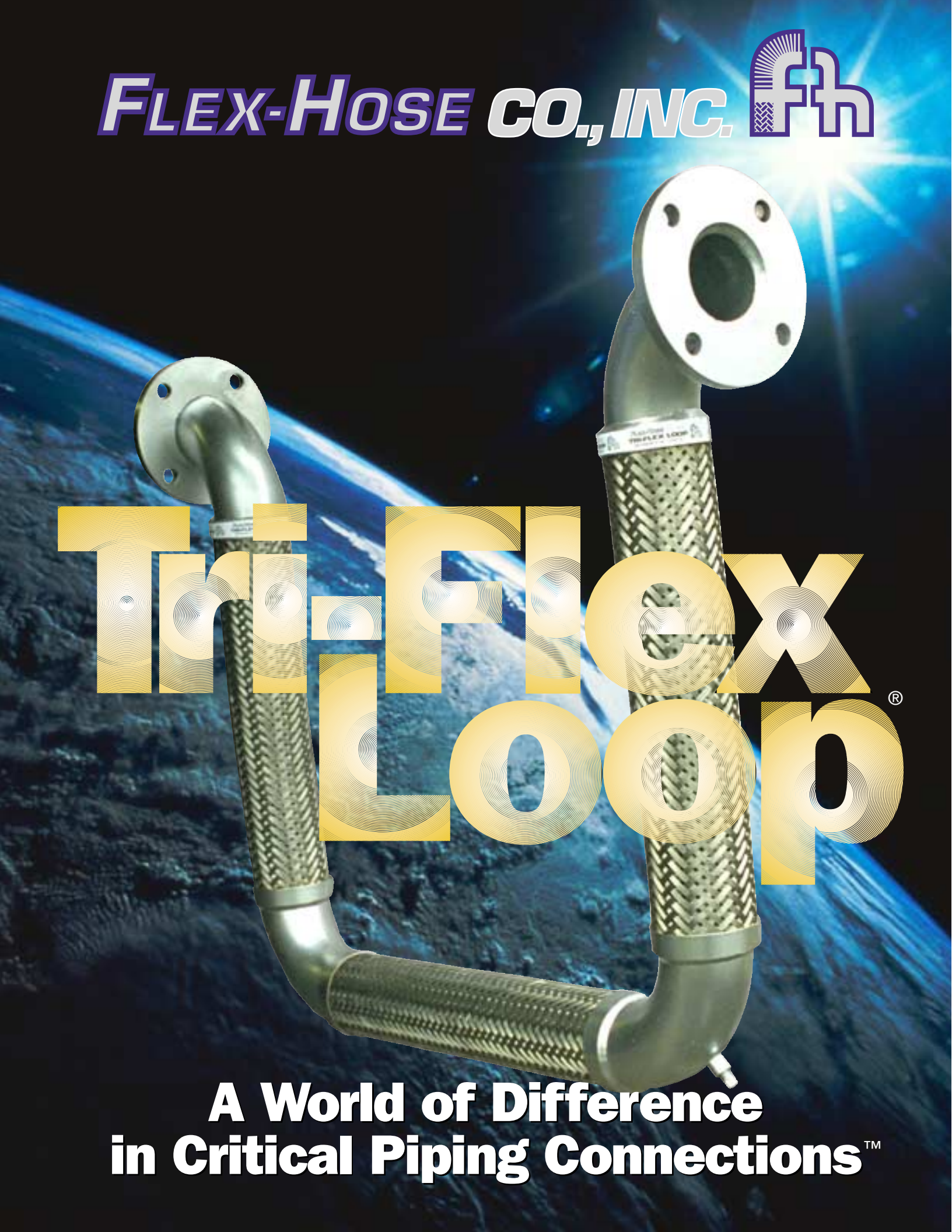
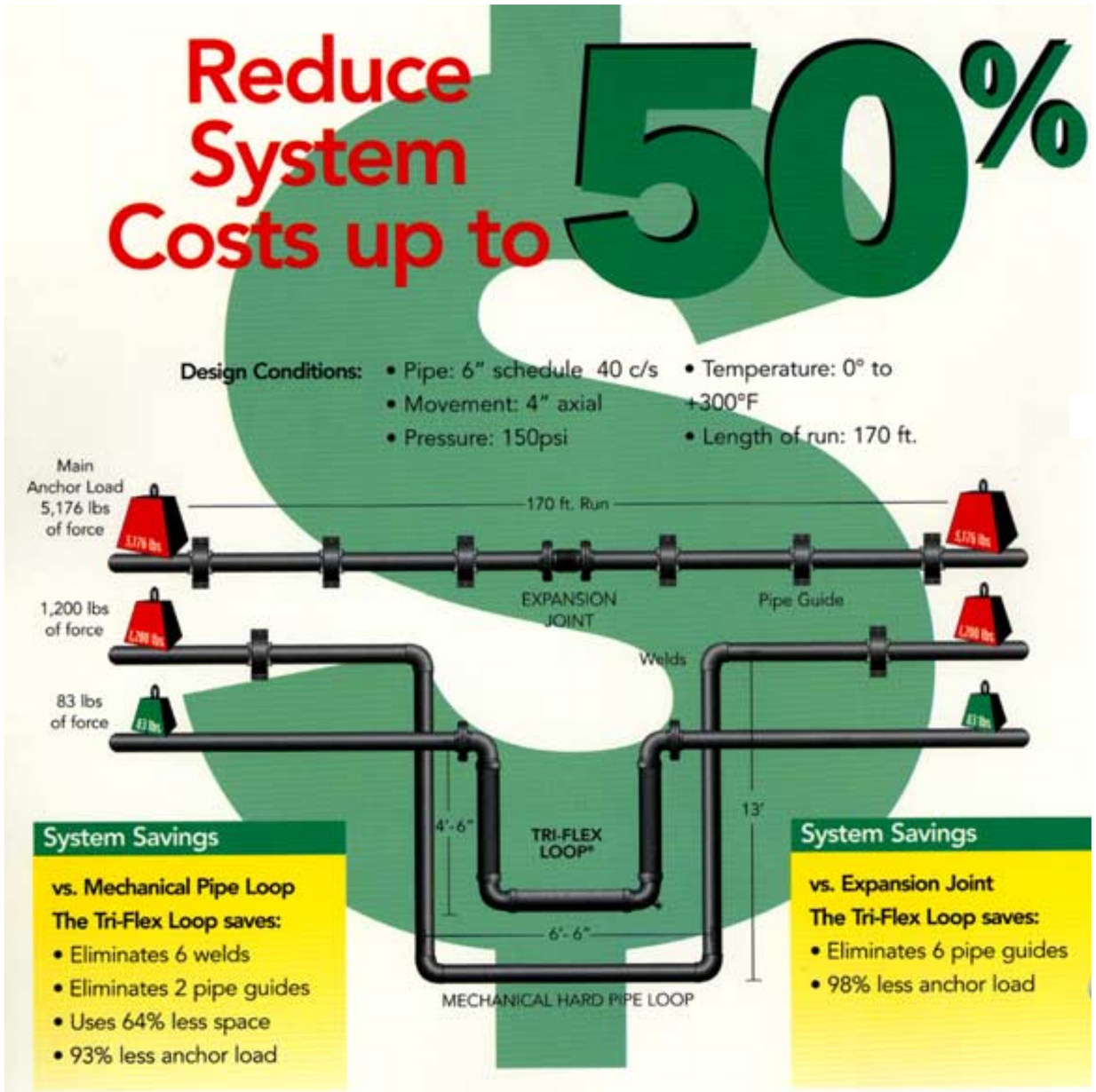
FLEX-HOSE CO., INC.



