NewsRelease

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23681-0001

H. Keith Henry
Langley Research Center, Hampton, Va.
(757) 864-6120/24
h.k.henry@larc.nasa.gov

Ross Haghighat
Triton Systems,Inc.
(978) 250-4200
ross-h@TRITONSYS.com

For Release: Sept. 19, 2000

RELEASE NO. 00-067

TWO NAMED AMONG 100 BEST NEW HIGH-TECH PRODUCTS

NASA inventions help in a material way

NASA Langley inventions have been named two of the 100 most significant new technical products of 2000.

One represents a dramatic improvement in aerospace materials -- the other a dramatic improvement in control of aerospace structures. In different ways, they will lengthen the life and improve the performance of spacecraft or aircraft and promise to further improve quality of life on Earth through future consumer products.

The R&D 100 award is presented annually by *Research and Development Magazine* to the innovators of the 100 most technologically significant new products of the year from around the world. Selections are made by a panel of distinguished scientists and engineers.

Cosmic Protection

One of the Langley inventions is a class of aerospace materials that is highly resistant to the harsh extremes of low Earth orbit where an increasing number of satellites are being placed. These superplastics -- called polymers -- will provide an effective coating when applied to spacecraft surfaces, protecting against erosion by atomic oxygen and damage from space radiation. This resistance translates to spacecraft components with longer lifetimes and reduced cost.

NASA Langley's commercial partner, Triton Systems, Inc., Chelmsford, Mass., has developed processing and fabrication techniques for the materials and manufactures them in the form of powder, adhesive tape, solution, fiber, thread, fabric and film. The fibers are twisted into thread that can be used to sew multi-layer thermal insulation blankets, woven into fabric and braided to make tethers. Large films can be metallized and used for solar arrays or inflatable space structures.

Triton markets its product under the TOR tradename. The materials have been selected for use on two NASA space missions scheduled for launch in the winter of 2000. They are presently

- more -

under evaluation for several electronic applications because of inherent resistance to high voltage and arcing.

Smart Wings and Things

The second NASA Langley invention is a super-sensitive actuator that has at least a dozen potential applications, but is presently being evaluated for the control of vibrations in very large, flexible space structures. As envisioned, the lightweight composite actuators would be embedded in the framework of giant antennae or telescope mirrors. When low voltages are automatically applied, the actuators would eliminate vibrations and unwanted distortions in the shape of the deployed structure. With this technology, telescope mirrors would theoretically be large enough, and stable enough, to see planets orbiting other stars.

Closer to home, the same technology could allow airplanes to mimic birds by instantly reshaping the wing surface while in flight. A series of embedded actuators could adjust to flight conditions, improving performance and fuel efficiency of future aircraft.

Similar actuators can be retrofitted to existing aircraft, naval, automotive or civil engineering structures for vibration damping and to increase structural life. They can also be integrated into aircraft passenger compartments, engine nacelles and helicopter blades to reduce noise levels.

Called the LaRC Macro-Fiber Composite, the actuator device is proving to be low-cost, have high performance and endurance, and be conformable. It may be used as an integral part of virtually any composite structure.

In the 33 years of NASA Langley's participation in the R&D 100 competition, 33 NASA Langley developments have been selected.

Individuals to be honored Sept. 27 at the Chicago Museum of Science and Industry:

- For atomic-oxygen resistant TOR Polymers. From NASA Langley: John Connell, principal inventor; Paul Hergenrother; and Joseph Smith. From Triton Systems: Ross Haghighat, president, and Peter Schuler.

- For LaRC Macro-Fiber Composite actuator. All from NASA Langley: Keats Wilkie, principal inventor; James High; Robert Bryant; Robert Fox; Antony Jalink, Jr.; Paul Mirick; Richard Hellbaum, and Bruce Little.

- end -