

# Flex-Tend® Flexible Expansion Joint

Technical Guide W5.6

Flex-Tend expansion joints for protection of infrastructure pipe lines from motion, and shear and provide seismic resilience.



10.2.1 | W5.6 FLEX-TEND EXPANSION JOINT

## Applications

Tank settling and other differential settling  
 Bridge crossings and other underground to aerial transitions  
 Active fault crossings and liquefaction

## Product Attributes

Ball ends

Telescopic center sections

Low contribution to mechanical thrust

Large movement ranges

Above or below ground installation

## Approvals/Standards

All wetted parts coated with NSF61  
 Approved FBE

100% test program for all completed units

Flanges available in ANSI, AS and EN standards

## Quality

NSF-61 Health and Safety Effects

AWWA C213 coating standards

Poly Sleeves to AWWA C116

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The Flex-Tend flexible expansion joint is specifically designed to allow pipe movement. It protects pipelines from any shear caused by fault lines, structural settling and transition from one structure to another. With its ease of movement it contributes significantly less mechanical force to the pipe line.

### Design Specifications

- Ball ends allow up to 20 degrees of deflection
- Telescopic center sections can be added together for increased extension
- Low contribution to mechanical thrust
- Large movement ranges
- Above or below ground installation

### Applications

- Tank settling and other differential settling such as vessel to vessel
- Bridge crossings and other underground to areal transitions
- Active fault crossings and liquefaction
- Near roadways and dams
- Across any unstable ground

### Flex-Tend Double Ball Submittal Reference Drawing – Flange by Flange

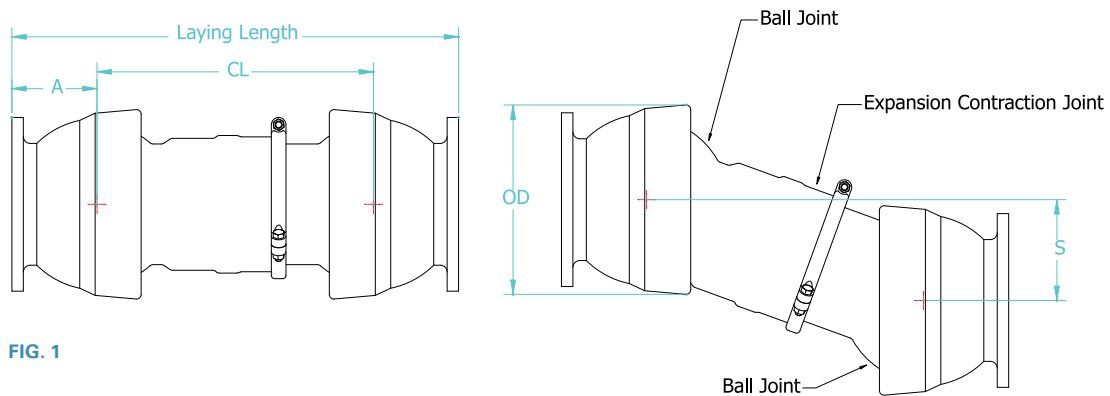


FIG. 1

### Flex-Tend Single Ball Submittal Reference Drawing – Flange by Flange

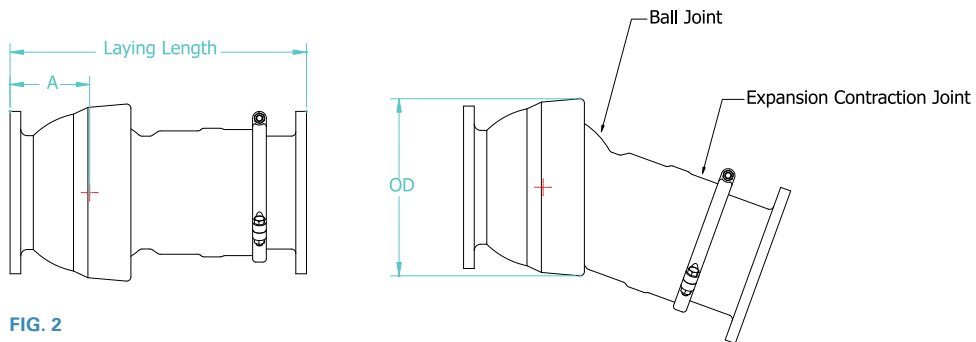


FIG. 2

**Note:**

t) Deflection in degrees per ball

tt) The expansion values listed represent the total movement for the particular size and configuration. Unless otherwise specified, FLEX-TEND assemblies are preset at factory to reserve 50% of total movement for expansion and 50% for contraction.

