Microflex® inc.

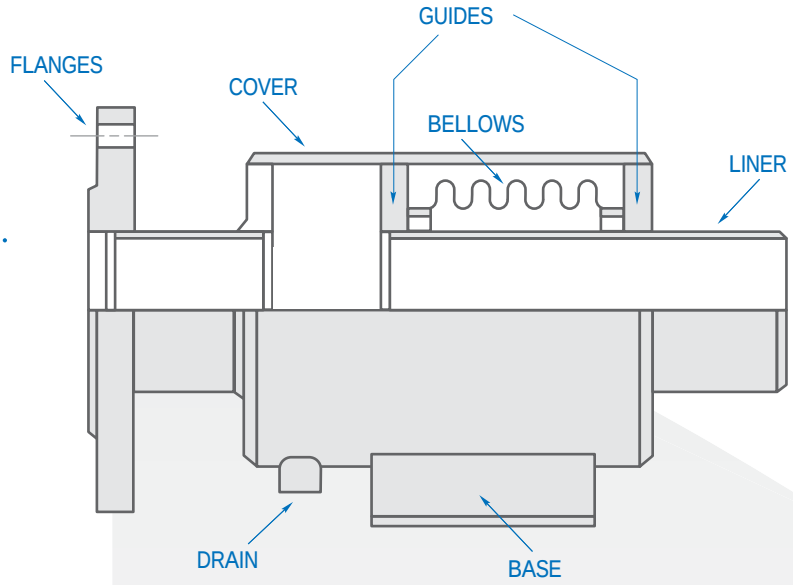
MICROFLEX INDUSTRIAL

MX EXTERNALLY PRESSURIZED EXPANSION JOINTS

MX PRESSURIZED

THE MX DESIGN ADVANTAGE

Microflex's MX expansion joints are designed with an uncompromising standard of quality for years of maintenance free operation in distribution pipelines conveying liquids or gases.



FEATURES

1 FLANGES

To insure pressure tight sealing, raised face slip on flanges in full compliance with ANSI B 16.5 are standard. Flange material is either ASTM A-105 (Forged) or ASTM A-36 (Plate). Lap joint flanges can be furnished as an option to permit easy alignment of bolt holes. Alloy ends are available where additional corrosion resistance may be required.

2 COVER

Designed for full line pressure to insure in the unlikely event of bellows failure media will not escape radially outward.

3 DRAIN

Provides a convenient location for installing a steam trap. May also be used to drain liquids when pipeline is shut down.

4 BASE

Bases are standard on double designs and optional on single designs. Base is designed as a support or intermediate anchor.

5 GUIDES

Internal and external guide rings are welded to inner end of pipe and outer cover. They are designed to provide accurate guiding of bellows as the pipeline expands or contracts. This insures bellows will not be scored or subject to movement for which it was not designed to accommodate.

6 BELLOWS

Single or multiple bellows are precision formed from cylinders of deep draw quality annealed sheet conforming to ASTM specifications - Type 304 is standard and suitable for most chloride free applications such as steam, condesate, oil or chill water. Where chlorides may be present, Inconel 600 bellows should be specified.

7 LINER

Carbon steel pipe liner is standard and designed to prevent bellows fatigue failure due to flow induced vibration. Liner is not affected by flow direction, therefore the MX may be used in pipe systems that have reverse flow conditions. Where additional corrosion resistance is required, liner and all other wetted surfaces may be furnished with alloy construction.

HOW TO ORDER > MICROFLEX MX EXPANSION JOINTS

1 SPECS

Specify size, type, pressure, style and end connections.

2 MATERIALS

304 SS Belows or carbon steel bellows are come standard with your parts. Alternate materials are also available.

MATERIAL	BELLOWS	ENDS
304SS	STD	E1
304LSS	B2	E2
316SS	B3	E3
316LSS	B4	E4
321SS	B5	E5
INC. 600	B6	E6
INC. 625	B7	E7

EXAMPLE

BASIC DESCRIPTION					ALT. MATERIALS	
SIZE	TYPE	PRESSURE	STYLE	ENDS	BELLOW	ENDS
12"	MXS	150	M	22	B6	—

THE MX PERFORMANCE ADVANTAGE

Microflex's MX expansion joints out-perform all other methods of thermal expansion compensation and in most cases with lower installed cost.

THE MX ADVANTAGE OVER EQUALIZING EXPANSION JOINTS

Some manufacturers of bellows expansion joints depend upon the use of bolted on external reinforcing, or equalizing rings, when design pressures exceed 50 PSIG. These rings are required since the bellows by itself is not capable of withstanding 300 PSIG or even 150 PSIG, as commonly encountered in distribution piping systems. Because these equalizing rings can be made from common gray cast iron they are prone to fracture failure if subjected to a sudden thermal shock such as spraying cold water on a hot equalizing ring.

An equalizing ring failure could result in bellows rupture. In addition, since equalizing expansion joints do not have Internal liners as part of their internal design, flow induced vibration can cause this rough textured cast equalizing rings to rub through or locally thin the bellows wall.

Microflex's MX expansion joints have bellows that are designed to withstand operating pressure without the need of any external reinforcing or equalizing rings. Each MX design has been computer verified to comply with the rigid design criteria of the 5th edition of the of the EJMA standards. Internal liner and external cover of pipe wall thickness are an inherent part of the MX design. The MX is literally "sledge hammer" tough. The initial cost of an MX can be significantly lower than an equalizing expansion joint with optional liner and cover.

