



FLEX-WELD, INC.

Hydro-Formed

Electro-Deposited



Edge Welded

Mechanically Formed **BELLOWS**

Flex-Weld, Inc. bellows are formed from TIG welded tubing fabricated, assembled, and tested to exact specifications. A variety of forming methods can be utilized to achieve optimum performance. Bellows can be selected or designed for any application or market. Single or multi-ply fabrication capabilities allow for a wide range of pressure, cycle life, or spring rate requirements.

Flex-Weld, Inc.'s exceptional manufacturing methods result in a bellows configuration that exceed each industry's highest standards. Uniform wall thickness, symmetrical convolutions and reliable spring rates are assured. All incoming material is metallurgically checked to internal requirements. Our proprietary forming processes preserve and increase the inherent strength and ductility of the bellows material to enhance cycle life and fatigue resistance.

The most important feature of **Flex-Weld** bellows is the multi-ply geometry produced by telescoping thin wall precision tubing. Utilizing the same dimensions, **Flex-Weld** bellows can accept significantly more movements than our competitors. The stresses induced on the individual layers of **Flex-Weld** bellows are a fraction of the stresses induced in single wall bellows of equal thickness. This results in **Flex-Weld** bellows having a much higher cycle life and lower spring rates than our competition.

ADVANTAGES:

Extensive Size Range

Fastest Deliveries

Most OEM Valve
Bellows in Stock

Anderson
Greenwood Crosby

Dresser
Consolidated

Kunkle

Lonergan

And many more

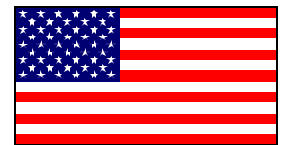
Bellows System
Design Engineering
Available

Multi-Ply


Variety of End
Configurations

No Minimum Order

*The Single
Source for All
your Bellows
Requirements!*



**100%
American Made**



BELLWOS

MARKETS

Automotive
Aerospace
Medical
Industrial
HVAC
Semiconductor

Power Generation
Commercial
Instrumentation
Vacuum
Process
Electronic

Military
Cryogenic
UHV
Nuclear
National Labs
Valve

Valve Repair
Steel
Paper
Engine/ Exhaust
Petrochemical
Pharmaceutical

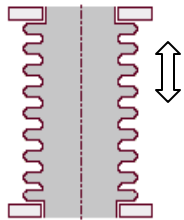
AVAILABLE MATERIALS

T-321 Stainless Steel
T-316 (L) Stainless Steel
T-304 (L) Stainless Steel
T-347 Stainless Steel
Brass
Beryllium Copper
Phosphor Bronze
Carpenter Alloy 20

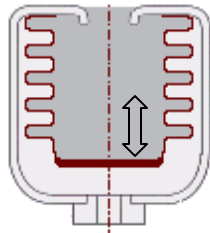
Inconel 625
Inconel 625 LCF
Monel 400
Hastelloy C-276, C-22, C-2000
Haynes 230
Hastelloy B, B2
Titanium
Other alloys available upon request



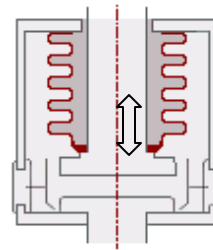
TYPICAL APPLICATIONS



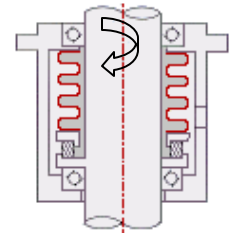
Expansion Joint



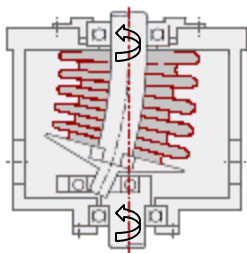
Accumulator



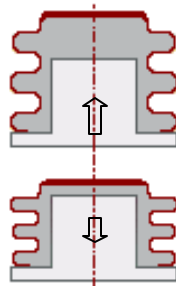
Electrode or
Shaft Sealing



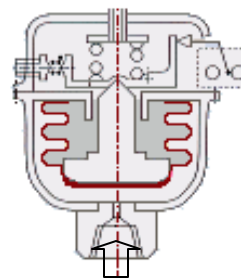
Mechanical Sealing



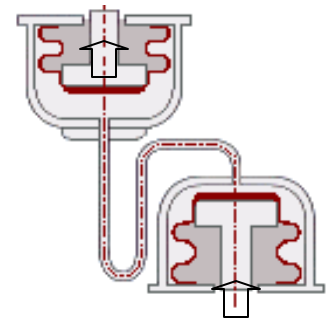
Rotary Seal Housing



Air Pressure Control



Pressure Detector



Remote Transmission
& Flow Control

TOLL FREE: 1-800-323-6893

Spotlight on Multi-ply Bellows



FLEX-WELD FEATURES:

