



DISPOFLEX

Dispositivos Flexibles S.A. de C.V.

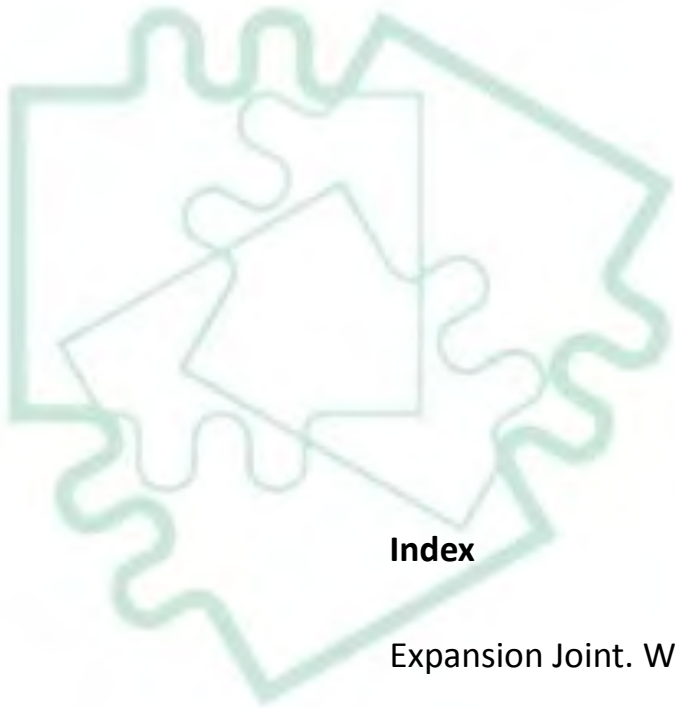
Metallic Expansion Joints



DISPOFLEX

Dispositivos Flexibles S.A. de C.V.

Product Catalog



Index

Expansion Joint. What is an expansion joint?

Types of Movement.

Metallic Expansion Joints.

Types of Metallic Expansion Joints.

Rectangular Expansion Joints.

Accessories for Metallic Expansion Joints.

Positioning of pipe guides.

Thermal Expansion of the pipe in inches by 100 feet.

Expansion Joint

What is an expansion joint?

When designing, producing and maintaining industrial pipe systems, different situations have to be taken into account. Such situations can be mechanical movements, vibrations, misalignments in pipes or movement caused by thermal expansion. All of these movements in the pipe are transmitted to the mounting and equipment connected to them, provoking deformations, failure and ruptures in the systems, which can lead to pricy production stops.

There are different ways to attack this situation, being the correct use of Expansion Joints in the pipes one of the most effective ones.



Expansion Joints are flexible devices designed to absorb movements generated by the pipe system because of variations in temperature and pressures. By absorbing those movements, the joints reduce the mechanical vibration caused by other equipment and diminishes the noise of the pipes.

The essential part of an Expansion Joint, which allows the movement and flexibility, is the bellow. The bellow requires to be very resistant to support the pressure of the fluids handled, but also flexible enough to absorb the present movements such as axial, lateral, angular, rotations and vibrations.



Types of Movement

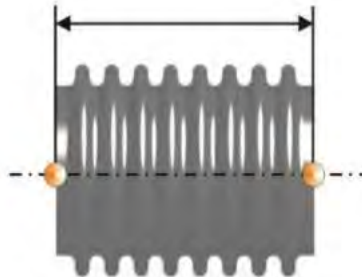
Basic movements that can exist in an Expansion Joint are:

Axial movement that can be of *compression* or *extension*, **lateral** movement and **angular** movement.

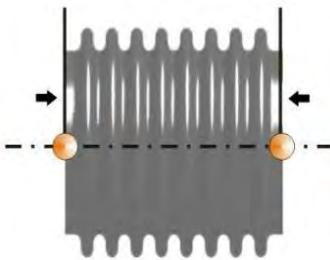
One can also find **rotational** and **vibratory** movement.

Neutral Bellow

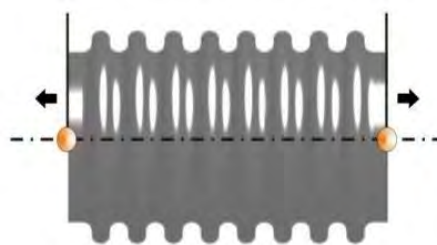
Under any pressure or temperature.



