

ThorburnFlex



Metallic Expansion Joints



FCCU Expansion Joints



Rubber Expansion Joints

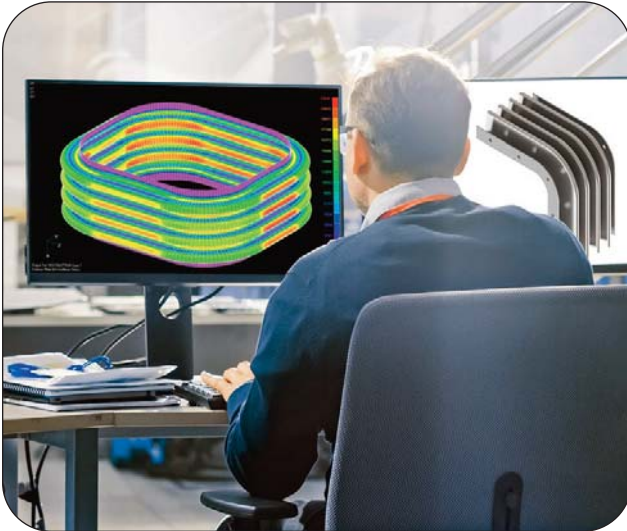
PETROCHEMICAL

Engineered Solutions For Pipe Motion



www.thorburnflex.com

Thorburn Expansion Joint Services



Team Thorburn can provide answers to piping and ducting problems by performing piping stress and finite element analysis, on-site measuring the results against the actual failure mode. Our services include...

- Quality verification of installation before start up
- On-site consultation, engineering & training sessions
- Maintenance service during shutdowns & turnarounds
- Refurbishing, retrofitting, repairing & replacements
- Guidance in the installation & maintenance
- Stress analyses to verify design

Design Tools & Capabilities

- Finite Element Analysis (FEA)
- Pipe stress analysis
- CAD & Solidworks
- 3D Modeling
- Mathcad



Thorburn Expansion Joint Applications



Metallic Piping Expansion Joints

- High Temperature Piping
- LNG Service
- High Pressure Steam Systems
- Caustic Media Processing
- Sulfuric & Nitric Acid Production
- High Pressure Steam Transfer
- Heat Exchangers
- Gas Separation
- FCCU Flexible Piping
- Scrubber Piping
- Heat Recovery
- Penetration Seals



Fabric Ducting Expansion Joints

- Pollution Abatement Ducting
- Turbine Exhaust
- HRSG Diverter
- Bypass Stack
- Inlet/Outlet HRSG
- Corrosive Fume Control
- Precipitator/Scrubber
- Exhaust Gas & Air
- Process Gas & Air
- Penetration Seals



Rubber Piping Expansion Joints

- Dismantling Joints
- Pump Inlet & Discharge
- Vibration Absorption
- Mud Pump Lines
- Diesel Fuel Lines
- Fresh Water Potable Water & Sea Water Lines
- Slurry Transfer
- Chemical Transfer
- Underwater Piping
- Permanent Ballast Water
- Secondary Containment
- Platform Process Systems
- Turbine to Condenser

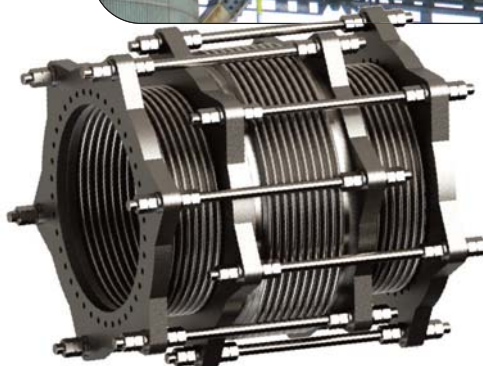
In-Line Dual Purpose Pressure Balanced Expansion Joints

Thorburn Model IPBU in-line pressure balanced expansion joint will absorb thermal motion while eliminating the pressure thrust loads on a piping system without a change in direction of the piping. The unique design of this in-line pressure balanced joint consists of a constant volume device which is created by the addition of a balancing bellow where the difference in cross-sectional area is exactly twice the cross-sectional area of the line bellows.