Increased flexibility

Minimal installation length required

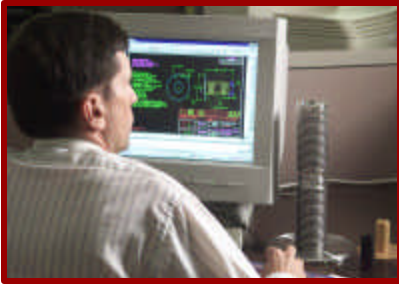
Higher pressures attainable

Fail safe design

Lower thrust forces

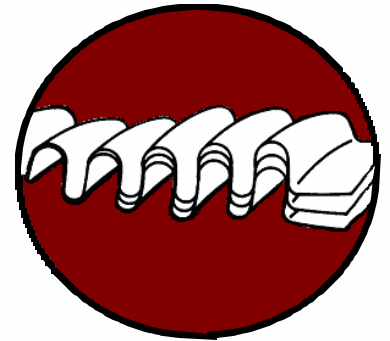
Elevated corrosion resistance

ADVANTAGES:



MULTI-PLY SAFETY FACTORS - In a critical application, a multi-ply bellows assembly 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 bellows 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 .002" - .006" wall thickness material is that less residual stresses are introduced at the time of bellows forming. Overall, Flex-Weld multi-ply bellows 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 bellows are optimized to offer the highest fatigue life.



COMPACT DESIGN - Multi-ply bellows have more flexibility than conventional single-ply bellows 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 bellows 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.



Spotlight on Multi-ply Bellows



MANUFACTURING CAPABILITIES



Proprietary forming techniques produce metallic bellows of consistent quality and close tolerances.

In-process testing & inspection result in the most reliable bellows.

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 1/8" I.D. to 280" I.D.

Pressures ranging from vacuum to 10,000 PSI depending on application.

Temperatures ranging from cryogenic to 2800° F

Axial movements up to 24" depending up on size.

Material handling from abrasive solids to corrosive gases and liquids.