Tri-Flex Loop®

A World of Difference in Critical Piping Connections™

Tri-Flex Loop®



Pure Form.

Influenced by long-term reliability issues as well as overall ease of installation and extreme cost savings with ease. The TRI-FLEX LOOP system is the answer to these special needs to stay on budget, complete an installation with less manpower, less welding and less cost.

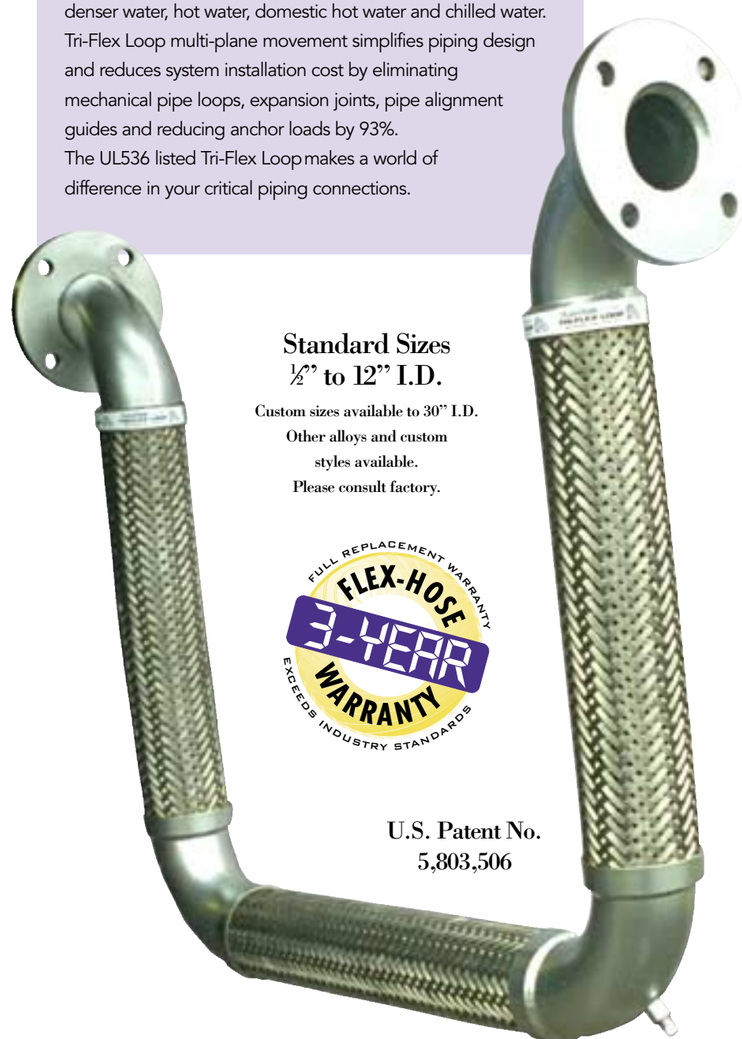
UL listed and labeled Tri-Flex Loop products are tested, listed labeled and regularly inspected by Underwriters Laboratories to ensure they meet or exceed industry performance standards. It is the safest and most reliable means of absorbing movement resulting from thermal changes and random seismic shifts in a piping system.

LISTED
Tri-Flex Loop®
for combustible gases
and flammable liquids
33NB

Tri-Flex Loop stainless steel flexible loops have a UL536 listing having a nominal inside diameter from 1 to4 inches intended for use if piping systems carrying flammable and combustible gases and liquids, at pressures not exceeding 175 psi at ambient temperature.

Note: The terms flammable and combustible gases and liquids, as used herein, mean gases and liquids such as alcohol, fuel oil, gasoline, kerosene, liquefied petroleum gases and manufactured and natural fuel gases. A combustible liquid has flash point at or above 100°F or 38°C. A flammable liquid has a flash point below 100°F and a vapor pressure not exceeding 40 PSIG (276 kPa) at 100°F.

UL536 listed Tri-Flex Loop® connections are approved for gas service. The multi-plane design can reduce expansion devices required in a piping system by 50%. Common applications for Tri-Flex expansion loops and seismic pipe connectors include flammable and combustible gases and liquids, 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 UL536 listed Tri-Flex Loop makes a world of difference in your critical piping connections.



Standard Sizes
½" to 12" I.D.

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

FULL REPLACEMENT WARRANTY
FLEX-HOSE
3-YEAR
WARRANTY
EXCEEDS INDUSTRY STANDARDS

U.S. Patent No.
5,803,506

Visit us on the web — www.flexhose.com

Tri-Flex Loop®: What is it?

The Tri-Flex Loop 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 flammable and combustible gases and liquids. 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 or copper tube female sweat ends.

Seismic Connections

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. The 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 three (3) year full replacement warranty.*

Tri-Flex Loops design and manufacturing utilizes state-of-the-art welding technology. Flex-Hose Co. welders are AMSE Section VII 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.

