



MAXWOR

Focus on Excellence

PUMPS • SEALS • GASKETS • BLOWERS • EXPANSION JOINTS • HEAT EXCHANGERS
COOLING SYSTEMS • WATER HEATER TANKS • ACCUMULATION TANKS
BUFFER TANKS • EXPANSION TANKS • SEPERATORS

PRODUCT CATALOGUE
EXPANSION JOINTS (COMPENSATORS)



- ✓ Reliability
- ✓ Sustainability
- ✓ Productivity
- ✓ High Quality
- ✓ Strong Sales Network
- ✓ Service Networks



MAXWOR

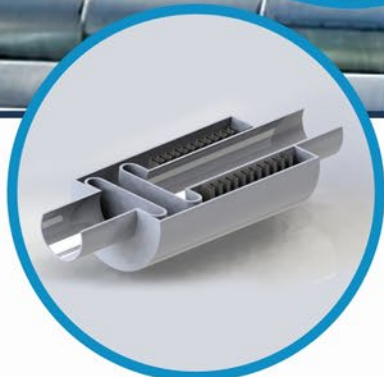
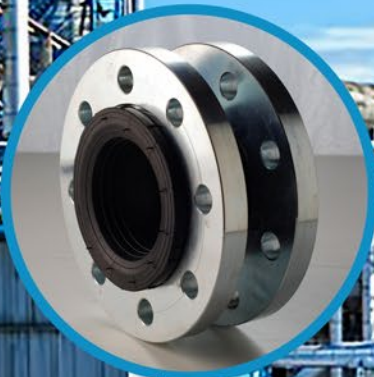
Focus on Excellence

Maxwor Makina is the supplier needed by the leader companies in the sector with its engineering solutions and special products it produces.

Carry out in heating, cooling, transfer and storage of fluids; specializes in technology and process equipment manufacturing and offers sustainable solutions in these areas.

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EXPANSION JOINTS



- ✓ METAL EXPANSION JOINTS
- ✓ RUBBER EXPANSION JOINTS
- ✓ FABRIC EXPANSION JOINTS

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EXPANSION JOINTS FOR EVERY APPLICATION

METAL EXPANSION JOINT

They are flexible connections, installed in piping and ducting systems to accommodate expansion and vibration caused by changes in temperature, pressure and/or media.

Metal bellows are made of one or multiple plies of stainless steel in austenitic steel, Incolloys, Inconels or other formable materials.

Metal expansion joints can be designed with hardware, intended to retain system pressure thrust load, while allowing intended design movement.

Maxwor offers reliable and innovative expansion joints solutions for many applications worldwide.



USAGE AREAS

- ✓ Power Generation
- ✓ Ship power and ship building
- ✓ District Heating
- ✓ Steel Mills
- ✓ Water Treatment
- ✓ Wind Power
- ✓ Pulp and Paper Plants
- ✓ Desulphurization plants
- ✓ Refineries
- ✓ Chemical and Petrochemical Plants

Maxwor offers a full range of metal expansion joints from round and rectangular ducting expansion joints to highly engineered and complex FCCU assemblies with a long history of welding and forming of special materials including a wide range of nickel alloys. Documentation is offered according to the latest industry standards.

Metal expansion joints are installed in flue gas piping systems. Also, metal expansion joints can be designed in many shapes and sizes.

Metal expansion joints are installed in engines and exhaust gas systems.

PRESSURIZED METAL EXPANSION JOINTS

Axial Type - Lateral Type - Angular Type Expansion Joints

Pressure Type Metal Expansion Joints are used in piping systems to allow axial, lateral or angular motion.

Pressurized Metal Expansion Joints are manufactured with a standard 30 mm and 60 mm expansion; There are also special productions for other different expansion values. Liner material is used optionally and is also used to give smoothness to flow and to cut the connection between bellows and fluid. The bellows material, wall thickness and number of layers are designed depending on the fluid temperature and pressure used.

