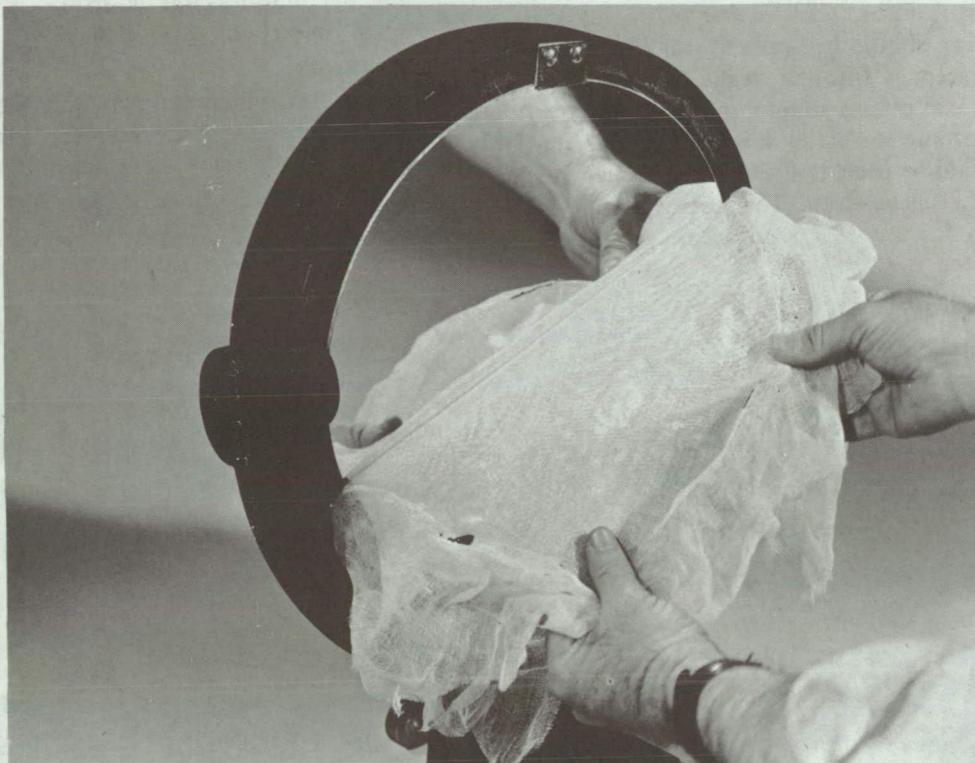


NASA TECH BRIEF



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Collodion Technique of Mirror Cleaning



The cleaning of front surface mirrors is a very delicate operation. In the past only a special detergent solution and water were used for this process. Mirrors were removed from their holders and cleaned with running water and compressed air. Realignment of the optical system was necessary after each mirror was cleaned and returned to its holder, creating alignment problems and the risk of damage to the mirror in handling.

A modified cleaning technique (see Note 1) of a collodion cleaning method is being utilized whereby the mirror can be cleaned in its holder, saving manpower, system downtime, and minimizing mirror damage. The modification consists of the addition of a layer of cheesecloth embedded in the collodion, which aids in peeling the dry collodion coating from the mirror. The only equipment necessary is collodion, cheesecloth, and a soft camel's hair brush. Only U.S.P.

(continued overleaf)

collodion (cellulose nitrate in ether-methanol solution) should be used. "Flexible" collodion, with a camphor plasticizer, cannot be substituted.

A thin even film of collodion is painted over the entire surface of the mirror using the camel's hair brush. It may be desirable to scrub the mirror very lightly with collodion using the brush. Application of five or six thin coats should be sufficient. A few minutes should be allowed for each coat to dry, lending support to the following coat without running. Dryness can be determined by pressing the finger gently against the mirror surface. The entire mirror surface should be inspected to ensure that all areas are gelled and dry. After the first three or four coats have completely dried, two layers of cheesecloth should be placed over the mirror with a 2- or 3-inch overlap beyond the mirror edges. Then one or two additional coats of collodion should be applied over the cheesecloth to allow seepage through to the original coats, making a solid seal of cheesecloth and collodion over the entire mirror surface. After sufficient time to dry, the overlap should be peeled off the mirror by a gentle even pull on the cheesecloth. The mirror should be clean and ready for use. If it is not clean, the process should be repeated.

In several minutes, mirrors which have suffered loss of reflectivity from minor chemical, dust, or aerosol deposits are returned to near original reflectance by this simple and economical technique. Fresh fingerprints can be quickly removed. Mirrors having severe damage, however, cannot be effectively cleaned by this process and must be sent to the factory for recoating.

Notes:

1. The original technique first appeared in Applied Optics, vol. 2, Jan. 1964, p. 152.
2. No additional documentation is available. Specific questions, however, may be directed to:
Technology Utilization Officer
Langley Research Center
Hampton, Virginia 23365
Reference: B70-10463

Patent status:

No patent action is contemplated by NASA.

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