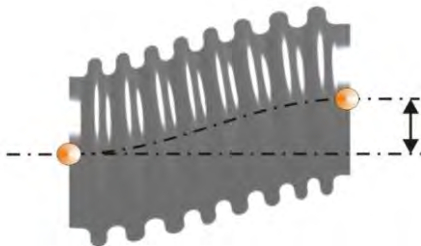
Axial movement to compression



Axial movement to extension



Lateral Movement



Angular Movement

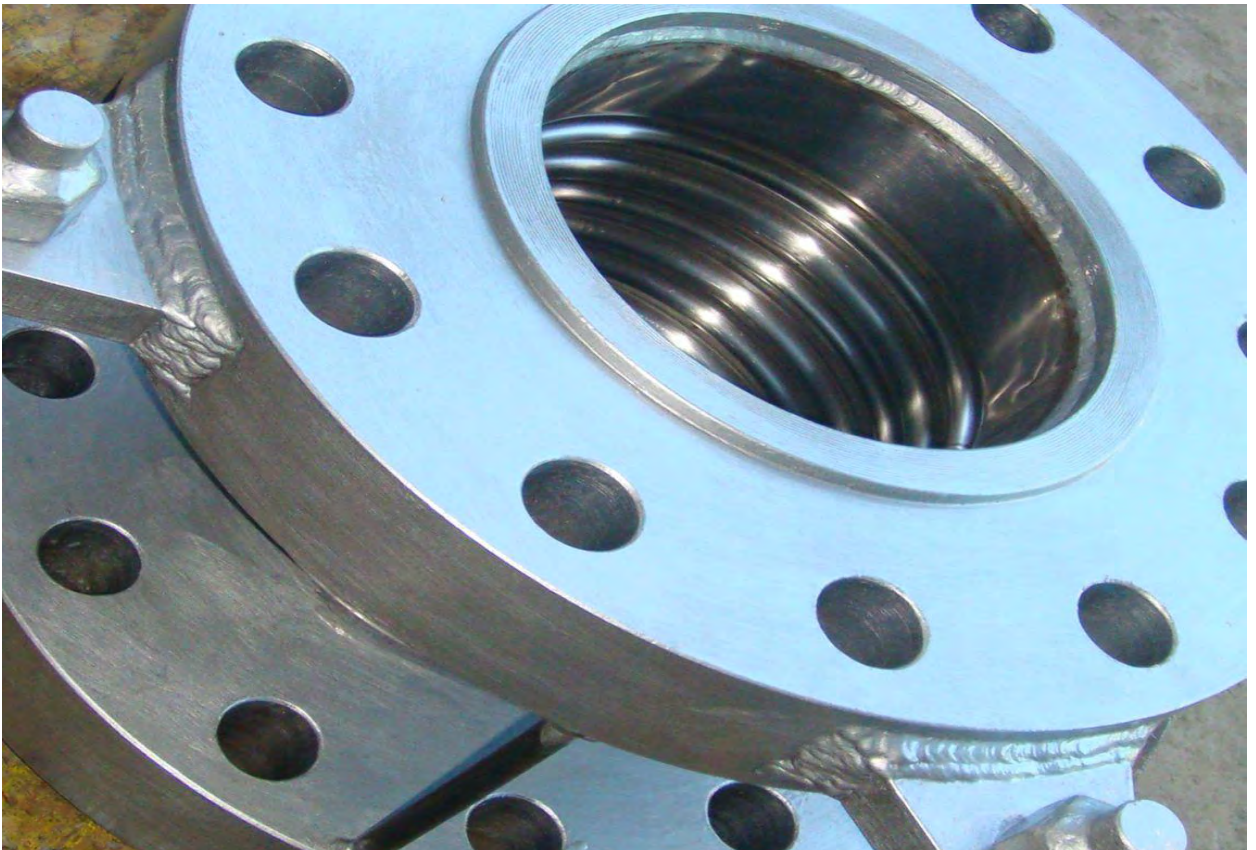


Metallic Expansion Joints

In the industrial pipe system field, different configurations of expansion joints have been developed as to cover most present situations that require attention and solution.

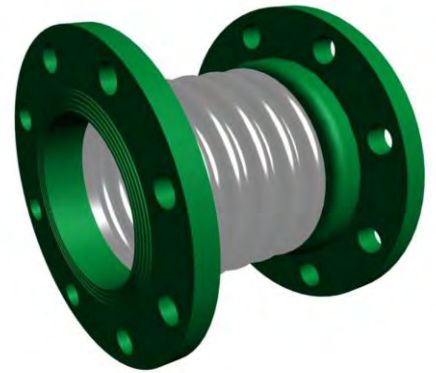
Metallic Expansion Joints are built as a part of a system of bellows. Their design and material depends upon the service submitted as well as the operation conditions and the fluid it will contain. Additionally to the characteristics of the design and the property of the material, the expansion joint can include a variety of accessories, as to be able to adapt to a specific situation.

For more information or questions please contact our technical support team. If you should not know any data or characteristic required we will gladly help you.



Metallic Expansion Joint: Simple

The extremes of the bellow can be welded or flanged. This is ideal to absorb axial movements and vibrations, as well as small lateral and angular movements, by itself or combined, as long as there are at one level to avoid torsion.



Description

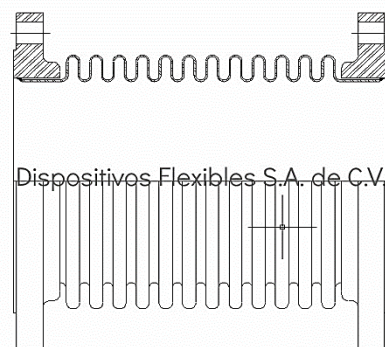
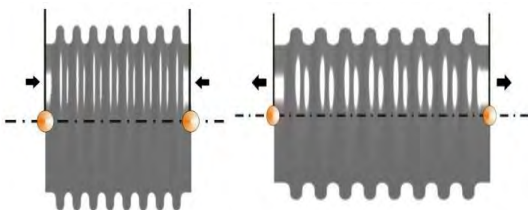
It is the most used model, easy and economical.

Perfect to absorb axial movements in pipe systems.

It should not be submitted to torsion.

