9.51	6.25	175	1.00	723	0.38	650	50-25-S1M1	7.00	250	1.00	723	0.38	650	50-25-S1M2	12.50	250	1.00	723	0.38	650	50-25-S1M3
3"	4.50	12.47	6.25	175	0.75	1634	0.25	1927	50-30-S1M1	7.13	285	0.75	1634	0.25	1927	50-30-S1M2	12.50	350	0.75	1634	0.25	1927	50-30-S1M3
3-1/2"	4.50	16.69	x	x	x	x	x	x	x	7.25	285	1.00	1277	0.25	2011	50-35-S1M2	12.50	300	1.00	1277	0.25	2011	50-35-S1M3
4"	6.00	20.51	7.75	175	1.38	1094	0.50	1193	50-40-S1M1	8.88	275	1.38	1094	0.50	1193	50-40-S1M2	14.00	275	1.38	1094	0.50	1193	50-40-S1M3
5"	6.00	30.63	7.75	175	1.13	2180	0.38	3542	50-50-S1M1	9.12	225	1.13	2180	0.38	3542	50-50-S1M2	14.00	225	1.13	2180	0.38	3542	50-50-S1M3
6"	6.00	41.83	7.75	175	1.25	1999	0.31	4526	50-60-S1M1	9.38	260	1.25	1999	0.31	4526	50-60-S1M2	14.00	260	1.25	1999	0.31	4526	50-60-S1M3
8"	6.00	69.07	8.25	175	1.25	2541	0.25	9312	50-80-S1M1	9.75	260	1.25	2541	0.25	9312	50-80-S1M2	14.00	260	1.25	2541	0.25	9312	50-80-S1M3
10"	9.00	107.9	8.25	175	2.38	1578	0.50	4052	50-100-S1M1	10.13	250	2.38	1578	0.50	4052	50-100-S1M2	14.00	250	2.38	1578	0.50	4052	50-100-S1M3
12"	9.00	148.6	8.25	175	2.38	1894	0.50	6653	50-120-S1M1	10.63	250	2.38	1894	0.50	6653	50-120-S1M2	14.00	250	2.38	1894	0.50	6653	50-120-S1M3
14"	9.00	181.1	8.12	150	2.75	1425	0.50	6092	50-140-S1M1	10.75	190	2.75	1425	0.50	6092	50-140-S1M2	14.00	190	2.75	1425	0.50	6092	50-140-S1M3
16"	9.00	231.7	8.25	150	2.75	1614	0.50	8842	50-160-S1M1	11.25	190	2.75	1614	0.50	8842	50-160-S1M2	14.00	190	2.75	1614	0.50	8842	50-160-S1M3
18"	9.00	289.4	8.38	150	2.75	1823	0.38	12441	50-180-S1M1	11.63	190	2.75	1823	0.38	12441	50-180-S1M2	14.00	190	2.75	1823	0.38	12441	50-180-S1M3
20"	9.00	352.8	8.50	150	2.75	2022	0.38	16820	50-200-S1M1	12.00	190	2.75	2022	0.38	16820	50-200-S1M2	14.00	190	2.75	2022	0.38	16820	50-200-S1M3
22"	9.00	422.6	8.63	150	2.75	2220	0.33	22,117	50-220-S1M1	x	x	x	x	x	x	x	14.00	185	2.75	2220	0.33	22,117	50-220-S1M3
24"	9.00	498.6	8.75	150	2.75	2417	0.33	28409	50-240-S1M1	13.00	185	2.75	2417	0.33	28,409	50-240-S1M2	14.00	185	2.75	2417	0.33	28,409	50-240-S1M3

- \*\* Movements are non-concurrent-minimum 3000 cycles
- Custom lengths and pressure available on request
  - Stainless flanges available on request
  - Tie rods available on request
  - Flow liners may be required. See EJMA 10 guidelines
  - T-316, T-304, C-276, Inconel 625 and other alloys available

# MULTI-PLY EXPANSION JOINTS

## Series 1 for Higher Pressure

### SERIES 1 - LONG



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-36 C/S PLATE FLANGES (FF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-105 C/S FORGED FLANGES (RF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- STD. WALL A-53 C/S WELD ENDS
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX

BELLOWS			PLATE FLANGES A-36 C/S						FORGED FLANGES A-105 STEEL						BEVELED WELD ENDS A-53 STD.								
SIZE	BELLOWS LIVE LENGTH (IN)	EFFECTIVE AREA (SQ-IN)	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 600°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER
2"	6.00	5.78	7.75	150	1.00	567	0.75	175	50-20-S1L1	8.25	150	1.00	567	0.75	175	50-20-S1L2	14.00	150	1.00	567	0.75	175	50-20-S1L3
2-1/2"	6.00	9.51	7.75	140	1.38	562	0.75	284	50-25-S1L1	8.50	140	1.38	562	0.75	284	50-25-S1L2	14.00	140	1.38	562	0.75	284	50-25-S1L3
3"	6.00	12.47	7.75	175	1.13	1260	0.50	835	50-30-S1L1	8.63	285	1.13	1260	0.50	835	50-30-S1L2	14.00	300	1.13	1260	0.50	835	50-30-S1L3
3-1/2"	6.00	16.69	x	x	x	x	x	x	x	8.75	250	1.38	983	0.50	873	50-35-S1L2	14.00	250	1.38	983	0.50	873	50-35-S1L3
4"	9.00	20.51	10.75	120	2.00	711	1.25	344	50-40-S1L1	11.88	120	2.00	711	1.25	344	50-40-S1L2	17.00	120	2.00	711	1.25	344	50-40-S1L3
5"	9.00	30.63	10.75	175	1.75	1453	0.75	1049	50-50-S1L1	12.13	200	1.75	1453	0.75	1049	50-50-S1L2	17.00	200	1.75	1453	0.75	1049	50-50-S1L3
6"	9.00	41.83	10.75	175	2.00	1332	0.75	1341	50-60-S1L1	12.38	225	2.00	1332	0.75	1341	50-60-S1L2	17.00	225	2.00	1332	0.75	1341	50-60-S1L3
8"	9.00	69.07	11.25	175	2.00	1694	0.63	2759	50-80-S1L1	12.75	240	2.00	1694	0.63	2759	50-80-S1L2	17.00	240	2.00	1694	0.63	2759	50-80-S1L3
10"	12.00	107.9	14.25	150	3.38	1165	1.00	1681	50-100-S1L1	13.12	150	3.38	1165	1.00	1681	50-100-S1L2	20.00	150	3.38	1165	1.00	1681	50-100-S1L3
12"	12.00	148.6	14.25	160	3.25	1399	0.88	2761	50-120-S1L1	13.63	160	3.25	1399	0.88	2761	50-120-S1L2	20.00	160	3.25	1399	0.88	2761	50-120-S1L3
14"	12.00	181.1	14.12	140	3.50	1069	1.00	2570	50-140-S1L1	13.75	140	3.50	1069	1.00	2570	50-140-S1L2	20.00	140	3.50	1069	1.00	2570	50-140-S1L3
16"	12.00	231.7	14.25	150	3.75	1218	0.88	975	50-160-S1L1	14.25	150	3.75	1218	0.88	975	50-160-S1L2	20.00	150	3.75	1218	0.88	975	50-160-S1L3
18"	12.00	289.4	14.38	175	3.75	1367	0.75	5248	50-180-S1L1	14.63	175	3.75	1367	0.75	5248	50-180-S1L2	20.00	175	3.75	1367	0.75	5248	50-180-S1L3
20"	12.00	352.8	14.50	175	3.75	1516	0.63	7096	50-200-S1L1	15.00	175	3.75	1516	0.63	7096	50-200-S1L2	20.00	175	3.75	1516	0.63	7096	50-200-S1L3
22"	12.00	422.6	14.63	175	3.75	1665	0.63	9,331	50-220-S1L1	x	x	x	x	x	x	x	20.00	175	3.75	1665	0.63	9,331	50-220-S1L3
24"	12.00	498.6	14.75	175	3.75	1813	0.50	11,985	50-240-S1L1	16.00	175	3.75	1813	0.50	11,985	50-240-S1L2	20.00	175	3.75	1813	0.50	11,985	50-240-S1L3

- \*\* Movements are non-concurrent-minimum 3000 cycles
- Custom lengths and pressure available on request
  - Stainless flanges available on request
  - Tie rods available on request
  - Flow liners may be required. See EJMA 10 guidelines
  - T-316, T-304, C-276, Inconel 625 and other alloys available

# MULTI-PLY EXPANSION JOINTS

## Series 1 for Higher Pressure

### SERIES 1 - XL



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-36 C/S PLATE FLANGES (FF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-105 C/S FORGED FLANGES (RF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- STD. WALL A-53 C/S WELD ENDS
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX

