Bikar
Manufacturers of Expansion Joints

Guaranteeing customer loyalty through the design and manufacture of expansion joints for the world market, applying experience and innovation through specialisation.

Prestige
Specialisation
Flexibility
Internationalization
With experience spanning over 30 years, Bikar is a company that manufactures Expansion Joints geared mainly towards the fluid handling and sealing industry. Bikar’s human team has broad experience and is specialised in collaborating technically with engineering companies and end users in order to provide solutions for the various problems that may arise in the execution of their projects.

1/ Project engineering and technical development
2/ Moulded and custom made manufacturing
3/ Our products
4/ Broad range
2.1 Project engineering and technical development

WE DESIGN AND WE PROVIDE TECHNICAL ADVICE

Each project requires a customized solution. Our capacity for design and manufacture is the result of our experience and specialization in many different sectors. Ensuring customer loyalty in our market requires a team of persons who are able to adapt their knowledge towards finding the best technical solution. BIKAR offers experience, commitment and quality in a sector that demands trust. Our aim is to guarantee the best result by developing all our production processes as expert manufacturers of reliability and prestige.
2.2 Moulded and custom made fabrication

PROFESSIONAL EXPERTS

Our technical and production team develops each specific part, applying their experience and know-how in a moulded and custom made manufacturing process, with the aim of ensuring maximum precision and quality in each project. One of the aspects most appreciated by our clients is our capacity to deal successfully with situations that are difficult to solve.
2.3 Our products

TYPES OF EXPANSION JOINTS

We manufacture and develop our own products to meet specific needs, taking into consideration critical situations related to temperature, pressure or movement. In addition to offering advice and participating in the study of each project, we offer diverse solutions, always underscoring quality as our most consistent hallmark.

RUBBER EXPANSION JOINTS
METAL EXPANSION JOINTS
FABRIC EXPANSION JOINTS
2.4 Broad range

Rubber Expansion Joints

Single wave, double and triple wave, hinged, gimbal, self-compensated compensators from DN 32 (1 1/4") up to DN 4,000 (160"). Body materials: E.P.D.M., Neoprene, Nitrile, Viton®, Hypalon®, Butyl, etc. Flange Materials: Carbon steel, High yield stress steels, Polypropylene, Aluminium, Stainless Steel, Aluminium Bronze, Duplex, Super Duplex, Hastelloy, etc. Flange Standards: DIN, ANSI, AWWA, BS, GIS.

Metal Expansion Joints


Fabric Expansion Joints


All types of compensators, from economic products with a high rotation to added-value components that are custom designed to meet our clients’ needs.

® Registered trademarks by DuPont
Rubber Expansion Joints
Handling of fluids

Nuclear Energy
Water Transfer Systems
Desalination Plants
Rubber Expansion Joints

High resistance to corrosion, absorption of movements, vibrations and tensions

Mainly used in Desalination, Petrochemical, Combined Cycle, Water Pumping, Phosphate Plants, etc., to absorb movements, vibrations, and tensions in the pipe systems with fluids at temperatures under 200 °C (390 °F) and standard pressures under 25 bar (362 psi). They provide protection against thermal movements and mechanical forces for high value equipment (pumps, valves, condensers, etc.). We design and produce to measure for highly special working conditions (high pressures, high temperatures, large movements, etc.).

All our joints are designed pursuant to FSA regulations, selecting the most appropriate elastomers per service (Neoprene, E.P.D.M., nitryl, Hypalon®, Viton®, food grade E.P.D.M.) and all kinds of reinforcements (Nylon Polyamide® and Kevlar Polyaramide®) and for all kinds of dimensions.

© Registered trademarks by Dupont

We design and advise technically

Each project requires a customised solution. Our capacity to design and manufacture come from experience and specialization in different sectors. Developing market loyalty requires a team of people with the capacity to adapt their knowledge in favour of the best technical solution.

Construction types

Moulded:

B-flex

BL-flex

Manual:

BF-pps

Other special applications

Manufacturers of Expansion Joints
B-flex

This type of expansion joint was initially designed for air conditioning installations; however, today it is used industrially for light duty services, mainly to absorb vibrations and compensate small movements.