Advantages

- ✓ Easy to absorb the expansion movements
- ✓ No direction changes of the flow
- ✓ Minimum application area
- ✓ Possible lateral and angular expansion absorption by the additional bellows.
- ✓ To provide a non-stressed area where the pressure is not too high such as pump and compressor applications.
- ✓ Low application costs

Application Areas

- ✓ HVAC piping lines
- ✓ Exhaust Systems
- ✓ Vibration absorption
- ✓ Industrial process & applications
- ✓ Power generation & Energy plants

Design Structure

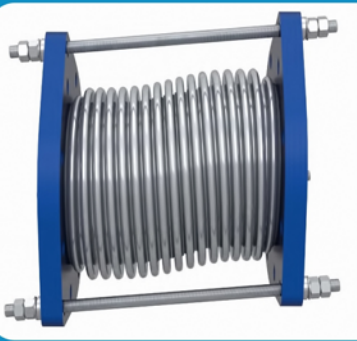
- Bellow Material : Stainless Steel AISI 321 (opt.304, 316L, 316TI, 309)
- Connection Types : Fixed and Floating Flanged and Welded Ended
- Flange Material : Carbon Steel St.37.2 as standard, the material can be customised on request
- Inner Sleeve : Available in stainless steel AISI 321 (opt.304, 316L, 316TI, 309) on request



AX Type Expansion Joints

AX Type Expansion Joints are used to absorb only movements along the longitudinal axis (axial) of the pipeline.

They can be equipped with weld ends, fixed or loose flanges.



LA Type Expansion Joints

LA Type Expansion Joints are intended for lateral movement only. Lateral expansion joints are available in two principal types.

One with tie rods, and one with hinges that controls how the bellows move. Tie rods and hinges retain the load generated by the system pressure (pressure thrust), within the expansion joint.

AN Type Expansion Joints

AN Type Expansion Joints are intended for angular movement only. They are divided into two types. For one plane angular movement a hinged type is appropriate. For two plane angular movement a gimbal type must be used.



EXTERNAL PRESSURIZED EXPANSION JOINTS

Multi-knuckle compensators are used to absorb high expansion amounts in very long pipelines. As the number of knuckles increases, the possibility of twisting of the expansion joint increases. Although this situation can be prevented with a certain amount of liner, the best solution is external pressure expansion joints.. In addition, it is suitable to use in fluids that require high safety values (eg hot oil, etc.).

In these applications; By changing the direction of the fluid, the pressure is applied to the outside of the bellows, creating a expansion joint(compensator) that can withstand high pressure and expansion amounts without torsion.

Although externally pressurized expansion joints are manufactured with 30, 60, 90 and 120 mm expansion as standard, special production is possible for other desired expansion values.



Design Structure: Design and production are made according to EJMA standards. Pressure and temperature values comply with DIN2401 values

Materials:

It is produced in stainless steel in accordance with the DIN 17440 standard, and the fittings are produced as stainless steel or carbon steel. Other materials can be produced on demand.

Bellow Material: Stainless Steel AISI 321 (opt.304,316L,316TI,309)

Pipe Material: Carbon Steel St.37.2 as standard, the material can be customised on request



Connection Types:

Fixed and Floating Flanged and Welded End

Nominal Diameters:

DN 25 (1")- DN 1500 (60")

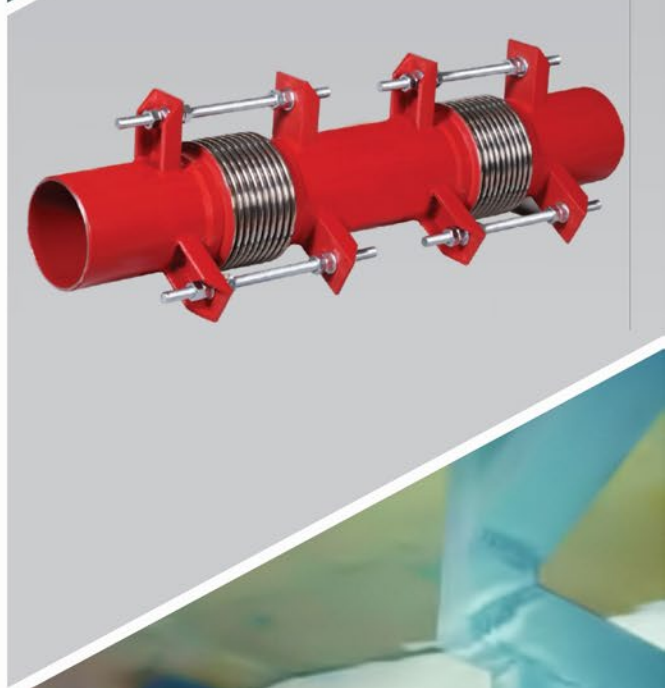
Operating Pressure:

As standard PN 16. Available in for high pressure classes we can design and produce special external pressurized expansion joints.