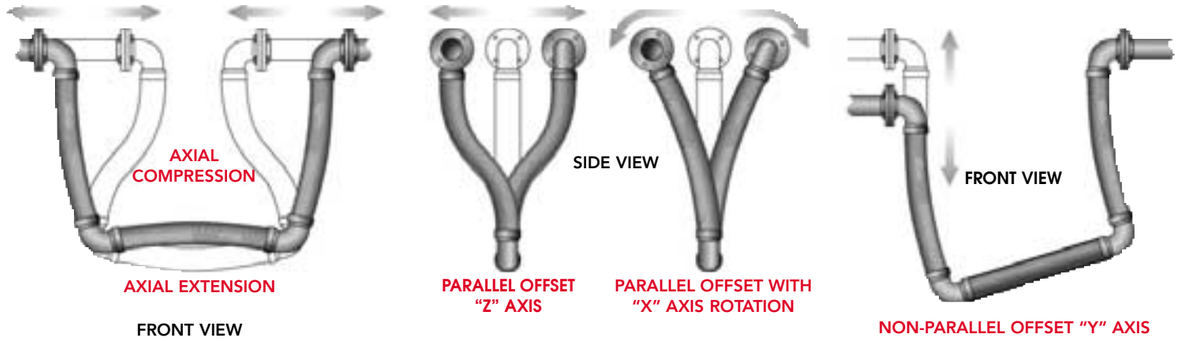
** refer to warranty registration for details*

Standard Sizes
½" to 12" I.D.

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

Tri-Flex Loop® Movement Capabilites

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



Tri-Flex Loop®: Passing the Test

The New York State Center for Advanced Technology (CAT) at Rensselaer Polytechnic Institute, Troy, NY
Tri-Flex Loop Flexible Coupling for Seismic Applications Testing Project No. A70614, October 1998

Introduction

The focus of the Flexible Coupling Evaluation is to study the motion capabilities of two flexible couplings; the Flex-Hose Tri-Flex Loop and the product of a national competitor. The products are deisgned to withstand large and irregular movements such as might be caused by seismic activities. The capabilities of the two couplings are compared (1) analytically using finite element modeling and computer simulation and (2) using physical testing.

Testing Setup

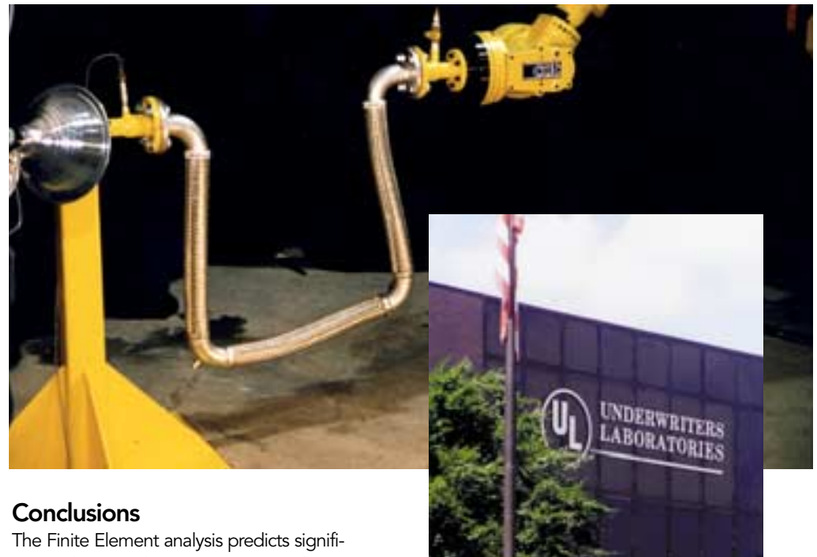
Materials

The robot was used to move the free end of the loop throught a series of simultaneous three-dimensional motions. The pressure transducer is used to sense the internal pressure of the loop during testing, which is filled with water and Nitrogen presssurized at 155 psi during testing. It is interfaced with an analog input channel of the data-logging computer. During the testing, the output of the pressure sensor was recorded twice per second.

Stress Level Comparison Test Results

While conducting this test, it was observed that the forces required to displace the free end of the coupling were significantly greater for the national competitor's loop than for the Tri-Flex Loop. The displacements used for testing were determined partially by the large forces required to displace the free end of the national competitor's coupling/loop.

Because of the large forces involved from the competitor's loop in the displacements of the free end of the coupling/loop had to be limited to prevent overloading the robot payload capacity of 264 pounds. Similar limitations were not observed when testing the Flex-Hose Tri-Flex Loop.



Conclusions

The Finite Element analysis predicts significantly higher strain energy, and therefore greater likelyhood of failure, in the national competitor's than in the Flex-Hose Tri-Flex Loop coupling for a given displacement. This is consistent with the experimental results, in which the Flex-Hose Tri-Flex Loop exhibited signficantly superior ability to withstand repeated cyclic loading in three dimensions. Based on the testing conducted on the Tri-Flex Loop, it is likely that the Flex-Hose Tri-Flex Loop will withstand limited application of displacements in excess of those published by the manufacturer without failure.

The New York State Center for Advanced Technology (CAT) concluded the Flex-Hose Tri-Flex Loop is found to be more likely to survive a seismic event where large, three dimensional relative displacements of the ends of the coupling are involved than the national competitor.

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 video.

For your complimentary copy of the video call us toll free 1-877-TRI-FLEX

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and flammable liquids
33NB

Tri-Flex Loop stainless steel flexible loops have a UL536 listing having a nominal inside diameter from 1 to4 inches intended for use if piping systems carrying flammable and combustible gases and liquids, at pressures not exceeding 175 psi at ambient temperature.

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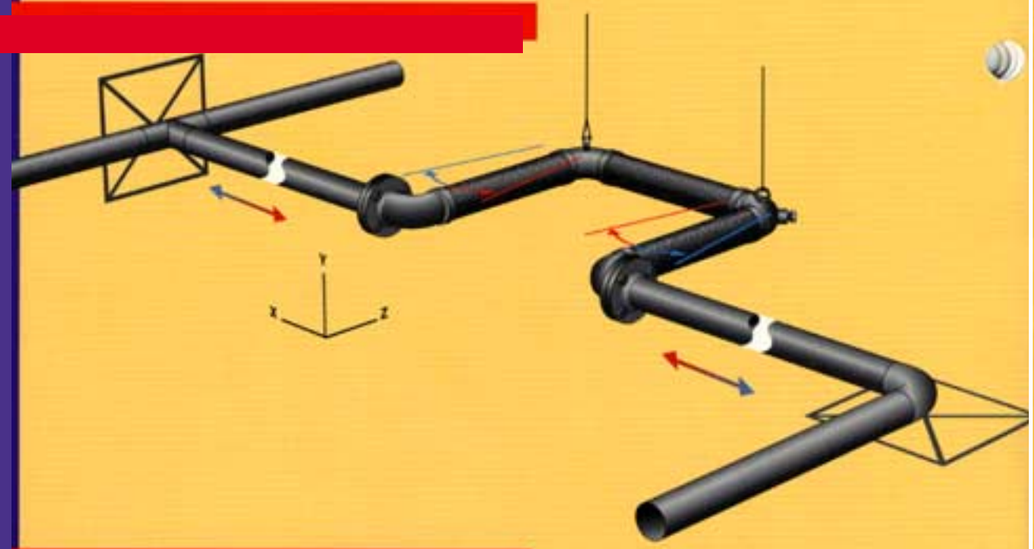
Movement Applications: The Tri-Flex Loop® at work