THE MX ADVANTAGE OVER SLIP JOINTS

Slip joints depend upon the resiliency of packing rings to effect a pressure tight seal. Exposed to the ravages of time, temperature and slip movement even the so called "high performance" packings lose resilience and volume with inevitable leakage. Because of possible leakage, all slip joint manufacturers recommend periodic inspection of the installation to insure leaks are stopped before irreparable wire drawing of the packing or metal components occurs.

slip joints (vaults for underground pipelines) and the continual maintenance costs of inspection, adding packing and shut downs to change packing.

Microflex's MX expansion joints are packless, hermetically sealed with all welded construction, therefore can be installed in remote locations without need for access vaults, inspection or maintenance, ever. In addition, the initial cost of an MX is 20%-50% less than a slip joint.

THE MX ADVANTAGE OVER PIPE LOOP

Pipe loops are usually field fabricated from pipe elbows with a length of pipe between. It is the pipe between elbows, not the elbows themselves, that provide flexibility. Since pip, especially in larger diameters is very rigid, loops require many feet of pipe and space to compensate for even small amounts of thermal expansion. As an example to compensate for 4" of movement in a 12" sch 40 pipe a loop would have to be 8.5' wide by 17' high. The additional pipe and elbows results in greater heat loss, increased pressure drop, and increased operating costs.

Microflex's MX expansion joints are a straight through design with full bore internal pipe liner and cover, that when insulated will have no greater heat loss or pressure drop that the section of pipe it replaces. Although initial cost is comparable to a pipe loop, operating costs are less, and where space is at a premium the MX is the clear choice for economic savings.

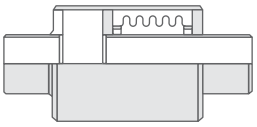
WARRANTY

Microflex's MX expansion joints are warranted to be free from defects in material and workmanship for a period of 5 years from date of shipment. In addition they are warranted to provide 5 years of leak free and 5 years of maintenance free operation when installed, anchored, and guided in accordance with Microflex's instructions, in a piping system conveying liquids or gases that are non corrosive to the bellows, end connection and housing materials of construction.

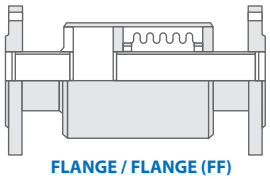
Buyers exclusive remedy shall be limited to repair or replacement for any product which is determined to be defective by Microflex upon it's return to the factory. Microflex will not allow any charge for labor, shipping expense or damage of any kind, direct or indirect attributed to defective material, and by accepting material buyer will assume all liability for any damages which may result from its use or misuse.

MX PRESSURIZED

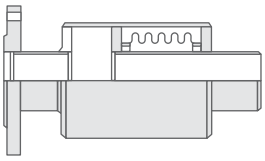
MX DESIGN TYPE



WELD / WELD (WW)



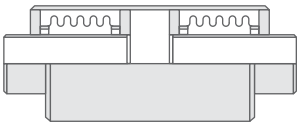
FLANGE / FLANGE (FF)



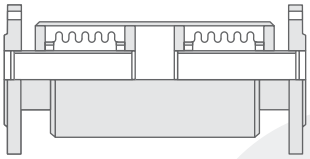
FLANGE / WELD (FW)

TYPE MXS

The **MX single** design options include weld, flange or combination end types and comply with **MIL E - 17813 E** type IV style 1 & 2 (class 1 single).



WELD / WELD (WW)



FLANGE / FLANGE (FF)

TYPE MXD

The **MX double** design options include weld, flange or combination end types and comply with **MIL E - 17813 E** type IV style 1 & 2 (class 2 double).

Note: axial movement listed in chart is combined total of both bevels.

TECHNICAL DATA SHEET

SIZE	BELLOWS AREA	TYPE	PSI	STYLE	MOVEMENT AXIAL		SPRING RATE	WW		FF		FW		SHELL	CENTER TO BASE
	SQ/IN		650°F		COMPRESS	EXTEND	LBS/INCH	OAL	WGT	OAL	WGT	OAL	WGT	O.D. INCH	INCH
1"	6	MXS	150	S	4	0.75	85	21.00	19	22.50	23	21.25	21	4 1/2"	4"
				M	6	1.12	57	28.75	26	30.50	30	29.25	28		
				L	8	1.50	43	35.00	31	36.50	35	35.25	33		
			300	S	4	0.75	170	21.00	20	23.00	26	21.25	23	4 1/2"	4"
				M	6	1.12	114	28.75	27	31.00	34	29.25	31		
				L	8	1.50	86	35.00	32	37.00	39	35.25	36		
		MXD	150	S	8	1.50	85	35.25	34	37.65	38			4 1/2"	4"
				M	12	2.25	57	51.00	49	53.75	53				
				L	16	3.00	43	63.25	58	65.75	62				
			300	S	8	1.50	170	35.25	36	38.50	42			4 1/2"	4"
				M	12	2.25	114	51.00	51	54.50	57				
				L	16	3.00	86	63.25	61	66.50	67				
1 1/4"	6	MXS	150	S	4	0.75	85	21.00	20	22.75	26	21.25	23	4 1/2"	4"
				M	6	1.12	57	28.75	29	30.75	34	29.25	32		
				L	8	1.50	43	35.00	33	36.75	39	35.25	36		
			300	S	4	0.75	170	21.00	22	23.25	33	21.25	27	4 1/2"	4"
				M	6	1.12	114	28.75	30	31.25	41	29.25	35		
				L	8	1.50	86	35.00	35	37.25	46	35.50	40		
		MXD	150	S	8	1.50	85	35.25	35	38.00	42			4 1/2"	4"
				M	12	2.25	57	51.00	50	54.00	56				
				L	16	3.00	43	63.25	60	66.00	66				
			300	S	8	1.50	170	35.25	37	39.25	49			4 1/2"	4"
				M	12	2.25	114	51.00	52	55.25	64				
				L	16	3.00	86	63.25	63	67.25	75				
1 1/2"	6	MXS	150	S	4	0.75	85	21.00	20	22.75	26	21.25	23	4 1/2"	4"
				M	6	1.12	57	28.75	29	30.75	35	29.25	32		
				L	8	1.50	43	35.00	33	36.75	39	35.25	36		
			300	S	4	0.75	170	21.00	22	23.25	31	21.25	28	4 1/2"	4"
				M	6	1.12	114	28.75	30	31.25	41	29.25	35		
				L	8	1.50	86	35.00	35	37.25	48	35.50	42		
		MXD	150	S	8	1.50	85	35.25	36	38.00	42			4 1/2"	4"
				M	12	2.25	57	51.00	52	54.00	58				
				L	16	3.00	43	63.25	62	66.00	68				
			300	S	8	1.50	170	35.25	37	39.25	49			4 1/2"	4"
				M	12	2.25	114	51.00	54	55.25	66				
				L	16	3.00	86	63.25	65	67.25	77				
2"	12	MXS	150	S	4	0.75	194	23.25	33	25.50	44	23.50	39	5 9/16"	4 1/2"
				M	6	1.12	130	32.00	46	34.50	56	32.50	51		
				L	8	1.50	97	39.25	55	41.50	65	39.50	60		
			300	S	4	0.75	388	23.25	35	25.75	49	23.75	42	5 9/16"	4 1/2"
				M	6	1.12	260	32.00	48	34.75	63	32.50	56		
				L	8	1.50	194	39.25	58	41.75	72	39.75	65		
		MXD	150	S	8	1.50	194	39.50	60	43.25	70			5 9/16"	4 1/2"
				M	12	2.25	130	57.25	85	61.25	95				
				L	16	3.00	97	71.50	102	75.25	112				
			300	S	8	1.50	388	39.50	62	43.50	76			5 9/16"	4 1/2"
				M	12	2.25	260	57.25	89	61.50	103				
				L	16	3.00	194	71.50	109	75.50	123				

