



A World of Difference...

IN CRITICAL PIPING CONNECTIONS



Tri-Flex Loop®: What is it?

The Tri-Flex Loop's superior design is the only flexible pipe loop that absorbs and compensates pipe movement in six degrees of freedom. (three coordinates axes, plus rotation about those axes simultaneously.)

The multiplane movement design can reduce expansion devices required in a piping system by up to 50%. It is the safest and most reliable means of absorbing movement resulting from thermal changes and random seismic shifts in a piping system.

Simplifies Piping Design

The Tri-Flex Loop does not impose pressure thrust on the piping system. The braid is designed to take the stress of pressurization containing the core, reducing anchor loads by 93% compared to mechanical pipe loops and 98% less than expansion joints.

Tri-Flex Loops also eliminate pipe guides required by traditional pipe designs such as mechanical pipe loops or expansion joints.

Compact Design increases useable space and reduces system cost

The Tri-Flex Loop uses 64% less space than a mechanical pipe loop, and eliminates six welds. Fewer fittings and welds can be achieved in the piping system by positioning the Tri-Flex Loop at directional changes and rotating one of the Tri-Flex elbows during manufacturing to incorporate directional change, eliminating 90° elbows in the field. It can also be designed to incorporate elevation changes in the piping system, saving space, fewer fittings and welds.

Applications

Flex-Hose Co.'s UL536 listed Tri-Flex Loop and sesimic connectors are approved for compressed and combustible gases. Other common applications for the Tri-Flex Loop include steam, condenser water, hot water, domestic hot water and chilled water.

Tri-Flex Loop makes a world of difference in your critical piping connections. They are designed to handle working pressures up to 1325 psi, or full vacuum and operating temperatures of -400°F to 1500°F.

Tri-Flex Loops are manufactured with 321 (ASTM A240) grade stainless steel or bronze (ASTM C51000) grade annular corrugated close pitch metal flexible hose.

Tri-Flex Loops are available with flanged ends, steel male NPT ends, weld ends, grooved ends, copper female sweat, or press fit ends.

Passing the Test! **CATS**

The Tri-Flex Loop's superior capabilities for withstanding large and irregular movements caused by seismic activities in a piping system were proven by independent, third party testing at The New York State Center for Advanced Technology (CAT) at Rensselaer Polytechnic Institute.

The Tri-Flex Loop's unique design of three flexible sections allow it to compensate pipe movement in six degrees of freedom (three coordinates axes, plus rotation about those axes simultaneously). It is the safest and most reliable means of absorbing movement resulting from random seismic shift.

The Tri-Flex Loop is capable of accommodating seismic displacements for vertical piping between floors of the building, where pipes pass through or bridge building seismic joints or building expansion joints. They are also used for horizontal piping across building seismic and building expansion joints to accommodate the resultant of the drifts of each building unit, or where rigidly supported pipes connect to equipment mounted on vibration isolators.

Quality Assurance... Precision Manufacturing

Tri-Flex Loop units are pressure tested prior to release for shipment and have a five (5) year product replacement warranty.

Tri-Flex Loops are UL Listed, CSA Certified and FM Approved and are manufacturing utilizes state-of-theart welding technology. Flex-Hose Co. welders are ASME (American Society of Mechanical Engineers) Section IX certified.

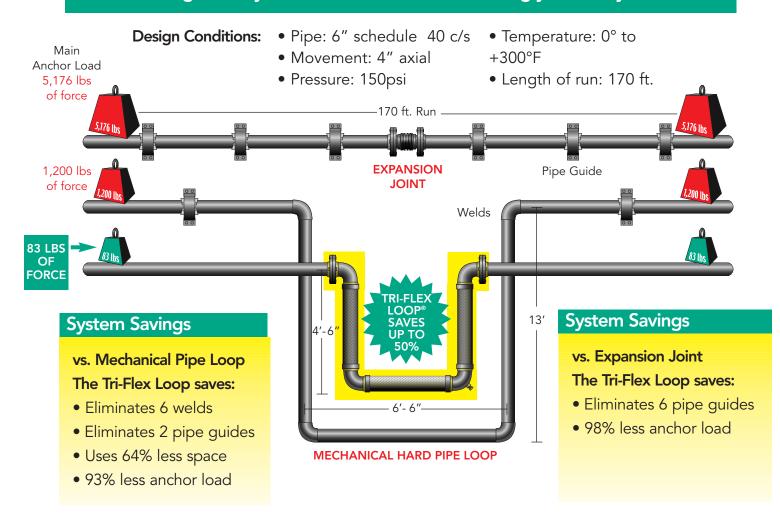
Tri-Flex Loops are 100% dye penetrant tested at the seal welds. The seal weld joins the hose, braid, and collar. It is one of the most critical welds in the manufacturing process.

