



EXPANSION JOINTS

EXPERIENCE. EXPERTISE. EXCELLENCE.

METAL & FABRIC EXPANSION JOINTS





A CENTURY OF EXCELLENCE



Founded in 1841, Boston, Massachusetts



Present day: BADGER Industries Zelienople, Pennsylvania

Experience counts...**BADGER** has been in continuous operation since 1841! **BADGER** began as "Coppersmiths" and metal expansion joints became a large part of the business starting in 1916. Throughout the 20th Century and into the 21st, **BADGER** engineered expansion joint products were approved by leading engineering and end user companies. The results are **BADGER** fabric and metal expansion joints installed worldwide in power generation, refining, chemical, pipelines, steel, smelting, pulp & paper and other industries. **BADGER...moving forward to another Century of Excellence.**

BADGER's extensive facilities have the capacity for production of large diameter-heavy expansion joint assemblies. Both manufacturing buildings have full length overhead cranes, supplemented with strategically placed jib cranes, for cost efficient product processing.



Property --- 16.5 Acres
Manufacturing Floor Area ---- 127,000 ft²



BADGER INDUSTRIES

A Division of Markovitz Enterprises, Inc.

100 Badger Drive • Zelienople, PA 16063 • Tel: (724) 452 4500 • Fax: (724) 452 0802
sales@badgerind.com • www.badgerind.com



QUALITY ASSURANCE

BADGER has a worldwide reputation for designing and manufacturing high quality expansion joint products... a reputation that has endured the test of time, with more than a century of positive experience. Our craftsmen understand that quality is built into the product the first time around, and that quality inspection is the verification of manufacturing excellence.

BADGER employees average 16 years of experience and welders average 14 years of experience in expansion joint manufacturing and testing.

BADGER'S Quality Management System is in full compliance with ASME Section VIII and includes:

- Receiving Inspection
- In-Process Inspection
- Raw Material Traceability
- Drawing Control
- Final Inspection

Available testing, as required, includes:

- Radiographic (X-ray)
- Dye Penetrant
- Ultrasonic
- Helium Leak Detection
- Hydrostatic, Pneumatic
- Positive Material Identification (PMI)
- Bellows Cycle Life
- Bellows Spring Rate
- Hardness
- Ferrite



Non-destructive testing such as dye penetrant inspection is regularly performed to check for cracks in the welds



Hydrostatic testing of a universal expansion joint



ENGINEERING

Engineering Expertise for Every Application

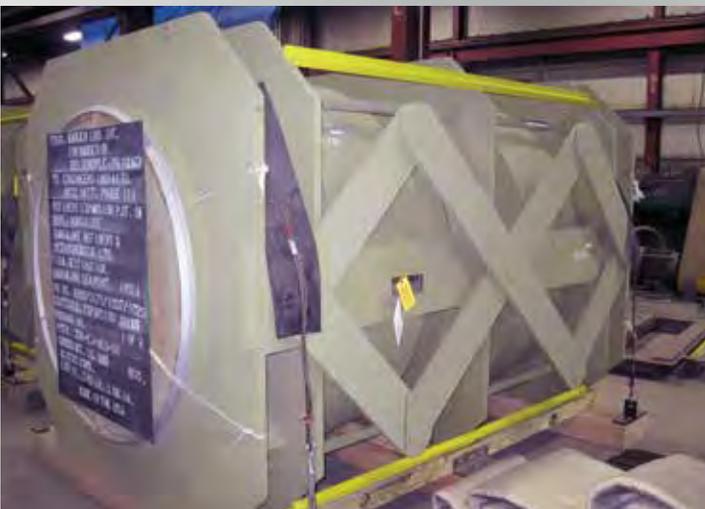
Heat Exchangers • FCCU • SCR • MTBE • Styrene • Gas Turbine • HRSG • Steam Extraction
Steam Turbine Cross-Over / Cross-Under • Condensers • Boiler Penetration Seals • Precipitators
Scrubbers • Cogeneration • Turbine-Driven Pipeline Compressor Stations • Acid Plants • Tank Farms
Clamshell Bellows Replacement