TECHNICAL DATA SHEET

SIZE	BELLOWS AREA	TYPE	PSI	STYLE	MOVEMENT AXIAL		SPRING RATE	WW		FF		FW		SHELL	CENTER TO BASE
	SQ/IN		650°F		COMPRESS	EXTEND	LBS/INCH	OAL	WGT	OAL	WGT	OAL	WGT	O.D. INCH	INCH
2 1/2"	12	MXS	150	S	4	0.75	194	23.25	35	25.50	51	23.50	44	5 9/16"	4 1/2"
				M	6	1.12	130	32.00	50	34.50	65	32.50	58		
				L	8	1.50	97	39.25	60	41.50	75	39.50	68		
			300	S	4	0.75	388	23.25	36	25.75	56	23.75	48	5 9/16"	4 1/2"
				M	6	1.12	260	32.00	52	34.75	73	32.50	63		
				L	8	1.50	194	39.25	63	41.75	84	39.75	74		
		MXD	150	S	8	1.50	194	39.50	65	43.25	79			5 9/16"	4 1/2"
				M	12	2.25	130	57.25	92	61.25	106				
				L	16	3.00	97	71.50	112	75.25	126				
			300	S	8	1.50	388	39.50	67	24.50	87			5 9/16"	4 1/2"
				M	12	2.25	260	57.25	97	31.0	117				
				L	16	3.00	194	71.50	118	39.50	138				
3"	16	MXS	150	S	4	0.75	252	22.25	46	24.50	63	22.75	55	6 5/8"	5"
				M	6	1.12	190	28.50	57	31.00	74	29.00	66		
				L	8	1.50	126	37.25	74	39.5	91	37.75	83		
			300	S	4	0.75	504	22.25	47	24.75	75	22.75	62	6 5/8"	5"
				M	6	1.12	380	28.50	59	31.25	87	29.00	74		
				L	8	1.50	252	22.25	78	39.75	106	37.75	93		
		MXD	150	S	8	1.50	252	37.50	82	41.25	98			6 5/8"	5"
				M	12	2.25	190	50.25	104	54.25	120				
				L	16	3.00	126	67.50	138	71.25	154				
			300	S	8	1.50	504	37.50	82	41.75	110			6 5/8"	5"
				M	12	2.25	380	50.25	106	54.75	134				
				L	16	3.00	252	67.50	146	71.75	172				
3 1/2"	30	MXS	150	S	4	0.75	425	22.75	69	25.00	93	23.25	82	8 5/8"	6 1/4"
				M	6	1.12	283	29.50	86	31.75	109	30.00	98		
				L	8	1.50	212	38.50	152	40.75	175	39.00	164		
			300	S	4	0.75	850	22.75	72	25.75	108	23.50	91	8 5/8"	6 1/4"
				M	6	1.12	566	29.50	90	32.50	127	30.25	110		
				L	8	1.50	424	38.50	163	41.50	199	39.25	182		
		MXD	150	S	8	1.50	425	38.75	120	42.50	142			8 5/8"	6 1/4"
				M	12	2.25	283	52.00	155	56.00	177				
				L	16	3.00	212	70.00	210	73.75	232				
			300	S	8	1.50	850	38.75	126	43.50	143			8 5/8"	6 1/4"
				M	12	2.25	566	52.00	164	57.00	181				
				L	16	3.00	424	70.00	220	74.75	237				
4"	30	MXS	150	S	4	0.75	425	22.75	72	25.75	99	24.00	86	8 5/8"	6 1/4"
				M	6	1.12	283	29.50	89	32.50	117	30.50	104		
				L	8	1.50	212	38.50	116	41.25	144	39.50	131		
			300	S	4	0.75	850	22.75	74	25.75	121	23.50	99	8 5/8"	6 1/4"
				M	6	1.12	566	29.50	94	32.50	141	30.00	119		
				L	8	1.50	424	38.50	124	41.25	170	39.00	148		
		MXD	150	S	8	1.50	425	38.75	127	42.50	153			8 5/8"	6 1/4"
				M	12	2.25	283	52.00	162	56.00	188				
				L	16	3.00	212	70.00	216	73.75	242				
			300	S	8	1.50	850	38.75	133	43.25	177			8 5/8"	6 1/4"
				M	12	2.25	566	52.00	171	56.75	215				
				L	16	3.00	424	70.00	231	73.75	275				
5"	42	MXS	150	S	4	0.75	501	21.50	95	24.00	128	22.00	113	10 3/4"	7 1/2"
				M	6	1.12	334	27.50	116	30.00	149	28.00	134		
				L	8	1.50	251	33.75	138	36.25	171	34.25	156		
			300	S	4	0.75	1002	21.50	97	24.50	158	22.25	130	10 3/4"	7 1/2"
				M	6	1.12	668	27.50	120	30.75	181	28.25	153		
				L	8	1.50	501	33.75	143	36.75	203	34.50	175		
		MXD	150	S	8	1.50	501	36.00	170	40.25	200			10 3/4"	7 1/2"
				M	12	2.25	334	48.00	212	52.50	242				
				L	16	3.00	251	60.50	296	64.75	286				
			300	S	8	1.50	1002	36.00	174	40.75	230			10 3/4"	7 1/2"
				M	12	2.25	668	48.00	220	53.00	276				
				L	16	3.00	501	60.50	266	65.25	322				

