



TURNING METALS INTO ENGINEERED SOLUTIONS: EXPANSION JOINTS

MACOGA



EXPERIENCE & INNOVATION

It started in 1960 when Manuel Concheiro and his sons Mario and Carlos Concheiro founded a small company dealing with technical products for serving the Spanish industry.

Early in the 70's the first Expansion Joints were designed, manufactured and shipped from MACOGA. Throughout its more than 40-year history, MACOGA has been a leader in developing technologies and in converting those technologies for use in commercial markets.

From its early days as an industrial distributor MACOGA has success-

fully built upon its pioneering tradition to become a global leader. From bellows for jet engines to huge size units for the power generation sector, high tech expansions for oil and gas projects to the simplest units for heating and ventilating MACOGA people are dedicated to turning ideas into leading products and services.

Today MACOGA is a worldwide leading supplier of Expansion Joints as well as comprehensive specific solutions. MACOGA designs, manufactures and supplies and state-of-the-art Expansion Joints.



QUALITY ASSURANCE

MACOGA is fully committed to a quality management process with quality as a foundational business principle. The core of the process is achieving customer satisfaction by meeting our internal and customer requirements on time.

Employee participation in a continuous improvement effort develops reviews and implements the quality assurance system, procedures, and practices needed to meet the highest standards.

The end goal is to continue meeting world-class standards for the mutual benefit of our customers and employees.

Quality is the engine for improvement in our Company. It is the combination of actions that increase efficiency and output in activities and processes to provide added advantages to both the company and customers.

Our vision is to create value through innovation and continual improvement. And we apply it to all areas in our company, from the purchasing of raw materials to the final tests and controls carried out on each Expansion Joint, from design control and verification to the perfect efficiency of all departments.



- ISO 9001
- ISO 14001
- PED 97/23/CE. MODULE H
- TÜV AD 2000-MERKBLATT HPO
- ASME "U" STAMP
- "NB" CERTIFICATE OF AUTHORIZATION
- BUREAU VERITAS TYPE APPROVAL
- LLOYD'S REGISTER TYPE APPROVAL
- DET NORSKE VERITAS TYPE APPROVAL CERTIFICATE
- MINISTRY OF DEFENSE AND NATO MEMBER COUNTRIES
- GOST R



SERVICE

When it comes to Expansion Joints we offer overall solutions to meet your particular needs.

DESIGN & CALCULATION

Our analysis and design practices include:

- Design calculations
- Finite Element Analysis (FEA)
- Pipe Stress Analysis
- CAD
- 3-D Modelling

ON-SITE SERVICE

MACOGA Site Staff of expert technicians is available on and as-needed basis.

Our service group consists of highly-qualified technicians and engineers specialized in expansion joints. We offer our customer custom made and professional solutions to solve their site needs as follows:

Supervising Package

Guidance and instruction during assembly and/or erection process and unquestionably a Final Inspection after completion the assembly and/or erection works.

Assembly Package

For those Expansion Joints that due to its size are not transportable in one piece our Qualified (ASME, EN) and trained welders carry out the works to weld and assemble all the individual parts and accessories of the Expansion Joints into one complete unit.

Erection Package

Erecting and installing the Expansion Joint into our customers' site ducts or equipments.

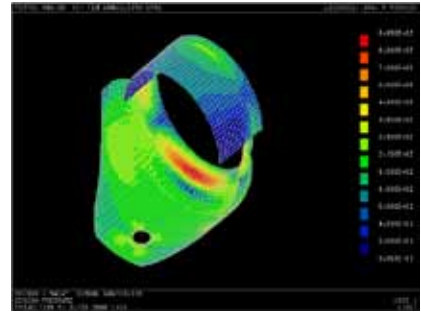
PREMIUM SERVICE

During an emergency situation (plant shut-down, parts failure, etc.) you can't afford to wait in line for a standard delivery to get your Expansion Joints.

This Premium tool is the most reliable and efficient solution for those customers who require Expansion Joints in a record time.