Standard Sizes ½" to 24" I.D.

Custom sizes available to 30" I.D. Other alloys and custom styles available. Please consult factory.

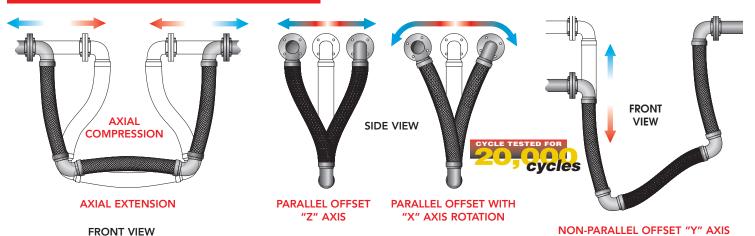
Tri-Flex Loop in thermal expansion applications

Tri-Flex Loop reduces system costs! It's multi-plane design reduces expansion devices required in a piping system by 50% and significantly reduces structural anchors saving you money!



Tri-Flex Loop® Movement Capabilities

Tri-Flex Loop design is capable of handling the following movements simultaneously:



Tri-Flex Loop®

The Tri-Flex Loop® Seismic Connection System meet the requirements of Chapter 17.1.1 of ASCE Standard 7-16 code for total displacement.

From coast to coast, the 2018 International Building Code (IBC) & ASCE Standard 7-16 are requiring architects, engineers and building owners to adapt to new building requirements related to seismic regulations. Flex-Hose Company's Tri-Flex Loop design meets the displacement requirements as defined by Chapter 17.1.1 of the ASCE 7-16 code. It's three flexible sections allow it to compensates movement in six degrees of freedom (three coordinates axes, plus rotation about those axes simultaneously from random seismic shifts).

2018 International Building Code (IBC) (16.1 Scope)

Every structure, and portion thereof, including non-structural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with Chapters 11, 12, 13, 15, 17 and 18 of ASCE 7 as applicable. The *seismic design category* for a structure is permitted to be determined in accordance with Section 1613 or ASCE 7.

Flex-Hose Co., Inc.'s Tri-Flex Loop provides the most complete engineering solution for the IBC's most stringent specifications.

Standard Sizes ½" to 24" I.D.

Custom sizes available to 30" I.D.
Other alloys and custom styles available
Please consult factory.

Tri-Flex Loop stainless steel flexible loops have a UL536 listing having a nominal inside diameter from 1 to 4 inches intended for use in piping systems carrying compressed and combustible gases at pressures not exceeding 175 psi at ambient temperature.

Note: The terms compressed and combustible gases, as used herein, mean gases such as liquefied petroleum gases and manufactured and natural fuel gases.

Applications

Flex-Hose Co.'s UL536 listed Tri-Flex Loop and sesimic connectors are approved for compressed and combustible gases. Other common applications for the Tri-Flex Loop include steam, condenser water, hot water, domestic hot water and chilled water.Tri-Flex Loop multi-plane movement simplifies piping design and reduces system installation cost by eliminating mechanical pipe loops, expansion joints, pipe alignment guides and reducing anchor loads by 93%. The multi-plane design can reduce expansion devices required in a piping system by 50%. The UL536 listed Tri-Flex Loop makes a world of difference in your critical piping connections.



LISTED

Tri-Flex Loop® for compressed and combustible gases



CSA standard B51 certified. Inspected and tested by the Technical Standards and Safety Authority of Canada.



For Fire Protection Systems



NSF/ANSI 61, California low lead law and NSF/ANSI 372 third party listed by IAPMO R&T



Tri-Flex Loop® Seismic Connectors

Horizontal Pipe Run Spanning a Building Seismic Joint

The Tri-Flex Loop's superior capabilities for withstanding large and irregular movements caused by seismic activities in a piping system were proven by independent, third party testing at The New York State Center for Advanced Technology (CAT) at Rensselaer Polytechnic Institute.