It requires a controlled, anchored and guided pipe system to guaranty perfect functioning.

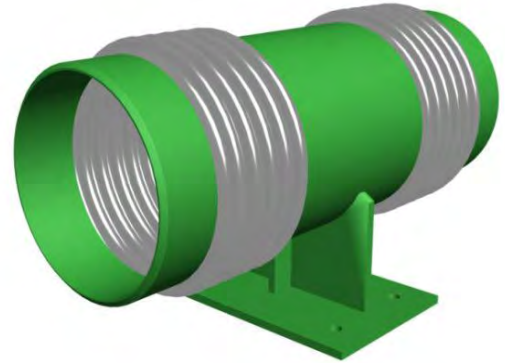
Axial movement to Compression and Extension



Metallic Expansion Joint: Duplex

Made of two bellows joint by a central tube spool anchored at the center.

This joint is designed to absorb axial and angular movement using the anchoring to divide the pipe system into two independent parts, so each bellow acts like a simple joint for each part of the system. Achieving the combination of the different movements present in the pipe system.



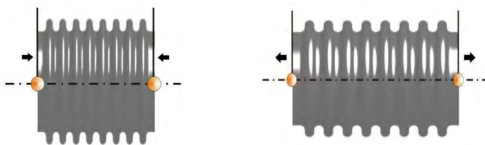
Description

Perfect to absorb angular and axial movement, as well as small lateral movements.

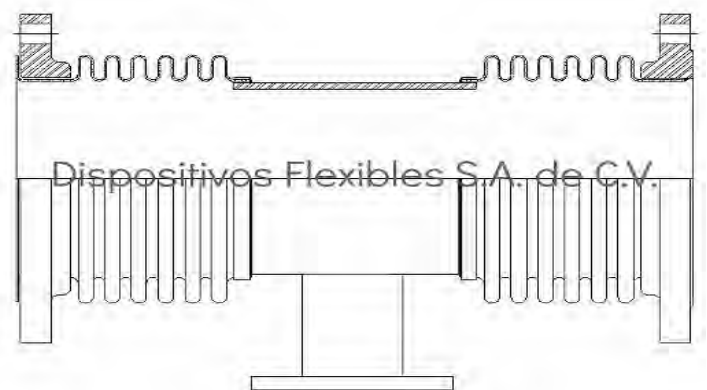
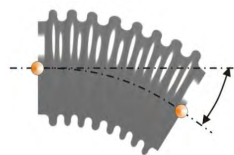
It can absorb the combination of two different movements present in the pipe system.

Because of the way of operation of this joint, it is necessary to use central anchoring.

Axial movement to Compression and Extension

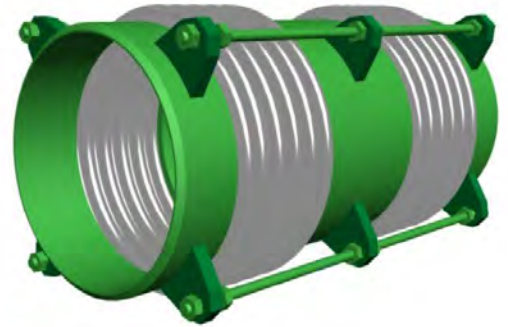


Angular Movement

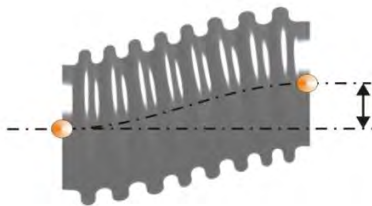


Metallic Expansion Joint: Universal

Formed by two simple bellows linked by a central spool and control bars that limit movements and support the possible pressure that lacking anchors in the pipe system could cause. It has the capacity to absorb big lateral movement, which can be increased by extending the central spool.