Characteristics and properties

- Moulded type
- Dimensions up to DN300 (12”)
- Pressures up to 16 bar (250 psi)
- Floating flanges
- Standard lengths (as per mould)
- Recommended working temperature up to 80 ºC (180 ºF)
- Economic
- Limited movements
- Limited useful life

B-flex

Life expectancy
Movement absorption
Flexibility
Sealing
Response in unexpected circums.
Price ratio
Special designs

Usually installed in:
- Light duty industrial services
- HVAC
- Low pressure pumping

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Manufacturers of Expansion Joints
In relation to the B-FLEX, the BL-FLEX design has improved in its joint sealing area and arch profile to increase the working areas in terms of dimensions and movement absorption.

Characteristics and properties

- Moulded type
- Dimensions up to DN1000 (40”)
- Working pressures up to 10 bar (150 psi)
- Single length
- Recommended working temperature up to 80 ºC (180 ºF)
- Economic

BL-flex Technical Analysis

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Scale</th>
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<tbody>
<tr>
<td>Life expectancy</td>
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<td>Movement absorption</td>
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<td>Flexibility</td>
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<td>Sealing</td>
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<td>Response in unexpected circums.</td>
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<tr>
<td>Price ratio</td>
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<tr>
<td>Special designs</td>
<td></td>
</tr>
</tbody>
</table>

Usually installed in:

Collectors
Cooling towers
Light duty pumping
Thermosolar plants
Usually installed in:
- Desalination plants
- Nuclear power plants
- Combined cycles
- Refineries
- Heavy duty pumping

Initially used in FRP (fibreglass reinforced plastic) pipe systems. Thanks to its great elasticity and movement absorption, it offers minimum activation forces. It can solve any problem of other rubber expansion joint types due to its characteristics.

**Characteristics and properties**

- Custom made manufacture
- Dimensions up to DN4000 (160”)
- Pressures up to 90 bar (1300 psi)
- Integrated vulcanized one-piece flanges
- Specific design as per need
- Recommended working temperature up to 200 °C (390 °F)
- Can be used as a dismantling joint
- Unlimited movements
- Interior PTFE lining available.
- Low tightness torque

**Technical Analysis**

- Life expectancy
- Movement absorption
- Flexibility
- Sealing
- Response in unexpected circums.
- Price ratio
- Special designs

**Maximum performances**
Metal Expansion Joints

High pressure fluids

Oil & Gas
Petrochemical
Energy
Shipyards
High performance in pipe systems with high temperatures and pressures

Metal Expansion Joints

We provide technical advice. Each project requires a custom made solution. Our capacity to design and manufacture come from experience and specialization in different sectors. Developing market loyalty requires a team of people with the capacity to adapt their knowledge in favour of the best technical solution based on standard or special references.

Mainly used in refineries, petrochemical plants, shipyards, etc., to absorb movements, vibrations, and tensions in the pipe systems with fluids at temperatures up to 1200°C (2200°F) and standard pressures up to 100 bar (1500 psi).

Design and calculation

COMPLIANCE WITH STANDARDS

Pursuant to requirements established under EJMA standards, ANSI codes applicable to piping, ASME Boiler and Pressure Vessel (Section VIII, Appendix 26), ASME B31.1 (Appendix X) and pursuant to the European Directive for pressure equipment PED 97/23/EC and standards EN13445, EN13480, and EN14917.

CALCULATIONS:

Calculations are made using special software packages, based on the foregoing standards mentioned.

QUALITY AND DOCUMENTATION CONTROLS


OUR HOMOLOGATIONS AND CERTIFICATIONS

Cert.: 0.04.08191 / 3.00.09008

Special designs

Our capacity to design and manufacture comes from experience and specialization in different sectors. Knowledge of these allows us to develop special designs as per the needs and requirements of each project.