BELLOWS			PLATE FLANGES A-36 C/S							FORGED FLANGES A-105 STEEL							BEVELED WELD ENDS A-53 STD.							
SIZE	BELLOWS LIVE LENGTH (IN)	EFFECTIVE AREA (SQ-IN)	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 600pF	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	
2"	x	5.78	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2-1/2"	x	9.51	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3"	9.00	12.47	10.75	140	1.63	840	1.00	248	50-30-S1XL1	11.63	140	1.63	840	1.00	248	50-30-S1XL2	17.00	140	1.63	840	1.00	248	50-30-S1XL3	
3-1/2"	9.00	16.69	x	x	x	x	x	x	x	11.75	100	2.00	639	1.38	251	50-35-S1XL2	17.00	100	2.00	639	1.38	251	50-35-S1XL3	
4"	12.00	20.51	13.75	65	2.50	527	2.00	144	50-40-S1XL1	14.88	65	2.50	527	2.00	144	50-40-S1XL2	20.00	65	2.50	527	2.00	144	50-40-S1XL3	
5"	12.00	30.63	13.75	125	2.38	1090	1.25	443	50-50-S1XL1	15.13	125	2.38	1090	1.25	443	50-50-S1XL2	20.00	125	2.38	1090	1.25	443	50-50-S1XL3	
6"	12.00	41.83	13.75	125	2.75	999	1.00	566	50-60-S1XL1	15.38	125	2.75	999	1.00	566	50-60-S1XL2	20.00	125	2.75	999	1.00	566	50-60-S1XL3	
8"	12.00	69.07	14.25	150	2.75	1271	1.00	1164	50-80-S1XL1	15.75	150	2.75	1271	1.00	1164	50-80-S1XL2	20.00	150	2.75	1271	1.00	1164	50-80-S1XL3	
10"	15.00	107.9	17.25	100	4.25	958	1.63	884	50-100-S1XL1	19.13	100	4.25	958	1.63	884	50-100-S1XL2	23.00	100	4.25	958	1.63	884	50-100-S1XL3	
12"	15.00	148.6	17.25	120	4.13	1150	1.50	1451	50-120-S1XL1	19.63	120	4.13	1150	1.50	1451	50-120-S1XL2	23.00	120	4.13	1150	1.50	1451	50-120-S1XL3	
14"	15.00	181.1	17.12	85	4.75	855	1.50	1316	50-140-S1XL1	19.75	85	4.75	855	1.50	1316	50-140-S1XL2	23.00	85	4.75	855	1.50	1316	50-140-S1XL3	
16"	15.00	231.7	17.25	100	5.00	975	1.25	1921	50-160-S1XL1	20.25	100	5.00	975	1.25	1921	50-160-S1XL2	23.00	100	5.00	975	1.25	1921	50-160-S1XL3	
18"	15.00	289.4	17.38	110	4.75	1094	1.25	2687	50-180-S1XL1	20.63	110	4.75	1094	1.25	2687	50-180-S1XL2	23.00	110	4.75	1094	1.25	2687	50-180-S1XL3	
20"	15.00	352.8	17.50	125	4.75	1213	1.00	3633	50-200-S1XL1	21.00	125	4.75	1213	1.00	3633	50-200-S1XL2	23.00	125	4.75	1213	1.00	3633	50-200-S1XL3	
22"	15.00	422.6	17.63	135	4.75	1332	1.00	4,777	50-220-S1XL1	x	x	x	x	x	x	x	23.00	135	4.75	1332	1.00	4,777	50-220-S1XL3	
24"	6.00	498.6	17.75	150	4.75	1450	0.88	6136	50-240-S1XL1	22.00	150	4.75	1450	0.88	6,136	50-240-S1XL2	23.00	150	4.75	1450	0.88	6,136	50-240-S1XL3	

- \*\* Movements are non-concurrent-minimum 3000 cycles
- Custom lengths and pressure available on request
- Stainless flanges available on request
- Tie rods available on request
- Flow liners may be required. See EJMA 10 guidelines
- T-316, T-304, C-276, Inconel 625 and other alloys available

# MULTI-PLY EXPANSION JOINTS

## Series 2 for Greater Movement

### SERIES 2 - SHORT



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-36 C/S PLATE FLANGES (FF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-105 C/S FORGED FLANGES (RF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- STD. WALL A-53 C/S WELD ENDS
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX

