

METALLIC BELLOWS / EXPANSION JOINT



DESCRIPTION

Bellows (expansion joints) are used extensively in piping system to

- Prevent stresses due to expansion and contraction
- Accommodate axial, lateral or angular movements or a combination of these
- Accommodate thermal expansion
- Isolate vibrations
- Accommodate fabrication tolerances

They are widely used in

- Refineries
- Chemical plants
- Cement plants
- Agro / fertilizers
- Shipping
- Tyre industry
- Nuclear & thermal power stations

DESIGN

The expansion joints are designed, fabricated and tested to provide an accurate and effective solution to the customer's requirements. Metallic bellows are manufactured as per EJMA standard.

They are manufactured in all Ferrous / Non Ferrous / Alloy Steel / Non Alloy Steel material as per customer's requirement.

The number, shape and construction of the convolution depend on the type and amount of movement necessary to accommodate the thermal expansion.

Bellows are designed to take movement, pressure, temperature, media, fatigue life and corrosion. Big corrugations offer great elasticity and movement but reduce the capacity to absorb internal pressure and require more space.

A combination of experience, calculation and practical testing make a good bellow, which is critical in order to give the level of performance as required.

While designing a bellow following parameters are taken into consideration, Pressure, Temperature, Corrosion resistance, Minimum maintenance, Durability, Reliability, Long life, Economy, Performance and Safety.

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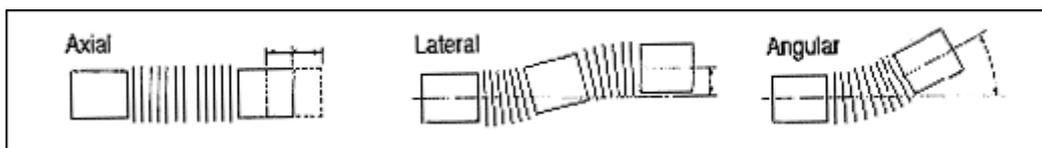
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- Single convolution
- Multiple convolutions
- Universal Styles
- Hinge Type
- Square Type
- Rectangular Type
- Circular Type
- Gimble Type



BELLOW MOTION / MOVEMENT

Axial Compression	Reduction of face to face dimension measured along the axis
Axial Elongation	Increase of face to face dimensions measured along the axis
Transverse or Lateral Movement	The movement of the joint perpendicular to the axis
Vibration absorption	The movement of the joint due to vibrations which are effectively intercepted and insulated against transmission to remainder of system
Angular Movement	The displacement of the longitudinal axis of the joint from its initial straight line position (a combination of axial elongation and axial compression)



BELLOW WORKING

The function of Metallic Expansion Bellows is to absorb Thermal Expansion or Contraction of a pipe Line. while, at the same time, continuing the flowing media and withstanding the design temperature and pressure

Axial Type Bellows are used to take Axial Movement and absorb Thermal Expansion and contraction

Hinge Type Bellows are used to take Lateral Movement

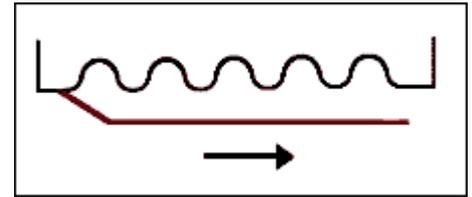
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METALLIC BELLOWS ACCESSORIES

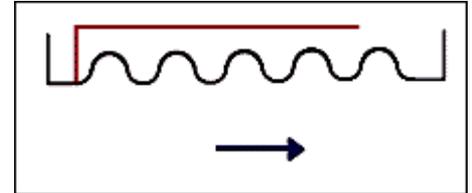
Flow Liner

The flow liner protects the corrugated metal bellows from abrasion and reduced buildup of particulate. The liner also helps to provide a laminar flow. Available in materials like carbon steel, cornet, stainless steel.



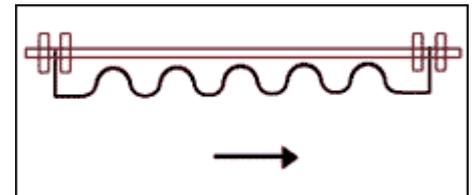
Cover

The metal bellow cover provided to protect from external environment and dirt build up. Provided in stainless steel or galvanized steel.



Control Rods/Limit Rods

Control rods provide stability and/or limit movements. This helps over-extension or compression of the joint, which could cause damage.



End Connection

Flanged, weldable ends, or any other connections as per customer's requirement.



HOW BELLOWS FAIL PRE-MATURELY?

- Faulty piping design
- Incorrect stress analysis
- Improper erection
- Corrosive cracks due to improper application & storage
- Un-closed piping system i.e. not having sufficient anchors and guides
- Mechanical dents/bends on convolutions

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