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Tri-Flex Loop's superior capabilities were proven in computer-controlled, rigorous robotic testing at the New York State Center for Advanced Technology (CAT) at Rensselaer Polytechnic Institute and are available on a DVD.

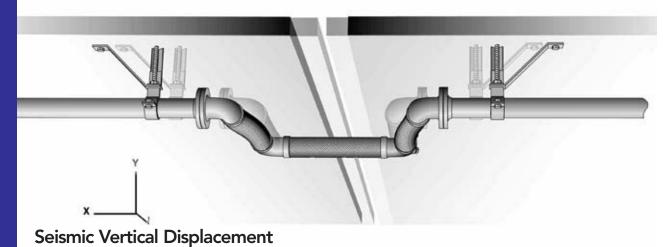
For a complimentary copy call us toll free 1-877-TRI-FLEX.

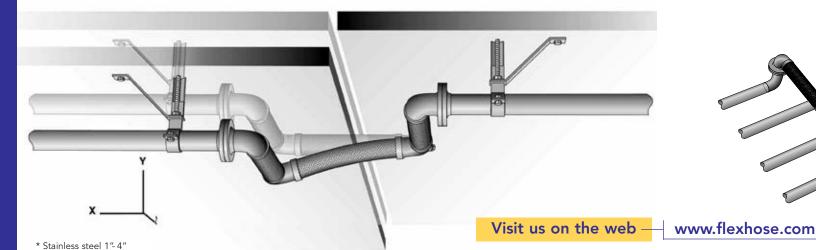
LISTED

Tri-Flex Loop® stainless steel 1"-4" for compressed and combustible gases at 175PSI at ambient temperature

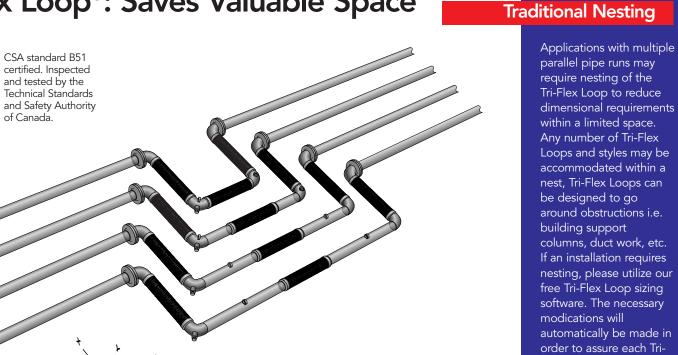


Seismic Horizontal Displacement





Tri-Flex Loop®: Saves Valuable Space

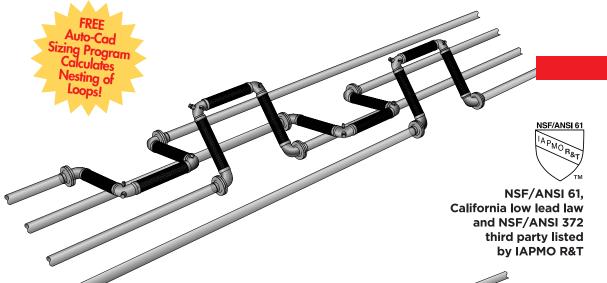


Diagonal Nesting By staggering Tri-Flex Loop locations and installing diagonally, standard Tri-Flex Loops can be used saving valuable space vs.

traditional nesting.

Flex Loop is free to move

as per its intended



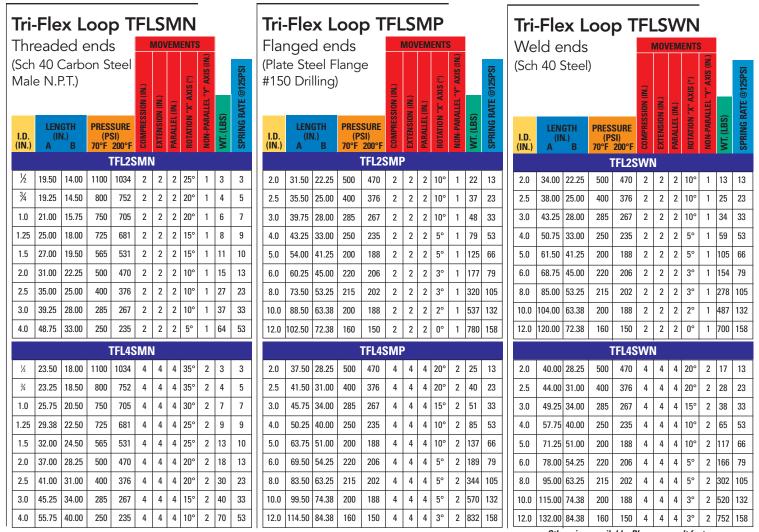
Over/under Pipe Nesting

Insulating Tri-Flex Loop

Tri-Flex Loops can be field insulated. A flexible insulating material should be used. Caution should be taken when insulating not to impede the performance.

