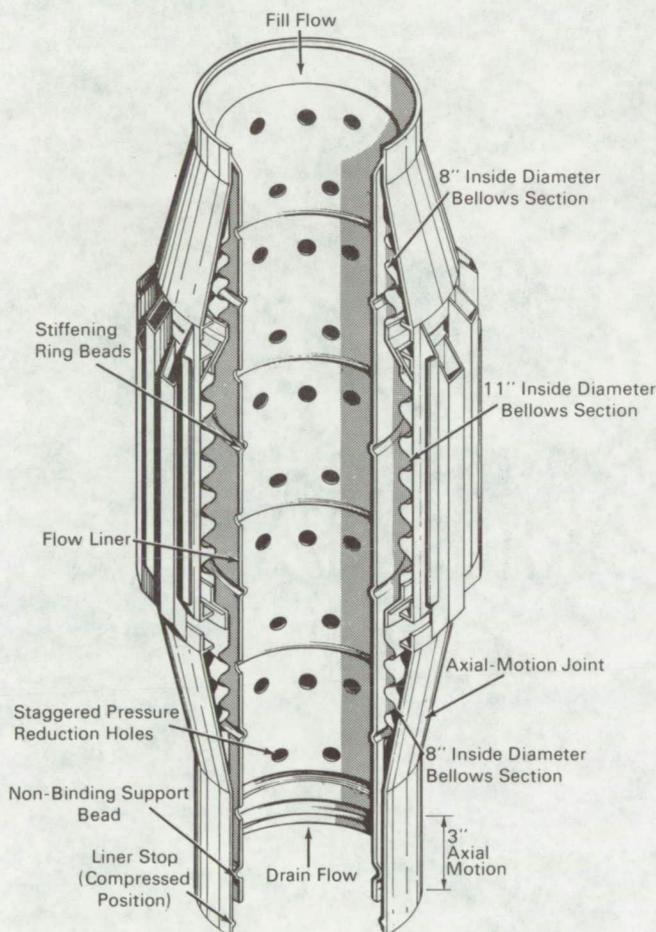


# NASA TECH BRIEF



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Division, NASA, Code UT, Washington, D.C. 20546.

## Two-Directional-Flow, Axial-Motion-Joint Flow Liner



Two-Directional-Flow, 8" Diameter,  
Axial-Motion-Joint Flow Liner

### The problem:

To design a flow liner capable of eliminating high-cycle fatigue in ducts carrying cryogenic fluids.

### The solution:

Use a 3-inch axial motion joint consisting of two end bellows sections of 8-inch inside diameter and an intermediate section of 11-inch inside diameter.

### How it's done:

The flow liner is designed for limited axial motion of the duct with structural stability by use of stiffening ring beads and a non-binding bead. This configuration is capable of handling two-directional, high-velocity cryogenic liquid flow with a 3-inch axial motion without binding within a 25-inch length. Staggered holes within the liner wall reduce the pressure gradient, and the liner isolates the inner surfaces of the bellows from the high velocity fluid flow.

### Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer  
Marshall Space Flight Center  
Huntsville, Alabama 35812

Reference: B70-10166

### Patent status:

No patent action is contemplated by NASA.

Source: George M. Innes and Lloyd L. Bissing of  
Space Division  
North American Rockwell Corporation  
under contract to  
Marshall Space Flight Center  
(MFS-16215)

Category 06