"Laying, Total, and CL" lengths reflects the standard 50% / 50% preset condition. Modifying the preset ratio requires a corresponding modification of these lengths.

## Flex-Tend Double Ball Submittal Reference Drawing – Flange by Flange

TABLE 1

Nominal Pipe Size	OD	Deflection per ball <sup>†</sup> (degrees)	A	Expansion <sup>**</sup>	Laying Length	CL	S (offset)	Weight (kg)	Assembly Number				
50	154.94	20	99.06	101.6 (+69.85, -31.75)	604.52	406.4	157.48	19.98	402F20				
				101.60	901.70 (±50.8)	546.1 (±50.8)	190.50	86.71	403F20				
				203.20	1290.32 (±101.6)	934.72 (±101.6)	322.58	106.69	403F21				
80	233.68	20	177.8	304.80	1676.4 (±152.4)	1320.8 (±152.4)	454.66	127.12	403F22				
				101.60	864.62 (±50.8)	579.37 (±50.8)	215.65	73.09	404F20				
				203.20	1251.97 (±101.6)	966.72 (±101.6)	365.51	95.34	404F21				
100	275.59	20	142.748	304.80	1639.32 (±152.4)	1404.87 (±152.4)	515.37	118.95	404F22				
				101.60	915.67 (±50.8)	601.98 (±50.8)	223.27	101.24	406F20				
				203.20	1278.38 (±101.6)	202.69 (±101.6)	364.74	129.39	406F21				
150	311.912	20	156.718	304.80	1641.09 (±152.4)	1327.4 (±152.4)	506.22	157.08	406F22				
				101.60	1026.41 (±50.8)	675.39 (±50.8)	248.41	154.36	408F20				
				203.20	1458.21 (±101.6)	1109.73 (±101.6)	414.27	196.13	408F21				
200	376.428	20	175.514	304.80	1895.09 (±152.4)	1544.07 (±152.4)	580.14	238.35	408F22				
				101.60	1137.92 (±50.8)	720.85 (±50.8)	263.91	231.54	410F20				
				203.20	1539.24 (±101.6)	1122.17 (±101.6)	418.59	294.19	410F21				
250	457.962	20	208.534	304.80	1940.56 (±152.4)	1523.49 (±152.4)	573.28	356.39	410F22				
				101.60	1241.04 (±50.8)	768.1 (±50.8)	280.16	315.08	412F20				
				203.20	1646.17 (±101.6)	1173.23 (±101.6)	436.12	381.81	412F21				
300	526.288	20	236.474	304.80	2051.3 (±152.4)	1578.36 (±152.4)	592.07	449.01	412F22				
				203.20	1638.3 (±101.6)	1117.6 (±101.6)	299.47	603.37	414F20				
				406.40	2308.86 (±203.2)	1790.7 (±203.2)	479.81	733.66	414F21				
355	635	15	345.44	609.60	2981.96 (±304.8)	2453.64 (±304.8)	659.38	864.42	414F22				
				203.20	1866.9 (±101.6)	1176.02 (±101.6)	315.21	547.07	416F20				
				406.40	2578.1 (±203.2)	1884.68 (±203.2)	504.95	697.80	416F21				
400	635	15	345.44	609.60	3289.3 (±304.8)	2593.34 (±304.8)	694.94	848.53	416F22				
				203.20	1849.12 (±101.6)	1193.8 (±101.6)	319.79	864.87	418F20				
				406.40	2537.46 (±203.2)	1882.14 (±203.2)	504.44	1043.29	418F21				
450	774.7	15	353.06	609.60	3225.8 (±304.8)	2567.94 (±304.8)	688.09	1221.26	418F22				
				203.20	1752.6 (±101.6)	1165.86 (±101.6)	312.42	878.04	420F20				
				406.40	2438.4 (±203.2)	1859.28 (±203.2)	498.09	1070.53	420F21				
500	774.7	15	289.56	609.60	3136.9 (±304.8)	2550.16 (±304.8)	683.26	1263.03	420F22				
				203.20	2108.2 (±101.6)	1325.88 (±101.6)	355.35	1470.51	424F20				
				406.40	2806.7 (±203.2)	2019.3 (±203.2)	541.02	1796.93	424F21				
600	947.42	15	393.7	609.60	3492.5 (±304.8)	2712.72 (±304.8)	726.95	2123.81	424F22				
				254.00	2506.98 (±127)	1658.62 (±127)	444.50	2291.34	430F20				
				508.00	3378.2 (±254)	2514.6 (±254)	673.86	2745.34	430F21				
750	1120.14	15	424.18	762.00	4241.8 (±381)	3352.8 (±381)	898.40	3198.88	430F22				
				254.00	523.8 (±127)	1600.2 (±127)	428.75	3231.57	436F20				
				508.00	3327.4 (±254)	2463.8 (±254)	660.15	3875.80	436F21				
900	1285.24	15	431.8	762.00	4191 (±381)	3327.4 (±381)	891.54	4519.57	436F22				
				1060	1682.75	12	547.624	609.60	4033.52 (±304.8)	2890.52 (±304.8)	584.45	6434.09	442F20
				1200	1704.34	12	571.5	609.60	4033.52 (±304.8)	2890.52 (±304.8)	739.90	7785.19	448F20

