



M'News

Issue No. 19

M'News is MACOGA's online news bulletin featuring the latest development of significant projects, achievements, events and expansion joints related news.

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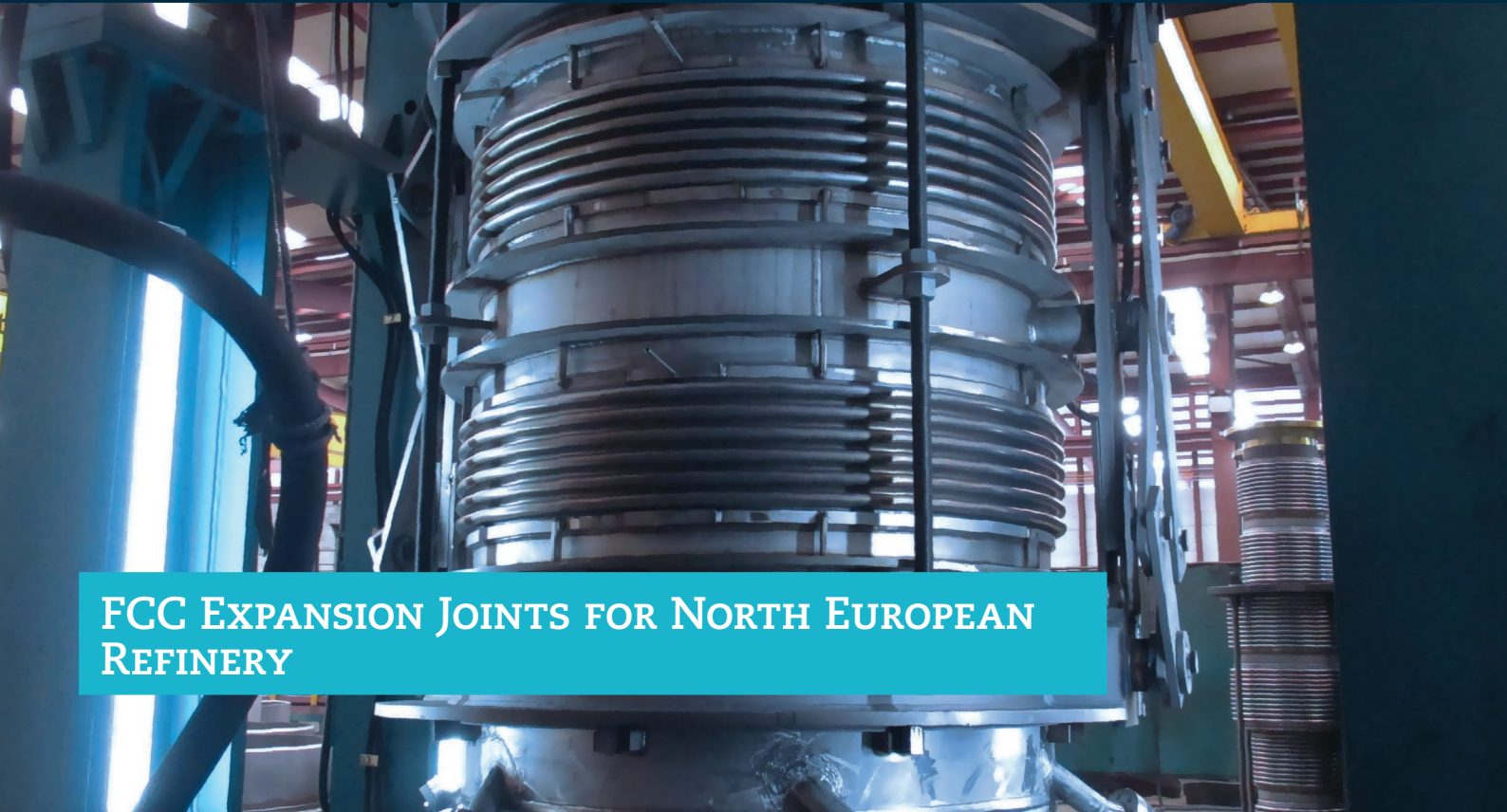
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FCC EXPANSION JOINTS FOR NORTH EUROPEAN REFINERY

The expansion joints used in the FCCU service are exposed to high temperatures, high pressure, large movement, aggressive media and hostile environments.