BELLOWS			PLATE FLANGES A-36 C/S							FORGED FLANGES A-105 STEEL							BEVELED WELD ENDS A-53 STD.						
SIZE	BELLOWS LIVE LENGTH (IN)	EFFECTIVE AREA (SQ-IN)	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 600°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER
2"	3.00	5.78	4.75	175	0.63	568	0.19	689	50-20-S2S1	5.25	275	0.63	568	0.19	689	50-20-S2S2	11.00	275	0.63	568	0.19	689	50-20-S2S3
2-1/2"	3.00	9.51	4.75	175	1.00	271	0.25	541	50-25-S2S1	5.50	275	1.00	271	0.25	541	50-25-S2S2	11.00	275	1.00	271	0.25	541	50-25-S2S3
3"	3.00	12.47	4.75	175	0.75	718	0.19	1866	50-30-S2S1	5.63	275	0.75	718	0.19	1866	50-30-S2S2	11.00	275	0.75	718	0.19	1866	50-30-S2S3
3-1/2"	3.00	16.69	x	x	x	x	x	x	x	5.75	170	1.00	509	0.19	1794	50-35-S2S2	11.00	170	1.00	509	0.19	1794	50-35-S2S3
4"	4.50	20.51	6.25	175	1.00	755	0.38	1455	50-40-S2S1	7.38	150	1.00	755	0.38	1455	50-40-S2S2	12.50	150	1.00	755	0.38	1455	50-40-S2S3
5"	4.50	30.63	6.25	175	1.00	1417	0.25	4080	50-50-S2S1	7.63	200	1.00	1417	0.25	4080	50-50-S2S2	12.50	200	1.00	1417	0.25	4080	50-50-S2S3
6"	4.50	41.83	6.25	175	1.00	1684	0.19	6642	50-60-S2S1	7.88	200	1.00	1684	0.19	6642	50-60-S2S2	12.50	200	1.00	1684	0.19	6642	50-60-S2S3
8"	4.50	69.07	6.75	175	1.00	2342	0.13	15487	50-80-S2S1	8.25	200	1.00	2342	0.13	15487	50-80-S2S2	12.50	200	1.00	2342	0.13	15487	50-80-S2S3
10"	6.00	107.9	8.25	140	2.00	854	0.38	4897	50-100-S2S1	10.13	140	2.00	854	0.38	4897	50-100-S2S2	14.00	140	2.00	854	0.38	4897	50-100-S2S3
12"	6.00	148.6	8.25	140	2.00	1009	0.25	7921	50-120-S2S1	10.63	140	2.00	1009	0.25	7921	50-120-S2S2	14.00	140	2.00	1009	0.25	7921	50-120-S2S3
14"	6.00	181.1	8.13	155	2.00	1525	0.25	14649	50-140-S2S1	10.75	155	2.00	1525	0.25	14649	50-140-S2S2	14.00	155	2.00	1525	0.25	14649	50-140-S2S3
16"	6.00	231.7	8.25	165	2.00	1872	0.19	22953	50-160-S2S1	11.25	165	2.00	1872	0.19	22953	50-160-S2S2	14.00	165	2.00	1872	0.19	22953	50-160-S2S3
18"	6.00	289.4	8.38	160	2.00	1950	0.19	29908	50-180-S2S1	11.63	160	2.00	1950	0.19	29908	50-180-S2S2	14.00	160	2.00	1950	0.19	29908	50-180-S2S3
20"	6.00	352.8	8.50	155	2.00	2162	0.19	40430	50-200-S2S1	12.00	155	2.00	2162	0.19	40430	50-200-S2S2	14.00	155	2.00	2162	0.19	40430	50-200-S2S3
22"	6.00	422.6	8.63	155	2.00	2373	0.13	53,157	50-220-S2S1	x	x	x	x	x	x	x	14.00	155	2.00	2373	0.13	53,157	50-220-S2S3
24"	6.00	498.6	8.75	155	2.00	2584	0.13	68,298	50-240-S2S1	13.00	155	2.00	2584	0.13	68,298	50-240-S2S2	14.00	155	2.00	2584	0.13	68,298	50-240-S2S3

- \*\* Movements are non-concurrent-minimum 3000 cycles
- Custom lengths and pressure available on request
  - Stainless flanges available on request
  - Tie rods available on request
  - Flow liners may be required. See EJMA 10 guidelines
  - T-316, T-304, C-276, Inconel 625 and other alloys available