Operating Temperature: -196 C°/+600 C°

Applications :

Thermal equilibrium and mechanical expansion in all types of pipelines. The widest application area is underground pipelines. It is frequently used especially in geothermal lines.



PIPE EXPANSION JOINT

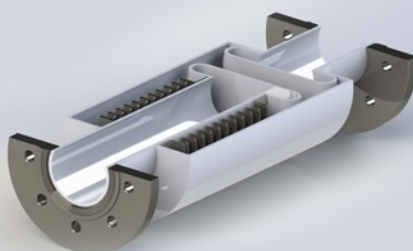
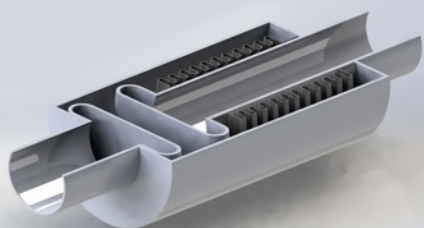
Pipe expansion joints are expansion parts that absorb vibration and noise. The piping system is divided into various expansion sections and isolated by means of fixed points. Thus, the movement in a vibration zone is absorbed by the pipe compensator used in this zone.



Nowadays widespread heating of multi-storey buildings and hot water supply temperature change resulting from contraction and expansion on the column line, for bending the pipe, the noise, the breakage of the joints and cause the stripping teeth.

Advantages of Pipe Expansion Joints

- ✓ They prevent damage to pipelines result of the line movements
- ✓ They absorb the possible noises and provide convenience for the users
- ✓ They are installed easily and provide time and money saving
- ✓ They have a compact and decorative design that reduces the waste of space
- ✓ They help to protect equipment from stress due to misalignment



A heating pipeline system at 90/70°C causes approximately 3 mm of movement for each floor of the buildings. The expansion in the column line of a 7-storey(21 meters) building can be taken with the elbows in the vent and main line collection. The pipe expansion joint, which must be used in the column lines of buildings higher than 7 floors, should be used at most every 30 meters(every 10-storey).

- ✓ The maximum distance between two fixed points is 30 meters. The pipe compensator is mounted on the floor between two fixed points, close to the ceiling.

Materials Structure:

In accordance with the DIN17440 standard stainless steel exterior part, decorative appearance of aluminum, fittings manufactured in carbon steel.

Connection Types: Threaded and Welded End
Operation Conditions

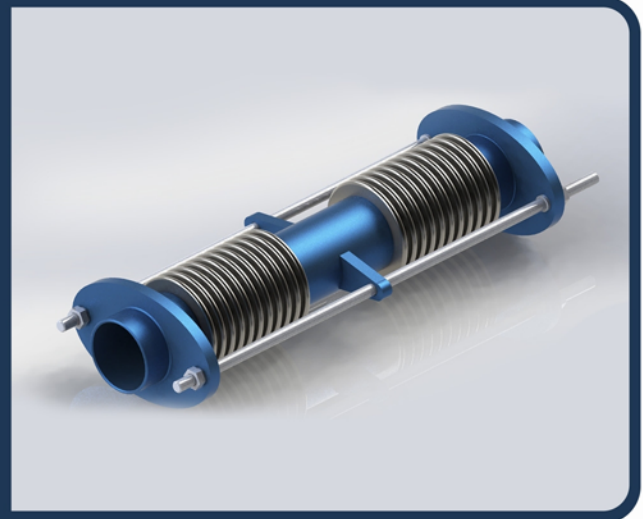
Operating Temperature: 20°C - 100°C

Operating Pressure: PN 16

Nominal Diameters: DN15 (1/2") - DN100 (4")

UNIVERSAL TYPE JOINT WITH TIE ROD

Universal tied expansion joints (limit rod type) are placed in the determined places in the pipe systems and in building collapses and movements; Despite its rigid pipe structure, thanks to its flexible structure, it prevents stress, rupture, etc. in pipelines. They are the elements that protect the system by removing the problems.