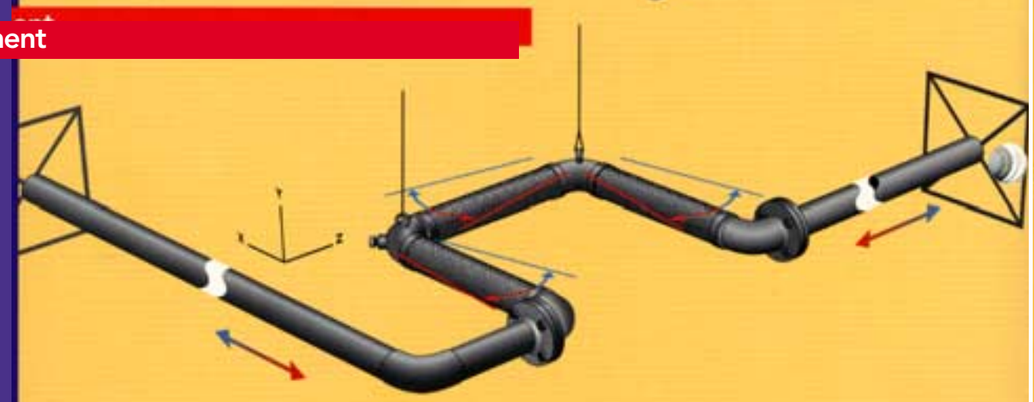
Axial Movement

The Tri-Flex Loop simplifies piping design. Tri-Flex Loops do not impose pressure thrust on the piping system. The braid is designed to take the tensile stress of pressurization containing the core, reducing anchor loads by 93% compared to mechanical pipe loops and 98% less compared to expansion joints. Tri-Flex Loops also eliminate pipe guides required by traditional pipe expansion loops and expansion joints.



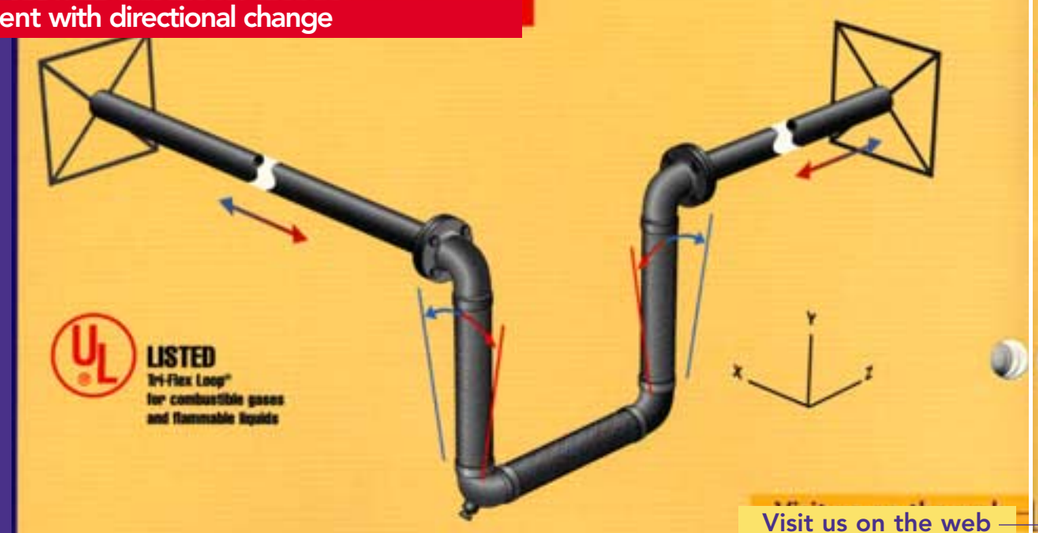
2 Planes Movement

The Tri-Flex Loop can reduce the number of expansion devices and anchors by up to 50% by positioning the Tri-Flex Loop at directional changes allowing it to absorb two planes of movement simultaneously.



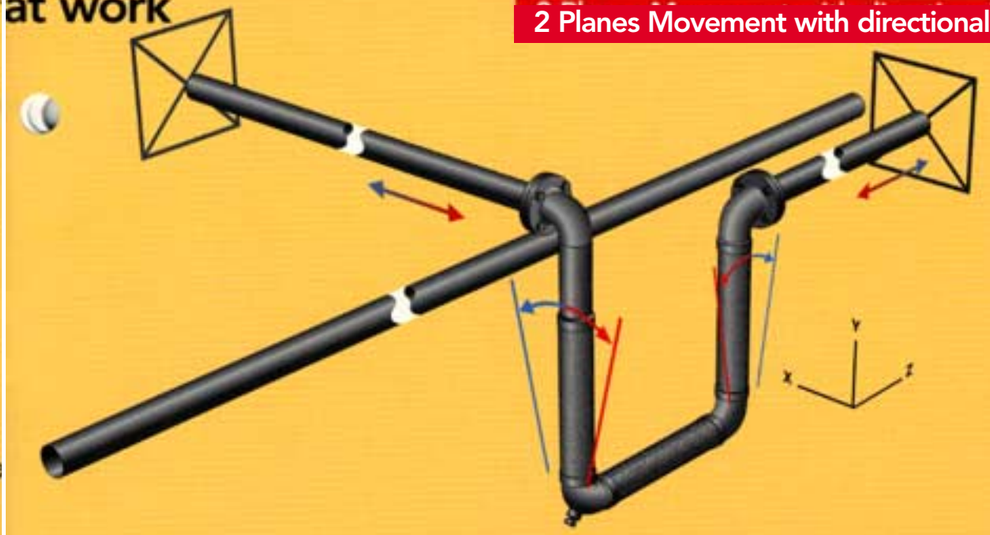
2 Planes Movement with directional change

Fewer fittings and welds can be acheived in the piping system by positioning the Tri-Flex Loop at directional changes and rotating one of the Tri-Flex elbows during the manufacturing process eliminating 90° elbows in the field.



2 Planes Movement with directional & elevation change

Tri-Flex Loop can also be designed to incorporate elevation changes in the piping system saving space, requiring fewer fitiings and welds, while simplifying installation.