Features and Benefits: Immediate reply to your inquiry + High Priority Production + Guaranteed Delivery.

Delivery is 100% guaranteed anywhere in the world in a record time.



PRODUCT

MACOGA Expansion Joints are designed, manufactured and tested in accordance with:

E.J.M.A. (*Expansion Joint Manufacturers Association, Inc.*)

ASME VIII, Div. I, App. 26

EN 14917, European Standard for Metal Expansion Joints.

If specially requested or included in the terms of the contract, the Expansion Joints can also be designed according to various international standards and codes, including the following:
AD-Merkblätter B13, Stoomwezen D 0901, Suomen SFS 2773, CODAP.

Owmanufacturing range includes Circular Expansion Joints of the following types:

Axial
Hinged
Gimbal
Lateral
Pressure Balanced
Jacketed
Externally Pressurized
Lens

As well as Rectangular Expansion Joints which, with limitless dimensions, can be supplied with different convolution and corner types:

V-shaped	Camera Corner
V-shaped	Miter Corner (single or double)
U-shaped	Rounded Corner

Circular Expansion Joints are manufactured with single or multiple ply with a diameter ranging from 15 to 8000 mm.

Materials used in manufacturing are basically Austenitic Steels as **AISI 321, 304, 316, 316L, 316Ti, 309, 253 Ma, 254 SMO, etc.** and **Nickel Alloys such as Monel 400, Inconel 600, 625, Incoloy 800 H, Hastelloy, etc.**



QUALITY CONTROL & TESTING

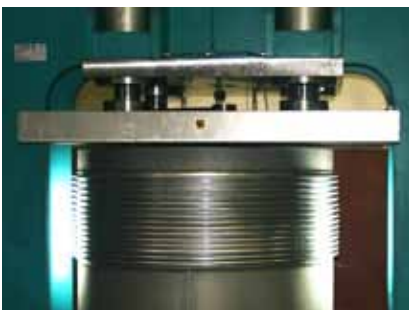
All of our Expansion Joints undergo a series of controls and tests at each of the different steps in the manufacturing process and before they leave the factory. Every Expansion Joint is submitted to a final Dimensional Check and a Leak Detection Test. The following tests can also be carried out if requested and/or if stipulated in the terms of a contract.

NON-DESTRUCTIVE

- Radiographic Examination
- Liquid Penetrant Examination
- Ultrasonic Examination
- Magnetic Particle Examination
- Hydraulic Pressure Test
- PMI (Positive Material Ident.)
- Chemical and Mech. Analysis
- Spring Rate Test
- Helium Leak Detection Test

DESTRUCTIVE

- Fatigue Life Testing
- Squirm Testing
- Meridional Yield Rupture
- Burst Test



HEALTH, SAFETY AND ENVIRONMENT POLICY

Protecting the Environment is a primary objective of MACOGA. It is an integral part of corporate strategy and all new activities are assessed for environmental impact and appropriate health and safety position.

MACOGA aims to reduce the health, safety and environmental impact of its products and processes and prevents pollution by utilising a structured risk management approach, taking into account the needs of its customers and society.

The certification of our company in line with ISO 14001 is a crucial element of MACOGA's Environmental Management System.

Indeed, occupational health and safety are of prime importance to us. Safety in the design of workplaces, industrial processes and facilities is a priority.

Whether is the global environment, workplace conditions or the people who live near by, MACOGA cares.



INDUSTRIES

We offer a complete package of integrated engineering, design, fabrication and delivery of Expansion Joints to selected industries so we can provide our customers with in-depth knowledge and expertise. We've developed tools, methodologies and best-practices based on years of experience with companies in key industries. That's why more than three-quarters of our business comes from repeat customers.

Each industry has its own unique requirements and challenges and we are aware that different industries have different requests and needs.

