

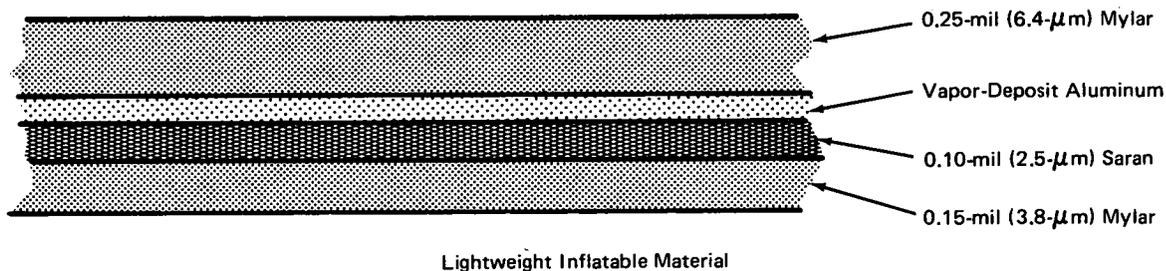
# NASA TECH BRIEF

## Langley Research Center



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### Lightweight Inflatable Material With Low Permeability



A new inflatable material is lighter in weight than prior materials, and it also has the ability to maintain high pressure for longer periods of time. The material was devised to provide inflatable braces for the high-altitude decelerator, but it could be fabricated into unlimited shapes and used in any lightweight configuration requiring full inflation over long periods of time. The material can be used for items such as balloons, for structural members such as spars and braces, and in portable disposable radar dishes or inflatable habitats.

This new material (see illustration) features the combination of Mylar, for strength, and saran, for impermeable qualities. A second lamination of Mylar prevents blocking, adds strength, and increases barrier rating. Different combinations of laminations produce a variety of thicknesses and barrier ratings. The material can be metallized for increased barrier reliability and radar reflectivity, and can be treated with a heat-resistant coating. The metallization can be sandwiched between laminations; this permits more handling and folding without damage to metal deposit.

A satisfactory quality material can be produced in a range from 0.40- to 0.70-mil (10.2 to 17.8  $\mu\text{m}$ ) thick. It could have four or five laminations, which would include one or two Mylar and one or two aluminum depositions. The saran used is 10 gauge, while the Mylar

is either 15 or 25 gauge. The material shown weighs 0.004749 lb/ft<sup>2</sup> (0.023187 kg/m<sup>2</sup>), while the 0.40-mil thickness weighs 0.003698 lb/ft<sup>2</sup> (0.018056 kg/m<sup>2</sup>).

During the fabrication of this material, it was determined that the preferred procedure is to metallize first and then to coat, in producing a metallized and coated web. The best possible product quality is required for metallizing; if the film is coated first, any defects introduced in the coating step will decrease the chance of getting a good quality product, after metallizing.

#### Note:

Requests for further information may be directed to:  
 Technology Utilization Officer  
 Langley Research Center  
 Mail Stop 139-A  
 Hampton, Virginia 23665  
 Reference: B73-10400

#### Patent status:

NASA has decided not to apply for a patent.

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