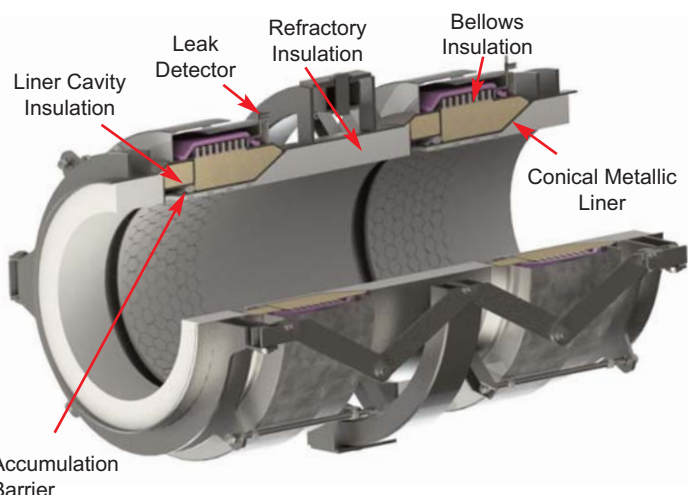
By proper crosslinking, the change in volume of the line bellows, due to a change in length (i.e. compression and/or extension) can be made to cause an equal but opposite change in volume of the balancing bellows. Thus, since the volume changes are of an equal value, the pressure forces that are normally present in a piping system containing bellows expansion joints are eliminated.

Features

- Absorbs axial deflection
- Absorbs lateral deflection independently from the balancing and line bellows
- Neutralizes pressure thrust forces
- Eliminates the requirement for main anchors
- Protects sensitive equipment against detrimental pressure thrust forces



Fluid Catalytic Cracking Unit (FCCU) Expansion Joints



- Custom designed to suit application requirements
- Tied Universal, Hinged, Gimbal, Pressure Balanced
- Bellows Inconel 625 LCF (Low Cycle Fatigue)
- Abrasive resistant refractory lining
- Typical Operating Conditions: 566°C to 760°C

Cold Wall: Installed in flue gas piping and utilize anchors and high density 125mm thick refractory lining to reduce the shell wall temperatures below 340°C. Internal insulation and liner seal keeps fluid particles out of the liner and bellows cavity. External insulation is used to prevent the bellows from dropping below the acid dew point.

Hot Wall: Found in flue gas piping and incorporate an abrasion resistant lining made of hex-mesh and refractory. The lining is designed to withstand abrasion from the catalyst flow but is not intended to be used as a thermal barrier and therefore the shell temperature of the expansion joint will rise above allowable temperatures for normal carbon steel.

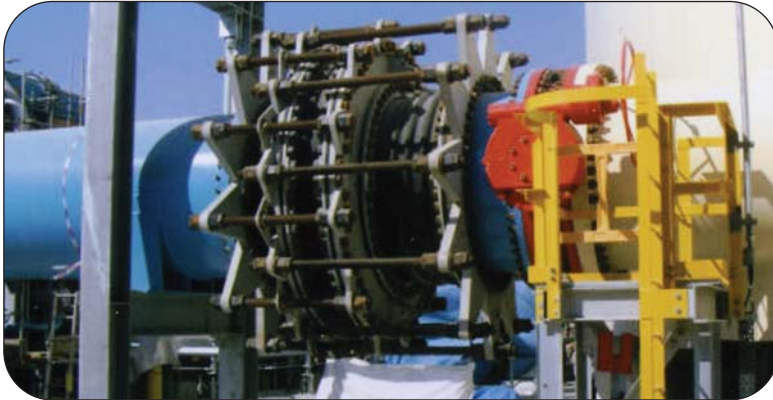
Unlined: Used for inlet and outlet ducting systems and can be exposed to very high temperatures and external insulation is required. These joints are designed to accept large movements and have the same hardware as lined expansion joints but do not convey catalyst and therefore do not require lining.

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ISCIR Romania | CNCAN Romania | EN 13480-2002 | HAF 604 China | TSG China

42HP-IRPB In-line Rubber Pressure Balanced Expansion Joints



Eliminates pressure thrust loads on your piping system while absorbing axial & lateral movement. An alternative to metallic in-line pressure balanced bellows expansion joints, which are susceptible to failures from corrosive media, cyclic loading conditions and solids from settling into the thin walled metallic convolutions.

Design

- ASME B31.1, B31.3 Pressure Piping Certification
- FSA Technical Handbook 8th Edition
- Sizes 12.7mm (1/2") to 4000mm (276") ID
- Pressures full vacuum to 20 bar
- Available with CRN

Other Innovative Thorburn Expansion Joints



PTFE Lined Rubber Expansion Joints



Rubber Dismantling Expansion Joints



PTFE Lined Metallic Expansion Joints



Rubber Lined Metallic Expansion Joints