Lateral Movement

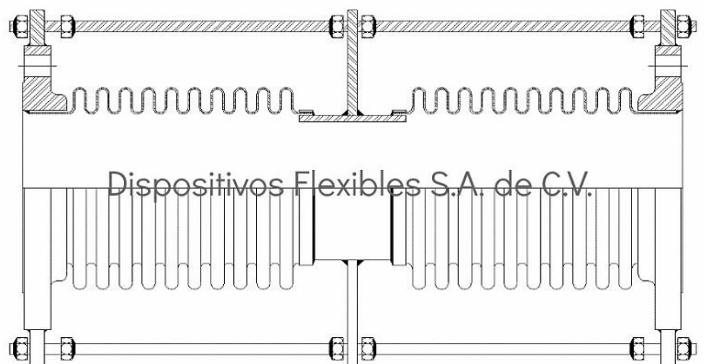


Description

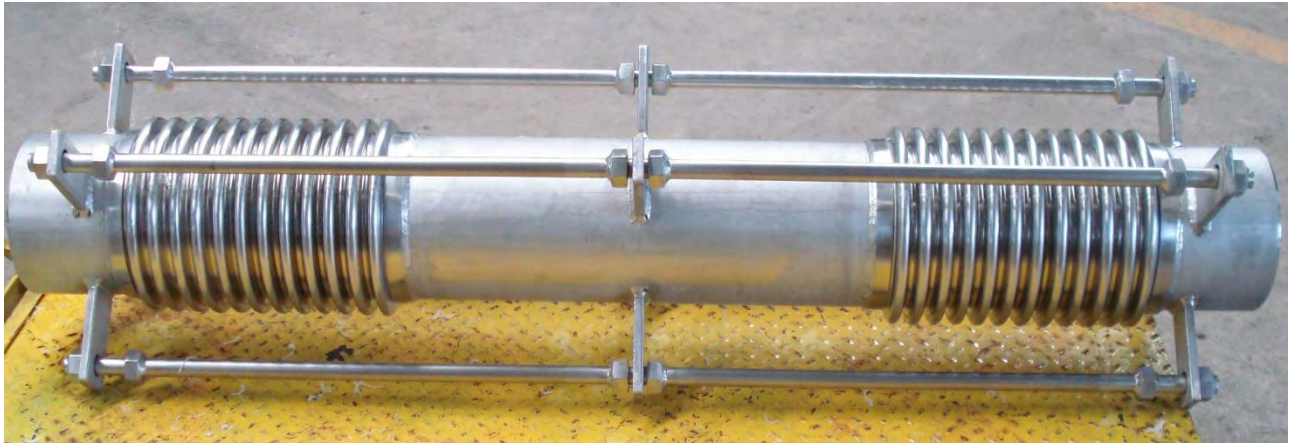
Perfect to absorb angular and axial movement, as well as small lateral movements.

It can absorb the combination of two different movements present in the pipe system.

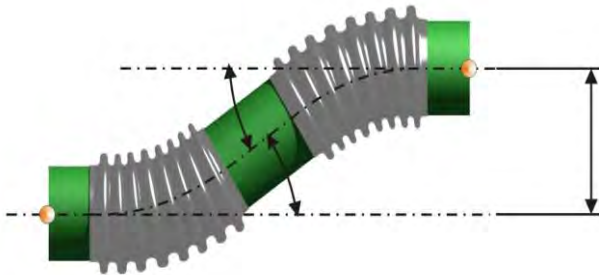
The capacity of absorption depends on the bellows design and the length of the central spool.



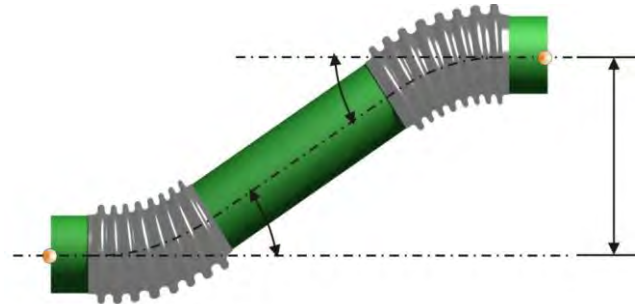
Lateral movement Universal Joint



Universal joint short spool.



Universal joint long spool.

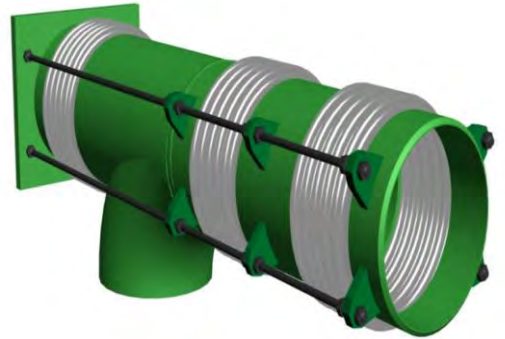


Increases the capacity to absorb lateral movement of a universal joint, increasing at the same time the length of the central spool.

Metallic Expansion Joint: Pressure Balanced

This type of expansion joint consists in one or two bellows in the flux section and one balance bellow in the posterior part of the elbow.

As its name indicates its function is to balance or reduce the reaction strength caused by internal pressure.



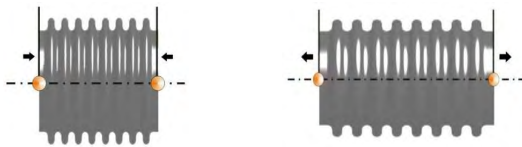
Description

Perfect to absorb axial and lateral movement.

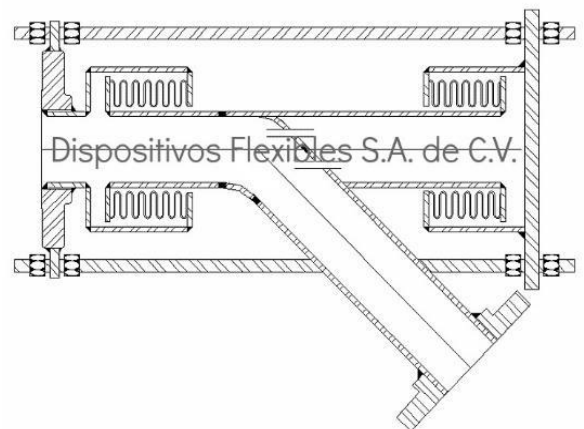
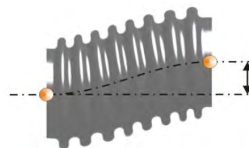
It restricts the push strength in the pipes.

It requires a minimum of guidance and eliminates the use of principal anchoring.

