EXPANSION JOINT SOLUTIONS

SINCE 2019

SHIYA ENGINEERING

ISO 2009 : 2015

METALLIC
EXPANSION JOINT

About us :

" We specialize in manufacturing metal expansion joints that not only withstand high design tenperatures, pressures, and media but also provide the necessary flexibility. Our joints can accommodate axial, lateral, or angular movements, ensuring the integrity of piping systems. In many installations, a balance between flexibility and rigidity is essential to support piping loads and control the motion of the bellows and pipes."

First Choice **designer and manufacturer** of **METALLIC EXPANSION JOINTS**

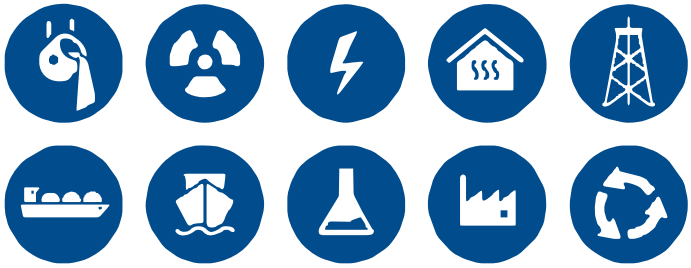
STATE-OF-THE-ART PRODUCTION

- Lifting Capacity: up to 10 tonnes
- Extensive stock of raw materials
- Methods of bellows forming: Rolling, Punch and Hydraulic
- Several test rigs; largest handles up to DN 3500
- Separate painting facility
- Advanced welding equipment

OPERATING IN THE FOLLOWING

SECTORS

Steel, Nuclear, Power, District Heating, Fluid Catalytic Cracking (FCC), Oil & Gas, Chemical, Pulp & Paper, Recycling Industry. Processing and Shipping including Liquefied Natural Gas (LNGVLiquefied Petroleum Gas (LG) Carriers, tankers, scrubbers etc.



WHAT WE DO

Siya Engineering **HIGH QUALITY EXPANSION JOINT SOLUTIONS** within the range:

DIMENSION

DN 15–12.000

(DN 6.000-12.000
ARE SUPPLIED IN SEGMENTS)

PRESSURE

UP TO **150** BARG (2176 PSI)

OR MORE IF REQUIRED (ALSO RING REINFORCEMENT IF NEEDED)

DESIGN CODES

- **EN 13445**
- **EN 13480**
- **EN 14917**
- **ASME VIII**
- **Div. I,**
- **PED 2014/68/EC**
- **ASME B31.3**
- **ASME B31.1**
- **AD2000**
- **EJMA**

and others upon request

MATERIALS

MATERIALS

ALL **STAINLESS STEELS** & HIGH ALLOYED STAINLESS STEELS, INCLUDING:

- **DUPLEX**
- **INCOLOY**
- **INCONEL**
- **TITANIUM**
- **HASTELLOY**
- **ALLOY**

PANTOGRAPH LINKAGE EXPANSION JOINT

RECTANGLE EXPANSION JOINT

ROUND EXPANSION JOINT

Axial Joint

Flexible connector used to absorb thermal expansion or contraction in a pipeline, allowing movement along the pipe's axis.

Universal Joint

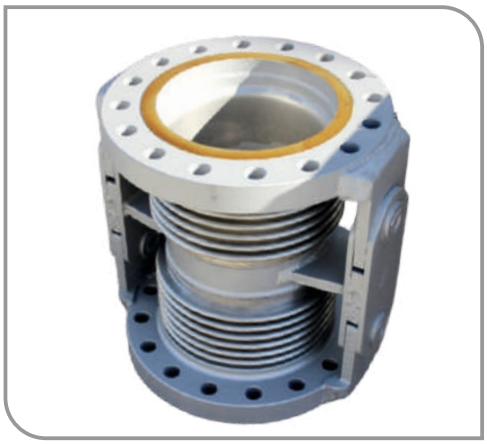
Flexible connector with two bellows and an intermediate pipe, designed to absorb lateral, axial, and angular movements in piping systems.