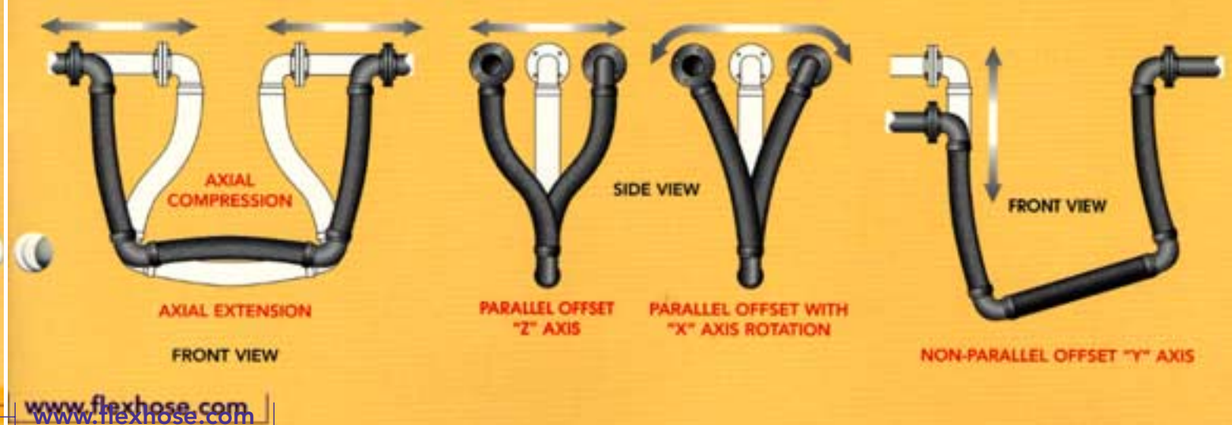


2 Planes Multi-Movement

Tri-Flex Loop's compact design increases useable space and reduces system cost. The Tri-Flex Loop uses 64% less space than a mechanical pipe loop. The Tri-Flex Loop can be designed to handle both the movement of the main pipe run as well as the pipe take offs, eliminating or reducing anchors points and expansion devices.

Tri-Flex Loop® Movement Capabilites

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



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

Pressures

Maxiumum Working Pressure:
Maximum operating pressure to which the hose should be subjected. It is established at 25% of the nominal design burst pressure.

Maximum Proof Pressure:
Maximum test pressure to which the hose should be subjected. It is established at 150% of the maximum working pressure with the hose installed straight. No harmful deformation shall occur.

Hydrostatic field tests of hose assemblies installed in varying degrees of radial bend or parallel offset should be limited to 120% of maximum rated working pressure at 70°F, or 150% of the actual operating pressure, whichever is the lesser.

Nominal Design Burst Pressure:
The pressure at which the hose can be expected to rupture, based on the minimum annealed ultimate tensile strength of the braid wire and the corrugated hose alloys at 70°F with the hose installed straight.

Motion Classifications

The Tri-Flex Loop 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%.

Offset Motion:
Motion that occurs when one end of the hose assembly is deflected in a plane perpendicular to the longitudinal axis with the ends remaining parallel. Offset is measured as displacement of the free end centerline from the fixed end centerline.

Intermittent Offset is motion that occurs on a regular or irregular cyclic basis. It is normally the result of thermal expansion and contraction or other non-continuous actions.

NOTES:

Flex-Hose Co. Tri-Flex Loop manufactured with a 4:1 safety factor

Spring Rate: force to achieve full offset motion in pounds when pressurized at 125 psi. Please consult factory for spring rate forces for Tri-Flex Loops above 125 psi.

Tri-Flex Loop TFLSMN

Threaded ends
(Sch 40 Carbon Steel Male N.P.T.)

I.D. (IN.)	LENGTH (IN.) A	B	PRESSURE (PSI) 70°F	200°F	MOVEMENTS: COMPRESSION (IN.)	EXTENSION (IN.)	PARALLEL (IN.)	ROTATION "X" AXIS (°)	NON-PARALLEL "Z" AXIS (IN.)	WT. (LBS)	SPRING RATE @125PSI
TFL2SMN											
½	19.50	14.00	1325	1245	2	2	2	25°	1	3	3
¾	19.25	14.50	1100	1030	2	2	2	20°	1	4	5
1.0	21.00	15.75	700	655	2	2	2	20°	1	6	7
1.25	25.00	18.00	550	515	2	2	2	15°	1	8	9
1.5	27.00	19.50	450	420	2	2	2	15°	1	11	10
2.0	31.00	22.25	450	420	2	2	2	10°	1	15	13
2.5	35.00	25.00	300	285	2	2	2	10°	1	27	23
3.0	39.25	28.00	275	255	2	2	2	10°	1	37	33
4.0	48.75	33.00	270	250	2	2	2	5°	1	64	53
TFL4SMN											
½	23.50	18.00	1325	1245	4	4	4	35°	2	3	3
¾	23.25	18.50	1100	1030	4	4	4	35°	2	4	5
1.0	25.75	20.50	700	655	4	4	4	30°	2	7	7
1.25	29.38	22.50	550	515	4	4	4	25°	2	9	9
1.5	32.00	24.50	450	420	4	4	4	25°	2	13	10
2.0	37.00	28.25	450	420	4	4	4	20°	2	18	13
2.5	41.00	31.00	300	285	4	4	4	20°	2	30	23
3.0	45.25	34.00	275	255	4	4	4	15°	2	40	33
4.0	55.75	40.00	270	250	4	4	4	10°	2	70	53

Tri-Flex Loop TFLSMP

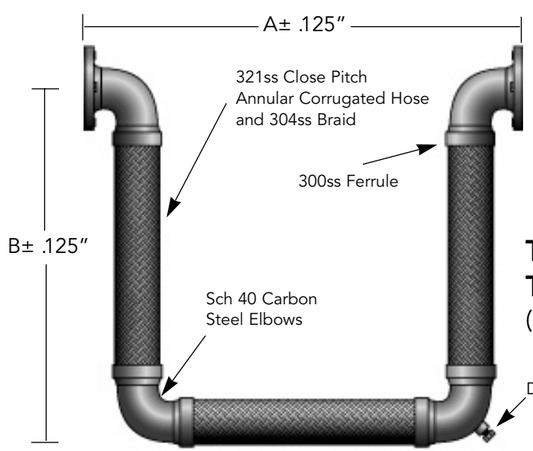
Flanged ends
(Plate Steel Flange #150 Drilling)