Axial movement to Compression and Extension



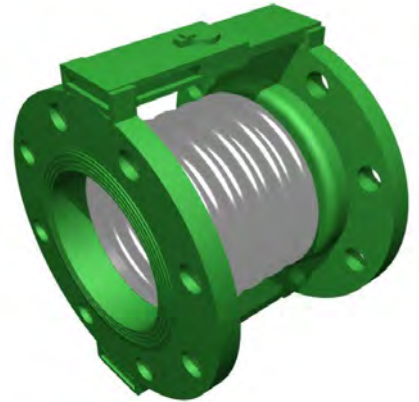
Lateral Movement



Metallic Expansion Joint: With hinge

This joint counts with just one bellow and has accessories that force it to only work in angular way and on one level at the same time that it supports internal pressure.

It can be used to absorb big expansion when placed correctly in the pipe system.



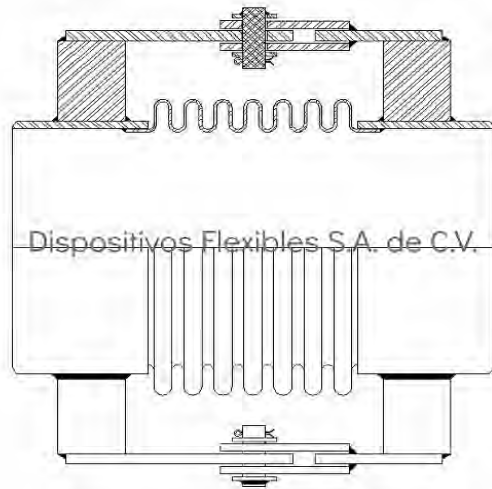
Description

The design with hinge allows total control in the bellow movement preventing torsions and maximizing its span of life.

Ideal angular movement absorption in one level.

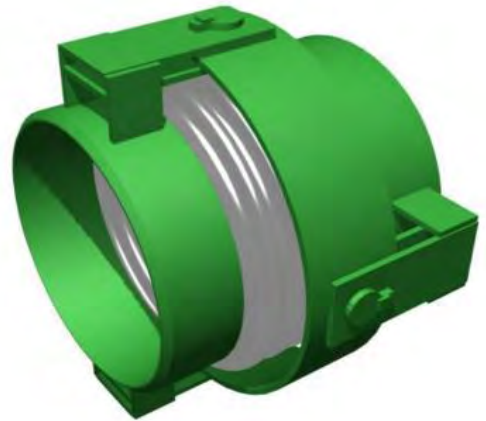
For major lateral movement a double joint with two bellows joint by a central spool can be applied.

Angular Movement



Metallic Expansion Joint: Cardan

This type of expansion joint has only one bellow and counts with movement limiting accessories, which only permits angular movements in two dimensional levels. It is used in combination with two or more similar joints and it does not produces expansion strength caused by internal pressure.



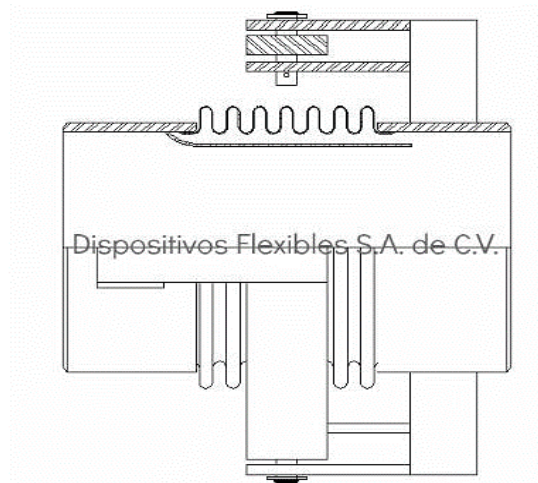
Description

It maintains total control of the bellow preventing torsions and maximizing its span of life.

Its design allows absorption of angular movements in two levels.

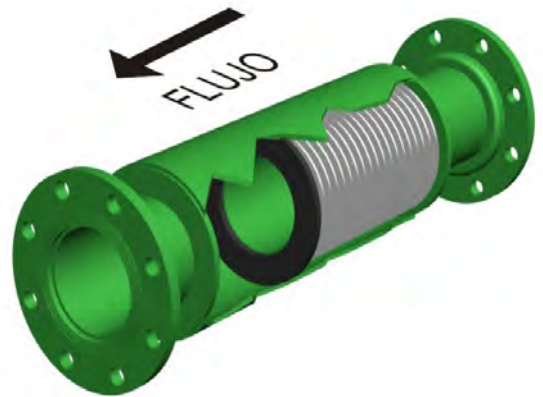
For major lateral movements a double joint with two bellows joint by a central spool can be applied.

Angular Movement

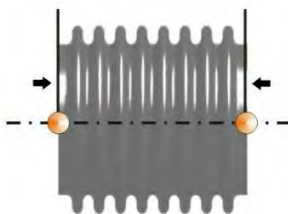


Metallic Expansion Joint: Tipo "X" Alta Presión

The construction of this type of joints forces the bellow to work under external pressure, which allows major length of the corrugated parted and therefore has major absorption of axial movement on one side and supports major pressure than the joints with bellow submitted to internal pressure.