Universal tied expansion joints are made up of two bellows connected each other by an intermediate pipe and a system of tie rods able to withstand the thrust resulted of the internal pressure. Universal tied expansion joints are absorbed 50, 100, 150 and 200 mm lateral movements as standard, also special productions are possible for other desired expansion values. In this type of compensators, the part is stabilized by using control rods.

Materials Structure: Accordance in DIN17440 for stainless steel, the fittings can be produced stainless steel or carbon steel. Design and production are made according to EJMA standards. Pressure and temperature values comply with DIN2401 standards. They have the ability to absorb collapsing movements thanks to their bellows and limit rod on their double side.

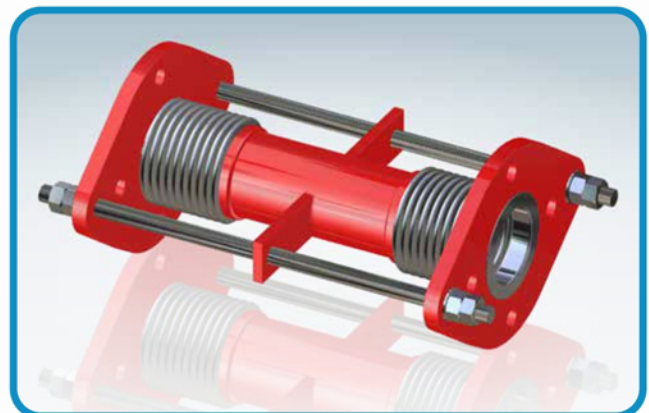
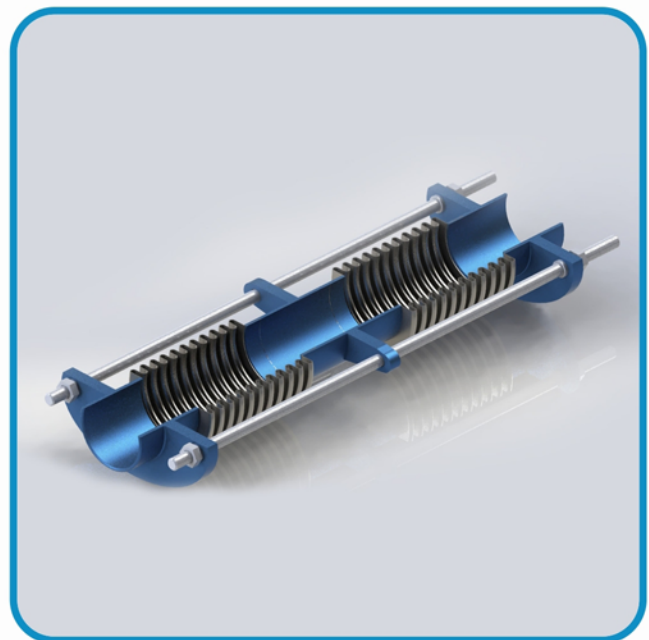
Connection Types: Fixed Flanged, Rotary Flanged, and Welded End

Nominal Diameters: DN25 (1") - DN1000 (40")

Operating Pressure: As standard PN16. Also we can produce different pressure class for special design. Operating pressure depends on nominal diameter and operating temperature.

Operating Temperature: For materials structure -196°C - 600°C

Application: At all dilatation points in the building history, underground, above ground, overhead, etc. It is used in all lines and all systems with fluid.



GIMBAL TYPE EXPANSION JOINTS

Gimbal type Expansion Joints protect the system by absorbing the movements (circular movements in X, Y, Z directions) in all directions such as earthquakes and collapses, absorbing any movement in the pipelines. It protects rigid pipe systems from stress thanks to their flexible and mobile structure.



Gimbal type Expansion Joints absorb axial movements, lateral deviations and angular rotation with containing two bellows. Since it is an FM approved product in fire circuits, it has an absolute use in dilatation passages. Design and production are made according to "EJMA" standards. Pressure and temperature values comply with DIN2401 standards. It has the capability of damping or absorbing all kinds of movements thanks to its bellows and universal joints on its double side.

