WEEKEND Arts FINE ARTS LEISURE

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MUSEUM REVIEW

# *Finding a Flair in the Smartest Fabrics of Our Lives*

By GRACE GLUECK

Don't look for aesthetic pizazz in "Extreme Textiles: Designing for High Performance," the intensely tech-y show of industrial fibers and fabrics at the Cooper-Hewitt National Design Museum.

On the other hand, don't rule it out.

Some of what is in this show, the first museum display of materials made to function in extreme conditions, is visually exciting, by virtue of properties like texture, color and shape. The old design dictum "form follows function" was never so true as here.

But the raison d'être of the exhibits is solely use. The sinewy orange weave of a polyester fabric used for reinforcing tires, the sculptural-looking gears and cogwheels made of felt, and the sensuous curve of a carbon fiber prosthetic designed to enable amputees to run, jump and climb are not about aesthetics but functionality. Still, their innovations could, and do, inspire new approaches in the field of aesthetic design.

In the catalog for a 1956 textile show at the Museum of Modern Art, Arthur Drexler, the longtime director of that museum's department of architecture and design, wrote that industrial fabrics "seem beautiful largely because they share the precision, delicacy, pronounced texture and exact repetition of detail characteristic of 20th-century machine art."

He is quoted by Matilda McQuaid, head of Cooper-Hewitt's textile department and curator of this show, in her introduction to its catalog. In her usefully arranged display, she grouped more than 150 examples of hard-working textiles, used in fields ranging from architecture to space exploration, into five categories: stronger, faster, lighter, safer and smarter.

For stronger, there's an awesome industrial sling that can hoist 50 tons, capable of replacing steel chains for heavy lifting. It is made of bundled polyester monofilaments in a sleeve of abrasion-resistant Kevlar. For faster, there are sporting equipment, boats, racing cars and bicycle wheels, mostly employing woven and nonwoven carbon fiber composites. Examples of lighter include high-strength laminates of nonwoven fibers that replace ripstop nylon for parachutes, and I-beams made of carbon fiber instead of steel, for lightweight bridges.

In the safer category are woven synthetic fabrics designed to prevent a broken-off fan blade from penetrating a jet engine case, and a group of brightly colored climbing ropes whose braided fiber core takes the main load while a braided sheath protects the core from abrasion.

And smarter? How about a wall of pliable fabric that can generate low-voltage electrical power, store and access digital information, and emit digital light; and the prototype of a Sensewear body monitor in the form of a small bandage-shaped patch, which when worn collects, processes and stores physiological data.

With all its technical information and less than familiar objects, this is not an easy show to negotiate. Still, there are several quick attention-grabbers. Who can resist the appeal of the suave, small, but full-fledged Vanguard Vector racing dinghy, with hull and deck of woven and nonwoven glass fiber. Nor is it easy to pass by the incredibly long and sleek Lightweight Advantage single racing shell, made of satin-weave glass fiber and nonwoven carbon fiber.

And how does one ignore the awesome presence of a WilliamsF1 BMW FW26 racing car, ultra-engineered but radiating the spirit of speed. Its chassis is made of carbon and other heat-resistant and high-strength fibers.

Lagniappe for campers: don't miss the Ursack bear-resistant food bag, claw- and tooth-proofed by virtue of its impenetrable fabric of woven polyethylene filament.

A comprehensive display of protective suits, gloves, boots and other gear for space explorers, as well as earthbound firefighters, adds more viewer appeal to this enormously ambitious show. A lovable example of space gear is the "Tumbleweed" Mars rover, constructed from high-performance fiber and silicon rubber. Essentially an airbag that has progressed from a protective device for the rover lander to an investigative and experimental instrument in itself, it can be propelled across the Martian surface by wind, like a tumbleweed. Studded with tiny cleats, it partly deflates and stops in place to conduct experiments and investigations, then re-inflates and moves on.

Less conspicuous must-sees lurk everywhere. For contrast, a replica of a wing section from the Wright brothers' 1902 glider, made of plain unbleached cotton muslin with laminated ash ribs, is hung near a prototype for a compact airplane made in 2004 by the University of Kentucky College of Engineering. Designed to explore the Martian surface by remote control, its high-performance fabric wings inflate when deployed and go rigid when exposed to ultraviolet light.

