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NASA TECH BRIEF

Langley Research Center

NASA-Tricot: A Lightweight, Radar Reflective, Knitted Fabric

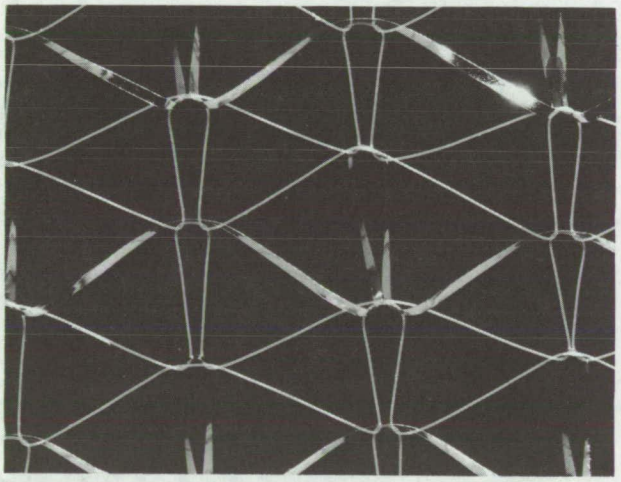

Figure 1.

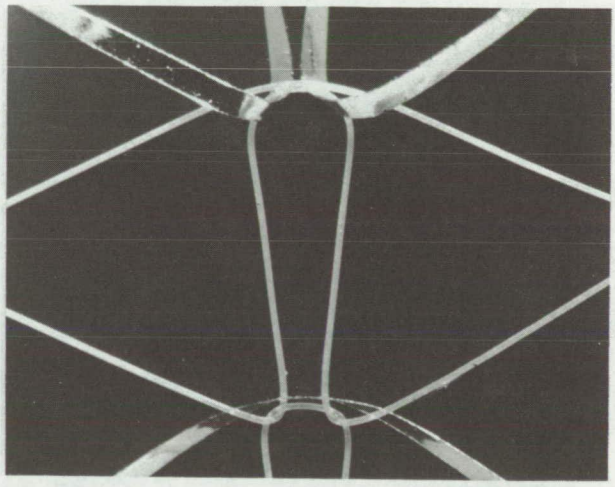

Figure 2.

A new fabric, knitted on conventional knitting machines using commercially available yarns, is radar reflective and extremely lightweight, and has a high aerodynamic drag capability. Previously, the availability of suitably fine meshes for typical high-altitude (80 to 100 km) decelerator canopies was severely limited by fabrication problems. A number of fabrication concepts including gluing, punching, slicing, milling, weaving, and knitting were investigated, but the technology was essentially limited to punched or glued Mylar tape meshes produced in small quantities at relatively high cost. The new fabric, however, can be produced in large quantity at relatively low cost.

The two yarn components used in NASA-Tricot are 15-denier nylon monofilament and aluminized Mylar tape (Lurex TE 100). The nylon monofilament is 38μm (1.5 mils) in diameter. The Lurex tape is 1.3μm (0.5 mil) thick and 250μm (10 mils) wide. The Lurex is coated on both sides with aluminum 400 Å thick; the aluminum is in turn covered with a chemically resistant coating which is more than 400 Å thick.

The basic shape of the elements making up the mesh fabric is triangular (see Figures 1 and 2), with side lengths of approximately 3 mm. The NASA-Tricot is a circular knit mesh fabricated as a continuous, seamless cylinder which may be split to form a continuous sheet. Nominal weight is 5 gm/m^2, and the drag-producing efficiency has been established through studies based on Stoke's law.

Note:

Requests for further information may be directed to:

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(continued overleaf)

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to:

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