# MULTI-PLY EXPANSION JOINTS

## Series 2 for Greater Movement

### SERIES 2 - MEDIUM



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-36 C/S PLATE FLANGES (FF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-105 C/S FORGED FLANGES (RF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- STD. WALL A-53 C/S WELD ENDS
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX

BELLOWS			PLATE FLANGES A-36 C/S							FORGED FLANGES A-105 STEEL						BEVELED WELD ENDS A-53 STD.							
SIZE	BELLOWS LIVE LENGTH (IN)	EFFECTIVE AREA (SQ-IN)	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 600°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER
2"	4.50	5.78	6.25	130	1.00	379	0.50	204	50-20-S2M1	6.75	130	1.00	379	0.50	204	50-20-S2M2	12.50	130	1.00	379	0.50	204	50-20-S2M3
2-1/2"	4.50	9.51	6.25	135	1.25	388	0.50	347	50-25-S2M1	7.00	135	1.25	388	0.50	347	50-25-S2M2	12.50	135	1.25	388	0.50	347	50-25-S2M3
3"	4.50	12.47	6.25	160	1.25	462	0.50	539	50-30-S2M1	7.13	160	1.25	462	0.50	539	50-30-S2M2	12.50	160	1.25	462	0.50	539	50-30-S2M3
3-1/2"	4.50	16.69	x	x	x	x	x	x	x	7.25	120	1.50	358	0.50	560	50-35-S2M2	12.50	120	1.50	358	0.50	560	50-35-S2M3
4"	6.00	20.51	7.75	150	1.50	581	0.63	632	50-40-S2M1	8.88	150	1.50	581	0.63	632	50-40-S2M2	14.00	150	1.50	581	0.63	632	50-40-S2M3
5"	6.00	30.63	7.75	175	1.50	1063	0.44	1721	50-50-S2M1	9.12	200	1.50	1063	0.44	1721	50-50-S2M2	14.00	200	1.50	1063	0.44	1721	50-50-S2M3
6"	6.00	41.83	7.75	175	1.38	1263	0.38	2802	50-60-S2M1	9.38	200	1.38	1263	0.38	2802	50-60-S2M2	14.00	200	1.38	1263	0.38	2802	50-60-S2M3
8"	6.00	69.07	8.25	175	1.25	1824	0.25	6533	50-80-S2M1	9.75	200	1.25	1824	0.25	6533	50-80-S2M2	14.00	200	1.25	1824	0.25	6533	50-80-S2M3
10"	9.00	107.9	8.25	95	3.25	552	0.88	1412	50-100-S2M1	10.13	95	3.25	552	0.88	1412	50-100-S2M2	14.00	95	3.25	552	0.88	1412	50-100-S2M3
12"	9.00	148.6	8.25	110	3.25	652	0.75	2285	50-120-S2M1	10.63	110	3.25	652	0.75	2285	50-120-S2M2	14.00	110	3.25	652	0.75	2285	50-120-S2M3
14"	9.00	181.1	8.12	150	3.00	1016	0.63	4340	50-140-S2M1	10.75	150	3.00	1016	0.63	4340	50-140-S2M2	14.00	150	3.00	1016	0.63	4340	50-140-S2M3
16"	9.00	231.7	8.25	150	3.00	1248	0.50	6801	50-160-S2M1	11.25	160	3.00	1248	0.50	6801	50-160-S2M2	14.00	160	3.00	1248	0.50	6801	50-160-S2M3
18"	9.00	289.4	8.38	150	3.00	1300	0.38	8862	50-180-S2M1	11.63	155	3.00	1300	0.38	8862	50-180-S2M2	14.00	155	3.00	1300	0.38	8862	50-180-S2M3
20"	9.00	352.8	8.50	150	3.00	1441	0.38	11979	50-200-S2M1	12.00	150	3.00	1441	0.38	11979	50-200-S2M2	14.00	150	3.00	1441	0.38	11979	50-200-S2M3
22"	9.00	422.6	8.63	150	3.00	1582	0.38	15,750	50-220-S2M1	x	x	x	x	x	x	x	14.00	150	3.00	1582	0.38	15,750	50-220-S2M3
24"	9.00	498.6	8.75	150	3.00	1723	0.25	20236	50-240-S2M1	13.00	150	3.00	1723	0.25	20,236	50-240-S2M2	14.00	150	3.00	1723	0.25	20,236	50-240-S2M3