MX PRESSURIZED

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TECHNICAL DATA SHEET

SIZE	BELLOWS AREA	TYPE	PSI	STYLE	MOVEMENT AXIAL		SPRING RATE	WW		FF		FW		SHELL	CENTER TO BASE
	SQ/IN		650°F		COMPRESS	EXTEND	LBS/INCH	OAL	WGT	OAL	WGT	OAL	WGT	O.D. INCH	INCH
6"	52	MXS	150	S	4	0.75	570	21.50	102	24.00	144	22.00	125	10 3/4"	7 1/2"
				M	6	1.12	380	27.50	124	30.25	167	28.00	148		
				L	8	1.50	285	33.75	149	36.25	191	34.25	172		
			300	S	4	0.75	1140	21.50	106	25.25	190	22.75	151	10 3/4"	7 1/2"
				M	6	1.12	760	27.50	130	31.25	214	28.75	175		
				L	8	1.50	570	33.75	155	37.50	239	35.00	200		
		MXD	150	S	8	1.50	570	36.25	184	40.25	222			10 3/4"	7 1/2"
				M	12	2.25	380	48.25	230	52.50	268				
				L	16	3.00	285	60.75	278	64.75	316				
			300	S	8	1.50	1140	36.25	192	41.50	270			10 3/4"	7 1/2"
				M	12	2.25	760	48.25	240	53.75	318				
				L	16	3.00	570	60.75	290	66.00	368				
8"	83	MXS	150	S	4	0.75	1212	22.50	161	25.25	228	23.25	198	12 3/4"	8 1/2"
				M	6	1.12	808	29.00	198	32.00	265	29.75	235		
				L	8	1.50	606	35.75	236	38.50	302	36.50	272		
			300	S	4	0.75	2424	38.25	168	26.75	295	24.00	237	12 3/4"	8 1/2"
				M	6	1.12	1616	51.25	209	33.50	336	30.50	278		
				L	8	1.50	1212	64.75	250	40.00	377	37.25	319		
		MXD	150	S	8	1.50	1212	38.25	260	42.50	320			12 3/4"	8 1/2"
				M	12	2.25	808	51.25	354	55.75	414				
				L	16	3.00	606	64.75	430	69.00	490				
			300	S	8	1.50	2424	38.25	294	44.00	416			12 3/4"	8 1/2"
				M	12	2.25	1616	51.25	376	57.25	492				
				L	16	3.00	1212	64.75	458	70.50	574				
10"	135	MXS	150	S	4	1.00	1065	23.75	209	26.75	306	24.50	263	16"	10 1/4"
				M	6	1.50	710	30.75	261	34.00	358	31.50	315		
				L	8	2.00	533	40.00	337	43.25	434	41.00	391		
			300	S	4	1.00	3266	23.75	216	28.50	396	25.25	315	16"	10 1/4"
				M	6	1.50	2177	30.75	272	35.75	452	32.50	371		
				L	8	2.00	1633	40.00	354	44.75	534	41.75	453		
		MXD	150	S	8	2.00	1065	40.50	364	45.25	450			16"	10 1/4"
				M	12	3.00	710	54.75	468	59.50	554				
				L	16	4.00	533	73.25	620	78.00	706				
			300	S	8	2.00	3266	40.50	378	46.75	540			16"	10 1/4"
				M	12	3.00	2177	54.75	489	61.25	651				
				L	16	4.00	1633	73.25	654	79.50	816				
12"	182	MXS	150	S	4	1.00	1217	24.50	257	28.00	400	25.50	321	18"	11 1/4"
				M	6	1.50	811	32.00	324	35.75	467	33.00	388		
				L	8	2.00	609	41.75	419	45.25	562	42.75	483		
			300	S	4	1.00	3491	25.00	285	30.50	540	27.00	400	18"	11 1/4"
				M	6	1.50	2327	32.50	355	38.25	610	34.50	470		
				L	8	2.00	1745	42.25	457	47.75	712	44.25	572		
		MXD	150	S	8	2.00	1217	42.25	455	47.25	583			18"	11 1/4"
				M	12	3.00	811	57.25	589	62.50	717				
				L	16	4.00	609	76.75	779	81.75	907				
			300	S	8	2.00	3491	42.75	511	49.75	741			18"	11 1/4"
				M	12	3.00	2327	57.75	651	65.00	881				
				L	16	4.00	1745	77.25	855	84.25	1085				
14"	212	MXS	150	S	4	1.00	1328	24.50	293	28.25	491	25.75	383	20"	12 1/4"
				M	6	1.50	885	32.00	367	36.00	565	33.25	457		
				L	8	2.00	1053	41.75	473	45.50	671	43.00	563		
			300	S	4	1.00	2656	25.00	373	30.75	732	27.25	567	20"	12 1/4"
				M	6	1.50	1770	32.50	468	38.50	828	34.75	663		
				L	8	2.00	1328	42.25	607	48.00	966	44.50	772		
		MXD	150	S	8	2.00	1328	42.25	529	47.50	709			20"	12 1/4"
				M	12	3.00	885	57.25	677	62.75	857				
				L	16	4.00	1053	76.75	889	82.00	1069				
			300	S	8	2.00	2656	42.75	673	50.00	1003			20"	12 1/4"
				M	12	3.00	1770	57.75	863	65.25	1193				
				L	16	4.00	1328	77.25	1141	84.50	1471				

