

# *ThorburnFlex*



Metallic Expansion Joints



FCCU Expansion Joints



Rubber Expansion Joints

# **PETROCHEMICAL**

**Engineered Solutions For Pipe Motion**

Canada   
[www.thorburnflex.com](http://www.thorburnflex.com)



## High Quality Custom Flexible Piping & Ducting Systems

Thorburn Flex Inc is a proven industry leader in the cost effective design, development, manufacturing and supply of ultra-high quality custom flexible piping and ducting systems. Thorburn Flex Inc is committed to a policy of continuous development and research to provide flexible piping products that set the industry standard for quality, safety, durability and ease of handling.



### METALLIC EXPANSION JOINT APPLICATIONS

- Hot Shell Refractory Piping
- LNG Service
- High Pressure Steam Systems
- Caustic Media Processing
- Sulfuric & Nitric Acid Production
- Heat Exchangers
- Gas Separation
- FCC Flexible Piping
- Scrubber Piping
- Heat Recovery



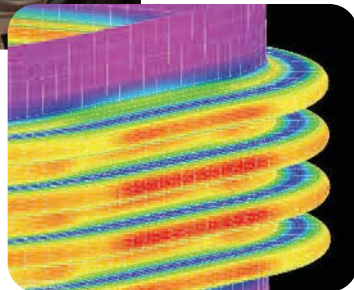
### FCCU EXPANSION JOINT APPLICATIONS

- Petrochemical industry
- Refining technology
- Chemical industry
- Process industry
- Hydrocarbon gases
- Petrochemical applications with large movements, high process temperatures and carbon steel (lower temperature) piping

### RUBBER EXPANSION JOINT APPLICATIONS

- Mud Pump Lines
- Diesel Fuel Lines
- Fresh Water & Sea Water Lines
- Permanent Ballast Water Secondary Containment Piping Systems
- Platform Process Systems.

*Operating under a strategy of global presence in niche markets, Thorburn is structured to consistently meet and exceed customer expectations of quality and value. Thorburn is also chosen by clients who understand successful project execution is based on selecting vendors who consistently provide on-time deliveries.*



### SITE SERVICES

Thorburn Flex Inc provides our clients with specialized site services such as installation supervision, quality control inspection, training, outage planning, expansion joint counter measure repair and installation.

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

- Stress analyses to verify design.
- Assistance in drawing regeneration or updates.
- Guidance in the installation & maintenance.
- On-site consultation, engineering & training sessions.
- Maintenance service during shutdowns & turnarounds
- Refurbishing, retrofitting, repairing & replacements

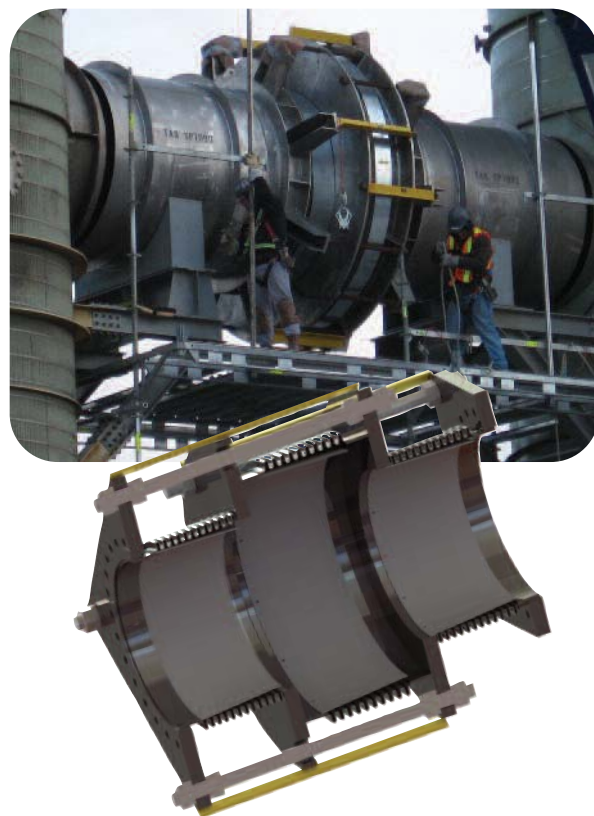
## Inline Dual Purpose Pressure Balanced Expansion Joints

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 two balancing bellows whose difference in cross-sectional area is exactly twice the cross-sectional area of the line bellows.