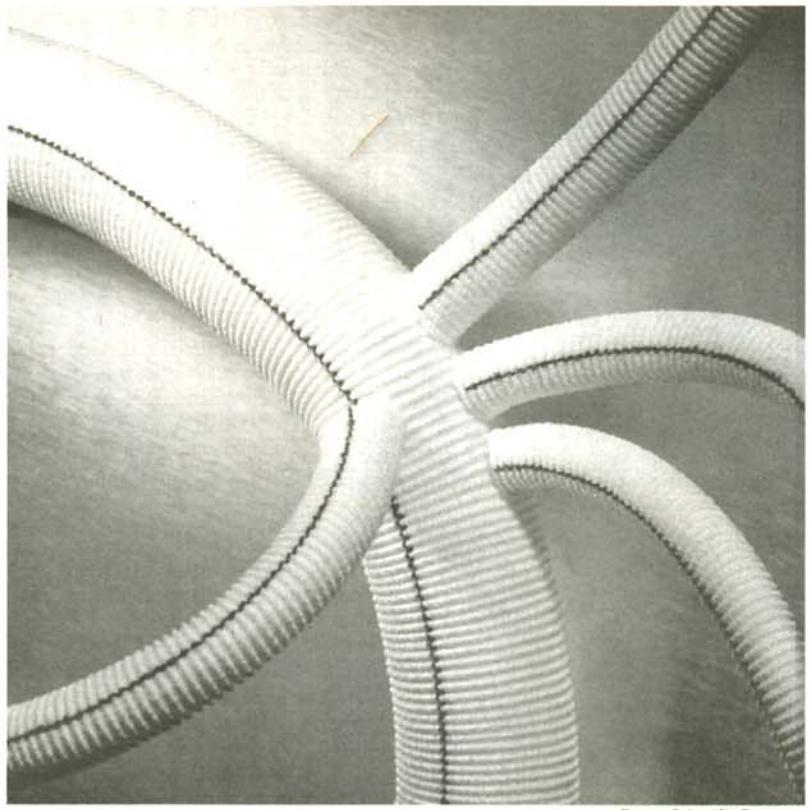
A special section deals with innovations in the field of medical devices. Here there are such miracles as the CorCap cardiac support device, a net of knitted polyester yarn that prevents organ enlargement during degenerative heart failure; and a membrane electrospun from nanofibers — each about one 180,000th the size of a human hair and many times tougher than steel — that can act as a scaffold for replacing damaged organs or tissues.

Age-old techniques like braiding — mostly in the form of ropes — and netting are seen to new advantage in the show. Displays of netting include mundane turf reinforcers like the Enkamat, a tangle of fused nylon filaments that help develop stable ground cover by intertwining with young root systems. But there are also exotic camouflages like the Palmhive Bobble net of knitted polyester and Lycra, which substitutes rough, foliagelike texture for printed surfaces to disguise large objects like tanks.

Another net, made of silver bobbinet, the same tulle fabric traditionally used for bridal veils, is a radar decoy that mimics the general shape of the warship carrying it. When an enemy missile is launched, it locks onto the net, which deflects it from the warship.

The strongest fiber rope ever made is here: the Marlow Superline of braided polyester used by British Petroleum in 11 mooring lines — more than 10 miles of rope — for its rigs in the Gulf of Mexico. The rope has a diameter of 10 inches and can hold onto 2,000 tons.

No one can say that "Extreme Textiles" fails to carry a heavy load of high-tech baggage. But there's a relaxing moment, too, at a rope-and-sound installation especially engineered for the exhibition. When the electronic ropes of this multidimensional harp are pulled, they transmit signals to a synthesizer, which responds with music. The show itself is its own reward, but this is a nice little bonus.



Boston Scientific Company

A detail of a woven vascular graft, one of the show's medical devices.

## 'Extreme Textiles: Designing for High Performance'

*Cooper-Hewitt National Design Museum*

*The show is at the Cooper-Hewitt National Design Museum, 2 East 91st Street, Manhattan, (212) 849-8400, through Oct. 30.*