

# NASA TECH BRIEF

## *Marshall Space Flight Center*



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### **Read-Only Optical Storage Medium**

A photosensitive recording medium has been developed which consists of a thin-film silicone resin deposited on a photoconductive substrate. The medium and its associated polymerization procedure form the basis of a holographic-image storage system.

The medium is based on commercially-available dimethyldiphenyl silicone fluid which has been observed to polymerize and cross-link spontaneously into a thermoset state upon exposure to a 5- $\mu$ A corona discharge. One drop of the fluid is applied to a photoconductor layer which has been deposited over a transparent ground plane. The photoconductor and the ground plane are Poly-N-vinyl carbazole and InO, respectively. The thickness of the silicone film is determined by the amount dropped onto the photoconductor surface and by the area of this surface. The entire structure is thus quite simple, consisting of an InO-coated glass substrate, the photoconductor (approximately 2  $\mu$ m thick), and one drop of silicone fluid over an area of approximately 10 cm<sup>2</sup>.

The object and reference laser beams are then made to superimpose at the fluid surface of the storage device, and a corona discharge is pulsed onto it for a period of about 1 to 2 seconds. A high-quality permanent hologram is formed in the device with the prior fluid state of the silicone changed to a

plastic-type film in a thermoset state. The entire process takes place at room temperature over a period of several seconds.

The new recording medium is useful for holographic interferometry studies. It can be applied in studies of material distortion in various nondestructive-testing applications, such as stress analysis and/or flaw detection in large metal fabrications.

#### **Note:**

Requests for further information may be made in writing to:

Technology Utilization Officer  
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#### **Patent status:**

Title to this invention has been waived under the provisions of the National Aeronautics and Space Act [42 U.S.C. 2457(f)], to the RCA Corp., Princeton, New Jersey 08520.

Source: R. A. Gange of  
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