



AT THE HEART OF **ADVANCED MEDICAL APPLICATIONS**
TECHNOLOGY AND SERVICES FROM
SENIOR AEROSPACE METAL BELLOWS

- CUSTOM DESIGNS
- WELDED METAL BELLOWS
- BELLOWS PUMPS/COMPRESSORS
- PRECISION METAL JOINING AND FABRICATION

senior
Aerospace
Metal Bellows

Medical Applications

METAL BELLOWS IS READY TO HELP YOU WITH YOUR GREATEST MEDICAL APPLICATION CHALLENGES

Senior Aerospace Metal Bellows is well-equipped to work with medical equipment developers and manufacturers to achieve their goals by offering technology, products, custom design and manufacturing capabilities. We deliver custom engineered solutions to meet our customers' mechanical and electromechanical component and assembly requirements.

Medical Design and Manufacturing Engineering Capabilities

- Structural analysis
- Stress analysis
- Fatigue analysis
- Component miniaturization
- Optimization for reduced parts count
- Design for manufacturability

Welded Metal Bellows

Our welded metal bellows are available in a variety of materials including stainless steel, titanium, Inconel, and other special alloys. We can manufacture bellows with diameters ranging from less than 1/4" to 20" or greater. Bellows designs can achieve 1,000,000 cycles, 10,000,000 cycles or greater.

Fabrication and Assembly to Your Specifications

We can help you custom design and manufacture a bellows or higher level assembly to meet your specific medical equipment needs and then use our precision metal joining and fabrication capabilities on your bellows or non-bellows designs. Our manufacturing capabilities include:

Precision Metal Joining and Welding

- Gas Tungsten Arc Welding
- Laser Welding
- Electron Beam Welding
- Furnace Brazing

Metal Finishing

- Passivation
- Etch
- Electropolish

Metal Forming

- Mechanical and Hydraulic Presses

Clean Room Manufacture

- Class 1000 clean room with class 100 flow benches

Metallurgy

- Metallographic analysis
- Instron tensile tester

For more information on how you can put our expertise to work in your medical applications, visit us at www.metalbellows.com/medical or call us at 1(800)BELLOWS, or email us at medical@metalbellows.com



Metal Bellows Technology - Already Embedded In Breakthrough Medical Applications

Radiation Therapy Equipment Welded Metal Bellows Dynamic Seal

Radiation therapy equipment uses a welded metal bellows hermetic seal in its beam alignment mechanism. The welded metal bellows allows for a range of axial and angular motion while maintaining a hermetic seal. Welded metal bellows can provide this range of motion in a small package and are capable of a very high cycle life.

Hyperbaric Chamber Welded Metal Bellows Compressor

The MET BEL® pumps and compressors provide for zero leakage, hermetic operation. All wetted surfaces are stainless steel and there are no wearing surfaces and no lubrication required. This results in maintenance free, clean operation, long life and high reliability.

Implantable Drug Pump Welded Metal Bellows Reservoir

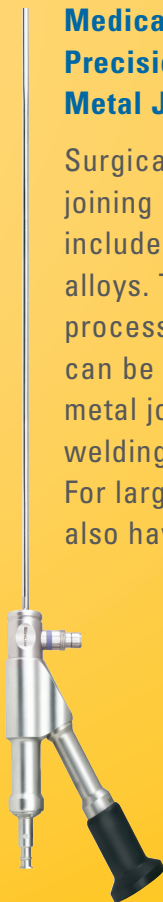
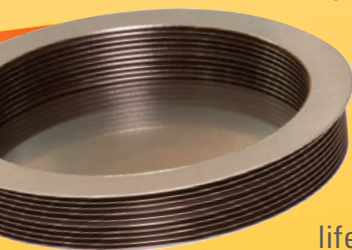
Extremely thin gauge titanium welded bellows are used in the peristaltic pump device as the main drug reservoir. This pump is used to combat chronic pain as well as other therapies. The bellows provides a flexible boundary between the medication and the gas pressure used to deliver the dosage to the pump. The benefits include a long cycle life as well as leak free operation - critical to the pump's success.

CO₂ Heart Laser Equipment Welded Metal Bellows Dynamic Seal

Medical lasers use a welded metal bellows in the beam focusing mechanism. The bellows allows a range of motion to align the front end of the mirror to a laser focus beam. The welded metal bellows maintains a hermetic seal and provides high cycle life.

Medical Instruments Precision Welding and Metal Joining

Surgical instruments require precision metal joining of very thin gauge metals. Materials include stainless steel, titanium and other alloys. The same precision metal joining processes used for metal bellows assemblies can be applied to non-bellows thin gauge metal joining. Processes include TIG and laser welding as well as vacuum furnace brazing. For larger, heavier gauge medical welding we also have electron beam welding capabilities.





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