If space becomes a consideration with traditional nesting, Tri-Flex Loops can be installed up and over piping or down and under by rotating the 90° elbows during the maunfacturing process and relocating the support lugs and the drain port accordingly

Tri-Flex Loop® Expansion Loops and Seismic Connections Design Specifications



Other sizes available. Please consult factory.

<u> </u>	A± .125"	
	321ss Close Pitch Annular Corrugated Hose and 304ss Braid	
B± .125"	Tri-Flex Loop TFLSMP (Flanged ends)	300ss Ferrule
	Sch 40 Carbon Steel Elbows	Drain F

Correction t	factor f	or tem	perati	ures ak	ove 7	0°F
Temperature °F	70	200	300	400	500	600
Factor S.S.	1.00	.94	.88	.83	.78	.74
Easter Prenza	1 00	90	02	70		

For safe working pressure above 70°F, multiply pressure shown at 70°F times correction factor of required temperature.







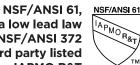
Grooved ends						MΟV	EM	ENTS	`~		
(Sch 40 Carbon Steel)						ION (IN.)	EL (IN.)	IN "X" AXIS (°)	PARALLEL "Y" AXIS (IN	(LBS)	SPRING RATE @125PSI
I.D. (IN.)	LEN (II A	GTH V.) B	PRES (PS 70°F		COMPR	EXTENSION	PARALLEL	ROTATION	NON-PA	WT. (LE	SPRIN
				TFL2	SVG						
1.0	21.00	15.75	750	705	2	2	2	20°	1	6	7
1.5	27.00	19.50	565	531	2	2	2	15°	1	11	10
2.0	31.00	22.25	500	470	2	2	2	10°	1	15	13
2.5	35.00	25.00	400	376	2	2	2	10°	1	27	23
3.0	39.25	28.00	285	267	2	2	2	10°	1	37	33
4.0	48.75	33.00	250	235	2	2	2	5°	1	64	53
5.0	61.50	41.25	200	188	2	2	2	5°	1	105	66
6.0	67.75	45.00	220	206	2	2	2	3°	1	154	79
8.0	82.00	53.25	215	202	2	2	2	3°	1	278	105
10.0	99.00	63.38	200	188	2	2	2	2°	1	487	132
12.0	113.00	72.38	160	150	2	2	2	0°	1	700	158
				TFL4	SVG						
1.0	25.75	20.50	750	705	4	4	4	30°	2	7	7
1.5	32.00	24.50	565	531	4	4	4	25°	2	13	10
2.0	37.00	28.25	500	470	4	4	4	20°	2	18	13
2.5	41.00	31.00	400	376	4	4	4	20°	2	30	23
3.0	45.25	34.00	285	267	4	4	4	15°	2	40	33
4.0	55.75	40.00	250	235	4	4	4	10°	2	70	53
5.0	71.25	51.00	200	188	4	4	4	10°	2	117	66
6.0	77.00	54.25	220	206	4	4	4	5°	2	166	79
8.0	92.00	63.25	215	202	4	4	4	5°	2	302	105
10.0	110.00	74.38	200	188	4	4	4	5°	2	520	132
12.0	125.00	84.38	160	150	4	4	4	3°	2	752	158