I.D. (IN.)	LENGTH (IN.) A	B	PRESSURE (PSI) 70°F	200°F	MOVEMENTS: COMPRESSION (IN.)	EXTENSION (IN.)	PARALLEL (IN.)	ROTATION "X" AXIS (°)	NON-PARALLEL "Z" AXIS (IN.)	WT. (LBS)	SPRING RATE @125PSI
TFL2SMP											
2.0	31.50	22.25	450	420	2	2	2	10°	1	22	13
2.5	35.50	25.00	300	280	2	2	2	10°	1	37	23
3.0	39.75	28.00	275	255	2	2	2	10°	1	48	33
4.0	43.25	33.00	270	250	2	2	2	5°	1	79	53
5.0	54.00	41.25	225	210	2	2	2	5°	1	125	66
6.0	60.25	45.00	165	155	2	2	2	3°	1	177	79
8.0	73.50	53.25	155	145	2	2	2	3°	1	320	105
10.0	88.50	63.38	150	140	2	2	2	2°	1	537	132
12.0	102.50	72.38	145	135	2	2	2	0°	1	780	158
TFL4SMP											
2.0	37.50	28.25	450	420	4	4	4	20°	2	25	13
2.5	41.50	31.00	300	280	4	4	4	20°	2	40	23
3.0	45.75	34.00	275	255	4	4	4	15°	2	51	33
4.0	50.25	40.00	270	250	4	4	4	10°	2	85	53
5.0	63.75	51.00	225	210	4	4	4	10°	2	137	66
6.0	69.50	54.25	165	155	4	4	4	5°	2	189	79
8.0	83.50	63.25	155	145	4	4	4	5°	2	344	105
10.0	99.50	74.38	150	140	4	4	4	5°	2	570	132
12.0	114.50	84.38	145	135	4	4	4	3°	2	832	158

Correction factor for temperatures above 70°F

Temperature °F	70	200	300	400	500	600
Factor S.S.	1.00	.94	.88	.83	.78	.74
Factor Bronze	1.00	.90	.82	.75		

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



LISTED
Tri-Flex Loop®
Stainless steel 1"-4" for combustible gases and flammable liquids at pressures not exceeding 175 psi at ambient temperature

Tri-Flex Loop TFLSMP
(Flanged ends)

Tri-Flex Loop TFLSWN

Weld ends
(Sch 40 Steel)

I.D. (IN.)	LENGTH (IN.) A	B	PRESSURE (PSI) 70°F	200°F	MOVEMENTS: COMPRESSION (IN.)	EXTENSION (IN.)	PARALLEL (IN.)	ROTATION "X" AXIS (°)	NON-PARALLEL "Z" AXIS (IN.)	WT. (LBS)	SPRING RATE @125PSI
TFL2SWN											
2.0	34.00	22.25	450	420	2	2	2	10°	1	13	13
2.5	38.00	25.00	300	280	2	2	2	10°	1	25	23
3.0	43.25	28.00	275	255	2	2	2	10°	1	34	33
4.0	50.75	33.00	270	250	2	2	2	5°	1	59	53
5.0	61.50	41.25	225	210	2	2	2	5°	1	105	66
6.0	68.75	45.00	165	155	2	2	2	3°	1	154	79
8.0	85.00	53.25	155	145	2	2	2	3°	1	278	105
10.0	104.00	63.38	150	140	2	2	2	2°	1	487	132
12.0	120.00	72.38	145	135	2	2	2	0°	1	700	158
TFL4SWN											
2.0	40.00	28.25	450	420	4	4	4	20°	1	17	13
2.5	44.00	31.00	300	280	4	4	4	20°	2	28	23
3.0	49.25	34.00	275	255	4	4	4	15°	2	38	33
4.0	57.75	40.00	270	250	4	4	4	10°	2	65	53
5.0	71.25	51.00	225	210	4	4	4	10°	2	117	66
6.0	78.00	54.25	165	155	4	4	4	5°	2	166	79
8.0	95.00	63.25	155	145	4	4	4	5°	2	302	105
10.0	115.00	74.38	150	140	4	4	4	3°	2	520	132
12.0	132.00	84.38	145	135	4	4	4	3°	2	752	158

Tri-Flex Loop TFLBSW

Sweat ends
(Female Copper Tube Ends)

I.D. (IN.)	LENGTH (IN.) A	B	PRESSURE (PSI) 70°F	200°F	MOVEMENTS: COMPRESSION (IN.)	EXTENSION (IN.)	PARALLEL (IN.)	ROTATION "X" AXIS (°)	NON-PARALLEL "Z" AXIS (IN.)	WT. (LBS)	SPRING RATE @125PSI
TFL2BSW											
½	15.00	13.50	525	490	2	2	2	25°	1	3	2
¾	18.00	16.00	450	420	2	2	2	20°	1	5	3
1.0	20.75	18.00	375	350	2	2	2	20°	1	6	4
1.25	23.25	20.00	300	280	2	2	2	15°	1	10	4
1.5	28.00	23.00	300	280	2	2	2	15°	1	13	5
2.0	30.50	25.50	200	185	2	2	2	10°	1	19	7
2.5	31.25	26.00	200	185	2	2	2	10°	1	27	8
3.0	34.75	28.75	125	115	2	2	2	5°	1	33	10
TFL4BSW											
½	19.25	17.75	525	490	4	4	4	35°	2	4	2
¾	22.50	20.50	450	420	4	4	4	30°	2	7	3
1.0	25.50	22.75	375	350	4	4	4	30°	2	8	4
1.25	28.50	25.25	300	280	4	4	4	25°	2	12	4
1.5	33.50	28.50	300	280	4	4	4	25°	2	16	5
2.0	36.50	31.50	200	185	4	4	4	20°	2	23	7
2.5	37.25	32.00	200	185	4	4	4	20°	2	33	8
3.0	41.50	35.50	125	115	4	4	4	15°	2	40	10

Tri-Flex Loop TFLSVG

Grooved ends
(Sch 40 Carbon Steel)