**Axial movement
to compression**

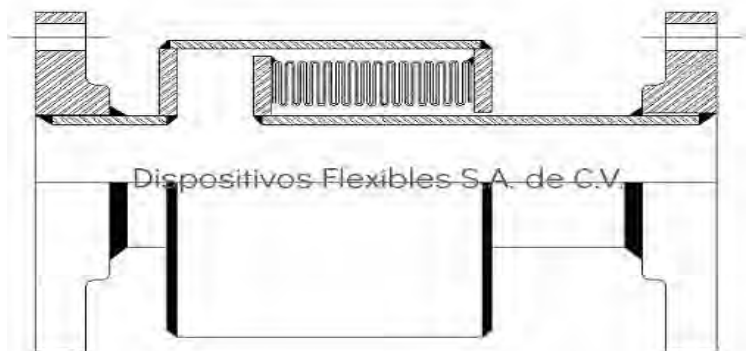


Description

Major absorption of compression axial movement and resistance to high pressure.

This type of joint is ideal for absorption of very big axial movements.

For major axial movements a double joint can be installed.



Rectangular Expansion Joints

Metallic Rectangular Expansion Joints have a variety of uses in energy generation, refinement, petrochemical, chemical and steel industry.

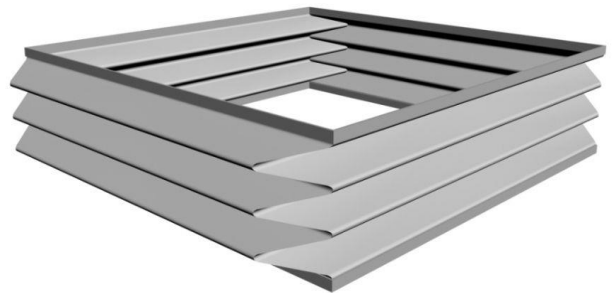
As there are no standard sizes of ducts and as there is a great variety of combinations in pressure and temperature, every metallic rectangular expansion joint is specifically designed to provide the most economical option, without sacrificing the integrity of the expansion joint or the system.

Metallic Rectangular Expansion Joints can absorb axial, lateral and angular movements. At the same time the joints can be built with different types of corners that result in different grades of economy and efficiency.

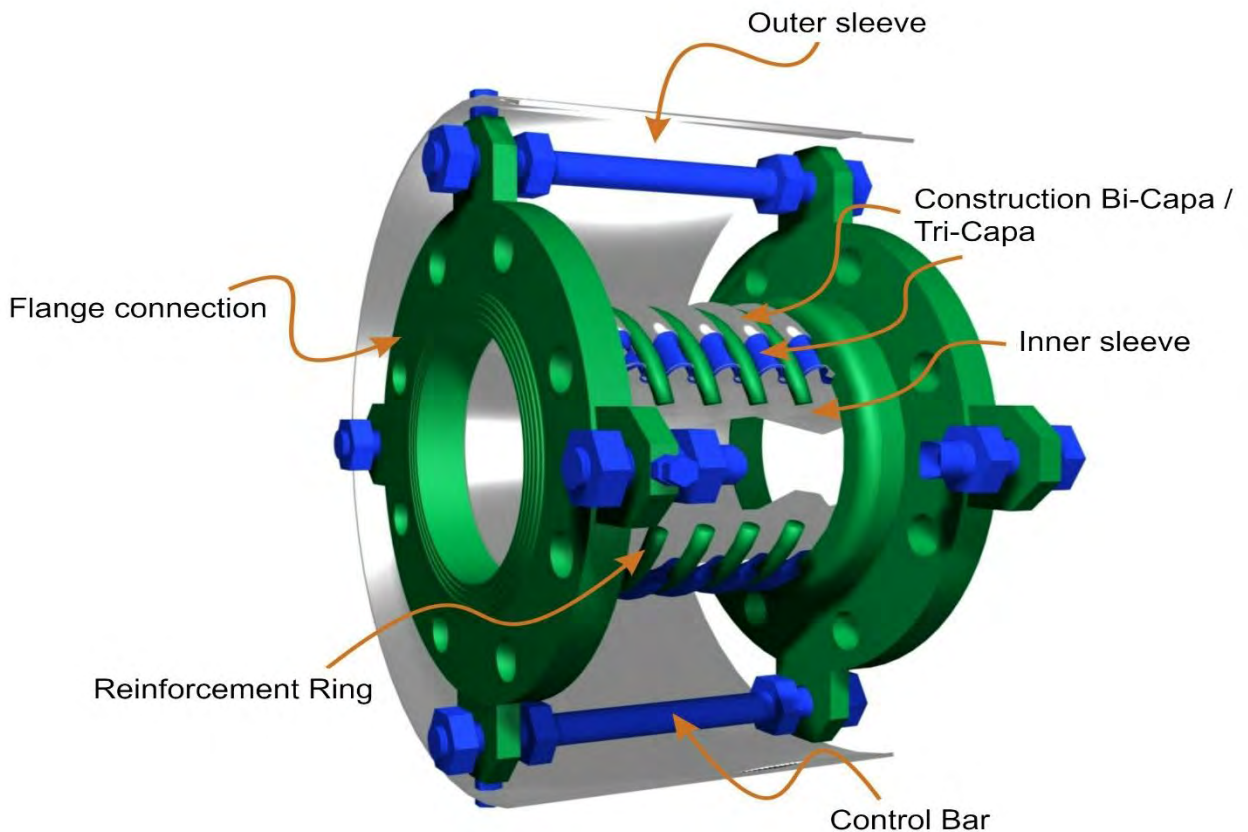
Simple Rectangular Expansion Joint with 90° corners



Rectangular Expansion Joint with camera corner



Accessories for Metallic Expansion Joints



Outer Sleeve.