Gimbal type Expansion Joints can absorb standard 100, 200, 300 and 400mm lateral movements, and special production is possible for other desired expansion values.

Material Structure: Stainless steel in accordance with DIN17440; fittings can be produced in stainless steel or carbon steel.

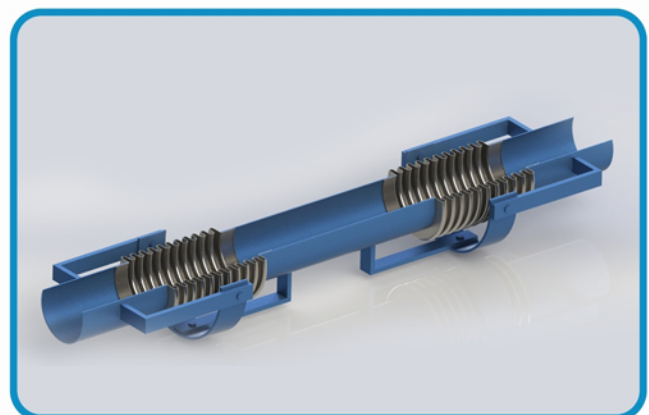
Connections: Rotating Flanged, Fixed Flanged, Welding Neck, Grooved, Threaded

Nominal Diameter: DN25 (1") - DN1000 (40")

Pressure Values: Gimbal type Expansion Joints are produced in the standard PN16 pressure class and are manufactured as a result of special designs for higher pressure classes. The operating pressure depends on the nominal diameter and operating temperature.

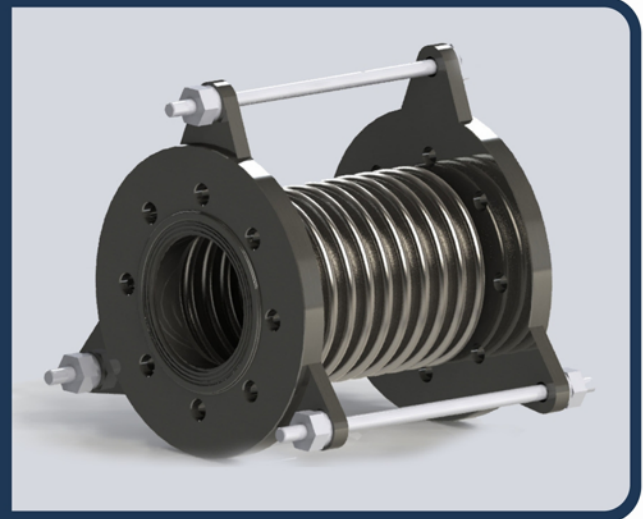
Operating Temperature: From -196 °C to 600 °C depending on the material structure.

Application: Dilatation - Earthquake Compensator is used in dilatation passages in fire circuit lines, all fuel tanks, tanks, all kinds of machine-device outlets, and all pipelines.



VIBRATION ABSORBER EXPANSION JOINTS

Metal bellows Vibration Absorber Expansion Joints reduce the stress and axial imbalance in the system. Thanks to their special designs, they can absorb vibration, absorb noise and sounds.



Structure

Design and production: Made according to EJMA standards. Pressure and temperature values are in accordance with DIN 2401 standards.

Material Structure: Bellows and liners are produced in stainless steel in accordance with DIN 17440, fittings are made of stainless steel or carbon steel. Other materials can be produced on request.

Connections: Rotating flange Welding neck

Nominal Diameter: DN 25 (1") - DN 2600 (104")

Pressure Values: Vibration absorber expansion joints are produced in standard PN16 pressure class, and they are manufactured as a result of special designs for higher pressure classes. The operating pressure depends on the nominal diameter and operating temperature.