TECHNICAL DATA SHEET

SIZE	BELLOWS AREA	TYPE	PSI	STYLE	MOVEMENT AXIAL		SPRING RATE	WW		FF		FW		SHELL	CENTER TO BASE
	SQ/IN		650°F		COMPRESS	EXTEND	LBS/INCH	OAL	WGT	OAL	WGT	OAL	WGT	O.D. INCH	INCH
16"	276	MXS	150	S	4	1.00	1425	24.50	329	28.75	547	26.00	430	22"	13 1/4"
				M	6	1.50	950	32.00	412	36.25	631	33.50	510		
				L	8	2.00	712	41.75	530	46.00	749	43.25	628		
			300	S	4	1.00	2850	25.00	418	31.50	798	27.50	608	22"	13 1/4"
				M	6	1.50	1900	32.50	525	39.25	905	35.00	718		
				L	8	2.00	1424	42.25	680	48.75	1060	44.75	870		
		MXD	150	S	8	2.00	1425	42.25	574	48.00	774			22"	13 1/4"
				M	12	3.00	950	57.25	740	63.25	940				
				L	16	4.00	712	76.75	976	82.50	1176				
			300	S	8	2.00	2850	42.75	750	50.75	944			22"	13 1/4"
				M	12	3.00	1900	57.75	964	66.00	1158				
				L	16	4.00	1424	77.25	1274	85.25	1468				
18"	338	MXS	150	S	4	1.00	1596	24.50	364	29.00	652	26.00	494	24"	14 1/4"
				M	6	1.50	1064	32.00	456	36.50	745	33.50	586		
				L	8	2.00	798	41.75	588	46.25	875	43.25	718		
			300	S	4	1.00	3192	25.00	463	31.75	1007	27.75	713	24"	14 1/4"
				M	6	1.50	2128	32.50	581	39.50	1126	35.25	831		
				L	8	2.00	1596	42.25	753	49.00	1297	45.00	1003		
		MXD	150	S	8	2.00	1596	42.25	633	48.25	893			24"	14 1/4"
				M	12	3.00	1064	57.25	817	63.50	1077				
				L	16	4.00	798	76.75	1081	82.75	1341				
			300	S	8	2.00	3192	42.75	832	51.00	1332			24"	14 1/4"
				M	12	3.00	2128	57.75	1068	66.25	1568				
				L	16	4.00	1596	77.25	1412	85.50	1912				
20"	404	MXS	150	S	4	1.00	1766	24.50	400	29.75	766	26.50	565	26"	17 1/2"
				M	6	1.50	1177	32.00	501	37.25	868	34.00	666		
				L	8	2.00	883	41.75	646	47.00	1012	43.75	811		
			300	S	4	1.00	3532	25.00	508	32.00	1189	27.75	823	26"	17 1/2"
				M	6	1.50	2354	32.50	637	39.75	1319	35.25	952		
				L	8	2.00	1766	42.25	826	49.25	1507	45.00	1141		
		MXD	150	S	8	2.00	1766	42.25	724	49.00	1054			26"	17 1/2"
				M	12	3.00	1177	57.25	924	64.25	1254				
				L	16	4.00	883	76.75	1214	83.50	1544				
			300	S	8	2.00	3532	42.75	1016	51.25	1646			26"	17 1/2"
				M	12	3.00	2354	57.75	1274	66.50	1904				
				L	16	4.00	1766	77.25	1652	83.75	2282				
22"	481	MXS	150	S	4	1.00	1936	24.50	436	30.00	848	26.50	621	28"	18 1/2"
				M	6	1.50	1290	32.00	546	37.50	959	34.00	731		
				L	8	2.00	968	41.75	703	47.25	1115	43.75	888		
			300	S	4	1.00	3872	25.00	553	32.75	1356	28.25	923	28"	18 1/4"
				M	6	1.50	2580	32.50	693	40.50	1497	35.75	1063		
				L	8	2.00	1936	42.25	899	50.00	1702	45.50	1269		
		MXD	150	S	8	2.00	1936	42.25	758	49.25	1128			28"	18 1/4"
				M	12	3.00	1290	57.25	978	64.50	1348				
				L	16	4.00	968	76.75	1292	84.75	1662				
			300	S	8	2.00	3872	42.75	998	52.00	1738			28"	18 1/4"
				M	12	3.00	2580	57.75	1278	67.25	2018				
				L	16	4.00	1936	77.25	1690	86.50	2430				
24"	562	MXS	150	S	4	1.00	2106	24.50	472	30.25	961	26.75	742	28"	19 1/2"
				M	6	1.50	1404	32.00	590	38.00	1081	34.25	862		
				L	8	2.00	1053	41.75	761	47.50	1250	44.00	1032		
			300	S	4	1.00	4212	25.00	598	33.00	1619	28.25	1140	28"	19 1/2"
				M	6	1.50	2808	32.50	750	40.75	1772	35.75	1284		
				L	8	2.00	2106	42.25	972	50.25	1993	45.50	1514		
		MXD	150	S	8	2.00	2106	42.25	852	49.50	1292			28"	19 1/2"
				M	12	3.00	1404	57.25	1088	64.75	1528				
				L	16	4.00	1053	76.75	1430	84.00	1870				
			300	S	8	2.00	4212	42.75	1078	52.25	2028			28"	19 1/2"
				M	12	3.00	2808	57.75	1382	67.50	2332				
				L	16	4.00	2106	77.25	1826	86.75	2776				