I.D. (IN.)	LENGTH (IN.) A	B	PRESSURE (PSI) 70°F	200°F	MOVEMENTS: COMPRESSION (IN.)	EXTENSION (IN.)	PARALLEL (IN.)	ROTATION "X" AXIS (°)	NON-PARALLEL "Z" AXIS (IN.)	WT. (LBS)	SPRING RATE @125PSI
TFL2SVG											
1.0	21.00	15.75	700	655	2	2	2	20°	1	6	7
1.5	27.00	19.50	450	420	2	2	2	15°	1	11	10
2.0	31.00	22.25	450	420	2	2	2	10°	1	15	13
2.5	35.00	25.00	300	280	2	2	2	10°	1	27	23
3.0	39.25	28.00	275	255	2	2	2	10°	1	37	33
4.0	48.75	33.00	270	250	2	2	2	5°	1	64	53
5.0	61.50	41.25	225	210	2	2	2	5°	1	105	66
6.0	67.75	45.00	165	155	2	2	2	3°	1	154	79
8.0	82.00	53.25	155	145	2	2	2	3°	1	278	105
10.0	99.00	63.38	150	140	2	2	2	2°	1	487	132
12.0	113.00	72.38	145	135	2	2	2	0°	1	700	158
TFL4SVG											
1.0	25.75	20.50	700	655	4	4	4	30°	2	7	7
1.5	32.00	24.50	450	420	4	4	4	25°	2	13	10
2.0	37.00	28.25	450	420	4	4	4	20°	2	18	13
2.5	41.00	31.00	300	280	4	4	4	20°	2	30	23
3.0	45.25	34.00	275	255	4	4	4	15°	2	40	33
4.0	55.75	40.00	270	250	4	4	4	10°	2	70	53
5.0	71.25	51.00	225	210	4	4	4	10°	2	117	66
6.0	77.00	54.25	165	155	4	4	4	5°	2	166	79
8.0	92.00	63.25	155	145	4	4	4	5°	2	302	105
10.0	110.00	74.38	150	140	4	4	4	5°	2	520	132
12.0	125.00	84.38	145	135	4	4	4	3°	2	752	158

Other sizes available. Please consult factory.

Pipe Growth

Calculating Pipe Growth

Example:
A 2" copper pipe line if 134 feet long. Maximum temperature the line will encounter is 200°F. Lowest temperature is 40°F.

Calculation:
From chart – the expansion of copper pipe at:

200°F	2.30"per 100 ft. pipe
40°F	.45" per 100 ft. pipe
Difference	1.85"per 100 ft. pipe

134/100 x 1.85 = 2.48" total length change

Example:
A 6" steel pipe line if 152 feet long. Maximum temperature the line will encounter is 340°F. Lowest temperature is -20°F.

Calculation:
From chart – the expansion of steel pipe at:

340°F	2.70"per 100 ft. pipe
-20°F	.12" per 100 ft. pipe
Total	2.82"per 100 ft. pipe

152/100 x 2.82 = 4.29" total length change

Thermal Expansion and Contraction

Application	Temperature Range	Thermal Expansion
Chilled Water	40°F - 100°F	.46" per 100 ft.
Condenser Water	40°F - 100°F	.46" per 100 ft.
Domestic Hot Water *(Copper Pipe)*	40°F - 140°F	1.14" per 100 ft.
Hot Water	40°F - 200°F	1.22" per 100 ft.
Steam 100 psig	40°F - 338°F	2.40" per 100 ft.

Thermal Expansion of Metal Pipe

Saturated Steam Pressure, psig	Temperature °F	Linear Thermal Expansion, in/100 ft. Carbon Steel	Type 304 Stainless Steel	Copper
	-30	-0.19	-0.30	-0.32
	-20	-0.12	-0.20	-0.21
	-10	-0.06	-0.10	-0.11
	0	0	0	0
	10	0.08	0.11	0.12
	20	0.15	0.22	0.24
-14.6	32	0.24	0.36	0.37
-14.6	40	0.30	0.45	0.45
-14.5	50	0.38	0.56	0.57
-14.4	60	0.46	0.67	0.68
-14.3	70	0.53	0.78	0.79
-14.2	80	0.61	0.90	0.90
-14.0	90	0.68	1.01	1.02
-13.7	100	0.76	1.12	1.13
-13.0	120	0.91	1.35	1.37
-11.8	140	1.06	1.57	1.59
-10.0	160	1.22	1.79	1.80
-7.2	180	1.37	2.02	2.05
-3.2	200	1.52	2.24	2.30
10.3	240	1.85	2.71	2.76
34.6	280	2.18	3.17	3.22
75.0	320	2.53	3.64	3.70
138.3	360	2.88	4.11	4.18
232.6	400	3.23	4.59	4.87
666.1	500	4.15	5.80	

Tri-Flex Loop® Seismic Connectors

Horizontal Pipe Run Spanning a Building Seismic Joint

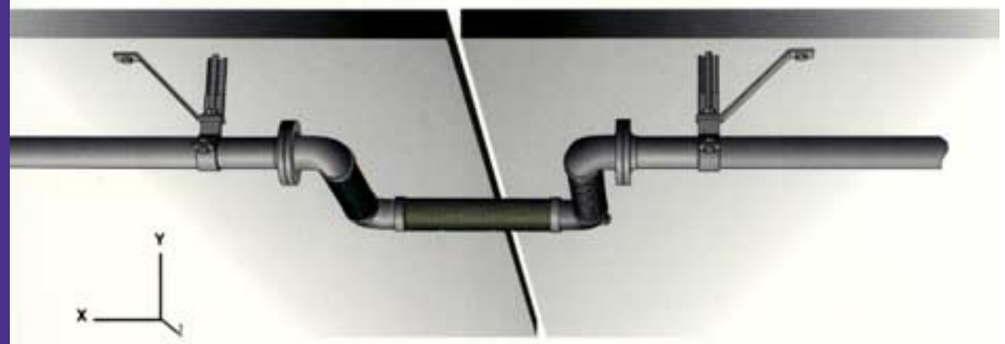
The Tri-Flex Loop's superior capabilities for withstanding large and irregular movements caused by seismic activities in a piping system were proven by independent, third party testing at The New York State Center for Advanced Technology (CAT) at Rensselaer Polytechnic Institute.

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.

