OTS BELLOWS

Off-The-Shelf Welded Diaphragm Metal Bellows

Description
Two contoured diaphragms – each constructed from thin stainless steel – are welded at the inside diameter to form a convolution. Capsules are formed when convolutions are stacked on a horizontal arbor and welded at the outside diameter.

- Most SAMB bellows have a nested ripple diaphragm configuration that provides maximum stroke, minimum stress, superior flexibility, and full nesting when collapsed or compressed. Customized bellows, including those with flat plate, single sweep, and torus contours, are available for special applications.
- 374 stainless steel ensures corrosion resistance, weldability, and engineering properties that perform in temperature ranges from cryogenic to 800°F and beyond. 347 is ideal for high-vacuum applications, research, instrumentation, and volume compensators – wherever moderate pressure, maximum stroke and constant spring rates are required. Other commonly used materials include AM 350 stainless steel, Inconel, titanium and hastelloy.
- Depending on applications, the service life ranges anywhere between 5,000 cycles to infinity. Reduced stroke and additional capsules increase bellows life.

SAMB Features
- Wide range of operating temperatures
- Constant effective area with change in pressure

Applications
OTS welded bellows are ideal for moderate pressure and high vacuum applications where immediate availability is critical. Such applications include:
- High vacuum seals
- Leak-free motion feedthroughs
- Flexible joints
- Volume compensators, accumulators
- Pressure and temperature actuators

• Excellent spring and pressure deflection characteristics
• Ability to withstand high pressure
• Long stroke per unit length
• Short nestled length
• Corrosion resistance
• Leak tightness to less than 1X10^-10scc/sec
Welded Diaphragm Metal Bellows: Off-The-
## CONTACT SENIOR AEROSPACE METAL BELLOWS

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### INDUSTRY TERM AND SYMBOLS

- **OD**: Outside diameter of the bellows
- **K**: Spring rate of a bellows. The ratio of force to stroke expressed in lb/in
- **ID**: Inside diameter of the bellows
- **Span**: Depth of a convolution measured from the OD to the ID and is equal to (OD-ID)/2. The ratio of the span to the OD should be less than 1/3
- **P**: Pitch, height or length of a convolution
- **NP**: Nested pitch (solid height of convolution)
- **T**: Diaphragm thickness
- **Free Length**: Length of bellows with no load
- **Length as Welded**: Length of bellows prior to operation
- **Mean Diameter**: (OD+ID)/2
- **EA**: Effective Area. That surface on which pressure acts to produce thrust. EA=π[(OD+ID)/2]^2
- **A/K**: EA/K = stroke in inches per psi
- **ΔV**: Volume displacement = EA × stroke
- **ΔP**: Pressure (differential across the bellows)
- **N**: Number of convolutions
Excellent spring and pressure deflection characteristics

Ability to withstand high pressure

Long stroke per unit length

Short nestled length

Corrosion resistance

Leak tightness to less than 1X10^-10scc/sec

Applications

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Ordering & Selection

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Indicate specifications from these four areas:

- End Fitting Types
- Stroke
- Bellows Diameters
- Single Or Multiple Capsules

- Each additional capsule increases allowable stroke while introducing a proportionate decrease in spring rate
- Order by part number, as indicated in the chart above
- Bellows are delivered from stock, except those with size 93 diameters and above
- Many other non-OTS bellows are available beyond those listed in this catalog

Ordering Information (Order by Part Number)

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<th>TYPE FITTINGS</th>
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Senior Aerospace

Metal Bellows

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