SPECIAL CAPABILITIES



Mass Spec Leak Testing

Teflon Coating

Heat Treating

Liquid Penetrant Testing / Radiography

Plating

Custom Flange Fitting Design

Machining / Stamping

Welding

Laser, Lap, ASME, MIG, TIG,
RSEW

Soldering

Brazing

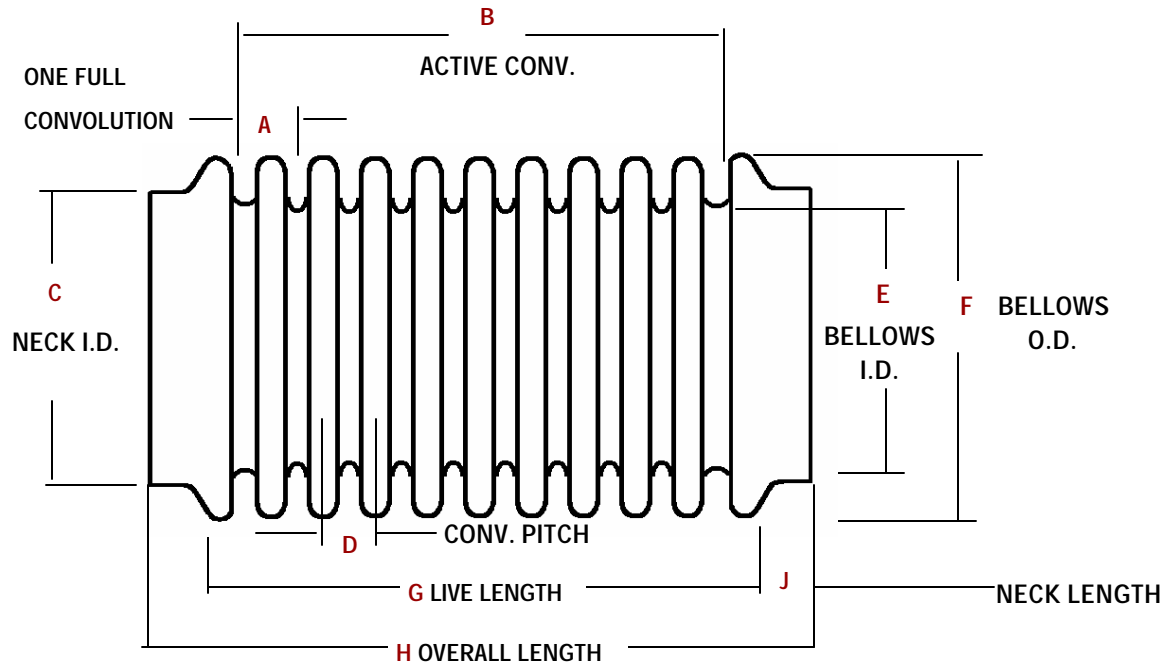
Material Selection



TOLL FREE: 1-800-323-6893

BELLOWS

BELLOWS DESIGN DATA



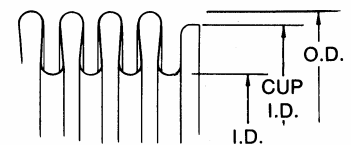
END CONFIGURATIONS

The selection of economical and proper end fittings is vital to good bellows design. **Flex-Weld, Inc.** offers a wide range of configurations including; straight, slotted, flared, flanged, grooved and fitted ends. These fittings permit wide latitude in valve and instrument design.

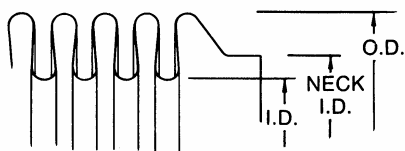
Flex-Weld, Inc. bellows engineers routinely are asked to analyze and review the entire scope of intended use to quickly and accurately insure overall system performance. Our reputation is based on our innovative designs, fast turn-around, and extensive customized end fittings so often demanded by progressive industries.



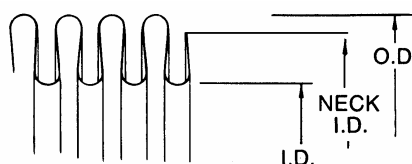
Cup Neck Open Convolution



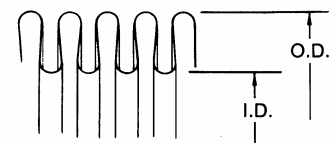
Standard Bellows Neck



Cuff Neck



Flat Faced Closed Convolution





BELLOWS

Bellows / 0703

DATA WORKSHEET FOR BELLOWS DESIGN RECOMMENDATIONS

Submitted By:	Company:	
Part Description:	Quantity Required:	
Size of Assembly: Nom. Size or inside diameter of the connecting end fittings	Inches	
Installed Length (OAL): Space between connecting points	Inches	
Type of Media: indicate if liquid, steam, gas, exhaust, slurry, solids, etc.		
Bellows Material Type:		
Temperature of Flowing Media: Indicate both operating and maximum temperatures of system	Operating ° F	Maximum ° F
Temperature of Surrounding Atmosphere: indicate both min. and max. temp of atmosphere at the expansion joint	Min. Degrees ° F	Max. Degrees ° F
Velocity of Flowing Media: In feet/sec or gallons/min	Feet/Sec	Gal/Min
Operating Pressure: Actual pressure which system works under normal conditions	Positive PSIG	Negative HG
Design Pressure of System: Highest / most severe pressure during operation	Positive PSIG	Negative HG
Test Method and Requirements: Test method used and testing levels required for system	Positive PSIG	Negative HG
Axial Movement (Compression/Extension): In inches as a result of system extension/expansion	Compression in Inches	Extension in Inches
Lateral Deflection / Offset: In inches:	Inches	
Angular Movement: In degrees:	Degrees	
Lead Time / Target Pricing:	Lead Time	Target Price
End Fittings 1/E: Indicate end fitting requirements, thickness, material type, & configuration		
End Fittings O/E: Indicate end fitting requirements, thickness, material type, & configuration		
Special Notes:		

Additional Literature:

Edge Welded Bellows

10MC / 30MC Exhaust Bellows Series

Fabricated Metal Hose