MATERIALS

304 S/S Inconel 600
304L S/S** Inconel 625
316 S/S Inconel 800/800H**
316L S/S
321 S/S Incoloy 825**
Monel 400**
Inconel 625
Inconel 800/800H**
Incoloy 825**
Hastelloy C-275**

PRESSURES
up to and beyond 100 bar (1450 psi)

TEMPERATURES
from -196 °C (-320 °F) to 1200 °C (2200 °F)

DIAMETERS
from 50 mm (2”) to 3000 mm (120”)
Simple

BM-SI

Description

This expansion joint is made up of a single bellows with its connections. It can absorb movements in any direction, axial, angular and lateral. It is mainly used to absorb axial dilations in longitudinal direction of straight piping systems, although depending on their design it can absorb small quantities of angular and lateral movements. It is the most straightforward type, although the piping must be controlled (anchored and guided) so the movements foreseen are conveniently directed to the right direction for correct operation.

It cannot resist the pressure force so it must be supported by duly designed fixed anchorages, or the joint will expand with awful results.

Characteristics and Properties:

BM-SI

WITHOUT TIE-RODS

- The most economic expansion joint
- Does not retain pressure forces.
- Absorbs angular, axial and lateral movements.
- Must be conveniently anchored and guided

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Manufacturers of Expansion Joints
Simple BM-SI-TI

Description

This metal expansion joint is made up of a single bellow with its connections to which tie-rods are connected. Installation of the tie-rods supported by retainers on the pipe or flanges, and designed to support the pressure force, thus eliminating the need for fixed anchorage.

The capacity to absorb axial movements is lost on installation of the tie-rods.

Characteristics and Properties:

BM-SI-TI WITH TIE-RODS

- Eliminates the need for fixed anchorage.
- Piping system must be anchored and guided.
- Absorbs small lateral movements on any plane.
- Absorbs angular movements on a plane when designed with two tie-rods.

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<thead>
<tr>
<th>MOVEMENTS</th>
<th>AXIAL</th>
<th>LATERAL</th>
<th>ANGULAR</th>
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<td>LATERAL</td>
<td>ANGULAR</td>
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<td>PRESSURE FORCE</td>
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<tr>
<td>CONSTRUCTION</td>
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<td>MULTIPLY</td>
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<tr>
<td></td>
<td>REINFORCED</td>
<td>YES</td>
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</tbody>
</table>

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Manufacturers of Expansion Joints
Universal

BM-UN

Description

A universal expansion joint is made up of two single bellows separated by a central pipe spool. The main aim of this construction is to achieve great absorption capacity of axial and lateral movements. This capacity depends on the bellows design and the intermediate spool length, the greater the length the greater the absorption capacity. Possible dilations on the intermediate spool are likewise absorbed by the two bellows.

This design cannot withstand pressure forces and must be supported by duly designed fixed anchorages.

Characteristics and Properties:

BM-UN

Absorbs large axial and lateral movements.
Allows angular movements.
Does not retain pressure forces.
Must be conveniently anchored and guided.

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Manufacturers of Expansion Joints
Universal

BM-UN-TI

Description

A universal expansion joint is made up of two single bellows separated by a central piping spool. The main aim of this construction is to achieve great absorption capacity of axial and lateral movements. This capacity depends on the bellows design and the intermediate spool length, the greater the length the greater the absorption capacity. Possible dilations on the intermediate spool are likewise absorbed by the two bellows. Installation of the tie-rods supported by retainers on the pipe or flanges, and designed to support the pressure forces, eliminates the need for fixed anchorage.

The capacity to absorb axial movements is lost on installation of the tie-rods.

Characteristics and Properties:

BM-UN-TI

WITH TIE-RODS

- Absorbs large lateral movements.
- Eliminates the need for fixed anchorage.
- The piping system must be guided.
Cardan

BM-GI

Description

It is designed to enable angular rotation on any plane with the use of two articulations linked to a common cardan pivot. This support ring can be round or square. The set of articulations and bolt pin must be designed to support the pressure force.

To absorb large lateral movements on several planes, they are used in double bellow design.

Characteristics and Properties:

BM-GI

- Angular movements on all planes.
- High lateral movements
- Retains the pressure forces
- Fixed anchorage not required in the system.
- Bellows protected from torsional movements
- Reduced forces in the piping system
- Minimum guides required.
- They can be designed to support the piping weight
- Excellent bellows movement control

Table:

<table>
<thead>
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<tr>
<td>CONSTRUCTION</td>
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</tbody>
</table>

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Manufacturers of Expansion Joints
BM-GI-DO

Description

This expansion joint is made up of two articulated Cardan bellows joined with an intermediate sleeve. These expansion joints not only allow angular rotation on any plane but can also absorb large lateral movements which will depend on the length of the central sleeve.