For one of the largest refineries in Europe and the most demanding customer we have now completed the design, manufacturing and testing of:

1 unit REACTOR STANDPIPE EXPANSION JOINT UNTIED UNIVERSAL EXPANSION JOINT

- N.D. 1100 mm - Length: 2310 mm
- Inconel 625 LCF bellows – 2 ply testable
- Refractory/abrasion lining AC20 – RESCO AA 22 S
- Hexagonal Mesh 410S
- Design Pressure: 2.5 barg
- Bellows Design Temperature: 50 °C
- Medium: Vapour

1 unit REACTOR RISER EXPANSION JOINT - PANTOGRAPH UNIVERSAL EXPANSION JOINT

- N.D. 1200 mm - Length: 8534 mm
- Inconel 625 LCF bellows – 2 ply testable
- Blanket Insulation Superwool Plus
- Refractory/abrasion lining AC20 – RESCO AA 22 S
- Design Pressure: 4.1 barg (2000 hours) / 2.5 barg (98000 hours)
- Bellows Design Temperature: 650 °C
- Medium Temperature: 750 °C
- Medium: OIL/STEAM/GAS/CATALYST

1 unit REGENERATOR OVERHEAD LINE EXPANSION JOINT

- N.D. 1662 mm - Length: 1415 mm
- Inconel 625 LCF bellows – 2 ply testable
- Blanket Insulation Superwool Plus
- Design Pressure: 0.98 barg
- Bellows Design Temperature: 365 °C
- Medium: Flue Gas





HUGE SIZE UNIVERSAL TIED AND DOG BONE EXPANSION JOINTS FOR POWER PLANT IN THE MIDDLE EAST

We have completed successfully the design, manufacturing and testing of one unit MWL Series Universal Tied Expansion Joints of 7900 mm diameter and 4800 mm long and a Dog Bone of 7900 x 6000 mm size for a large Combined Cycle Power Plant in the Middle East.

These units are not transportable in one piece so they have been delivered in sections and assembled on site by our specialized staff.

In recent years, we have positively supplied our large size expansion joints to many important energy generating projects for all main types and energy sources (geothermal, biomass & renewables, nuclear, solar, hydropower, coal, natural gas, etc.).





MACOGA SUCCESSFULLY COMPLETED ON-SITE ASSEMBLY WORKS AT CRICKET VALLEY ENERGY CENTER IN DOVER, NEW YORK, USA

We provide our clients expert assistance when and where it is required.

For those Expansion Joints that due to its size are not transportable in one piece, we offer our customers the Assembly Package.

On this occasion 3 huge In-Line Pressure Balanced Expansion Joints of 4200 mm (165") nominal diameter and more than 25 tons (55000 lbs) of weight each were transported to the plant in the United States in sections and assembled on site by our specialized staff.

These units are not transportable in one piece, so our specialists moved to the Cricket Valley Energy Center in Dover, New York, USA to assemble the different sections of the Expansion Joints.

Cricket Valley Energy Center (CVEC) is a 1.1GW natural gas-fired power plant being developed in Dover, New York, US. Upon completion, the facility is expected to be the most efficient combined cycle power plant in the state.

The project is anticipated to produce electricity sufficient to power one million homes in the Hudson Valley. It is expected to create 1,100 jobs during peak construction phase, and 80 permanent and indirect jobs upon completion.





REGENERATED CATALYST STAND PIPE EXPANSION JOINT FOR EUROPEAN REFINERY

A Regenerated Catalyst Stand Pipe Expansion (Universal Tied MWL DN 600 and 6200 mm long), been designed, manufactured, tested and delivered to one of North Europe's most efficient refinery. The complex refines crude oil into gasoline, diesel, liquefied petroleum gas (LPG) and jet fuel.

The Expansion Joint incorporates 2 ply testable & packed Bellows in Alloy 625 Gr. 1:

Temperature: 427 °C

Design Pressure: 11 bar (g)

Test Pressure: 20 bar (g)

This FCCU Expansion Joints undergo a comprehensive quality control and testing program including:

- Review Drawings
- Advanced Review of Calculations
- Check Material and welding consumables certificates
- PWHT diagram if applicable.
- Review and update WPS, PQR and WQR
- Review NDE Procedures & Operator Qualification
- 100% Visual inspection of welds.
- 100% RT- Radiographic Examination
- 100% PT - Liquid Penetrant Examination
- MT - Magnetic Particle Examination when applicable
- Pressure & Leak Detection Test
- 100% PMI - Positive Material Identification
- 100% Inspection of Refractory Lining
- Surface Preparation & Paint System





HONEYWELL UOP SELECTED MACOGA EXPANSION JOINTS FOR NEW PETROCHEMICAL PLANT IN TEXAS

We have completed the detailed engineering, manufacturing, testing and shipping of a large number of high-tech expansion joints (Universal Tied, Double Hinged, Double Gimbal and

Externally Pressurized) for a new Honeywell UOP modular CCR™ (Continuous Catalyst Regeneration) unit for a Petrochemical Plant in Texas, USA.