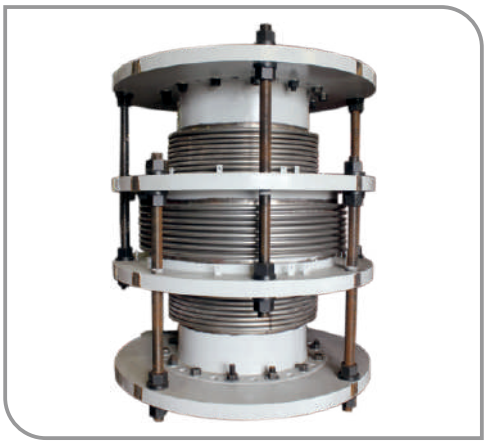
Gimbal Joint

Flexible joint used in piping systems that allows for angular rotation in multiple directions. It consists of a bellows assembly supported by a gimbal mechanism, which helps absorb movement while preventing axial displacement.

Hinged Joint

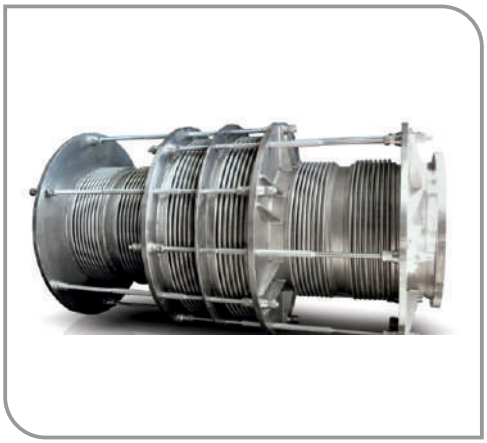
Flexible connector that allows angular movement in one plane while restraining axial and lateral movement. It uses a hinge mechanism to absorb thermal expansion or contraction in pipelines or duct systems.





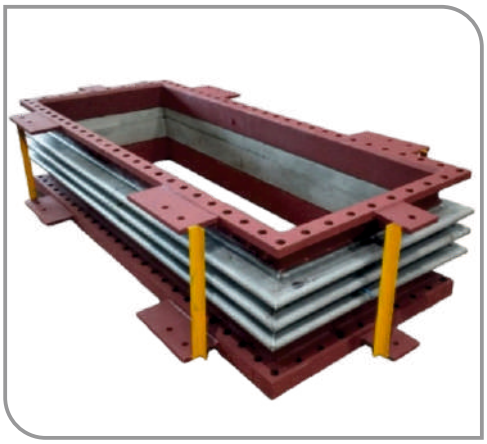
Pressure Balanced

Pressure balanced expansion joints absorb thermal expansion and contraction in piping systems while neutralizing pressure thrust forces, protecting connected equipment and reducing load on supports



In-Line Pressure Balance Joint

An inline pressure balance expansion joint absorbs axial movement while maintaining system pressure balance, preventing pressure thrust on adjacent equipment.



Rectangle Expansion joint

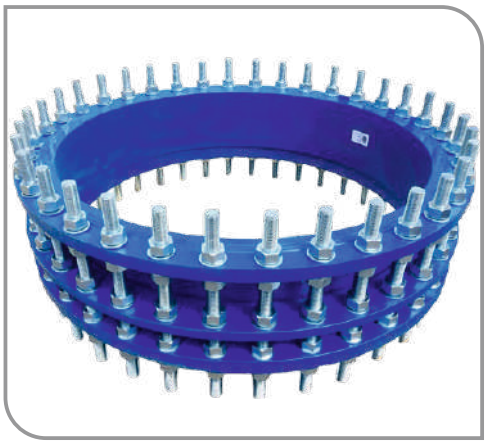
A metallic rectangle expansion joint is a component used in boilers and HVAC systems to accommodate thermal expansion, contraction, and movement between connected pipes or ducts. Made from metal, these joints are designed to absorb stress, prevent damage, and ensure system integrity by allowing controlled movement without leaking or compromising performance.

Non Metallic Expansion Joint

Non-metallic expansion joints are flexible components used in systems like boilers, bag filters, and Electrostatic Precipitators (ESPs) to absorb thermal expansion, vibration, and movement. Made from materials like rubber, PTFE, or fabric, they prevent damage from system shifts, ensuring smooth operation and prolonging equipment life. These joints allow for safe and effective handling of temperature and pressure variations without compromising structural integrity.

