



**HVAC Products**

***Expansion Joint  
Capabilities***

***Externally Pressurized  
Internally Pressurized  
Pump Connectors***

Manufactured By:



***FLEX-WELD.COM***

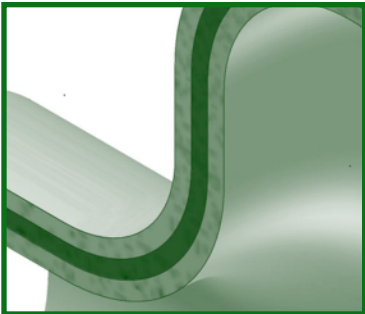


# IT IS AS EASY AS 1,2,3. THE CLEAR CHOICE IS KEFLEX MULTI-PLY EXPANSION JOINTS

## 1. DESIGN ADVANTAGES



**MULTI-PLY SAFETY FACTORS** - In a critical application, a multi-ply expansion joint can in most cases preclude a catastrophic failure. If a failure occurs in one ply due to corrosion or fatigue, the intact plies will work as a protective barrier to contain the pressure and the medium until a replacement can be made. Flex-Weld Multi-ply expansion joints are designed to provide utmost safety in the event of system failure. The burst pressures are a multiplier of the operating pressure making the Flex-Weld multi-ply bellows the most reliable component in the system



**CYCLE LIFE OPTIMIZATION** - The technical advantage of using multiple plies of thin wall thickness material is that less residual stresses are introduced at the time of bellows forming. Overall, Flex-Weld multi-ply expansion joints have lower built-in and induced stresses which ultimately results in longer cycle life. Also, the thinner gauge multiple plies have less localized induced stresses during operation compared to a single thicker ply. The configuration of the convolutions (pitch, depth, contour, number of plies, ply thickness) of FLEX-WELD multi-ply expansion joints are optimized to offer the highest fatigue life.



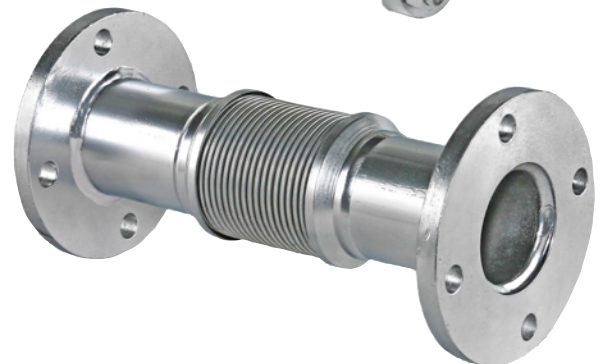
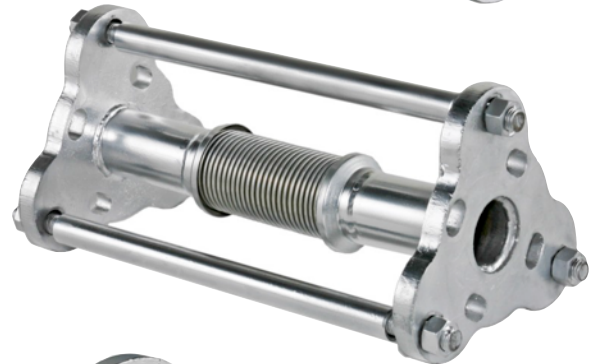
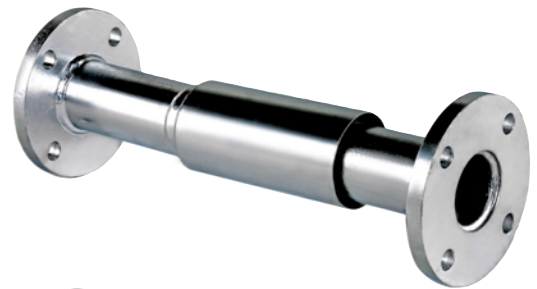
**COMPACT DESIGN** - Multi-ply expansion joints have more flexibility than conventional single-ply expansion joints and thus require less live length to accommodate a given movement. The live length of the bellows can be minimized to absorb a given combination of axial, lateral and angular movements. This results in an economical compact assembly which can be installed in a minimal amount of space. An additional benefit is a small effective area resulting in lower thrust pressures on the anchors and mechanical equipment in the system.



**LOWER THRUST FORCES** - The multi-ply design results in lower spring rates. Also, the effective cross sectional area of multi-ply expansion joints is less, compared to single-ply bellows, to accommodate a given movement. These two reductions result in lower forces and moments on the anchors, equipment and guides. A side benefit is that less anchors and guides will be required in the overall bellows piping system.

## 2. PRODUCT ADVANTAGES

- Increased flexibility
- Higher pressures attainable
- Lower thrust forces
- Lower spring rates & higher elasticity
- Minimal installation length required
- Fail safe design
  - Shoulders (on some products)
  - Liners (on some products)
  - Tie Rods (on some products)
  - Multi-ply standard construction
- Elevated corrosion resistance
- Bellow Material choices



EXPANSION JOINT BELLOW MATERIALS
T-321 Stainless Steel
T-316 (L) Stainless Steel
T-304 (L) Stainless Steel
T-347 Stainless Steel
Carpenter Alloy
Inconel 625
Inconel 625 LCF
Monel 400
Titanium
Hastelloy C-276, C-22, C-2000
Haynes 230
Hastelloy B, B2



### 3. MANUFACTURING CAPABILITIES

- Proprietary forming techniques produce metallic expansion joint bellows of consistent quality and close tolerances.
- In-process testing & inspection result in the most reliable expansion joints.
- Mechanically forming one convolution at a time minimizes material thinning.
- High frequency pulse TIG welds minimize the heat -affected (HAZ) zone and results in superior bellows strength, ductility and dependability.
- Diameters ranging from 2" I.D. to 42" I.D. (Depending on product)
- Pressures ranging from vacuum to 1,000 PSI depending on application.
- Temperatures ranging from cryogenic to 2600° F
- Axial movements up to 16" (Depending on size and Product)
- Material handling from abrasive solids to corrosive gases and liquids.



SPECIAL SERVICES & CAPABILITIES	
Mass Spec Leak Testing	Brazing
Teflon Coating	Material Selection
Heat Treating	Failure Analysis
Liquid Penetrant Testing / Radiography	Concurrent Engineering
Plating	Cleaning
Custom Flange Fitting Design	Electro-Polishing
Machining	Special Testing
Stamping	Prototyping/Modeling
Welding - Laser, MIG, TIG, RSEW	CAD / CAM
Soldering	System Engineering and Design