MX PRESSURIZED

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TECHNICAL DATA SHEET

SIZE	BELLOWS AREA	TYPE	PSI	STYLE	MOVEMENT AXIAL		SPRING RATE	WW		FF		FW		SHELL	CENTER TO BASE
	SQ/IN		650°F		COMPRESS	EXTEND	LBS/INCH	OAL	WGT	OAL	WGT	OAL	WGT	O.D. INCH	INCH
26"	635	MXS	150	S	4	1.00	2255	24.50	507	30.50	1064	26.75	996	32"	19 1/2"
				M	6	1.50	1503	32.00	634	38.25	1192	34.25	884		
				L	8	2.00	1128	41.75	818	47.75	1374	44.00	1068		
			300	S	4	1.00	4510	25.00	642	34.25	1872	29.00	1212	32"	19 1/2"
				M	6	1.50	3006	32.50	805	42.00	2036	36.50	1375		
				L	8	2.00	2255	42.25	1044	51.50	2274	46.25	1614		
		MXD	150	S	8	2.00	2255	42.25	915	49.75	1415			32"	19 1/2"
				M	12	3.00	1503	57.25	1169	65.00	1669				
				L	16	4.00	1128	76.75	1537	84.25	2037				
			300	S	8	2.00	4510	42.75	1156	53.50	2296			32"	19 1/2"
				M	12	3.00	3006	57.75	1482	68.75	2622				
				L	16	4.00	2255	77.25	1960	88.00	3100				
28"	730	MXS	150	S	4	1.00	2425	24.50	543	30.50	1173	26.75	828	34"	21"
				M	6	1.50	1616	32.00	679	38.00	1310	34.25	961		
				L	8	2.00	1212	41.75	875	47.75	1505	44.00	1160		
			300	S	4	1.00	4850	25.00	687	34.75	2230	39.35	1407	34"	21"
				M	6	1.50	3232	32.50	862	42.50	2406	36.75	1582		
				L	8	2.00	2424	42.25	1117	52.00	2660	46.50	1837		
		MXD	150	S	8	2.00	2425	42.25	980	49.75	1556			34"	21"
				M	12	3.00	1616	57.25	1252	65.00	1822				
				L	16	4.00	1212	76.75	1644	84.25	2214				
			300	S	8	2.00	4850	42.75	1239	54.00	2679			34"	21"
				M	12	3.00	3232	57.75	1589	69.25	3029				
				L	16	4.00	2424	77.25	2099	88.50	3519				
30"	804	MXS	150	S	4		3925	24.50	583	30.75	1282	27.00	898	36"	22"
				M	6		2616	32.00	731	38.50	1431	34.50	1046		
				L	8		1962	41.75	945	48.00	1643	44.25	1260		
			300	S	4		7850	25.00	742	35.75	2484	29.75	1552	36"	22"
				M	6		5233	32.50	932	43.50	2676	37.25	1742		
				L	8		3925	42.25	1214	53.00	2956	47.00	2024		
		MXD	150	S	8		4182	42.25	1052	50.00	1682			36"	22"
				M	12		2788	57.25	1348	65.25	1978				
				L	16		2091	76.75	1776	84.50	2406				
			300	S	8		8354	42.75	1339	55.00	2959			36"	22"
				M	12		5576	57.75	1719	70.25	3339				
				L	16		3925	77.25	2283	89.50	3903				
32"	934	MXS	150	S	4		4182	24.50	619	31.50	1492	27.25	1093	38"	23"
				M	6		2788	32.00	776	39.25	1650	34.75	1252		
				L	8		2091	41.75	1003	48.75	1875	44.50	1477		
			300	S	4		8364	25.00	787	36.25	2705	30.00	1798	38"	23"
				M	6		5576	32.50	990	44.00	2909	37.50	2001		
				L	8		4182	42.25	1288	53.50	3206	47.25	2299		
		MXD	150	S	8		4182	42.25	1158	50.75	1948			38"	23"
				M	12		2788	57.25	1472	66.00	2262				
				L	16		2091	76.75	1926	85.25	2716				
			300	S	8		8364	42.75	1494	55.50	3274			38"	23"
				M	12		5576	57.75	1900	70.75	3680				
				L	16		4182	77.25	2496	90.00	4276				
36"	1164	MXS	150	S	4		5398	24.50	703	31.75	1760	27.50	1276	42"	25 1/4"
				M	6		3600	32.00	884	39.50	1942	35.00	1459		
				L	8		2699	41.75	1148	49.00	2205	44.75	1720		
			300	S	4		10796	25.00	902	37.25	3471	30.50	2102	42"	25 1/4"
				M	6		7198	32.50	1139	45.00	3710	38.00	2339		
				L	8		5398	42.25	1494	54.50	4063	47.75	2694		
		MXD	150	S	8		5398	42.25	1406	51.00	1844			42"	25 1/4"
				M	12		3600	57.25	1634	66.25	2594				
				L	16		2699	76.75	2162	85.50	3122				
			300	S	8		10796	42.75	1633	56.50	4033			42"	25 1/4"
				M	12		7198	57.75	2107	71.75	4507				
				L	16		5398	77.25	2817	91.00	5217				