The set of articulated joints and pivots of the two bellows must be designed to support the pressure force.

Characteristics and Properties:

BM-GI-DO

DOUBLE BELLOW

- Angular movements on all planes.
- High lateral movements
- Retains the pressure forces
- Fixed anchorage not required in the system.
- Bellows protected from torsional movements
- Reduced forces in the piping system
- Minimum guides required.
- They can be designed to support the piping weight.

**Properties**

<table>
<thead>
<tr>
<th>Movements</th>
<th>Axial</th>
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<td>Lateral</td>
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<td>Reinforced</td>
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</tbody>
</table>

* HIGH ▲ | MEDIUM ▼ | LOW ▼ | NOT APPLICABLE ▲▼▼
**BM-HI**

**Description**

This expansion joint is made up of a simple bellows and metal articulations with their corresponding pivot, enabling angular rotation on a single plane. The articulation and pivot plates should be designed to support the pressure force and any other specified load. Should axial movements require absorption the bolt holes can be channelled, although the resulting design will not withstand the pressure forces.

To absorb large lateral movements on a plane, double bellow design are used.

**Characteristics and Properties:**

**BM-HI SIMPLE BELLOW**

- Angular movements on all planes.
- High lateral movements.
- Retains the pressure forces.
- Fixed anchorage not required in the system.
- Bellows protected from torsional movements.
- Reduced forces in the piping system.
- Minimum guides required.
- They can be designed to support the piping weight.

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**PROPERTIES**

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Manufacturers of Expansion Joints
Hinged

BM-HI-DO

Description

This expansion joint is made up of two articulated bellows joined by an intermediate sleeve. These expansion joints enable angular rotation on any plane and can also absorb large lateral movements, which will depend on the central sleeve length.

The set of articulations of the two bellows must be designed to support the pressure force.

Characteristics and Properties:

BM-HI-DO

**DOUBLE BELLOW**

- Angular movements on all planes.
- High lateral movements
- Retains the pressure forces
- Fixed anchorage not required in the system.
- Bellows protected from torsional movements
- Reduced forces in the piping system
- Minimum guides required.
- They can be designed to support the piping weight.

PROPERTIES

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</table>
Pressure balanced BM-PB-ELBOW

Description

This Pressure balanced expansion joint is used for direction change cases where the expansion joint with tie-rods should absorb axial movements while retaining the pressure force. The elbow for direction change is assembled between the line bellows and the compensation one which has the same area, and all are connected to tie-rods designed to support the pressure forces, and depending on the lateral movement they will be used as a simple line bellows or universal.

The aim of this expansion joint style is to support and compensate the pressure forces, so fixed anchorage is not required in the piping system, and to reduce the forces and moments to a minimum on the flanges of the delicate equipment joined to it, while absorbing axial and lateral movements.

Characteristics and Properties:

BM-PB-ELBOW PRESSURE BALANCED

- Depending on the design, they absorb axial, lateral and a combination of both movements.
- Pressure forces are retained in both directions.
- Fixed anchorage is not required since the pressure forces are compensated.
- Minimum guides required.
- Minimum loads are transferred to equipment next to it.
Pressure balanced

BM-PB-IN LINE

Description

This expansion joint is designed to absorb axial and lateral movements while retaining the pressure force. The basic principle of this expansion joint is that the pressure force is maintained using a compensation bellows and two line bellows connected by tie rods. The pressure force acting on the line bellows is balanced by the compensation bellows via the tie rods. The aim of this expansion joint type is to support and compensate the pressure force, so there is fixed anchorage required in the piping system and reduce to tolerable levels the forces and moments on the flanges of delicate equipment next to it.

They are used when axial and lateral movements need to be absorbed and there is no space for anchorage installation or it is very expensive.

