Mercuric Iodide Anticoincidence Shield for Gamma-Ray Spectrometer

Goddard Space Flight Center, Greenbelt, Maryland

A film-growth process was developed for polycrystalline mercuric iodide that creates cost-effective, large-area detectors for high-energy charged-particle detection. A material, called a barrier film, is introduced onto the substrate before the normal mercuric iodide film growth process. The barrier film improves the quality of the normal film grown and enhances the adhesion between the film and the substrate.

The films grown using this improved technique were found to have adequate signal-to-noise properties so that individual high-energy charged-particle interactions could be distinguished from noise, and thus, could be used to provide an anticoincidence veto function as desired.

This work was done by Neal Hartsough and Jan Iwanczyk of DxRay, Inc. for Goddard Space Flight Center. For further information, contact the Goddard Innovative Partnerships Office at (301) 286-5810. GSC-15635-1

Improved Method of Design for Folding Inflatable Shells

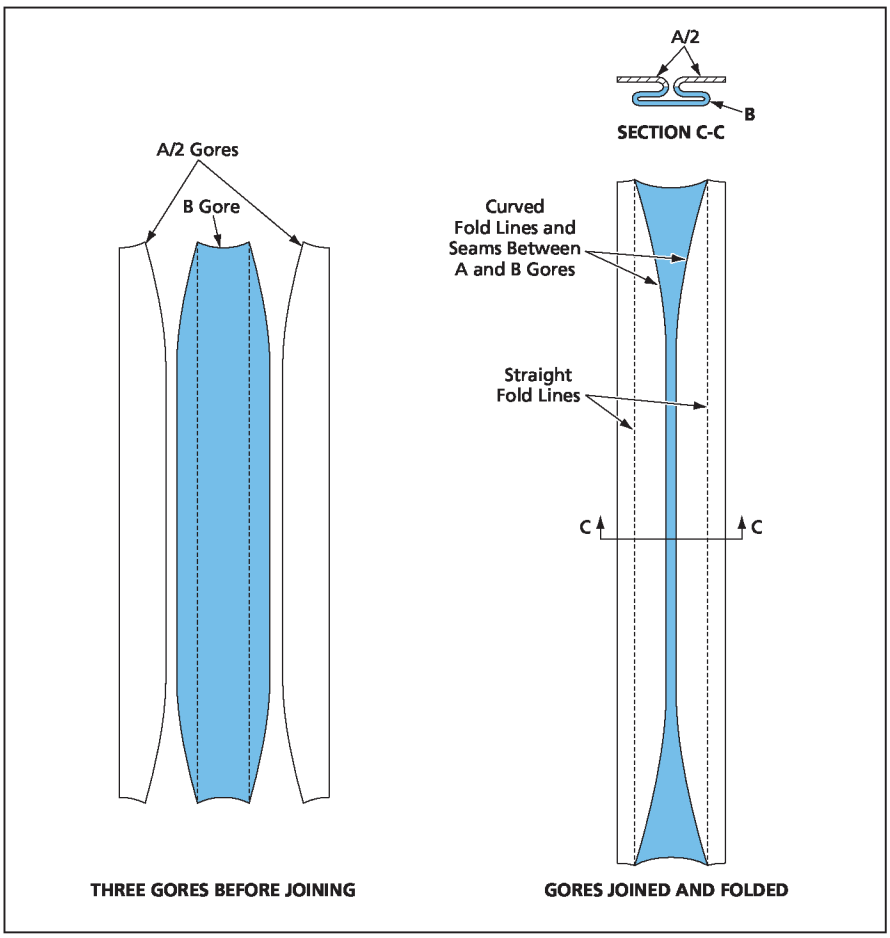
Designs of gores reflect multiple considerations of assembly, stowage, and deployment.

Lyndon B. Johnson Space Center, Houston, Texas

An improved method of designing complexly shaped inflatable shells to be assembled from gores was conceived for original application to the inflatable outer shell of a developmental habitable spacecraft module having a cylindrical mid-length section with toroidal end caps. The method is also applicable to inflatable shells of various shapes for terrestrial use.

The method addresses problems associated with the assembly, folding, transport, and deployment of inflatable shells that may comprise multiple layers and have complex shapes that can include such doubly curved surfaces as toroids and spheres. One particularly difficult problem is that of mathematically defining fold lines on a gore pattern in a double-curvature region. Moreover, because the fold lines in a double-curvature region tend to be curved, there is a practical problem of how to implement the folds. Another problem is that of modifying the basic gore shapes and sizes for the various layers so that when they are folded as part of the integral structure, they do not mechanically interfere with each other at the fold lines.

Heretofore, it has been a common practice to design an inflatable shell to be assembled in the deployed configuration, without regard for the need to fold it into compact form. Typically, the result has been that folding has been a difficult, time-consuming process resulting in a



The **Basic Repeating Unit** of a shell comprising a cylinder with toroidal end caps is a subassembly of three gores.