The UOP's C4 Oleflex™ technology will produce 425,000 metric tons per year of isobutylene, which is used to make high-octane fuel and high-performance synthetic rubbers and acrylics.

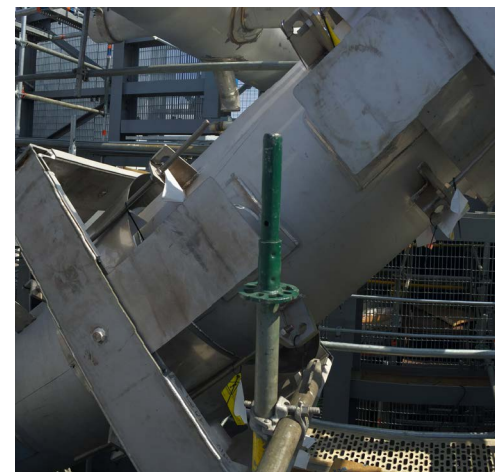
The Expansion Joints incorporate the bellows in Alloy 800H and pipes and accessories in stainless steel 316H and 304H.

This new project is added to the portfolio that MACOGA has successfully completed for Honeywell UOP's Continuous Catalyst Regeneration units like:

Project: PETROBRAS RPBC Refinery Pres. Bernardes-Cubato
Project location: Brasil

Project: PETROBRAS Paulina Refinery, Sao Paulo
Project Location: BRASIL

Project: Oleflex CCR Takreer
Project Location: Abu Dhabi, UAE



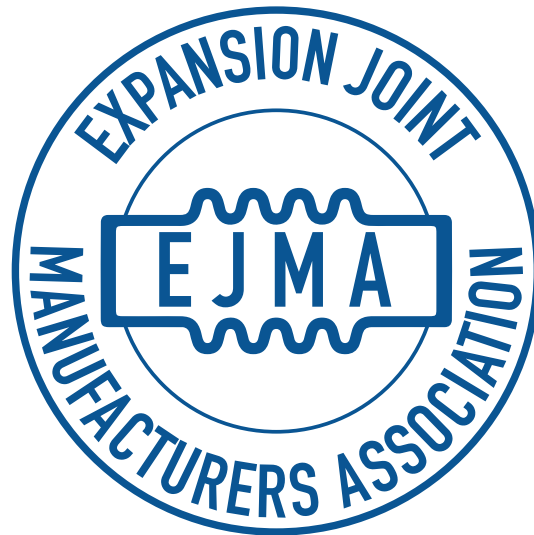


**MACOGA IS AN OFFICIAL MEMBER OF EJMA
(THE EXPANSION JOINT MANUFACTURERS
ASSOCIATION, INC.)**

The Expansion Joint Manufacturers Association, Inc. is an organization of established manufacturers of metal bellows type expansion joints. EJMA was founded in 1955 to establish and maintain quality design and manufacturing standards.

As a member of EJMA, MACOGA must adhere to strict quality standards in all aspects of expansion joint design, fabrication and testing.

The EJMA Standards are recognized throughout the world as the authority on the proper selection and application of metallic bellows type expansion joints for safe and reliable piping and vessel installation.