- \*\* Movements are non-concurrent-minimum 3000 cycles
- Custom lengths and pressure available on request
  - Stainless flanges available on request
  - Tie rods available on request
  - Flow liners may be required. See EJMA 10 guidelines
  - T-316, T-304, C-276, Inconel 625 and other alloys available



# MULTI-PLY EXPANSION JOINTS

## Series 2 for Greater Movement

### SERIES 2 - LONG



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-36 C/S PLATE FLANGES (FF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-105 C/S FORGED FLANGES (RF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- STD. WALL A-53 C/S WELD ENDS
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX

BELLOWS			PLATE FLANGES A-36 C/S							FORGED FLANGES A-105 STEEL							BEVELED WELD ENDS A-53 STD.						
SIZE	BELLOWS LIVE LENGTH (IN)	EFFECTIVE AREA (SQ-IN)	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 600°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER
2"	6.00	5.78	7.75	70	1.38	284	1.00	86	50-20-S2L1	8.25	70	1.38	284	1.00	86	50-20-S2L2	14.00	70	1.38	284	1.00	86	50-20-S2L3
2-1/2"	6.00	9.51	7.75	75	1.75	302	1.00	152	50-25-S2L1	8.50	75	1.75	302	1.00	152	50-25-S2L2	14.00	75	1.75	302	1.00	152	50-25-S2L3
3"	6.00	12.47	7.75	90	1.75	359	0.88	236	50-30-S2L1	8.63	90	1.75	359	0.88	236	50-30-S2L2	14.00	90	1.75	359	0.88	236	50-30-S2L3
3-1/2"	6.00	16.69	x	x	x	x	x	x	x	8.75	70	2.00	277	0.88	244	50-35-S2L2	14.00	70	2.00	277	0.88	244	50-35-S2L3
4"	9.00	20.51	10.75	60	2.00	378	1.50	182	50-40-S2L1	11.88	60	2.00	378	1.50	182	50-40-S2L2	17.00	60	2.00	378	1.50	182	50-40-S2L3
5"	9.00	30.63	10.75	120	2.25	709	1.00	510	50-50-S2L1	12.13	120	2.25	709	1.00	510	50-50-S2L2	17.00	120	2.25	709	1.00	510	50-50-S2L3
6"	9.00	41.83	10.75	145	2.13	842	0.88	830	50-60-S2L1	12.38	145	2.13	842	0.88	830	50-60-S2L2	17.00	145	2.13	842	0.88	830	50-60-S2L3
8"	9.00	69.07	11.25	175	2.00	1216	0.63	1936	50-80-S2L1	12.75	175	2.00	1216	0.63	1936	50-80-S2L2	17.00	175	2.00	1216	0.63	1936	50-80-S2L3
10"	12.00	107.9	14.25	50	4.50	408	1.50	586	50-100-S2L1	13.12	50	4.50	408	1.50	586	50-100-S2L2	20.00	50	4.50	408	1.50	586	50-100-S2L3
12"	12.00	148.6	14.25	60	4.50	482	1.38	948	50-120-S2L1	13.63	60	4.50	482	1.38	948	50-120-S2L2	20.00	60	4.50	482	1.38	948	50-120-S2L3
14"	12.00	181.1	14.12	95	4.25	762	1.13	1831	50-140-S2L1	13.75	95	4.25	762	1.13	1831	50-140-S2L2	20.00	95	4.25	762	1.13	1831	50-140-S2L3
16"	12.00	231.7	14.25	120	4.00	936	0.88	2869	50-160-S2L1	14.25	120	4.00	936	0.88	2869	50-160-S2L2	20.00	120	4.00	936	0.88	2869	50-160-S2L3
18"	12.00	289.4	14.38	125	4.00	975	0.88	3738	50-180-S2L1	14.63	125	4.00	975	0.88	3738	50-180-S2L2	20.00	125	4.00	975	0.88	3738	50-180-S2L3
20"	12.00	352.8	14.50	135	4.00	1081	0.75	5054	50-200-S2L1	15.00	135	4.00	1081	0.75	5054	50-200-S2L2	20.00	135	4.00	1081	0.75	5054	50-200-S2L3
22"	12.00	422.6	14.63	135	4.00	1187	0.63	6,645	50-220-S2L1	x	x	x	x	x	x	x	20.00	135	4.00	1187	0.63	6,645	50-220-S2L3
24"	12.00	498.6	14.75	135	4.00	1292	0.63	8,537	50-240-S2L1	16.00	135	4.00	1292	0.63	8,537	50-240-S2L2	20.00	135	4.00	1292	0.63	8,537	50-240-S2L3