	Tri-Flex Loop TFLBSW Sweat ends												T P
		(Female Copper Tube Ends)							"X" AXIS (°)	ALLEL "Y" AXIS (IN.)		ATE @125PSI	(C
or mind mail to	I.D. (IN.)	LEN (II A	GTH V.) B	PRES (P: 70°F		COMPRESSION (IN.	EXTENSION	PARALLEL (IN.)	ROTATION	NON-PARALLEL	WT. (LBS)	SPRING RATE	1.I (11)
	TFL2BSW												
7	1/2	15.00	13.50	565	502	2	2	2	25°	1	3	3	1
0	3/4	18.00	16.00	465	413	2	2	2	20°	1	5	5	3
3	1.0	20.75	18.00	335	298	2	2	2	20°	1	6	7	1.
3	1.25	23.25	20.00	300	267	2	2	2	15°	1	10	9	1.
3	1.5	28.00	23.00	295	262	2	2	2	15°	1	13	10	1.
3	2.0	30.50	25.50	210	186	2	2	2	10°	1	19	13	2
6	2.5	31.25	26.00	195	173	2	2	2	10°	1	27	23	
9	3.0	34.75	28.75	165	147	2	2	2	5°	1	33	33	1,
)5				1	ΓFL4E	SSV	/						3
32	1/2	19.25	17.75	565	502	4	4	4	35°	2	4	3	1.
58	3/4	22.50	20.50	465	413	4	4	4	30°	2	7	5	1.3
	1.0	25.50	22.75	335	298	4	4	4	30°	2	8	7	1.
7	1.25	28.50	25.25	300	267	4	4	4	25°	2	12	9	2
0	1.5	33.50	28.50	295	262	4	4	4	25°	2	16	10	
3	2.0	36.50	31.50	210	186	4	4	4	20°	2	23	13	Ca
3	2.5	37.25	32.00	195	173	4	4	4	20°	2	33	23	
3	3.0	41.50	35.50	165	147	4	4	4	15°	2	40	33	Fi
3													p Sy
6													מ

		Tri-Flex Loop TFLBPP Press Fit ends												
		Pre	MOVEMENTS											
SPRING RATE @125PSI		(Co Fit I	SION (IN.)	I (IN.)	.(IN.)	ROTATION "X" AXIS (°)	LLEL "Y" AXIS (IN		SPRING RATE @125PSI					
SPRING R		I.D. (IN.)	LEN (II) A		PRES (P: 70°F	COMPRESSION (IN	EXTENSION (IN.	PARALLEL	ROTATION	NON-PARALLEL	WT. (LBS)	SPRING F		
	TFL2BPP													
3		1/2	16.13	14.25	200	200	2	2	2	25°	1	3.5	3	
5		3/4	18.13	16.13	200	200	2	2	2	20°	1	5.5	5	
7		1.0	21.25	18.25	200	200	2	2	2	20°	1	6.5	7	
9		1.25	25.00	21.13	200	200	2	2	2	15°	1	10.75	9	
10		1.5	27.50	23.00	200	200	2	2	2	15°	1	14.25	10	
13		2.0	32.25	26.75	200	180	2	2	2	10°	1	20.75	13	
23						TFL4I	BPP							
33		1/2	20.38	18.50	200	200	4	4	4	35°	2	4.5	3	
		3/4	22.63	20.63	200	200	4	4	4	30°	2	7.5	5	
3		1.0	26.00	23.00	200	200	4	4	4	30°	2	8.5	7	
5		1.25	30.13	26.38	200	200	4	4	4	25°	2	12.75	9	
7		1.5	33.00	28.50	200	200	4	4	4	25°	2	17.25	10	
9		2.0	38.25	32.75	200	180	4	4	4	20°	21	24.75	13	
10 13 23			king p			ised o	on m	naxi	mı	ım fi	ttin	9		
20		_		_					_					

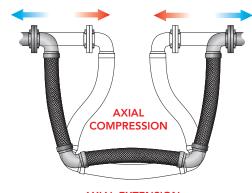
Fitting manufacturer suggests 15-85 psi water pressure test to confirm all fittings are pressed. System can then be tested to a maximum water pressure of 200 psi @ 70°F.

> California low lead law and NSF/ANSI 372 third party listed by IAPMO R&T



Tri-Flex Loop® Movement Capabilities l

Tri-Flex Loop design is capable of handling the following movements simultaneously:





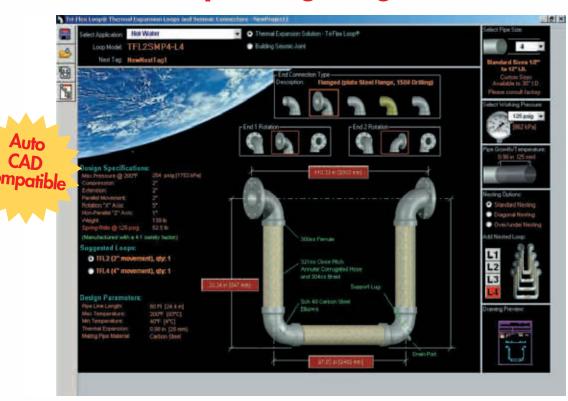
FRONT VIEW



NON-PARALLEL OFFSET "Y" AXIS

Tri-Fex Loop®

Tri-Flex Loop Sizing Program It's FREE!