Characteristics and Properties:

BM-PB-IN LINE

PRESSURE BALANCED

- Depending on the design, they absorb axial, lateral and a combination of both movements.
- Pressure forces are retained in both directions.
- Fixed anchorage is not required since the pressure forces are compensated.
- Minimum guides required.
- Minimum loads are transferred to equipment next to it.
Fabric Expansion Joints

Gas conduits

Cement plants
Thermal power stations
Industry in general
Mainly used in boilers, ventilation circuits, industrial furnaces, cement production plants and paper mills to absorb movements, vibrations, and prevent tensions in the pipe systems with gases, air vapours at temperatures of up to 1200 °C (2200 °F) and standard pressures under 0.35 Kg/cm² (5 psi). We use latest generation materials of the highest technology applying tools of great use like Solid Works and finite elements.

**Design and calculation of the part**

All our joints are designed pursuant to FSA (Fluid Sealing Association) regulations, using the most advanced materials for their manufacture (fluoroplastic laminates and latest generation heat insulation) for all dimensions.

**Construction types**

Bikar uses PTFE laminated fabrics and best existing materials on the market, to provide an optimum solution for the mechanical, chemical and thermal demands of the service:

- BF-tu
- BF-tb
- BF-ts
BF-tu

This is a fabric expansion joint characterized by its **economic installation**, used in small spaces to absorb vibrations and compensate limited movements in conduits. Manufactured in all kinds of fabrics and PTFE laminates according to temperature resistance, pressure and gases.

**Characteristics and properties**

- Circular and rectangular manufacture
- Dimensions without limit
- Pressures up to 0.35 bar (5 psi)
- Length recommended up to 300 mm (12”)
- Recommended working temperature 540 ºC (1000 ºF)
- Limited movements
- Possibility of special designs
- Manufactured in all kinds of fabrics and PTFE laminates
- Possibility of moulded corners
- Possibility of using Bolster and deflectors

**Technical Analysis**

<table>
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<tr>
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<th>U Type (diagram)</th>
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<tbody>
<tr>
<td>Life expectancy</td>
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<tr>
<td>Movement absorption</td>
<td><img src="image" alt="Movement absorption" /></td>
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<tr>
<td>Flexibility</td>
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<tr>
<td>Price ratio</td>
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<tr>
<td>Response in unexpected circums.</td>
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</tr>
<tr>
<td>Repair and maintenance</td>
<td><img src="image" alt="Repair and maintenance" /></td>
</tr>
</tbody>
</table>

**BF-tu**

**Usually installed in:**

- Inlets & outlets of blowers
- Piping systems with vibrations
- Piping systems with highly corrosive fluids

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This is a fabric expansion joint characterized by its easy installation, great capacity for absorbing heavy duty movements in conduits, and handling gases at very high temperatures. Manufactured in all kinds of fabrics and PTFE laminates according to temperature resistance, pressure and gases.

Characteristics and properties

- Circular and rectangular manufacture
- Dimensions without limit
- Pressures up to 0.35 bar (5 psi)
- Length without limit on faces
- Recommended working temperature up to 1200 ºC (2200 ºF)
- Large movements
- Possibility of special designs
- Manufactured in all kinds of fabrics and laminates
- Possibility of manufacturing with/without metal structure
- Possibility of using Bolster and deflectors

Usually installed in:
- Inlets & outlets of boilers
- Electrostatic precipitators
- Gases at high temperatures

BF-tb

Technical Analysis

<table>
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<th></th>
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</table>

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BF-ts

These fabric expansion joints are designed for very special services or high movements where other types lack of sufficient durability such as in the cases presented in conduit systems with high vibrations, fluttering and high movements. They are also for applications requiring total tightness.