- \*\* Movements are non-concurrent-minimum 3000 cycles
- Custom lengths and pressure available on request
  - Stainless flanges available on request
  - Tie rods available on request
  - Flow liners may be required. See EJMA 10 guidelines
  - T-316, T-304, C-276, Inconel 625 and other alloys available

# MULTI-PLY EXPANSION JOINTS

## Series 2 for Greater Movement

### SERIES 2 - XL



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-36 C/S PLATE FLANGES (FF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- 150# A-105 C/S FORGED FLANGES (RF)
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX



- 1- MULTI-PLY T-321 S/S BELLOWS
- 2- STD. WALL A-53 C/S WELD ENDS
- 3- T-304 S/S FLOW LINER (OPTIONAL)
- 4- DESIGN PER EJMA 10TH EDITION
- 5- WELDING PER ASME SECTION IX

BELLOWS			PLATE FLANGES A-36 C/S							FORGED FLANGES A-105 STEEL							BEVELED WELD ENDS A-53 STD.						
SIZE	BELLOWS LIVE LENGTH (IN)	EFFECTIVE AREA (SQ-IN)	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 70°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER	OVERALL LENGTH (IN)	WORKING PSIG @ 600°F	AXIAL COMPRESSION * (IN)	AXIAL SPRING RATE (LB/IN)	LATERAL OFFSET * (IN)	LATERAL SPRING RATE (LB/IN)	PART NUMBER
2"	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2-1/2"	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3"	9.00	12.47	10.75	40	2.00	239	1.75	70	50-30-S2XL1	11.63	40	2.00	239	1.75	70	50-30-S2XL2	17.00	40	2.00	239	1.75	70	50-30-S2XL3
3-1/2"	9.00	16.69	x	x	x	x	x	x	x	11.75	30	2.75	179	2.00	70	50-35-S2XL2	17.00	30	2.75	179	2.00	70	50-35-S2XL3
4"	12.00	20.51	13.75	35	2.50	291	2.00	79	50-40-S2XL1	14.88	35	2.50	291	2.00	79	50-40-S2XL2	20.00	35	2.50	291	2.00	79	50-40-S2XL3
5"	12.00	30.63	13.75	65	3.00	531	1.50	215	50-50-S2XL1	15.13	65	3.00	531	1.50	215	50-50-S2XL2	20.00	65	3.00	531	1.50	215	50-50-S2XL3
6"	12.00	41.83	13.75	80	3.00	631	1.50	350	50-60-S2XL1	15.38	80	3.00	631	1.50	350	50-60-S2XL2	20.00	80	3.00	631	1.50	350	50-60-S2XL3
8"	12.00	69.07	14.25	115	2.75	912	1.13	817	50-80-S2XL1	15.75	115	2.75	912	1.13	817	50-80-S2XL2	20.00	115	2.75	912	1.13	817	50-80-S2XL3
10"	15.00	107.9	17.25	30	6.00	336	2.00	308	50-100-S2XL1	19.13	30	6.00	336	2.00	308	50-100-S2XL2	23.00	30	6.00	336	2.00	308	50-100-S2XL3
12"	15.00	148.6	17.25	40	6.00	396	1.75	499	50-120-S2XL1	19.63	40	6.00	396	1.75	499	50-120-S2XL2	23.00	40	6.00	396	1.75	499	50-120-S2XL3
14"	15.00	181.1	17.12	60	5.50	610	1.75	938	50-140-S2XL1	19.75	60	5.50	610	1.75	938	50-140-S2XL2	23.00	60	5.50	610	1.75	938	50-140-S2XL3
16"	15.00	231.7	17.25	75	5.25	749	1.50	1469	50-160-S2XL1	20.25	75	5.25	749	1.50	1469	50-160-S2XL2	23.00	75	5.25	749	1.50	1469	50-160-S2XL3
18"	15.00	289.4	17.38	80	5.25	780	1.38	1914	50-180-S2XL1	20.63	80	5.25	780	1.38	1914	50-180-S2XL2	23.00	80	5.25	780	1.38	1914	50-180-S2XL3
20"	15.00	352.8	17.50	90	5.25	865	1.25	2587	50-200-S2XL1	21.00	90	5.25	865	1.25	2587	50-200-S2XL2	23.00	90	5.25	865	1.25	2587	50-200-S2XL3
22"	15.00	422.6	17.63	95	5.25	949	1.13	3,402	50-220-S2XL1	x	x	x	x	x	x	x	23.00	95	5.25	949	1.13	3,402	50-220-S2XL3
24"	15.00	498.6	17.75	100	5.25	1034	1.00	4,371	50-240-S2XL1	22.00	100	5.25	1034	1.00	4,371	50-240-S2XL2	23.00	100	5.25	1034	1.00	4,371	50-240-S2XL3

