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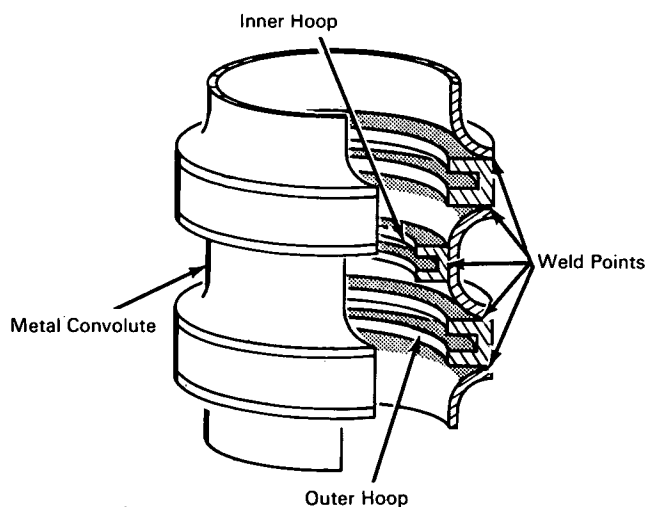
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# NASA TECH BRIEF



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## Bellows Design Features Low Spring Rate and Long Life



### The problem:

To design a high pressure bellows that is economical to produce, has a low spring rate, and is sensitive to pressure and temperature changes. Present high pressure bellows have high corresponding spring rates, are insensitive to small pressure changes, and exhibit unstable cross-sectional diameters.

### The solution:

A bellows that combines high strength rigid hoops for strength and stability with sheet stock for low spring rate effects.

### How it's done:

Sheet metal convolutes are welded to alternate rigid inner and outer hoops. The hoop skeleton structure withstands high pressures while supporting flexible sheet stock convolutes that provide the low spring rate to give the bellows long life. The bellows diameter

remains stable since the hoops do not deform under pressure application. This bellows has long life because the flexible sheet stock is protected from stress fatigue at its bend radii.

### Notes:

1. The simplicity of this bellows design facilitates manufacture by mass production methods.
2. This development is in conceptual stage only, and as of date of publication of this Tech Brief, neither a model nor prototype has been constructed.

### Patent status:

No patent action is contemplated by NASA.

Source: R. F. Lusic  
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