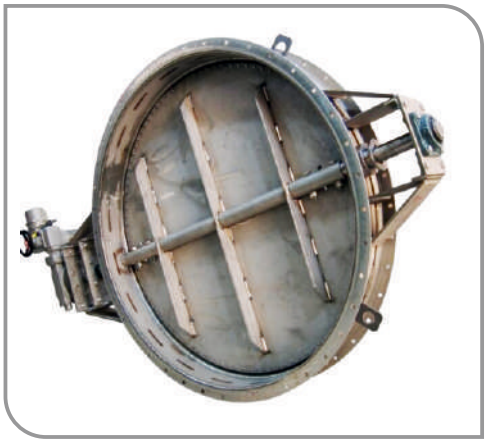
Dismantling Joint

A dismantling joint is a type of mechanical joint designed to allow easy disassembly of connected components or sections, typically in piping or machinery. It enables quick removal and reassembly for maintenance, repair, or replacement without damaging the parts.



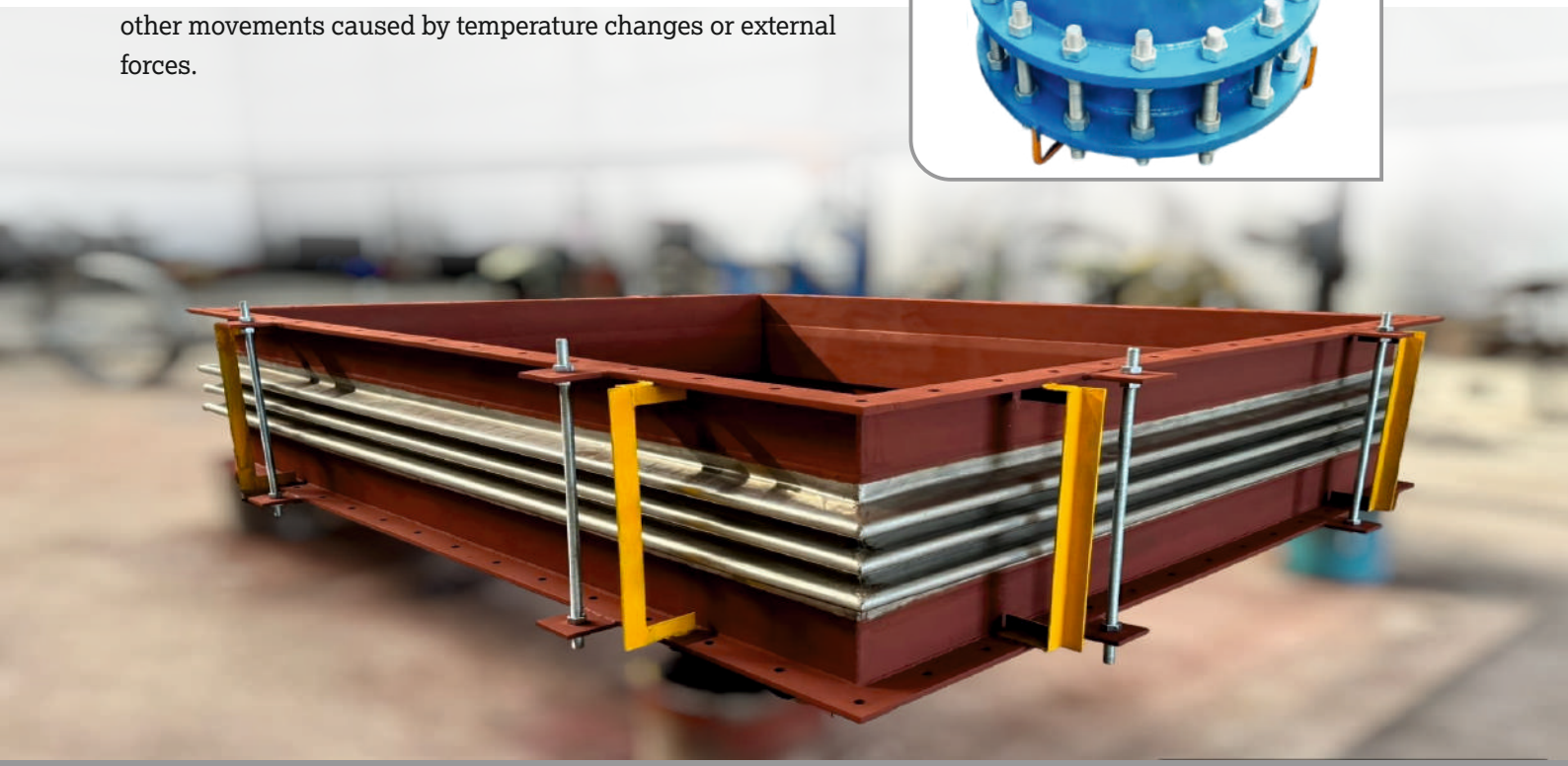
Damper

Damper is a device used to regulate or control the flow of air or gas within a system. Commonly found in HVAC systems, chimneys, and industrial ducts, dampers can be manually or automatically adjusted to maintain desired airflow, temperature, or pressure. They often improve energy efficiency and system performance.



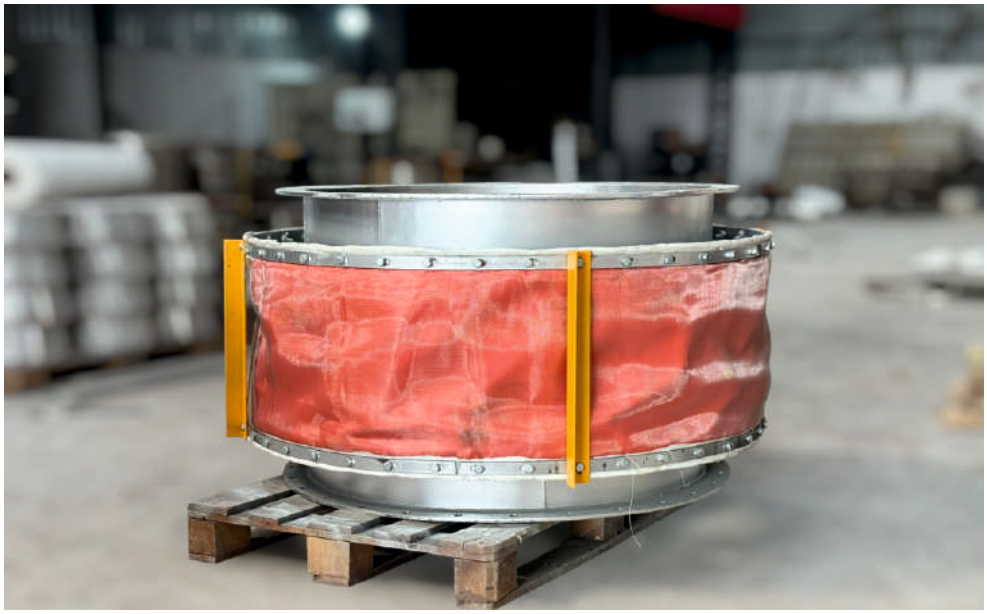
Slip Type Expansion Joint

Slip Type Expansion Joint is a mechanical device used in piping systems to absorb thermal expansion, contraction, and other movements caused by temperature changes or external forces.



FABRIC
EXPANSION JOINT

A fabric expansion joint is a flexible connector used in piping systems, ducts, or equipment to accommodate movement, absorb thermal expansion, reduce vibrations, and prevent damage to the structure. They are typically made from a combination of durable fabrics and elastomers, such as rubber or PTFE (polytetrafluoroethylene), and are often reinforced with materials like steel or fiberglass to provide additional strength.