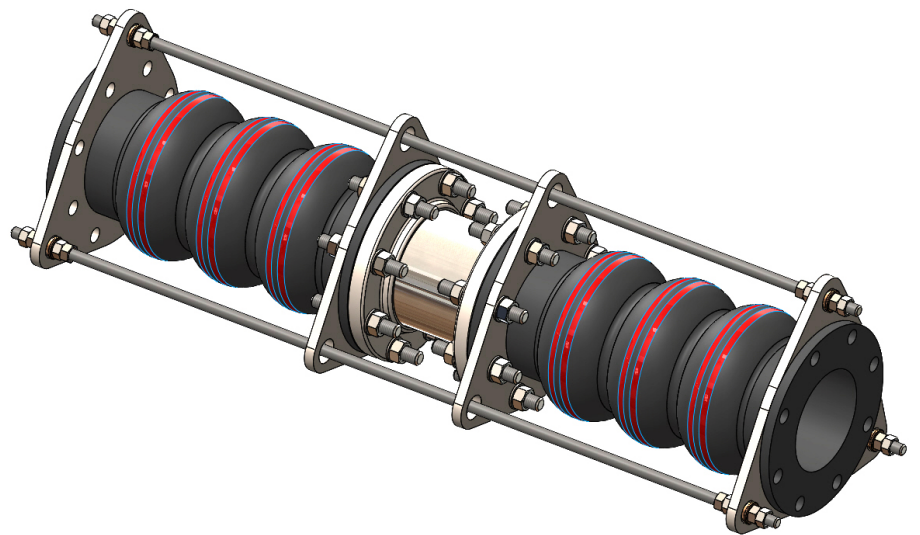


RUBBER EXPANSION JOINTS FOR ABU DHABI NATIONAL OIL COMPANY, ADNOC

Several MAC-FT3 Series MACOGA Rubber Expansion Joints have been successfully designed, manufactured and tested for ADNOC Ruwais Paraffinic Naphtha Tanks Fire Protection Upgrade in Abu Dhabi.

The Expansion Joints, which incorporate a system of PTFE coated tie rods, are built with a special EPDM for high temperature and 3 convolutions that allow them to withstand constant temperatures of 130 °C and absorb large lateral movements.

Our special EPDM HT rubber compound is suitable for high temperatures applications (up to 130 °C) without hardening, is weather-resistant, has a good gas tightness, is resistant to attack by oxygen, U.V., ozone and suitable to operate under extreme weather environments.





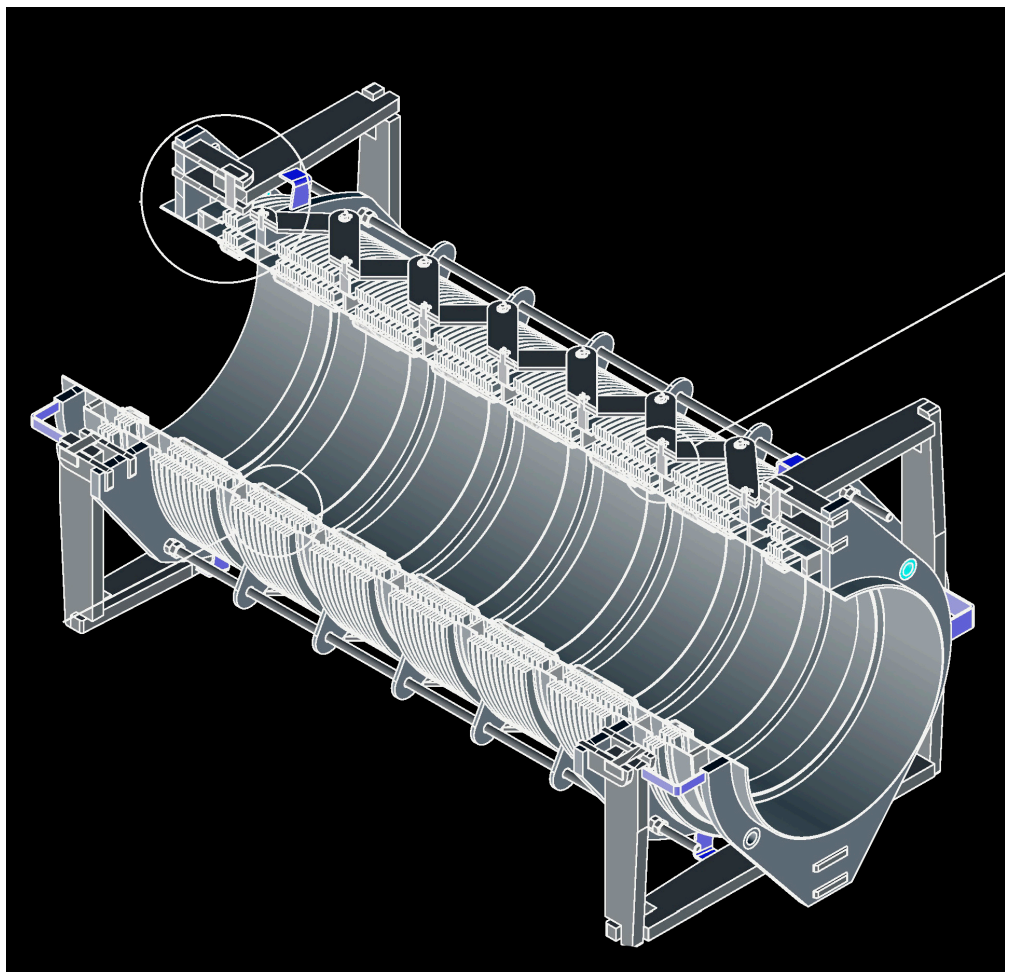
JACKETED AND PANTOGRAPHIC EXPANSION JOINT FOR STEEL PLANT IN EUROPE

We have completed the engineering, manufacturing, testing and shipping of a Jacketed and with Pantographic Linkage Expansion Joint for one of the largest steel plants in Europe.