Shell that protects the bellow from any damage from accidental blow or bump from the work area.

Inner Sleeve.

Generally uses the same material as the bellow, it protects the bellow from damages that the fluids could cause, such as vibration, resonance, loss of resistance to fluid in the system and abrasion.

Control Bar.

The functions of this element is to control the movements of the expansion joint bellow.

Construction Bi-Capa / Tri-Capa.

Allows major flexibility and resistance to the internal pressure.

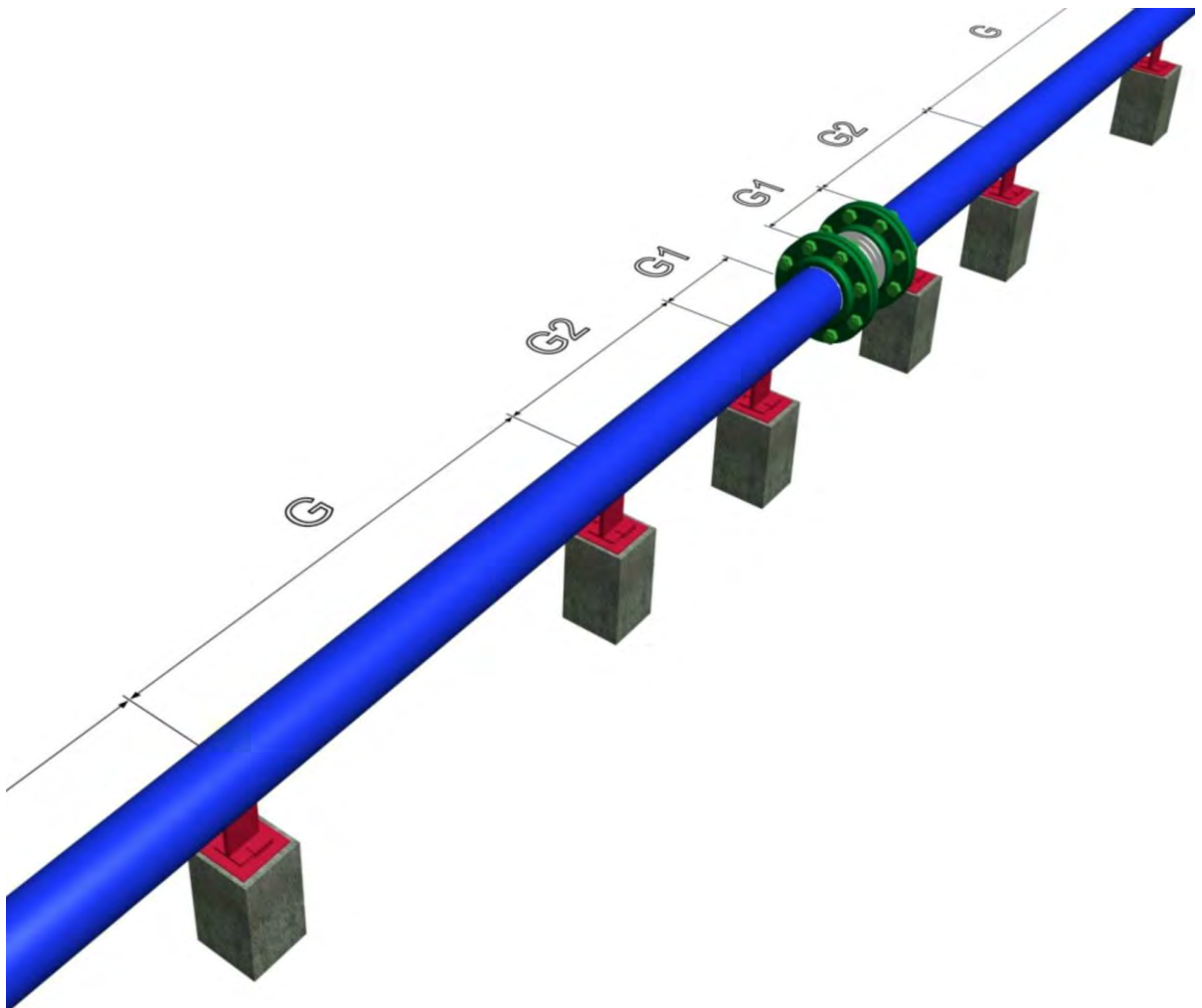
Reinforcement Ring.

Increases the capacity to support major pressure.

Positioning of pipe guides

To allow correct functioning of the pipe system with Expansion Joints it is necessary to install the right anchors and guides. Below drawing shows a pipe system with linear piping with a simple Expansion Joint and the necessary guides.

The first guide (G1) needs to be within 4 pipe diameters of the bellow, the second (G2) within 14 pipe diameters of the first guide.



