High-precision sealing solutions engineered in edge-welded bellows technology.

Semiconductor and High-Vacuum Bellows

TARA TECHNOLOGIES combines five decades of Belfab® experience in producing the finest quality bellows components and assemblies with state-of-the-art capabilities in chamber technology, advanced coatings and testing to help you solve problems and improve cost-of-ownership from Lab to Fab.

www.taratechnologies.com

Belfab® Products
Semiconductor and High Vacuum Bellows

TARA TECHNOLOGIES designs and manufactures Belfab® high-precision, edge-welded metal bellows used throughout front-end semiconductor wafer-processing equipment and in other high-vacuum and high-purity applications requiring hermetic sealing and/or flexibility.

TARA TECHNOLOGIES has more semiconductor equipment bellows experience than any other supplier in the world. These bellows are used in critical actuating, compensating, connecting, manipulating, sealing, vacuum barrier and valving systems where purity and reliability are paramount.

TARA TECHNOLOGIES also produces higher-level semiconductor equipment systems, such as wafer pedestals, heater tables, and source assemblies. Ask us about TARA TECHNOLOGIES capabilities in complete system design, fabrication and testing services.

As an ISO 9001-certified organization well-recognized for world-class cellular manufacturing, TARA TECHNOLOGIES has built its reputation on a foundation of total quality achievement.

Applications
- Accumulators
- Actuators
- Beam Lines
- Chamber-Lift Bellows
- Connectors
- Couplings (Flexible)
- Couplings (Torque)
- Feed Throughs
- Gas Lines
- Gate Valves
- Leak Detectors
- Lifters
- Orienters
- Reservoirs/Volume Compensators
- Sensors
- Slit Valves
- Valve Stem Seals
- Vibration Isolation
- Wafer-Lift Bellows
- Wafer Handlers
- X-Y-Z Manipulators

Capabilities
- Design and Fabrication
  - BELCALX™ (Bellows Design Program)
  - CAD (Computer Aided Design)
  - FEA (Finite Element Analysis)
  - Solid Modeling
  - Significant, Scalable Class 100, Class 1000, Class 10000 Clean Room Capabilities

- Testing/Reliability Engineering
  - Leak Detection
  - Life Cycle (at Pressure, Temperature)
  - Load/Force
  - Mass Spectrometer Testing (MST)
  - Mean Effective Area
  - Metallurgical
  - Pressure (Burst, Impulse)
  - Rupture
  - SEM (Scanning Electron Microscope)
  - Shock
  - Spring Rate
  - Vibration (Random, Sinusoidal)
  - Volume Displacement

- Welding
  - Electron Beam (EBW) (up to 150kV)
  - Gas Tungsten Arc (GTAW)
  - Laser
  - Micro Plasma Arc (PAW)
  - Orbital Gas Tungsten Arc

- Materials
  - 300 Series Stainless Steel
  - AM 350 Stainless Steel
  - Hastelloy C
  - Haynes 242
  - Inconel 625, 718
  - Titanium
Engineered Solutions from a Market Leader

Belfab® has more front-end semiconductor equipment bellows design and production experience than any other company in the world. With over 50 years of overall bellows design experience, and as a key supplier to the world’s largest wafer-process equipment companies since the 1970’s, Belfab® can provide an engineered solution for your bellows application, drawing on our unequalled design database and bellows manufacturing experience.

Edge-welded metal bellows provide superior stroke capabilities and more precise spring rates than formed bellows, thus offering greater flexibility and control in the smallest possible space. Because edge-welded metal bellows are manufactured by welding both the inner and outer diameters of the bellows plates, they can be produced in a broader variety of materials than formed bellows, in which the number and shape of the bellows convolutions are limited by material ductility. Belfab®’s half-century of experience in optimizing bellows configurations for demanding applications gives you the edge you need to make your equipment perform better and satisfy your own product warranty requirements.

Belfab® engineers will design a robust product that achieves the highest life-cycle possible while addressing all of your operating parameters, including stroke (lateral, angular and/or axial movement,) pressure (internal and external,) temperature and environment. Linear and thermal movements, vibration isolation and assembly offsets can all be accommodated with Belfab®-designed bellows devices.

Belfab® has developed the rapid design/prototyping and production-ramp capabilities required for our demanding industry. A Six-Sigma manufacturing focus ensures delivery of high-quality product at the lowest possible cost.

Demand Belfab® Metal Bellows when your application requires:
- Flexibility, especially in a small space
- Hermetic sealing
- Creating pressure barriers
- Accommodating thermal growth or mechanical movement
- Accommodating demanding temperatures, pressures and/or media
- Isolating vibration
- Offsetting assembly tolerances

The Belfab® Advantage

Experience
- Over 50 years of Bellows design knowledge
- Over 500,000 Belfab® Bellows Produced
- Extensive Design Database

Reliability
- Key/Preferred Supplier to Leading Equipment OEM’s and Fabs
- Cycle Life Warranties
- Complete Testing Capabilities

Quality
- Six-Sigma Focus/ISO 9001 Certified
- Class 100/Class 1000/Class 10000 Clean Rooms
- Award-Winning Quality Programs

Convenience
- Custom Engineering
- Rapid Prototyping/Short Lead Times
- Production in US and Asia
**Bellows Application Data Sheet**

**Required Information**
- Extended Length: ___________________  Compressed Length: ___________________
- Desired Free Length: ___________________  Desired Material: ___________________
- Spring Rate or Load Requirement & Tolerance: ___________________
- Cycle Life Requirement: ___________________  Shaft Diameter: ___________________
- Lateral (Parallel) Offset: ___________________  Angular Offset: ___________________
- Operating Pressure: ___________________  External: [ ]  Internal: [ ]
- Media: ___________________  External: [ ]  Internal: [ ]
- Temperature Range: °F: [ ]  °C: [ ]

**Additional Information**
- Application / Function: ___________________
- Equipment Used On (Type / Model): ___________________
- Market: Aerospace [ ], Medical [ ], Semiconductor [ ], UHV [ ], Other: ___________________
- Quantity Requirements: Prototype: ___________________  Production: ___________________
- Delivery Requirements: Prototype: ___________________  Production: ___________________
- Test Requirements (i.e. Burst / Test Pressure, Number of Cycles, Leakage Rate, etc.): ___________________
- Adaptive Hardware / End Fitting Requirements (i.e. Material, Design, etc.) May include sketch: ___________________
- Other Requirements (i.e. Cleaning, Marking, Packaging, etc.): ___________________

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**Contact Information**

**East Coast & Europe**
- 305 Fentress Boulevard
- Daytona Beach, FL 32114 USA
- Phone: 386-253-0628
- Toll Free: 1-866-669-8348
- Fax: 386-257-0122

**West Coast**
- 831 Bransten Road
- San Carlos, CA 94070
- Phone: 650-594-9797
- Toll Free: 1-866-669-8348
- Fax: 650-594-9620

**Asia**
- Blk 203, #05-52, Woodlands Avenue 9
- Woodlands Spectrum 2, Singapore, 738956
- Phone: 65-67592335
- Toll Free: 1-866-669-8348
- Fax: 65-67597319
e-mail: info@taratechnologies.com

www.taratechnologies.com