MANUFACTURING

BADGER... a leader in Expansion Joint Technology for 100+ Years
Metal and Fabric Expansion Joints
Round 2" to +240"
Rectangular - Any Practical Size





WELDING

All **BADGER** welders are qualified for welding procedures in compliance with ASME Section IX. **BADGER** has developed ASME welding procedures covering a wide range of similar and dissimilar metals including: Carbon Steel, Carbon Molybdenum, Chrome Molybdenum, Ferritic Stainless Steel, Austenitic Stainless Steel, Duplex Stainless Steel, Nickel, Nickel-Copper, and High Nickel Alloys.

BADGER Welding Expertise

- SMAW Manual (Stick)
- GMAW Semi-Automatic (MIG)
- FCAW Semi-Automatic (Fluxcore)
- GTAW Manual (TIG)
- GTAW Machine (Bellows Tube Welding)
- SAW Machine (Submerged Arc)
- RSW* (Resistance Welding)

***BADGER** two-ply testable bellows designs specify resistance welding to assure long-term reliability. You can rely on the extensive experience of our resistance welders to provide consistently high-quality two-ply testable bellows.



BADGER ASME qualified welders average 14 years of experience in expansion joint manufacturing





ON-SITE SERVICE

BADGER performs On-Site Service for inspection, installation supervision and repair of fabric and metal expansion joints. Our On-Site Service experience includes: refineries, chemical, power generation, turbine-driven pipeline stations, and heat exchanger companies. Specific expansion joint applications include: FCCU, SCR, Styrene, MTBE, Boiler Penetration Seals, Turbine Cross-Over, Extraction Steam, HRSG, Gas Turbine, and the **BADGER** specialty niche of "Clamshell" Bellows Replacement for Heat Exchangers.