Key Features and Functions:

- Flexibility: Fabric expansion joints are designed to flex, allowing for the absorption of thermal expansion, contraction, and misalignment of connected pipes or ducts.
- Temperature Resistance: They can handle a wide range of temperatures, depending on the materials used, making them suitable for high-temperature applications such as in power plants, exhaust systems, and industrial ventilation systems.
- Vibration Damping: Fabric expansion joints help dampen vibrations, reducing the stress and wear on the piping system.
- Sealing and Leak Prevention: They ensure that the system remains sealed, preventing leakage of fluids or gases.
- Versatility: They can be used in various industrial applications, including HVAC systems, chemical

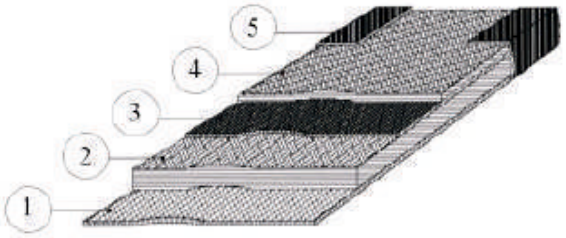
Applications:

- Piping systems: To accommodate the thermal expansion or contraction of pipes in heating, cooling, or fluid transport systems.
- Ventilation systems: In HVAC to absorb vibrations and allow for ductwork movement.
- Exhaust systems: In engines or industrial processes where high temperatures and vibrations are present.

