LETTER TO THE EDITOR

INSTANT INTERFEROMETER WINDOWS*

THE writers would like to point out a technique for making interferometer windows which they have found particularly useful in studies of natural convection phenomena with a Zehnder–Mach interferometer.

The windows consist of lacquer films from 0·5 to 1 μ thick made by a technique well known to model makers (see, for example, [1]) and used by them to cover gliders and other models where a very lightweight skin is desired.

Briefly, the steps in the procedure are:

(1) A clean pan somewhat larger than the desired window is partially filled with water (a depth of ½ in is sufficient). It is important that no soap or oils be present in the water or pan. We have found tap water satisfactory.

(2) With an eyedropper, several drops of brushing lacquer (containing about 6 per cent castor oil), or model airplane dope (not fuel-proof) with castor oil added are placed on the surface of the water near the center of the pan. The lacquer spreads over the surface of the water forming a film varying in thickness from 0·5 to 1 μ. The film drys in about a minute forming a skin over the water.

(3) Exercising reasonable care, the films thus formed may be removed from the water with a wire hoop by placing the hoop on top of the film and folding the edges over.

(4) The films are then hung up to dry and after aging for several days are quite tough and can be handled (though not touched) if care is used.

(5) The films are attached to frames of either wood or metal by placing them against the frame which has first been wetted.

The thickness and uniformity of the films can be readily observed by their color as seen under reflected light. We have been able to produce films in quantity and select the most uniform portions of these. The total fringe shift due to the two windows (no compensating windows are employed) is about 1½ fringes. Measurements of natural-convection boundary layers on a vertical plate 16 in wide with a temperature excess of 25°F have produced within ±0·5°F agreement between wall temperatures obtained from thermocouple measurements and by counting fringes from the ambient condition. The films are limited of course by the pressure differences they will withstand and the temperatures to which they can be subjected. The temperature limit appears to be about 120°F.

The research of which this development is a minor part was supported by the National Science Foundation under Grant NSF G-14247.

Princeton University, R. EICHHORN
New Jersey, U.S.A.
General Applied Sciences J. A. SCHETZ
Laboratories, Inc.
Hempstead, L.I., N.Y., U.S.A.
Princeton University, R. E. LUNA
New Jersey, U.S.A.

REFERENCE

1. J. BILGRI, Indoor models—Part 1, *Model Airplane News*, March (1960).