Some of the industries that we provide Expansion Joints to are:

- **Energy**
- **Engineering Companies**
- **LNG, LPG**
- **Petroleum Refining, FCC**
- **Petrochemical**
- **Aerospace**
- **Government/ Military**
- **Cryogenic**
- **Engines & Turbines**
- **Air-Conditioning & Air Heating**
- **Aircraft Engines & Engine Parts**
- **Cement Plants**
- **Co-generation**
- **Electrical Industrial Apparatus**
- **Energy/Public Utilities**
- **Food Industry**
- **Gas Compression Equipment**
- **General Bldg Contractors**
- **Heavy Construction**
- **Hydraulic plants**
- **Furnaces & Ovens**
- **Iron & Steel Foundries**
- **Metal Mining**
- **Metal Working**
- **Mining**
- **Natural Gas**
- **Nuclear**
- **OEMs**
- **Offshore**
- **Paper Mills**
- **Pharmaceutical**
- **Railroad Equipment**
- **Ship Building**
- **Steel Mills**
- **Steel Works, Blast Furnaces**
- **Water Transportation**



WORLDWIDE CUSTOMERS

We strongly believe in developing long-term partnerships with our customers, in order to provide them with long lasting, strategic benefits. We believe that our first-class customer reference list below reflects our commitment to value delivery.

This is a sample of some of our significant customers in different business key sectors:

OIL & GAS

ÖMV • BP • TOTAL • EXXONMOBIL • SHELL • REPSOL YPF • CEPESA • PETROBRAS • TOTAL • ADNOC • CONOCOPHILLIPS • KNPC • SONATRACH • STATOIL • GAL • PDVSA • NESTE OIL • ESSO • HELLENIC PETROLEUM • GAS NATURAL • PERTAMINA • CHEMOPETROL • UNIPETROL • ELF ATOCHEM • ANGARSK PETROCHEMICAL COMPANY • YUKOS • ANCAP • TEXACO NORTH SEA • KALA NAFT COMPANY • NATIONAL IRANIAN OIL CO. • PETROGAL • WINGAS

ENGINEERING

UOP • CHICAGO BRIDGE & IRON • SNC-LAVALIN • JACOBS • TECNICAS REUNIDAS • MITSUI ENGINEERING • SANMPROGETTI • TECNIMONT • FOSTER WHEELER • BECHTEL • FLUOR • TECHINT LUMMUS. TECHNIP • TECNIPETROL • HEYL & PATTERSON • ABB LUMMUS • McDONALDS ENGINEERING • INTECSA • UHDE • AKER • FOSTER WHEELER NORTH AMERICA CORP. • TOYO ENGINEERING • LTG

CHEMICAL

BASF • DUPONT • DSM • HUNTSMAN • BAYER • NESTE CHEMICALS • DOW CHEMICAL • SHELL CHEMICALS • BAYER • REPSOL QUIMICA • INEOS • EXXONMOBIL • LYONDELL CHEMICAL • KEMIRA • AKZO NOBEL • AIR LIQUIDE • EVAL • SOLVAY • GE PLASTICS • BASF SONATRACH PROPANCHEM

POWER ENGINEERING & GENERATION

ABB • GENERAL ELECTRIC • AUSTRIAN ENERGY & ENVIRONMENT • SIEMENS • ELECTRABEL • ENERCON • CEZ • A.S. • ALSTOM POWER • SKODA • INOVA • ANSALDO • CHIYODA • TECHNIP • GEA • SPX • MITSUBISHI • TRACTEBEL ENERGY ENG. • FOSTER WHEELER ENERGIA • EDISON • BECHTEL • BLACK & VEATCH • SARGENT & LUNDY • ROLLS ROYCE INDUSTRIAL POWER GROUP • IBERDROLA • STONE & WEBSTER • THERMODYN • DOOSAN HEAVY INDUSTRIES AND CONSTRUCTIONS • MHI • REYKJAVÍK ENERGY • GAMA POWER • ENDESA • ABENER • HYUNDAI HEAVY INDUSTRIES • ABB STAL • RELIANT ENERGY