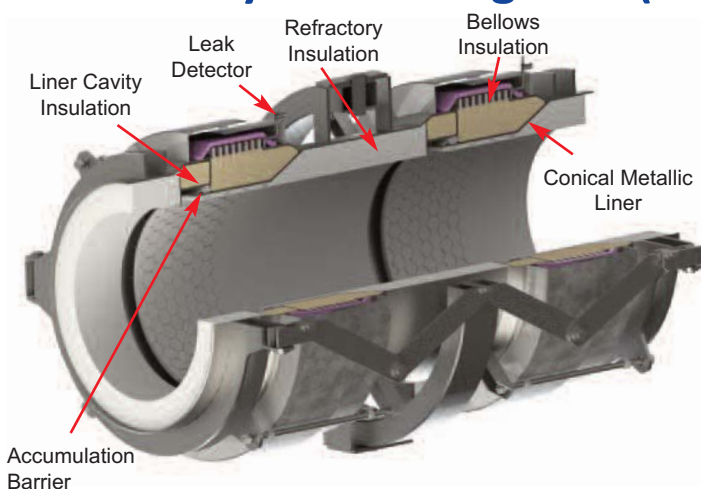
By proper crosslinking, the change in volume of the line bellows, due to a change in length (i.e. compression and/or extension) can be made to cause an equal but opposite change in volume of the balancing bellows. Thus, since the volume changes are of an equal value, the pressure forces that are normally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



**Cold Wall** - Installed in flue gas piping and utilize anchors and high density 125mm thick refractory lining to reduce the 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.

- Custom designed to suit application requirements
- Tied Universal, Hinged, Gimballed, Pressure Balanced
- Bellows Inconel 625 LCF (Low Cycle Fatigue)
- Abrasive resistant refractory lining
- Free floating structural support permits differential thermal expansion between structural rings and shell
- Typical Operating Conditions: 566°C to 760°C

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

## 42HP-PB 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

### Thorburn's 42HP-PB Advantages

#### Neutralizes Pressure Thrust:

Pressure balanced control rod system is custom designed to absorb the full pressure thrust forces, dead weight loads and eliminates the requirement for main anchors

#### Replaces Pipe Loops:

Reduces piping energy by eliminating pressure losses generated by the loop elbow

#### Extremely Compact:

Greater flexibility in piping layout

#### Filled arches:

Smooth unrestricted flow prevents media sediment buildup.

#### Freedom from Corrosion and Embrittlement:

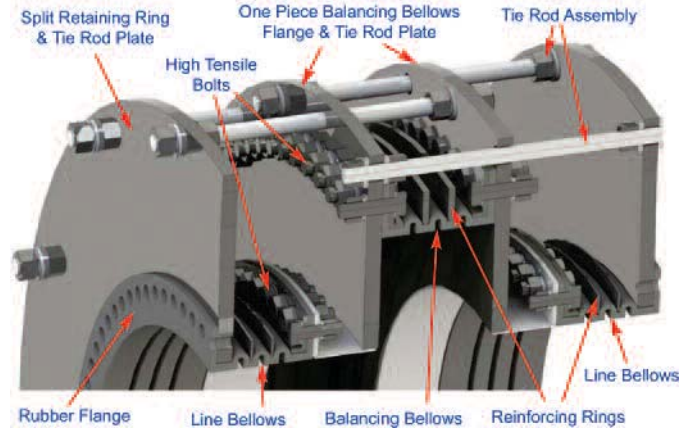
Impervious to corrosive media degradation, flex fatigue and shock

#### Super Abrasive and Erosion Resistance:

Available with smooth filled arches, abrasive resistant lining protects against sea water salt, slurry and other abrasive media

#### Wetted Metal Components Can Be Cladded or Rubber Lined:

Enhances corrosion & abrasive resistance at a fraction of the cost.



*Over 50 years of flexible piping experience  
 waiting to serve you...*