Operating Temperature: Depending on the material structure - 196 °C to + 600 °C

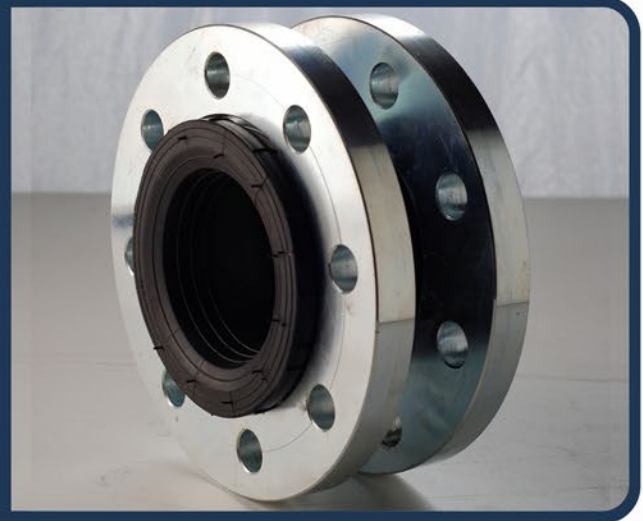
Applications:

- ✓ Air conditioning, ventilation systems, sanitary installations
- ✓ Air compressors
- ✓ Pipe lines
- ✓ Canalization and drainage lines
- ✓ Suction and discharge nozzles in pumps
- ✓ Hot air lines
- ✓ Chemical facilities
- ✓ Industrial facilities
- ✓ Power machines
- ✓ Marine systems



RUBBER EXPANSION JOINTS

Rubber Expansion Joints are expansion parts that absorb vibration and noise. Due to their chemical composition and excellent forming technique, they can be used at burst pressures above 40 kg / cm² or at normal internal pressures of 10 kg / cm². In addition, it can withstand 700 mm Hg vacuum and is an indispensable element of pump systems in suction and discharge.



Structure:

Rubber Expansion Joints have a heat resistant structure. Due to these features, they can also be used in hot water systems. Rubber Expansion Joints, due to its very soft skeleton structure, isolate vibration and intense sounds in all directions and prevent noise generation.

Other Advantages:

- ✓ They absorb elongation and shortening caused by temperature changes, and balance lateral and angular movements.
- ✓ They absorb water hammer and prevent water hammer.
- ✓ Since the flanges are rotary type, they can be easily mounted on pipelines. In addition, they can be equipped with flanges suitable for all pressure levels.
- ✓ They do not require gasket and packing.

Material Structure: Special synthetic rubber

Connection: Rotating Flange

Nominal Diameter : DN32 (3/4") - DN5000 (200")

Pressure Values: Max. Up to 10 bar. The operating pressure depends on the nominal diameter and operating temperature.

Operating Temperature: Depending on the material structure, from - 10 °C to + 160 °C



Elastomer expansion joints are characterized by gas tightness and drip tightness even if there is condensation.

Maximum propagation temperature is 200 ° C. The choice of rubber grade depends on the operating temperature and environment.

This decision is made based on our extensive experience and relevant durability tables.

For the most corrosive environments, we can equip the compensator with an additional PTFE liner that bonds tightly to the rubber bellows.

PTFE is resistant to a range of chemicals and many different mixtures and can therefore be used in case of corrosive chemical attack.

The table below provides an overview of the elastomers we use.

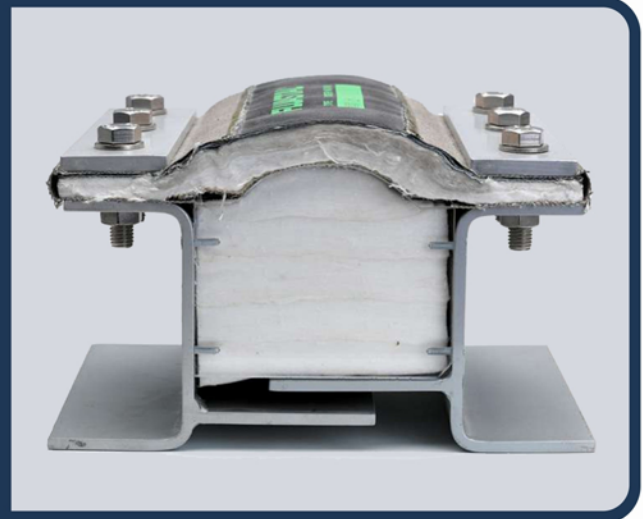
RUBBER GRADES		
Up to 100°C	EPDM	Flue gases, acids, bases, rinsing acids, dilute chlorine compounds, cooling water, hot water
	EPDM, drinking water approved	Drinking water
	EPDM, white, food grade	Foodstuffs
	EPDM, abrasion-resistant	Abrasive media, Water-sand conveyance
	EPDM, insulating	Electrical systems construction
	IIR	Acids, bases, gases
	CSM	Strong acids, bases, chemicals
	NBR	Petrol, solvents, compressed air
	NBR, bright, food grade	Oil, fatty foods
Up to 80°C	CR	Cooling water, slightly oily water, seawater
Up to 70°C	NR	Abrasive media
Up to 150°C	HNBR	Oils, petrol, solvents, compressed air
Up to 180°C	FPM	Corrosive chemicals, petroleum distillates
Up to 200°C	Silicon (Q)	Air, saltwater atmosphere
	Silicon (Q), white, food grade	Foodstuffs, medical technology
PTFE lining	Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300.	