STEEL

ARCELOR MITTAL • SSAB • BRITISH STEEL • KVAERNER METALS • NIPPON STEEL • UNITED STATES STEEL CORPORATION • NORTH AMERICAN STAINLESS • NUCOR CORPORATION • THYSSENKRUPP • OUTOKUMPU • SIDOR • TATA STEEL • DIRECT IRON REDUCTION CO • SIDERPERU • VOESTALPINE • SALZGITTER • CORUS • SALDANHA STEEL • DSD DILLINGER • US STEEL

SHIPBUILDING

NAVANTIA • STX FINLAND CRUISE OY • BLOHM + VOSS • FINCANTIERI • ENVC SHIPYARD • ROTTERDAM DRYDOCK COMPANY • ROYAL SCHELDE • ASMAR TALCAHUANO • ORSKOV YARD A/S • SHANGHAI EDWARD SHIPBUILDING

DEFENSE

PATRIA • LOCKHEED MARTIN • RAYTHEON • ARMADA DE CHILE • AIR WARFARE DESTROYER • NAVANTIA • SPANISH NAVY LNG/LPG GAS NATURAL • ECOELECTRICA • SONATRACH

CRYOGENIC

PRAXAIR • UNION CARBIDE • ARGON • S.E. CARBUROS METÁLICOS

PAPER

METSO • RENOVA • ENCE • STORA ENSO • MILLIKOSKY • SVENSKA CELLULOSA • INDAH KIAT PULP & PAPER CO • WEYERHAEUSER PAPER MILL • KVAERNER PULPING Food • NESTLE • UNILEVER • SAN MIGUEL • COREN • HELIOS • KRAFT

PHARMACEUTICAL

PFIZER • CELTIA • GLAXOSMITHKLINE • NOVARTIS • ABBOTT • MERCK • PROCTER & GAMBLE • AKZO NOBEL • SOLVAY

OTHERS

CODELCO • ENAMI • DEMAG DELAVAL • SULZER • SKODA AUTOMOBILLOVA • METSO PAPER • DÜRR • LEYBOLD • MITSUBISHI HEAVY INDUSTRIES LTD. • KAWASAKI HEAVY INDUSTRIES • DOOSAN HEAVY INDUSTRIES • ACCIONA • FCC • ALCAN ALUMINIUM • BABCOCK POWER • JORDAN PHOSPHATE MINES CO. • KOREA HEAVY INDUSTRIES & CONS. CO. • FAUJI FERTILIZERS • FERROVIAL • GENERAL MOTORS • HIDROELECTRICA ESPAÑOLA • EUROPEAN GAS TURBINES SA • FERRYTER-RANEE • AUDI AG • BABCOCK BSH • BMW AG • DAIMLER CHRYSLER AG • DEUTSCHE BABCOCK GMBH • DEUTZ MOTORENWERKE • EISENMANN • MDW • ROCKWOOL MINERALWOLLE • STEIN HEURTEY • STEINMÜLLER • WURZ • OPEL AG • BHARAT HEAVY ELECTRICALS LIMITED • LARSEN & TOUBRO LTD. • PETROMER • FIAT • UNITED SUGAR COMPANY • SLOVNAFT • ASTURIANA DEL ZINC • AVENTIS ANIMAL NUTRITION • CITROEN • MICHELIN • AB VOLVO PENTA • ABB ATOM • ALFA LAVAL • DSM • NBM • STORK WÄRTSILÄ • DUBAI ALUMINIUM • TOYOTA • BRICMONT • FAIRBANKS MORSE ENGINES • FORMOSA PLASTIC • KAISER ALUMINIUM • MPG INGREDIENTS • ZINC CORPORATION OF AMERICA



MACOGA

LEIRA. S/N. 15680 ORDENES. LA CORUÑA, SPAIN. TEL: (+34) 981 68 00 00. FAX: (+34) 981 68 02 38
WWW.MACOGA.COM E-MAIL: macoga@macoga.com