# SMA GROUP

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## Skin and Enclosure System

Here is an good example of the application of SMA.

**ORICALCO -- shape memory fabric**

Grado Zero Espace (http://www.gzespace.com/gzenew/index.php?pg=consultants&lang=en) has used Shape Memory Alloys to obtain a fabric used for the manufacturing of a shirt with long sleeves. The sleeves could be programmed to shorten immediately as the room temperature heats up. The shirt can be screwed up, pleated and creased, then, just by a flux of hot air (even a hairdryer), it can pop back automatically to its former shape. Later, the name "Oricalco" was associated to the fabric Oricalco obtained by Grado Zero Espace and used to manufacture the first shape memory shirt.

youtube: http://www.youtube.com/watch?v=_oGQz-eSIOQ

thinking of the skin and enclosure system of buildings, and the issue of sustainability. Maybe we could apply the SMA technology, together with other technology, to find the environmentally friendly skin system of architecture.

**Flexible Solar Cells**

Scientists develop solar cells with a twist
Mon Oct 6, 2008 3:42pm EDT By Julie Steenhuysen

CHICAGO (Reuters) - U.S. researchers have found a way to make efficient silicon-based solar cells that are flexible enough to be rolled around a pencil and transparent enough to be used to tint windows on buildings or cars.

The finding, reported on Sunday in the journal Nature Materials, offers a new way to process conventional silicon by slicing the brittle wafers into ultrathin bits and carefully transferring them onto a flexible surface. "We can make it thin enough that we can put it on plastic to make a rollable system. You can make it gray in the form of a film that could be added to architectural glass," said John Rogers of the University of Illinois at Urbana-Champaign, who led the research.
"It opens up spaces on the fronts of buildings as opportunities for solar energy," Rogers said in a telephone interview. Solar cells, which convert solar energy into electricity, are in high demand because of higher oil prices and concerns over climate change.

Many companies, including Japanese consumer electronics maker Sharp Corp and Germany's Q-Cells are making thin-film solar cells, but they typically are less efficient at converting solar energy into electricity than conventional cells.

Rogers said his technology uses conventional single crystal

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silicon. "It's robust. It's highly efficient. But in its current form, it's rigid and fragile," he said. Rogers' team uses a special etching method that slices chips off the surface of a bulk silicon wafer. The sliced chips are 10 to 100 times thinner than the wafer, and the size can be adapted to the application.
Once sliced, a device picks up the bits of silicon chips "like a rubber stamp" and transfers them to a new surface material, Rogers said.

"These silicon solar cells become like a solid ink pad for that rubber stamp. The surface of the wafers after we've done this slicing become almost like an inking pad," he said.

"We just print them down onto a target surface." The final step is to electrically connect these cells to get power out of them, he said.

Adding flexibility to the material would make the cells far easier to transport. Rogers envisions the material being "rolled up like a carpet and thrown on the truck."

He said the technology has been licensed to a startup company called Semprius Inc in Durham, North Carolina, which is in talks to license the technology.

"It's just a way to use thing we already know well," Rogers said.

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