## Flex-Tend Single Ball Submittal Reference Drawing – Flange by Flange

TABLE 2

Nominal Pipe Size	OD	Deflection per ball <sup>†</sup> (degrees)	A	Expansion <sup>**</sup>	Laying Length	Weight (kg)	Assembly Number
80	233.68	20	177.8	101.6	591.82 (±50.8)	53.57	403F10
				203.2	1061.72 (±101.6)	74.00	403F11
				304.8	1531.62 (±152.4)	94.43	403F12
100	275.59	20	142.748	101.6	645.92 (±50.8)	50.85	404F10
				203.2	1033.27 (±101.6)	71.28	404F11
				304.8	1420.62 (±152.4)	91.71	404F12
150	311.912	20	156.718	101.6	695.71 (±50.8)	69.01	406F10
				203.2	1058.42 (±101.6)	96.70	406F11

**TABLE 2**

Nominal Pipe Size	OD	Deflection per ball <sup>*</sup> (degrees)	A	Expansion <sup>††</sup>	Laying Length	Weight (kg)	Assembly Number
200	376.428	20	175.514	304.8	1421.13 (±152.4)	124.40	406F12
				101.6	761.49 (±50.8)	110.32	408F10
				203.2	1195.83 (±101.6)	152.09	408F11
				304.8	1630.17 (±152.4)	194.31	408F12
250	457.962	20	208.534	101.6	832.87 (±50.8)	162.99	410F10
				203.2	1234.19 (±101.6)	225.18	410F11
				304.8	1635.51 (±152.4)	287.84	410F12
300	526.288	20	236.474	101.6	880.87 (±50.8)	212.47	412F10
				203.2	1286 (±101.6)	279.66	412F11
				304.8	1691.13 (±152.4)	346.40	412F12
355	635	15	345.44	203.2	1224.28 (±101.6)	399.52	414F10
				406.4	1889.76 (±204)	530.27	414F11
				609.6	2565.4 (±304.8)	660.12	414F12
400	635	15	345.44	203.2	1358.9 (±101.6)	413.59	416F10
				406.4	2070.1 (±204)	564.32	416F11
				609.6	2781.3 (±304.8)	715.05	416F12
450	774.7	15	353.06	203.2	1358.9 (±101.6)	558.87	418F10
				406.4	2039.2 (±204)	737.30	418F11
				609.6	2727.96 (±304.8)	915.26	418F12
500	774.7	15	289.56	203.2	1270 (±101.6)	579.76	420F10
				406.4	1955.8 (±204)	771.80	420F11
				609.6	2654.3 (±304.8)	958.39	420F12
600	947.42	15	393.7	203.2	1447.8 (±101.6)	945.68	424F10
				406.4	2146.3 (±204)	1264.84	424F11
				609.6	2844.8 (±304.8)	1591.72	424F12
750	1120.14	15	424.18	254	1704.35 (±127)	1658.92	430F10
				508	2578.1 (±254)	2086.13	430F11
				762	3449.32 (±381)	2612.77	430F12
900	1285.24	15	431.8	254	1826.26 (±127)	2141.97	436F10
				508	2705.1 (±254)	2785.74	436F11
				762	3581.4 (±381)	3429.52	436F12
1200	1704.34	12	571.5	609.6		5455.26	448F10



**FIG. 3**



**FIG. 4**



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