- \*\* Movements are non-concurrent-minimum 3000 cycles
- Custom lengths and pressure available on request
  - Stainless flanges available on request
  - Tie rods available on request
  - Flow liners may be required. See EJMA 10 guidelines
  - T-316, T-304, C-276, Inconel 625 and other alloys available

**Tie rods** are designed to restrain the full pressure thrust generated by the expansion joint. For axial compression applications, the tie rod nuts will lose contact with the lugs during the compression cycle and the thrust force is now directed to the anchors. In the event of a main anchor failure, the tie rods will prevent the bellows from over-extending or over-compressing while restraining the full pressure loading and dynamic forces created by an anchor failure. With the addition of stops the tie rods will also function as limit rods. Standard tie rod construction consists of high strength A193-B7 c/s threaded rods and A516-70 c/s lugs. With stainless pipe and flanges carbon steel or stainless steel tie rods can be furnished.



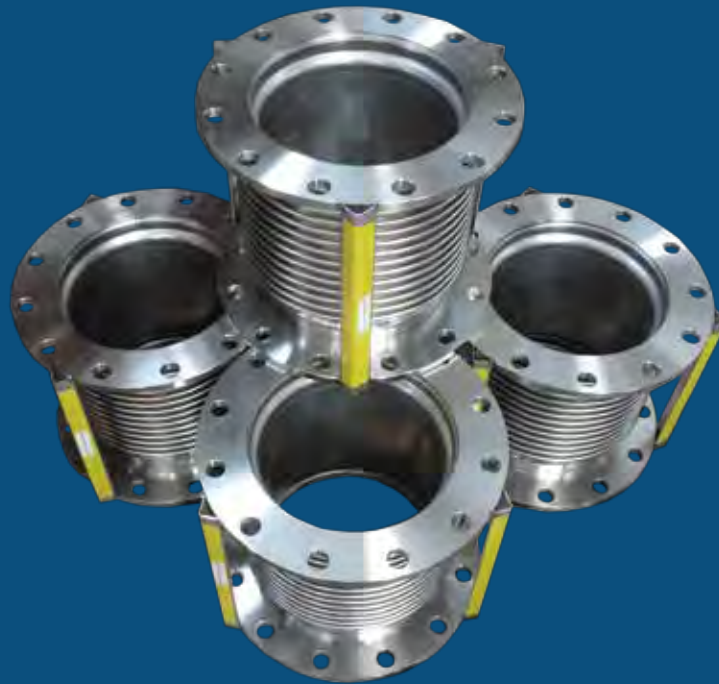
**Flow liners** are required to prevent flow induced vibration in the bellows which will lead to pre-mature failure. The Expansion Joint Manufacturers Association (EJMA) has established flow liner requirement guidelines based on a combination of factors. These are based on the bellows diameter, flow velocity, number of plies and length of the liner. A heavy flow liner will be required when abrasive materials are present in the flow media. By incorporating an oversized bellows into the expansion joint design a pipe flow liner that is the same thickness as the piping system can be used. The most common flow liner style is the single welded in liner which attaches to the upstream end fitting. The welded in telescoping liner is a good option for large amounts of axial travel. The drop-in flow liner can be removed and replaced when worn thus extending the life of the expansion joint.

**Covers** or shroud can be provided to protect the bellows from accidental damage caused by falling objects or mechanical damage caused by welding or cutting splatter. This shield is constructed from stainless steel or carbon steel sheet metal in one or more sections. The shroud is generally bolted on for easy removal when inspection is necessary. Sufficient clearance must be provided when lateral offset is present. As with telescoping flow liners a telescoping cover can be used for systems with large amounts of axial compression. The use of a cover may be required when insulation is necessary to protect personnel.



# SEND US YOUR INQUIRY

If your flexible piping product requirements are large or small Triad Bellows would like to be your go to manufacturer for metal bellows and expansion joints. We are a med sized company with large company capabilities ready to serve you with quality products at competitive prices, on time deliveries and nice friendly people to work with.



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