CONSTRUCTION & **DESIGN STYLES**

Selection of the optimum construction for fabric expansion joints depends on a number of factors which need to be Considered for the application, generally speaking there are no "standard" designs. Fabric expansion joints are available in many configurations with single-layer or multi-layer fabric elements.

The multilayer expansion joint IS generaly made from:



1. **Internal material;** to avoid abrasion
2. **Insulation material;** to resist high temperature
3. **Sealing foil;** for gas tight con- struction
4. **Outer cover;** against mechanical loads
5. **Reinforcement;** protection ensuring strong Construction in the area where bolts are fixed.

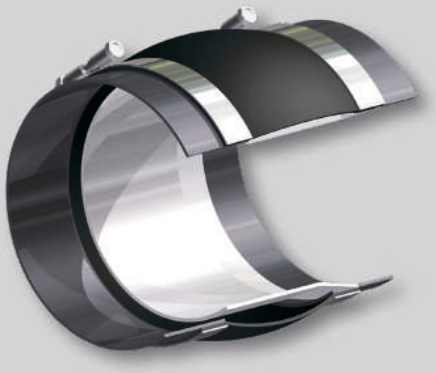
DESIGN STYLES :
Fabric expansion joints are usualy supplied as a "belt" or with integral flanges, the preferred arrangement will depend on the conditions of the installation and system temperature.Simple flanged solutions are common for installing against flanges mounted onto the ductwork, an arrangement suitable for low temperature areas.

Design Styles

Belt type expansion joint attached directly onto the outside of the duct using clamping bands nomally used for:

1. Low temperatures (up to 300°C)
2. Low to medium velocity
3. Low to medium dust load

ie. : Clean air ducts



Convoluted fabric expansion joints are attached directy onto the outside of the duct using clamping bands normally used for:

1. Large movements
2. Low velocity
3. Low dust content
4. Low temperature

i.e.: Pulp and paper industry

Fabric expansion joints mounted on vertical flanges, typically used in systems with:

1. Low flow velocity
2. Low dust content
3. Low temperature (up to 450°C)

The design can be made both with and without sleeve. The sleeve primariy acts to protect the fabric expansion joint from the particles in the flow medium

i.e.: Chemical industry (wet and dry)

Design Styles

Fabric expansion joints mounted on parallel flanges, typicaly used in ductwork with:

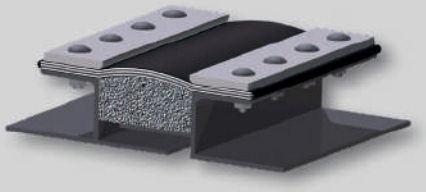
1. Medium temperature range (up to 500°C)
2. Higher flow velocities
3. Medium dust content in the flow

i.e.: Low temperature flue gas ductwork in conventional power stations

Fabric expansion joints mounted on parallel flanges with insulation bolster, typically used in plants with:

1. High temperatures (up to 600°C)
2. High dust content
3. High flow

i.e.: High temperature flue gas duct systems in conventional power stations



Fabric expansion joints with floating sleeve construction are typically used in plants with:

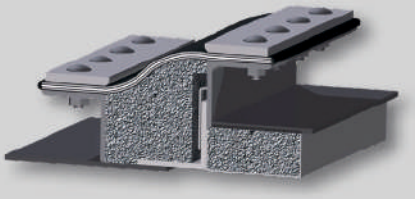
1. Medium to high temperatures (up to 600°C)
2. Very high dust content
3. Low to high flow velocities

The floating sleeve gives good protection against dust whilst allowing lateral movement.

i.e.: Cement industry

Hot to cold duct transition is often made inCombination with a fabric expansion joint. The purpose of the hot to cold duct transition is to be able to use a lower grade (and less expernsive) duct material, by incorporating the insulation internally in the duct. Temperatures up to 650°C.