Thermal Expansion of the pipe in inches by 100 feet

Temp. Degrees F.	Carbon C-Mo. 3Cr-Mo Steels	5CR-Mo through 9Cr-Mo Steels	Austenitic Stainless Steels 18Cr-8Ni	310 SS 25 Cr-20Ni	Alloy 400	Cu-30 Ni	Copper	Nickel 200	Alloy 800,825	Alloy 600, 625,691	Aluminum	Temp. Degrees V.
-325	-2.37	-2.22	-3.85	...	-2.62	-3.15	...	...	...	...	-468	-325
-300	-2.24	-2.10	-3.63	...	-2.50	-2.87	...	-2.44	...	...	-446	-300
-275	-2.11	-1.98	-3.41	...	-2.38	-2.70	...	-2.35	...	...	-4.21	-275
-250	-1.98	-1.86	-3.19	...	-2.26	-2.53	...	-2.25	...	-2.30	-397	-250
-225	-1.85	-1.74	-2.96	...	-2.14	-2.36	...	-2.13	...	-2.17	-3.71	-225
-200	-1.71	-1.62	-2.73	...	-2.02	-2.19	...	-2.01	...	-2.04	-3.44	-200
-175	-1.58	-1.50	-2.50	...	-1.90	-2.12	...	-1.83	...	-1.87	-3.16	-175
-150	-1.45	-1.37	-2.27	...	-1.79	-1.95	...	-1.65	...	-1.70	-2.88	-150
-125	-1.30	-1.23	-2.01	...	-1.59	-1.74	...	-1.47	...	-1.54	-2.57	-125
-100	-1.15	-1.08	-1.75	...	-1.38	-1.53	-1.83	-1.29	...	-1.37	-2.27	-100
-75	-1.00	-0.94	-1.50	...	-1.18	-1.33	-1.57	-1.11	...	-1.17	-1.97	-75
-50	-0.84	-0.79	-1.24	...	-0.98	-1.13	-1.31	-0.93	...	-0.97	-1.67	-50
-25	-0.68	-0.63	-0.98	...	-0.77	-0.89	-1.05	-0.75	...	-0.76	-1.32	-25
0	-0.49	-0.46	-0.72	...	-0.57	-0.66	-0.79	-0.56	...	-0.56	-0.97	0
25	0.32	-0.30	-0.46	...	-0.37	-0.42	-0.51	-0.36	...	-0.36	-0.63	25
50	-0.14	-0.13	-0.21	...	-0.20	-0.19	-0.22	-0.16	...	-0.16	-0.28	50
70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70
100	0.23	0.22	0.34	0.32	0.28	0.31	0.34	0.25	0.28	0.26	0.46	100
125	0.42	0.40	0.62	0.58	0.52	0.56	0.62	0.47	0.52	0.48	0.85	125
150	0.61	0.58	0.90	0.84	0.75	0.82	0.90	0.69	0.76	0.70	1.23	150
175	0.80	0.76	1.18	1.10	0.99	1.07	1.18	0.92	0.99	0.92	1.62	175
200	0.99	0.94	1.46	1.37	1.22	1.33	1.48	1.15	1.23	1.15	2.00	200
225	1.21	1.13	1.75	1.64	1.46	1.59	1.77	1.38	1.49	1.38	2.41	225
250	1.40	1.33	2.03	1.91	1.71	1.86	2.05	1.61	1.76	1.61	2.83	250
275	1.61	1.52	2.32	2.18	1.96	2.13	2.34	1.85	2.03	1.85	3.24	275
300	1.82	1.71	2.61	2.45	2.21	2.40	2.62	2.08	2.30	2.09	3.67	300
325	2.04	1.90	2.90	2.72	2.44	2.68	2.91	2.32	2.59	2.32	4.09	325
350	2.26	2.10	3.20	2.99	2.68	2.96	3.19	2.56	2.88	2.56	4.52	350
375	2.48	2.30	3.50	3.26	2.91	3.24	3.48	2.80	3.18	2.80	4.95	375
400	2.70	2.50	3.80	3.53	3.25	3.52	3.88	3.05	3.48	3.05	5.39	400
425	2.93	2.72	4.10	3.80	3.52	...	4.17	3.30	3.76	3.29	5.83	425
450	3.16	2.93	4.41	4.07	3.79	...	4.47	3.55	4.04	3.53	6.28	450
475	3.39	3.14	4.71	4.34	4.06	...	4.76	3.80	4.31	3.78	6.72	475
500	3.62	3.35	5.01	4.61	4.33	...	5.06	4.05	4.59	4.02	7.17	500
525	3.86	3.58	5.31	4.88	4.61	...	5.35	4.31	4.87	4.27	7.63	525
550	4.11	3.80	5.62	5.15	4.90	...	5.64	4.56	5.16	4.52	8.10	550
575	4.35	4.02	5.93	5.42	5.18	...	...	4.83	5.44	4.77	8.56	575
600	4.60	4.24	6.24	5.69	5.46	...	...	5.09	5.72	5.02	9.03	600
625	4.86	4.47	6.55	5.96	5.75	...	...	5.35	6.01	5.27	...	625
650	5.11	4.69	6.87	6.23	6.05	...	...	5.62	6.30	5.53	...	650



Dispositivos Flexibles S.A. de C.V.

Street 1 Norte, No. 3 Col. Atenatitlan,
Jiutepec, Mor. México C.P. 62572
Phone: 01(777) 319 45 06 / 320 5767

Fax: 320 2680

Dispositivosflexibles@hotmail.com

www.dispoflex.com.mx