Jacketed Expansion Joints are used in a set of circumstances such as when regular insulation is not sufficient and when the main fluid must be kept at a fixed temperature or simply for security reasons. This model involves using two bellows, one on the inside and one on the outside.

The pantographic linkage distributes the large axial movement between bellows.

Additionally, the Expansion Joint incorporates a double gimbal system that allows the expansion joint to take multi-plane lateral movements while restraining the pressure thrust.





MACOGA PROVIDES PROFESSIONAL ON-SITE ASSEMBLY SERVICE IN JAPAN

We provide our clients expert assistance when and where it is required.

On this occasion, our On-Site Team traveled to Japan to assemble two expansion joints of 8.0 meters in diameter. These units are not transportable in one piece, so our specialists moved to the Moka plant in Japan to assemble the different sections of the Expansion Joint.

These huge expansion joints connect the SGT5-8000H Siemens gas turbines to the air-cooled condenser of the combined cycle power plant of Kobe Steel, Ltd. (KOBELCO) in Moka City, Tochigi Prefecture in Japan. Fuji Electric Co, Ltd., will be erecting the plant on a turn-key basis for the end customer KOBELCO at its site. The plant is located inland some 50 km west from the shore of the Pacific Ocean.

The Moka Plant produces rolled aluminum products for use in airplanes, Shinkansen trains, beverage cans, hard disk drives, automobiles and other applications.

For those Expansion Joints that due to its size are not transportable in one piece, we offer our customers the Assembly Package. This package includes the Supervising Package plus a team of Qualified (ASME, EN) and trained welders and operators that carry out the works to weld and assemble all the individual parts and accessories of the Expansion Joints into one complete unit ready to be welded to the site ducts or equipment.





FCC EXPANSION JOINTS FOR REFINERY COMPLEX IN AFRICA

MACOGA has completed the detailed engineering, manufacturing and testing of a complete set of FCC Expansion Joints for an African Refinery Project. The refinery is expected to be the world's biggest single-train facility, upon completion in 2019.

The processing facilities at the refinery include a crude distillation unit (CDU) and associated facilities, a mild hydrocracking (MHC) unit, residual fluid catalytic cracking (RFCC), naphtha hydrotreater and RFCC gasoline hydrodesulfurisation (HDS) unit, as well as alkylation units.

The high-tech Expansion Joints provided by MACOGA have been designed as per UOP specifications and comprise the following units:

- REGENERATED CATALYST STAND PIPE UNIVERSAL EXPANSION JOINT COLD WALL DESIGN Type 1
- SPENT CATALYST STAND PIPE UNIVERSAL EXPANSION JOINT COLD WALL DESIGN Type 2
- RECIRCULATION CATALYST STAND PIPE No. 1 UNTIED UNIVERSAL EXPANSION JOINT COLD WALL DESIGN Type 1
- RECIRCULATION CATALYST STAND PIPE No. 2 UNTIED UNIVERSAL EXPANSION JOINT COLD WALL DESIGN Type 1
- COOLED CATALYST UNTIED UNIVERSAL EXPANSION JOINT COLD WALL DESIGN Type 1

These FCCU expansion joints incorporate 2-ply testable bellows where each ply is designed for the full operating conditions. If a hole or stress crack develops in the inner ply during service, the outer ply takes over without exposing operators to increased risk or creating the need for an unscheduled shut-down. 2 ply testable bellows system improves reliability and makes the expansion joint more maintenance friendly. The annular space between plies can be monitored for leakage to detect a ply failure. This will serve as a warning of an imminent problem. A pressure device in the outer ply alerts about the inner ply failure. The 2-ply testable bellows also allows inspectors to pressure test the inner and outer ply during shutdowns.



GLOBAL PRESENCE WORLD-CLASS COMMITMENT

Our expansion joints are present in more than 90 countries across all continents performing demanding tasks. MACOGA is always ready to provide support exceeding customer expectations.

We are conveniently located in NW Spain near two international airports (SCQ and LCG) and two deepwater oceanic sea ports (Vigo and La Coruna).