PROGRAM FEATURES

- Calculates pipe thermal expansion; various alloys for chilled water, condensor water, hot water, domestic hot water, saturated steam
- Calculates nesting of expansion seismic loops
- Building seismic joints
- Calculates spring rates of expansion seismic loops
- Automatically selects UL® Listed hanger assemblies
- Creates detailed schedule or submittals
- Allows saving of projects, opening new projects, and editing of projects
- Industry terminology
- Application examples
- Specifications

AND BEST OF ALL IT SAVES DESIGN TIME!

Compatible with all Auto CAD programs allowing input directly into your piping drawings!

The complete seismic system solution.



Save Labor Costs with these Tri-Flex Loop Accessories!

Tri-Flex Loop® Hanger Assembly Kit and Accessories

The UL Listed Seismic Wire Rope/Cable™ used in our hanger assemblies conform to the requirements of the ASCE (American Society of Civil Engineers) guidelines for structured applications of wire rope, in that the cable is pre-stretched and the permanent end fittings maintain the breakstrength of the cable with a safety factor of two.









Color coded, factory cable cutter & crimper to meet cable specifications

Color coded for Tri-Flex Loop installations of 10" and larger in diameter

Color coded for Tri-Flex Loop installations of up to 8" diameter

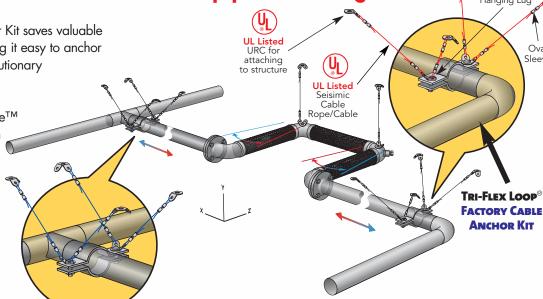


Listed • Color Coded • Pre-stretched • Breakstrength Certified

Tri-Flex Loop® Factory Cable Anchor Kit
It's simple, reliable & it reduces pipe anchoring costs!

The Tri-Flex Loop Factory Cable Anchor Kit saves valuable time on Tri-Flex Loop installation, making it easy to anchor the piping system when using the revolutionary Tri-Flex Loop.

The UL Listed Seismic Wire Rope/Cable™ used in our hanger assemblies conform to the requirements of the ASCE (American Society of Civil Engineers) guidelines for structural applications of wire rope, in that the cable is pre-stretched and the permanent end fittings maintain the breakstrength of the cable with a safety factor of two.





Listed • Factory Assembled • Simply install over pipe & fasten to above structure

• Color Coded • Pre-stretched • Breakstrength Certified

* UL EX26895 Vibration & Seismic Technologies

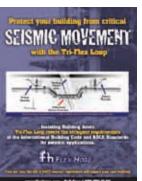
Visit our website for more information on our broad range of products.



Product Overview



Flexible Pipe Loop



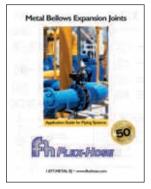
IBC Compliant



Flexible Pipe Loop Seismic Connections Hanger Kit & Accessories



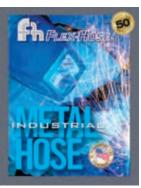
Braided Metal Pump Connectors



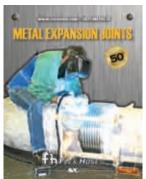
Expansion Joint Application Guide



Flexible Gas Connection



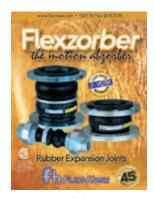
Industrial Metal Hose



Metal Bellows **Expansion Joints**



Enclosed Metal Bellows Expansion Joints



Rubber **Expansion Joints**



Expansion Joint Control Assemblies



Air Separators



Expansion Compensators



Externally Pressurized Expansion Joints

A World of Difference in Critical Piping Connections since 1968.



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