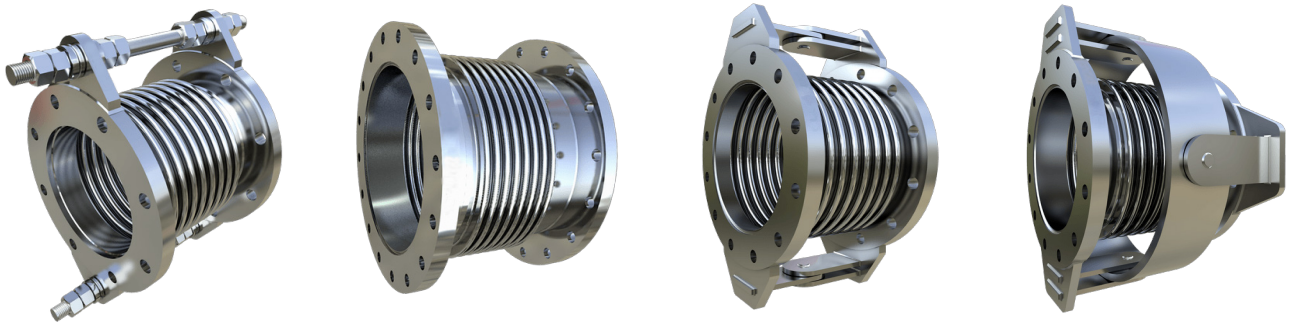


ABOUT

STAINLESS STEEL EXPANSION JOINTS

Singaflex Metallic Expansion Joints consist of a flexible bellow element with end fittings such as flanges installed in appliances, machines, apparatus, and pipe systems where space is restricted for movement compensation, expansion compensation, tension reduction, noise & oscillation transmission absorption, and installation inaccuracy compensation



High-Temperature Applications

Manufactured from stainless steel tubing to form a corrugated cylinder, our expansion bellows adds the structural reinforcement and flexibility necessary to contain system pressures and temperature (up to 600°C) customised in accordance with your specifications.

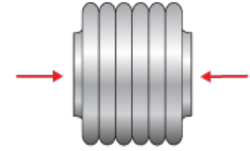
Singaflex Expansion Bellows are designed using the EJMA (Expansion Joint Manufacturers Association) standard with the general requirements of associated piping and vessel codes such as ASME / API / BS 5500 taken into consideration where appropriate.

With our in-house designing and manufacturing capabilities, suitable expansion joints can be fabricated with expedited lead times to replace existing parts without the need to modify the system to accommodate them.

Our expansion joints are supported by documentation including 3.1 material certificates and various test certification.

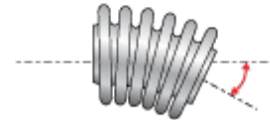
Axial Compression

Reduction of the bellows length due to piping expansion.



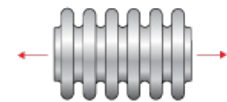
Angular Rotation

Bending about the longitudinal centre line of the expansion joint.



Axial Extension

Increase of the bellow length due to pipe correction.



Lateral Offset

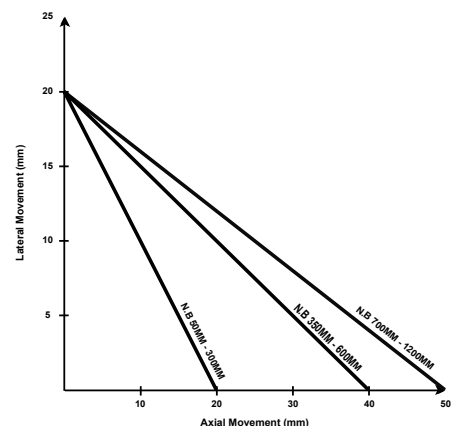
Refers to the traverse motion that is perpendicular to the plane of the pipe, while ensuring that the expansion joint ends remain parallel to each other.

Torsion

Twisting about the longitudinal axis of the expansion joint can reduce bellows life or cause expansion joint failure and should be avoided. Expansion joints should not be located at any point in a piping system that would impose torque to the expansion joint because of thermal change or settlement.

Chart of Movement Combination

Expansion Joints are generally designed to handle one main type of movement at a time. Although it is not recommended for the joints to be subjected to concurrent movement types, the movement types should not exceed two and be both of high velocity to ensure its optimum operability.



Cycle/Service Life

Singaflex Stainless Steel Expansion Bellows are rated for a load of 1000-2000 load cycles. Together with the tolerable operating conditions.

- **Pressure**
- **Temperature**
- **Movement**
- **Number of load cycles**

One movement cycle occurs each time the expansion joint deflects from the installed length to the operating temperature length, and then back again to the original installation length.

The following parameters may also affect service life:

Corrosion: Incorrect selection or combination of materials, conveyance of aggressive media and inappropriate cleaning with cleaning agents.

Movement & Environment: Subjecting the element to high frequency oscillations, sympathetic vibration, temperature shocks and pressures exceeding its permitted maximum values may result in fatigue failure/fracture.

Incorrect Installation: Can be prevented by compliance with the installation and assembly instructions.

Application of Bellow Expansion Joints in Piping Systems

It is essential to distinguish between the unrestrained expansion joint, usually used for axial movement, and the restrained unit, using bellows fitted with tie bars or hinges taking up the offset and angular movement.

The two have different applications, act upon the pipe differently, and must be installed differently.

At the design stage, identifying the pipe movements, the working and test conditions, and the environment in which the piping system will operate is of utmost importance. While challenging, this task is essential for successfully installing expansion joints. Regardless of complexity, any piping system can be divided into several individual expanding or contracting sections, each with relatively simple configurations. The number and location of pipe anchors are determined by the piping configuration, the amount of movement that a single joint can accommodate due to expansion, and the availability of suitable structural points for anchors.

Expansion joint elements have a limited capacity to transmit torque and absorb torsional rotation.

Designers of piping systems must exercise caution and careful planning to prevent such loading on the expansion joint, as any oversight could lead to potential risks and complications.

Accessories

Flow Liners/Inner Sleeves can be installed in the inner bore of the expansion joint to protect the bellows from erosion damage due to an abrasive material or resonant vibration due to turbulent flow or high velocity applications.

Range and Material

Sizes: DN50 TO DN3000

Bellow Material: Stainless Steel SS304L/SS316L, SMO, Duplex, Super Duplex

1. AXIAL EXPANSION JOINT
2. TIED AXIAL EXPANSION JOINT
3. HINGED EXPANSION JOINT
4. GIMBAL EXPANSION JOINT