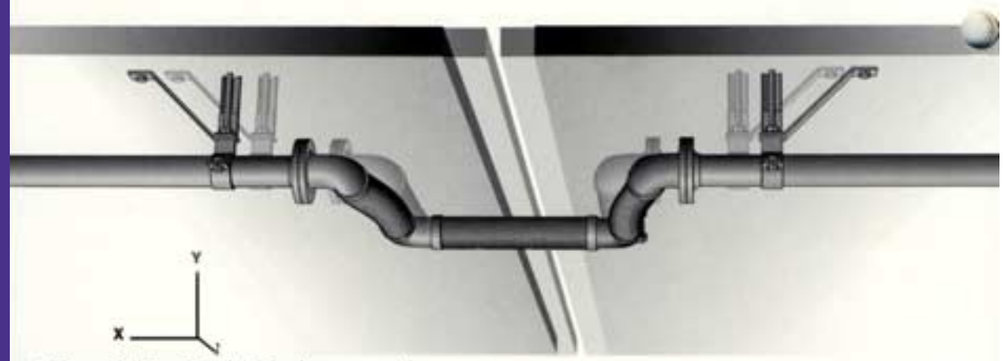
The Tri-Flex Loop is capable of accommodating seismic displacements for vertical piping between floors of the building, where pipes pass through or bridge building seismic joints or building expansion joints. The are also used for horizontal piping across building seismic and building expansion joints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

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

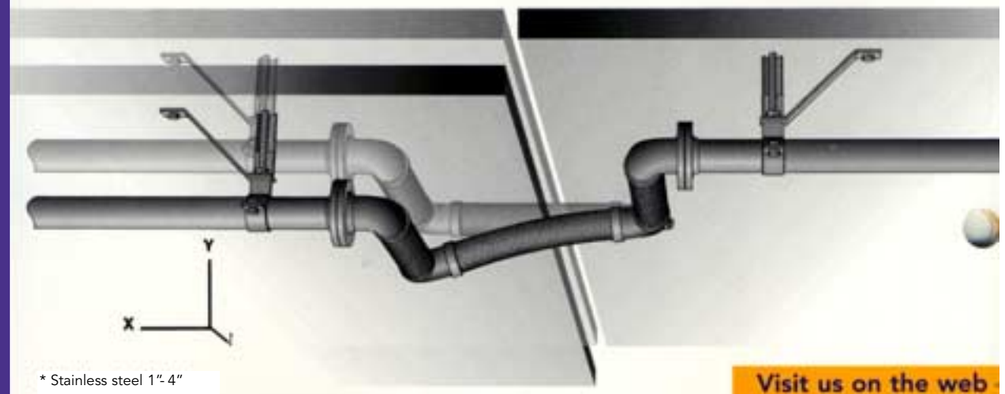
LISTED
Tri-Flex Loop® Stainless steel 1"-4" for combustible gases and flammable liquids at pressures not exceeding 175 psi at ambient temperature



Seismic Horizontal Displacement



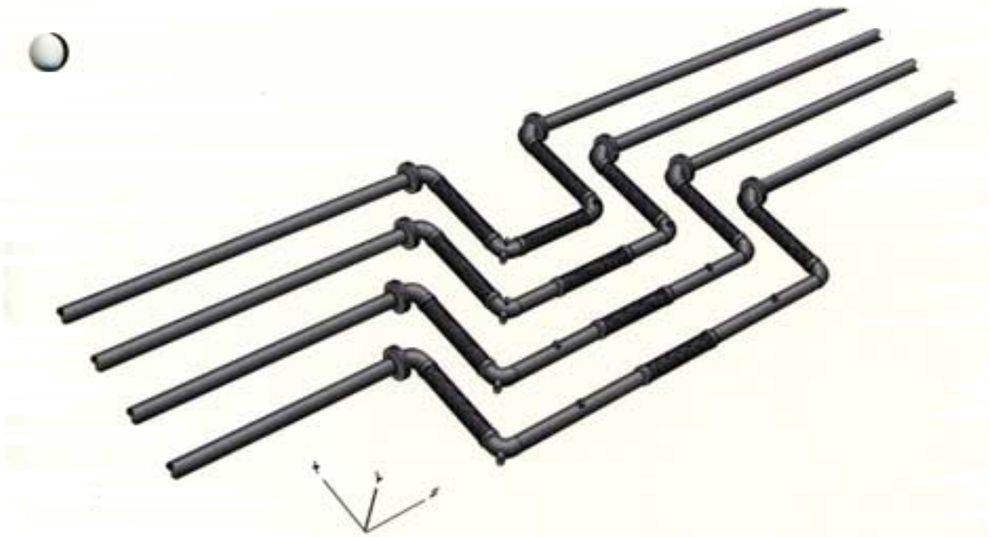
Seismic Vertical Displacement



* Stainless steel 1"- 4"

Visit us on the web

Tri-Flex Loop®: Saves Valuable Space

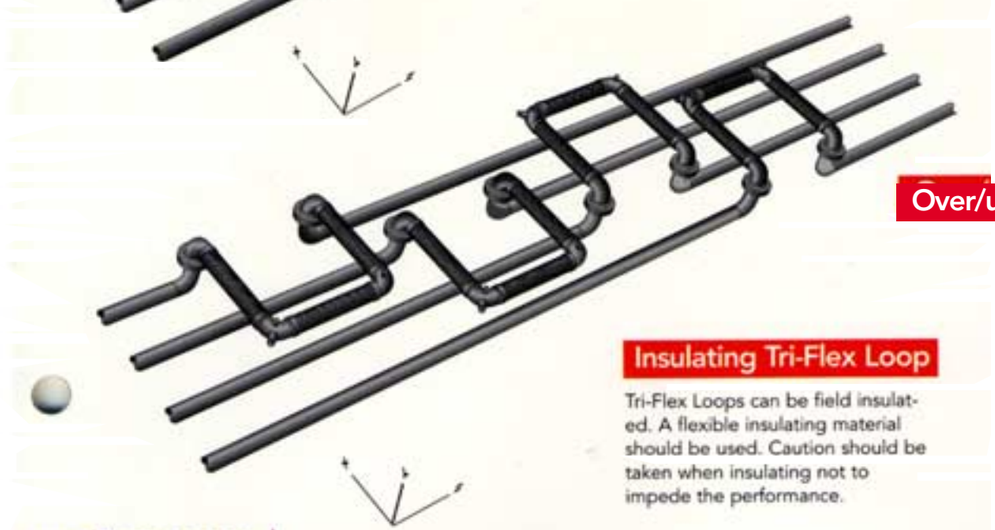


Traditional Nesting

Applications with multiple parallel pipe runs may require nesting of the Tri-Flex Loop to reduce dimensional requirements within a limited space. Any number of Tri-Flex Loops and styles may be accommodated within a nest, Tri-Flex Loops can be designed to go around obstructions i.e. building support columns, duct work, etc. If an installation requires nesting, please submit a Tri-Flex nested work sheet. The necessary modications will be made in order to assure each Tri-Flex Loop is free to move as per its intended design.

Diagonal Nesting

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



Over/under Pipe Nesting

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.

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.

www.flexhose.com

Make the Right Connection with our Representative:

Strand Earthquake Consultants
1436 S. Bentley Ave., #6, Los Angeles, CA, 90025

ATTN: Carl Strand
Tel: (800) 978-7263 / (310) 473-2426 / Fax: (310) 473-1366
E-mail: strandeart@aol.com / Website: www.strandearthquake.com