

## Reflective-polariscope Demonstration

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The method of birefringent coatings provides one of the most useful tools for nondestructive stress analysis of actual prototypes. Here is a quick inexpensive method for classroom instruction or industrial demonstration of the application of birefringent coatings.

The reflective polariscope as shown in Fig. 1 is an extension of the classical transmission polariscope applied to opaque two- and three-dimensional bodies. By using a viewgraph as the light source and properly aligned polarizer and quarter-wave plates sandwiched between Plexiglas sheets, the reflective polariscope shown in Fig. 2 is produced. With the specimen loaded in position at an angle to reflect the light, the isochromatic pattern resulting from the surface stress-strain field can be seen. In Fig. 3 a drilled hole produces the well-defined stress-strain field around a hole from an applied bending load.

By detaching and passing the second quarter-wave plate and analyzer around, students or personnel being briefed can observe the pattern from 20 to 30 ft away.

Experience has shown that a circular polariscope for demonstration purposes is preferred over a plane polariscope.

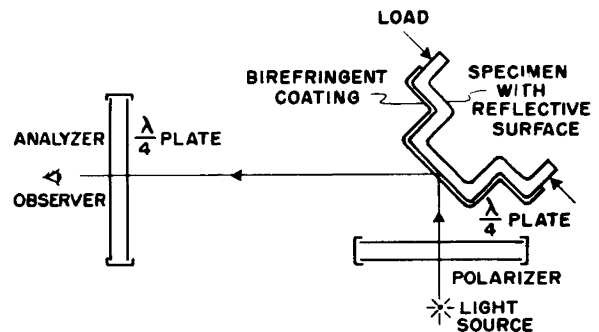


Fig. 1—Reflective polariscope

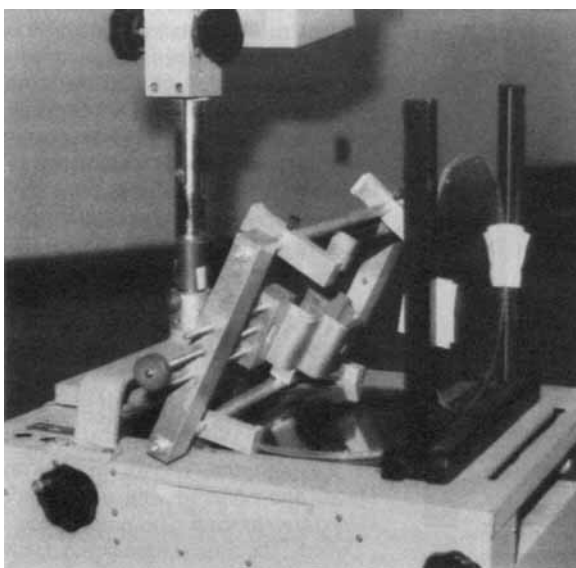


Fig. 2—Reflective-polariscope demonstrator

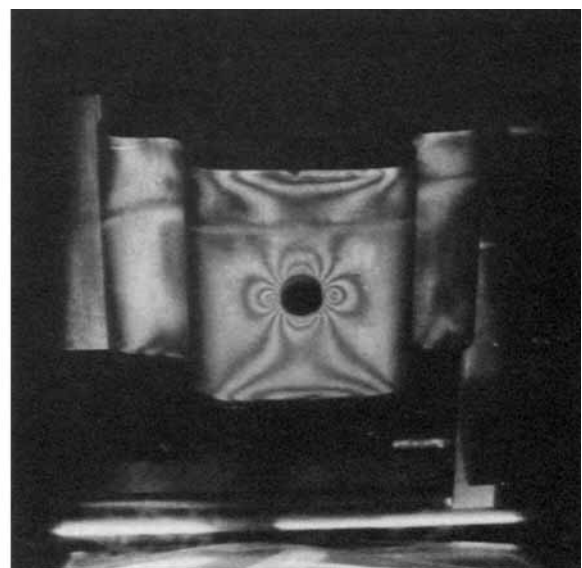


Fig. 3—Loaded specimen as observed with reflective polariscope