INSTALLATION INSTRUCTIONS

Microflex's MX expansion joints are designed to absorb axial movement only, and must therefore be installed in straight sections of pipelines, with properly designed anchors, guides, and supports. Figure 1-3 below illustrates proper installations. Methods for determining anchor loads are published in EJMA standards or available form Microflex on request.

MX SINGLE

Figure 1-1 shows the proper use of a **single** MX expansion joint to absorb axial pipe line expansion. Main anchors (MA) are located at changes in pipe direction. Only one expansion joint should be installed between anchors and preferably within four pipe diameters of an anchor. Pipe guides (G) are located in accordance with table below.

MX DOUBLE

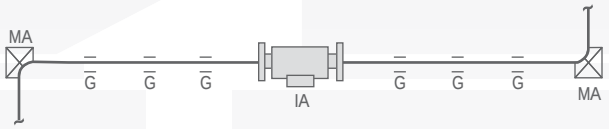

Figure 1-2 shows the proper use of a **double** MX expansion joint to absorb axial pipe line expansion. Main anchors (MA) are located at changes in pipe direction. The double MX expansion joint with intermediate anchor (IA) is located equal distance from main anchors. Pipe guides (G) are located in accordance with table below.

MX SINGLE (x3)

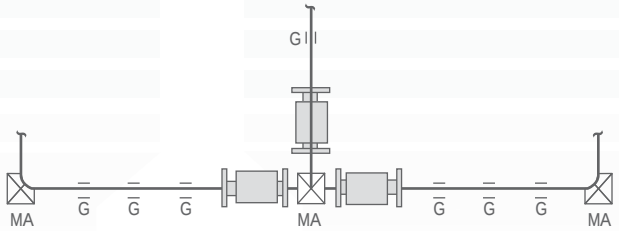

Figure 1-3 shows the proper use of a **three single** MX expansion joints to absorb axial pipe line expansion with a branch connection. Main anchors (MA) are located at changes in pipe direction. Only one expansion joint should be installed between anchors and preferably within four pipe diameters of an anchor. Pipe guides (G) are located in accordance with table below.

MX PIPE GUIDE REQUIREMENTS

To insure long maintenance free operation, pipe alignment guides must be installed as tabulated below.

		MX SIZE																							
MAX DISTANCE	PSI	1"	1½"	1¼"	2"	2½"	3"	3½"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	36"
FEET TO FIRST GUIDE	150 & 300	2	2	2	3	3	4	4	5	6	7	10	12	15	16	18	21	23	25	28	30	32	35	37	42
FEET TO ALL OTHER GUIDES	150	12	17	14	18	20	22	26	30	35	40	50	62	68	70	78	88	93	97	102	104	112	120	127	135
	300	8	11	9	12	13	16	18	21	24	28	56	44	49	50	56	62	65	70	75	78	82	85	90	96

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MX PIPE THERMAL EXPANSION IN INCHES PER 100 FEET

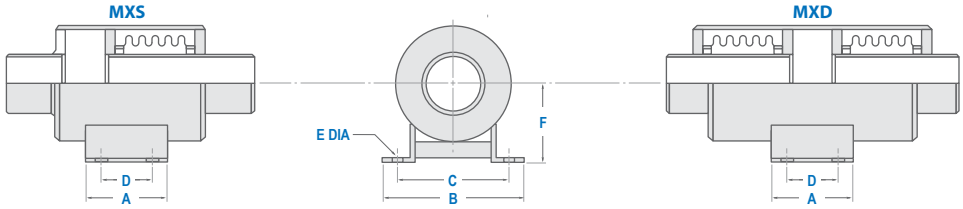
The table below shows expansion resulting from change in temperature from 70ºF to indicate temperature. This table is to be used as an informational guide only, and it is not implied that materials are suitable for all temperature ranges shown. Data for Inconel is based on information provided by the International Nickel Co., and all other data is based on Appendix B of the code for power piping ANSI