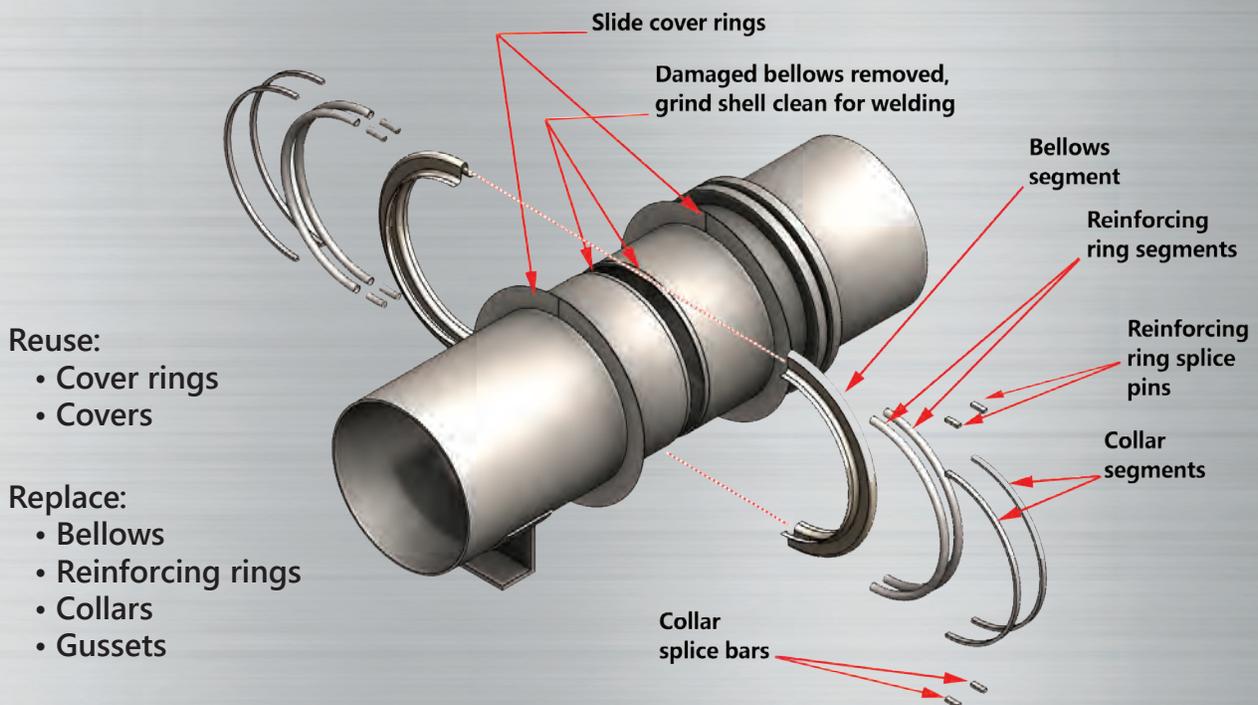


Gas turbine exhaust fabric expansion joint installed and spliced by Badger On-Site personnel



10' x 15' X 12" face-to-face fabric expansion joint belt and bolster replacement in a Louisiana gas turbine power plant

Typical On-Site Replacement of Leaking Heat Exchanger Bellows by the "Clamshell" Method



CUSTOMERS

WE HAVE PROUDLY SERVED

Power Generation

Alstom
American Electric Power
Babcock & Wilcox
Baltimore G&E
Consumers Energy
Dominion
Duke Energy
Energy
First Energy
Florida Power & Light
Georgia Power
High Desert Energy
Public Service E&G
Siemens
South Carolina E&G
Spectra Energy
Tennessee Valley Authority
Tulahoma Air Force Base
Virginia Electric
Vogt Power International
Westinghouse
Wisconsin Public Service
Yellowstone Energy

Refinery & FCCU

Ashland Oil
BP Oil
Chevron USA
Citgo Petroleum
Clark Oil & Refining
Continental Resources
Delta Refinery
ExxonMobil USA
Gulf Oil
Hess Corporation
Husky Oil
Indian Oil Refining
Japanese Gasoline Corp.
Koch Refining
Marathon Petroleum
Murphy Oil USA
National Refinery
Occidental Petroleum
PBF Energy/Toledo Refining
Pemex
Pennzoil
Phillips Petroleum
Powerline Oil
Quaker State Refining
Shell Canada
Shell Oil
Skelly Oil
Sinclair Oil
Standard Oil Company
Star Enterprises
Sun Refining & Marketing
Texaco
Texas City Refining
United Refining
Valero Refining

Chemical & Petrochemical

3M Company
AKO Chemical
Archer Daniels Midland
Ashland Chemical
Bayer
Callery Chemical
Eastman Chemical
Hoechst Celanese
IMC Agrico
Indspec Chemical
Jubail United Petrochemical
Liquid Carbonic
Millenium Inorganic Chemical
Monsanto
Nan Ya Plastics
Nova Chemical
PCS Phosphate
Petrobras Energia S.A.
Reichold Chemical
S-Oil
Solutia
SSC Chemical
Sunoco
Union Carbide
Welland Chemical

Engineers & Constructors

ABB Lummus Global
AECOM
Aker Kvaerner
Bechtel
Black & Veatch
Chicago Bridge & Iron
Dow Engineering & Construction

Engineers & Constructors (cont.)

El Paso Corporation
Enterprise Products OLP
Fluor Daniel
AMEC Foster Wheeler
Howe Baker
Halliburton
International Alliance Group
Jacobs Engineering
Kellogg Brown & Root
Mustang Engineering
Parsons Energy & Chemicals
Refinery Technology, Inc.
Samsung Engineering
S&B Eng. & Construction
Technip
Worley Parsons

Steel & Metal Mills

Allegheny Ludlum
Alcoa
AK Steel
API Powered Metals
ArcelorMittal
G.O. Carlson Inc.
Japan Steel Works
Kobe Steel
Koppers Inc.
Latrobe Steel Co.
Nippon Steel
Nishiyama Corp. of America
Nucor Corp.
Thyssenkrupp
United States Steel



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