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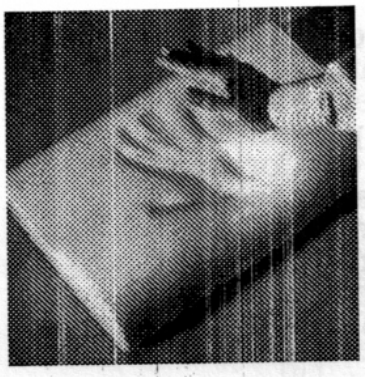
Technology Transfer

Famous Foam Has a Future

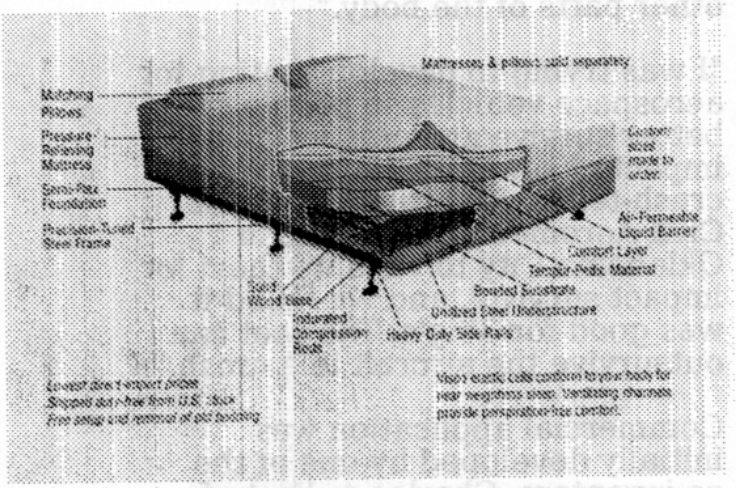
A NASA foam material is saving lives, reducing health care costs and providing cushioning aboard the Space Shuttle and in air flight tests. Temper Foam, a material first developed by NASA in the 1970s to improve seat cushioning and crash protection for airplane pilots and passengers, was recently inducted into the U.S. Space Foundation's Space Technology Hall of Fame.

Developed at NASA's Ames Research Center at Moffett Field, California, the material eventually found its way into commercial products, such as orthopedic support cushions, operating table pads, ear plugs, football helmets and furniture cushions. The foam is also used in Space Shuttle seats. The nonflammable, nontoxic and inexpensive Temper Foam takes the shape of impressed objects, but it returns to its original form even after 90-percent compression.

Co-inventor Charles Kubokawa of Palo Alto, California, now retired from Ames, says continued product development looks promising. "If you think about the potential uses for this material for passenger protection and comfort, infant protection and use by handicapped persons, the future for this product is almost unlimited," Kubokawa said.



Cushy Space Shuttle seat foam saves lives and provides patient comfort.



Temper Foam is used in pillows and mattress to treat such disorders as sleeplessness and bedsores.

Tempur-Pedic, a Lexington, Kentucky, company, is using the material in pillows and mattresses to treat disorders ranging from sleeplessness to the more severe illness of bedsores (pressure ulcers). Bedsores can be fatal if left untreated and cost the Medicare and Medicaid programs almost $2 billion annually for the treatment of wheelchair-bound, nursing home and hospital patients.

Tempur-Pedic's products have been cited by the U.S. Department of Veterans Affairs as "very effective for the treatment and prevention" of bedsores and "very comfortable" to patients. The company recently produced its one-millionth pillow using Temper Foam and billions of self-ventilating memory molecules that slowly react to body heat and weight.

In presenting the foam to NASA Administrator Daniel S. Goldin, Tempur-Pedic CEO Robert Trussell said, "We have taken NASA's space-age material and developed it into 'body-friendly' bedding, which distributes pressure more evenly throughout the spine, joints and other parts of the body."

"I was trying to develop seating for aerospace vehicles so people could better survive any crashes or impacts," said Kubokawa. "We crash-tested several seats at the Civil Aeromedical Institute in Oklahoma City to validate them for impact survival, and we found it was good for 36 g's. The seat can outsurvive the aircraft in a crash."

Commercial application was initially developed by one of the co-inventors, Charles A. Yost of Dynamic Systems in Leicester, North Carolina. This private company produces Temper Foam for industrial applications and for toy companies.

The Space Technology Hall of Fame was established in 1988 in

cooperation with NASA, and 27 technologies have been inducted to date. The U.S. Space Foundation administers the program, which honors technologies that were originally designed for aerospace programs and were later adapted for commercial use. The program also recognizes innovators who have transferred aerospace technology to industry.

For more information, contact Betsy Robinson at Ames Research Center.
Call (650) 604-3360, Fax: (650) 604-1592, E-mail: brobinson@mail.arc.nasa.gov
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Web Designer: Vanessa Nugent
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