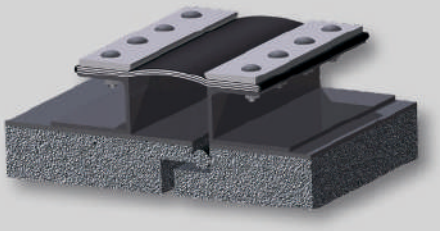
ie.: Gas turbine installations



Fabric expansion joints installed in refractory ined duct systems are typically used in plants with:

1. Very high temperatures (up to 1200°C)
2. Low to high dust content
3. Low to high flow velocity

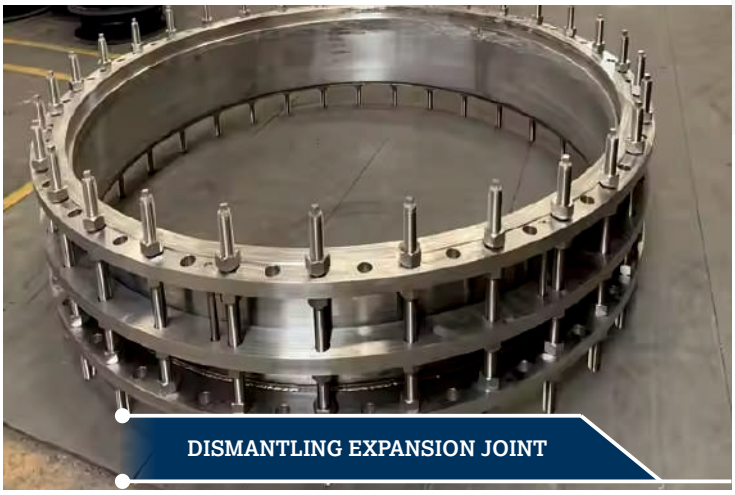
i.e.: Incineration plants



SPECIAL DESIGNS

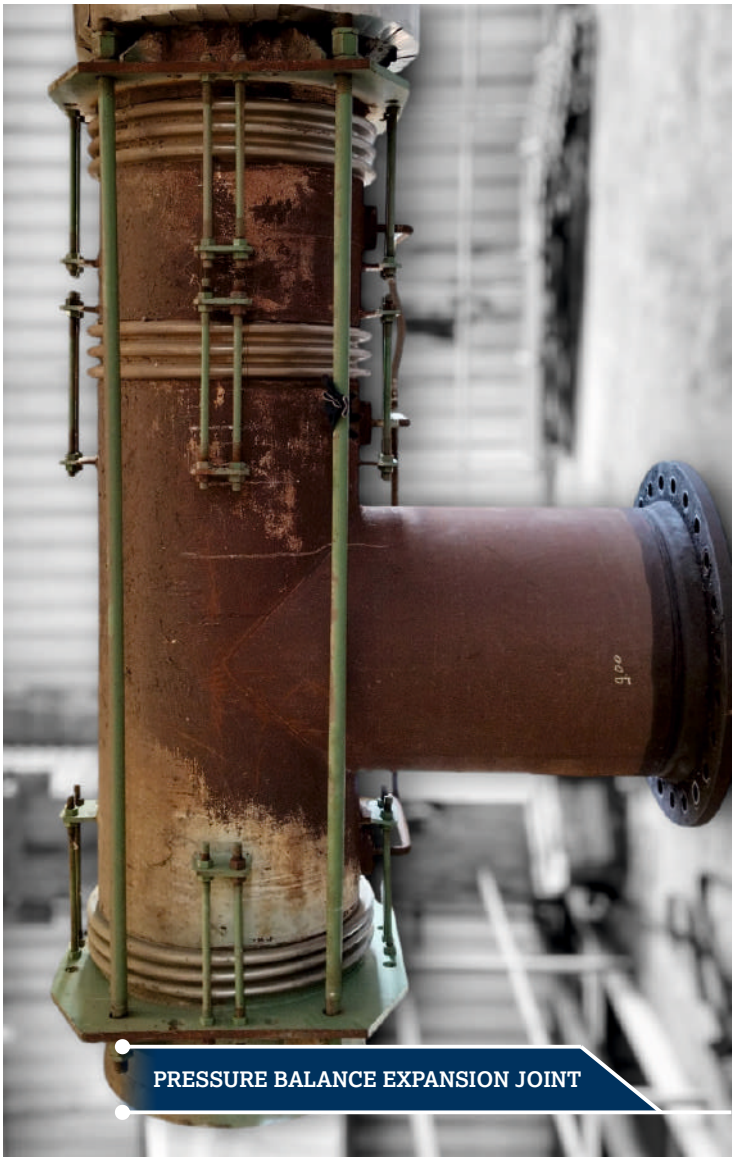
In this brochure we have tried to provide a general idea of our capacity to design and supply fabric expansion joints for commonly-found applications. In addition to the styles shown here we can assist with very special applications such as "picture-frame" units, units with pantographic linkage, pipe penetration seals and other special arrangements including "dog-bone" seals for low-pressure ductwork carrying condensates and fluids. Further details are available on request.