USAGE AREAS

- ✓ Plumbing systems
- ✓ Pumps
- ✓ Bellows
- ✓ Ventilators
- ✓ Vibration absorbers
- ✓ Coolers
- ✓ Ship Building
- ✓ AC systems
- ✓ Chemical, Petro-chemical and industrial systems
- ✓ Power supplies
- ✓ Iron and steel industries
- ✓ Nautical industries
- ✓ Paper industries

FABRIC EXPANSION JOINTS

Maxwor fabric expansion joints, are vital components in most industrial plants. They are installed as flexible connections in duct and piping systems to take up or compensate for thermal expansion, vibration and/or misalignment. Selecting the right expansion joint for your system is important toward ensuring reliable operation.



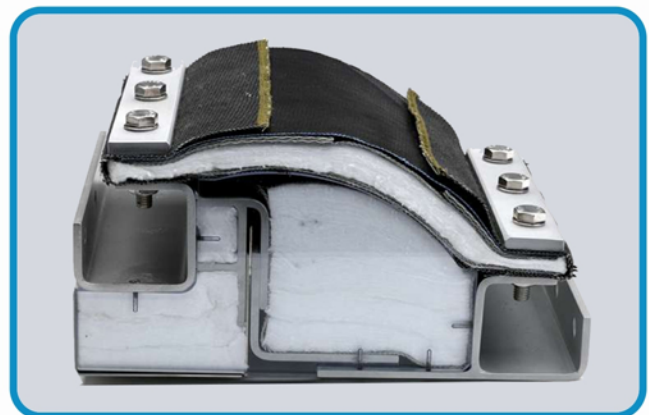
A properly designed and installed expansion joint can ensure uninterrupted plant performance between scheduled maintenance shutdowns. Selecting the right expansion joint for your system is important to ensure reliable operation. A properly designed and installed expansion joints can provide uninterrupted plant performance between scheduled maintenance stops. Our design engineers provide optimum solutions both technically and economically, combining different materials and taking into account the thermal, chemical and mechanical strength and fatigue properties of the material.

Fabric Expansion Joint Advantages:

- ✓ Compensates for movements in several directions simultaneously
- ✓ Minimal reactive forces
- ✓ Advanced insulation design ensures minimal heat loss
- ✓ Reduced surface temperature on the outer layer during operation to protect site personnel
- ✓ Working pressure up to 850 °C
- ✓ High flexibility
- ✓ Requires little space for installation
- ✓ Easily adapts to existing physical conditions
- ✓ Easy to transport

Criteria for Applications & Design

- ✓ Which type of Expansion Joint
- Place and Conditions of installation
- ✓ Movements
- ✓ Mechanical Loads (Vibrations and Structural Pressure)
- ✓ Flow Rates
- ✓ Product (Air, Flue Gases, etc.)
- ✓ Leakage Requirements
- ✓ Solid Matter
- ✓ Temperatures Below the Dew Point



The background of the entire page is a photograph of an industrial facility, likely a refinery or chemical plant. It features several tall, vertical distillation columns or towers, each equipped with multiple levels of red metal ladders and platforms. The columns are interconnected by a complex network of yellow and blue pipes. The sky is overcast with grey clouds. In the foreground, a large, horizontal, silver-colored metal pipe is visible, curving slightly to the right.

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