

U. of I. researchers find material that heals itself

BY GARY WISBY
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Wouldn't it be great if a crack in the skin of a jet plane or spaceship could heal itself, the way our own skin does?

Researchers at the University of Illinois at Urbana-Champaign said Wednesday they've developed such a material, and the U.S. Air Force is taking them seriously.

"It mimics what the human body does when you get a cut—the necessary chemicals are brought to the site of the injury, the blood clots and new skin is grown to repair the crack or cut," said project leader Scott White, a U. of I. professor of aeronautical and astronautical engineering.

The synthetic self-healing material developed by White's team is a polymer composite—the kind of stuff used in everything from air-

planes to golf clubs, tennis rackets and computer circuit boards.

Motorola has shown interest in the research. Boeing also is paying attention. And the Air Force has taken over funding of the research, awarding \$330,000 for the next three years.

Self-healing composites would come in handy for hard-to-reach items such as bridge supports and artificial joints—to say nothing of spacecraft.

A study by White and his team—professors Nancy Sottos, Philippe Geubelle and Jeffrey Moore and four grad students—appears in today's issue of the journal *Nature*.

The new material "nips the damage in the bud," said Richard P. Wool, a University of Delaware researcher, in an accompanying commentary.

The secret is microcapsules about the thickness of a human hair that

are spread throughout the material. When it cracks, the capsules break open and a liquid healing agent flows out. This stuff contacts a catalyst embedded in the material, and a chemical reaction seals the crack.

In tests, the material recovered as much as 75 percent of its strength within 48 hours. White said the technology could double or triple the life of things made with the composite material.

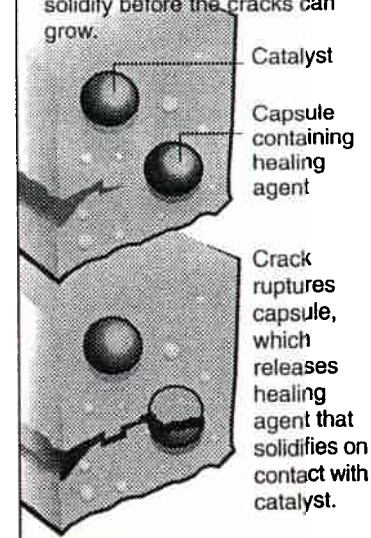
Because something made of the new material could break and repair itself without anyone noticing, the U. of I. researchers are thinking about working a dye into it.

They started about six years ago and have a few years of work ahead before things made of their material start being produced. How soon?

"Circuit boards, three to five years," White said. "A self-healing airplane, maybe 10 years or more. But it's out there."

QUICK FIX

In the future, composite materials in objects like graphite tennis rackets, artificial joints and bridge supports could be capable of mending themselves when cracks form. Scientists are experimenting with materials that contain microscopic capsules that release a liquid healing substance to fill tiny cracks and solidify before the cracks can grow.



SOURCE: *Nature*

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