OCTAGONAL EXPANSION JOINT



DISMANTLING EXPANSION JOINT

THICK WALL EXPANSION JOINT



PRESSURE BALANCE EXPANSION JOINT

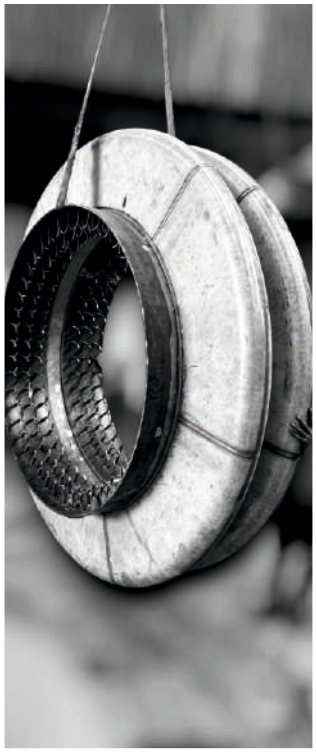
Testing & Manufacturing Facilities

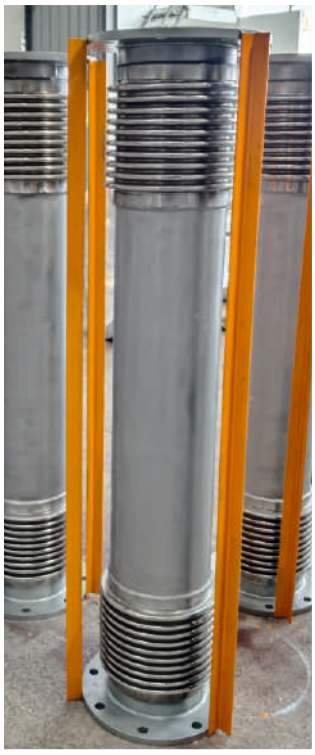
Test on Expansion bellow:

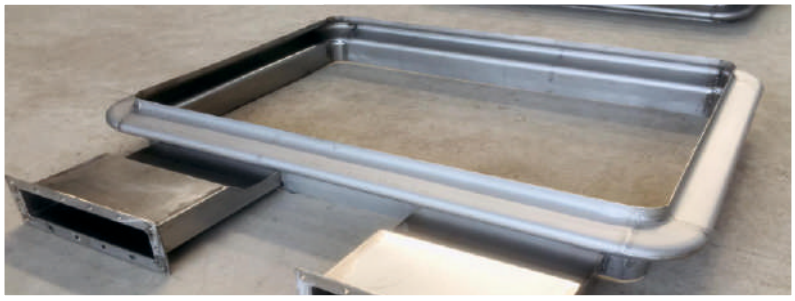
- Movement test (Axial, Lateral, Angular)
- Axial spring rate
- Life cycle test
- Squirm test
- Yield test
- Rupture test

Pressure test:

- Pneumatic test
- Hydro test
- Airjet leak test
- Vacuum test
- Liquid/Dye Penetrant test







Our Valuable Clients

+5000
EXPANSION JOINTS

SHIYA ENGINEERING

WE **ENSURE** YOU

- **Cost efficient** solutions
- **Minimizing** the time of shutdown
- **Smooth** operation
- **Engineered solutions** that suits your pipeline/application
- Advanced calculations which supports **the right choice**
- Comprehensive **Documentation**

Location and contact details

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