**Characteristics and properties**

- Circular and rectangular manufacture
- Dimensions without limit
- Pressures up to 1 bar (15 psi)
- Without maximum length on faces
- Unlimited movements
- Manufactured in all kinds of fabrics and laminates
- Possibility of manufacture with/without metal structure
- Possibility of using Bolster and deflectors
- 100% sealing designs
- Fluttering solution

**Technical Analysis**

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<th>Life expectancy</th>
<th>Movement absorption</th>
<th>Flexibility</th>
<th>Price ratio</th>
<th>Response in unexpected circums.</th>
<th>Repair and maintenance</th>
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Usually installed in:

- Galvanized furnace
- FGD plants
- Chimneys
- Thermosolar plant

www.bikarexansionjoints.com

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Tel.: +34 944 275 180  Fax: +34 944 419 471
info@bikarexansionjoints.com

Manufacturers of Expansion Joints
6. AFTER-SALES SERVICE

OUR TECHNICAL AFTER-SALE SERVICES SET US APART

Infrastructure supervision guarantees results with respect to safety, optimises performance and reduces costs. Know-how is the reserve of truly specialised companies such as Bikar. We offer an integrated process that includes design / calculation / manufacture / installation / supervision and inspection.
7. MAJOR LINES OF BUSINESS

More than 5 million m³ of water a day desalinated, more than 45,000 MW installed in combined cycle plants and more than 500 MW in nuclear and solar thermal power stations using our expansion joints. LNG vessels, offshore plants, paper mills, cement plants and mines.

Asia
- Al dur Desalination Plant (Bahrain)
- Jubail and Yanbu Petrochemical Plant (Saudi Arabia)
- Fujairah (United Arab Emirates)
- PulauSakra Combined Cycle Plant (Singapore)
- Messaied Combined Cycle Plant (Qatar)
- Beilungang Power Plant (China)
- Korangi Combined Cycle Plant (Pakistan)
- Barkha Desalination Plant (Oman)
- KelanitissaCCPP1 - L16 (Sri Lanka)

Latin America
- Monte AlegreCTMP (Brazil)
- CabatasCTMP (Brazil)
- Baja California (Mexico)
- MineraEscondida (Chile)
- Tamuin Petroleum Coke Fired Power Station I & II (Mexico)
- San Miguel Tucumán Combined Cycle plant (Argentina)
- Nehuenco Combined Cycle Plant (Chile)
- Curacao Desalination Plant (Netherlands Antilles)

Europe
- Sugres Combined Cycle Plant (Russia)
- Brazi Combined Cycle Plant (Romania)
- Barcelona Desalination Plant (Spain)
- Beckton Desalination Plant (U.K.)
- CAN Coal Boiler (Turkey)
- Dunkerque Combined Cycle Plant (France)
- Santurtzi Combined Cycle Plant (Spain)
- AgiosNikolaos Combined Cycle Plant (Greece)
- PortucelCTMP (Portugal)
- Dhekelia Desalination Plant (Cyprus)
- Esch Sur Azette Combined Cycle Plant (Luxembourg)
- CFB Boiler (Kazakhstan)

Oceania
- Melbourne Desalination Plant (Australia)
- Adelaida Desalination Plant (Australia)
- Perth I, II & III Desalination Plant (Australia)

Africa
- Koudiet Combined Cycle plant (Algeria)
- North Cairo Combined Cycle Plant (Egypt)
- Phosphate Plant (Morocco)
We have ISO Certification 9001: 2008 (registration no. 0.04.08191/02) and ISO Certification 14001: 2004 (registration no. 3.00.09008/02).

Sphere of application: design, manufacture and marketing of expansion joints, compensators and fabric, rubber and metal bellows.

8. CERTIFICATIONS

ISO CERTIFICATIONS

We have ISO Certification 9001: 2008 (registration no. 0.04.08191/02) and ISO Certification 14001: 2004 (registration no. 3.00.09008/02).

Sphere of application: design, manufacture and marketing of expansion joints, compensators and fabric, rubber and metal bellows.

TYPE APPROVAL

In accordance with The Lloyd’s Register requirements for:
Rubber expansion joints (certificate no. 07/0009)
Metal expansion joints (certificate no. 07/00010).

TZW CERTIFICATION

Food-grade quality certification of the rubber in contact with drinking water.

EUROPEAN DIRECTIVE

Group IV, according to European Pressure Equipment Directive 97/23/EC, Metallic expansion Joints

ATEX DIRECTIVE

Fabric Expansion joints according to ATEX DIRECTIVE 94/9/EC (ATEX-100)
In BIKAR, we are committed to the internationalization, being our company an industrial benchmark thanks to the presence of our expansion joints in more than 45 countries across five continents.

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