ºF	SAT. STEAM VACUUM IN HG[1]	CARBON CMO, 3CR MO STEEL	AUSTEN. STAINL. STEEL	5 TO 9 CR MO STEEL	FERRIT STAINL. STEEL	MONEL 400	INCONEL 600	25CR 20NI	ALUMINUM	GREY CAST IRON	BRASS	WROUGHT IRON	70CU 30NI
-325		-2.37	-3.85	-2.22	-2.04	-2.62		-3.00	-4.69		-3.88	-2.70	-3.15
-300		-2.24	-3.62	-2.10	-1.93	-2.50		-2.83	-4.43		-3.64	-2.55	-2.98
-275		-2.11	-3.40	-1.98	-1.81	-2.38		-2.66	-4.17		-3.41	-2.41	-2.81
-250		-1.98	-3.17	-1.85	-1.70	-2.26	-2.30	-2.49	-3.91		-3.18	-2.26	-2.63
-225		-1.84	-2.95	-1.73	-1.58	-2.14	-2.17	-2.32	-3.66		-2.94	-2.11	-2.46
-200		-1.71	-2.72	-1.61	-1.47	-2.03	-2.04	-2.15	-3.40		-2.71	-1.96	-2.29
-175		-1.58	-2.49	-1.49	-1.35	-1.91	-1.87	-1.98	-3.14		-2.47	-1.82	-2.12
-150		-1.45	-2.27	-1.37	-1.24	-1.79	-1.70	-1.81	-2.88		-2.24	-1.67	-1.95
-125		-1.30	-2.01	-1.23	-1.12	-1.59	-1.54	-1.60	-2.58		-2.00	-1.49	-1.76
-100		-1.15	-1.75	-1.09	-0.99	-1.38	-1.37	-1.39	-2.27		-1.76	-1.32	-1.55
-75		-1.00	-1.50	-0.94	-0.86	-1.18	-1.17	-1.19	-1.97		-1.53	-1.14	-1.34
-50		-0.84	-1.24	-0.78	-0.72	-0.98	-0.97	-0.98	-1.67		-1.29	-0.96	-1.12
-25		-0.67	-0.98	-0.63	-0.58	-0.77	-0.76	-0.76	-1.32		-1.03	-0.77	-0.90
0		-0.50	-0.72	-0.47	-0.43	-0.57	-0.56	-0.57	-0.97		-0.75	-0.57	-0.67
25		-0.32	-0.46	-0.30	-0.27	-0.37	-0.36	-0.37	-0.63		-0.48	-0.37	-0.43
50		-0.14	-0.21	-0.14	-0.12	-0.16	-0.16	-0.16	-0.28		-0.22	-0.17	-0.19
70	29.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	27.99	0.22	0.33	0.21	0.19	0.27	0.26	0.27	0.45	0.21	0.34	0.25	0.30
125	25.88	0.41	0.61	0.39	0.35	0.50	0.48	0.50	0.83	0.38	0.63	0.47	0.55
150	22.16	0.60	0.89	0.57	0.52	0.74	0.70	0.73	1.22	0.55	0.92	0.69	0.81
175	16.03	0.80	1.17	0.75	0.69	0.98	0.93	0.97	1.61	0.73	1.22	0.91	1.07
200	6.45	1.00	1.46	0.94	0.86	1.22	1.15	1.21	2.00	0.90	1.52	1.14	1.33
225	4	1.20	1.74	1.13	1.03	1.47	1.39	1.45	2.42	1.08	1.83	1.37	1.60
250	15	1.40	2.03	1.32	1.21	1.71	1.63	1.69	2.83	1.26	2.13	1.60	1.86
275	31	1.61	2.32	1.51	1.38	1.96	1.86	1.94	3.25	1.45	2.45	1.83	2.13
300	52	1.82	2.61	1.71	0.56	2.21	2.10	2.19	3.67	1.64	2.76	2.06	2.40
325	81	2.04	2.91	1.91	1.74	2.47	2.34	2.44	4.09	1.83	3.08	2.30	2.68
350	119	2.25	3.20	2.11	1.93	2.72	2.57	2.69	4.52	2.02	3.40	2.54	2.96
375	176	2.48	3.50	2.31	2.11	2.98	2.81	2.94	4.95	2.22	3.72	2.77	3.24
400	232	2.70	3.80	2.50	2.30	3.25	3.05	3.20	5.39	2.42	4.05	3.01	3.52
425	312	2.93	4.10	2.72	2.49	3.51	3.30	3.46	5.83	2.62	4.38	3.25	
450	408	3.16	4.40	2.93	2.68	3.78	3.54	3.72	6.27	2.82	4.72	3.50	
475	525	3.39	4.70	3.14	2.88	4.06	3.79	398	6.72	3.03	5.06	3.74	
500	665	3.62	5.01	3.35	3.08	4.33	4.03	4.24	7.17	3.24	5.40	3.99	
525	835	3.86	5.31	3.57	3.28	4.61	4.28	4.51	7.63	3.45	5.75	4.24	
550	1035	4.10	5.62	3.79	3.48	4.89	4.53	4.78	8.09	3.67	6.09	4.50	
575	1260	4.35	5.93	4.01	3.69	5.17	4.77	5.05	8.56	3.89	6.44	4.75	
600	1528	4.60	6.24	4.24	3.90	5.46	5.02	5.33	9.03	4.11	6.80	5.01	
625	1838	4.85	6.56	4.46	4.10	5.75	5.29	5.60		4.34	7.16	5.27	
650	2185	5.11	6.87	4.68	4.31	6.04	5.54	5.88		4.57	7.52	5.53	

[1]Saturated steam vacuum in HG: Below 212ºF pressure, Above 212ºF PSIG

MXS SINGLE & MXD DOUBLE ANCHOR BASE PATTERN

Anchor base is designed as a support or intermediate anchor only.



DIMENSION	MX SIZE 1"	1½"	1¼"	2"	2½"	3"	3½"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	36"
A	6	6	6	6	6	6	11	11	11	11	12	12	14	14	14	14	14	14	14	14	14	14	14	14
B	10	10	10	10⅝	10⅝	11¼	11⅝	11⅝	11⅞	11⅞	12½	12¾	13¼	13⅝	14	14⅜	15⅛	15⅜	15¾	16	22	22	22	21
C	7	7	7	7¾	7¾	8¼	8¾	8¾	8¾	8¾	9¾	9¾	10¼	10¾	11	11¾	11¾	11¾	11¾	12	17	17	17	17
D	4	4	4	4	4	4	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8
E	½	½	½	½	½	½	¾	¾	¾	¾	⅞	⅞	⅞	1	1	1	1	1¼	1¼	1¼	1¼	1¼	1¼	1¼
F	4	4	4	4½	4½	5	6¼	6¼	7½	7½	8½	10¼	11¼	12¼	13¼	14¼	16¼	17¼	18¼	19¼	21	22	23	25¼

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