

MICHIGAN
STATE HIGHWAY DEPARTMENT

JOHN C. MACKIE, COMMISSIONER

December 9, 1963

To: W. W. McLaughlin
Testing and Research Engineer

From: E. A. Finney

Subject: Polymer Plastic Marker Posts (Handley Industries, Inc.).
Research Project R-63 NM-87. Research Report R-445.

At its meeting of April 30, 1963, the Committee for Investigation of New Materials referred a sample of plastic marker post to the Research Laboratory Division for study, especially of the paints used in coating the post (white body and black cap). The manufacturer stated that these paints utilize a softening agent for the base plastic which assures thorough bonding of the coating. Laboratory study was assigned to F. J. Bashore and A. J. Permoda, who reported as follows:

1. Sample Identification Number: 63 PR-180
2. Post Dimensions: a closed tube having a length of 5 ft 8 in., an OD of 2-5/8 in., a wall thickness of 0.15 in., and a weight of 3 lb.
3. Materials: The black plastic used in molding of the post was painted white, with a cap overcoated with black, as shown in Fig. 1.
 - a. After 300 hr of weatherometer exposure and 100 hr in the humidity cabinet, the paints showed considerable loss of gloss and chalking, which was significantly greater than that of license plate finishes run at the same time.
 - b. For outdoor exposure, the white paint thickness of about 1 mil is considered inadequate for the chalking and eroding type of paint used on this post as evidenced in the laboratory tests by the appearance of thin spots in the coating.
 - c. Penetration of the paint into the plastic could not be detected but bonding was good, and adequate.
 - d. Maintenance repainting of the posts in the field, when required, should present no problem.
4. Chemical Nature: The plastic was found to be of the ABS type (acrylonitrile-butadiene-styrene) by identification and infrared tests.

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5. Low-Temperature Brittleness: at -15 F, the material had good resistance to fracture, as tested by a hammer blow.
6. Rot Resistance: ABS plastics are used in sewer pipes because of their good resistance to rot and microorganism attack.
7. Other Remarks: the thin plastic cap closure was bonded to the post by solvent softening and was found to be inadequate for outdoor exposure.

Considering the problem the Department has had with repainting of treated cedar posts, because of bleeding and paint peeling, we feel that these plastic posts merit consideration for field trial. Should these posts be recommended for such trial, on the basis of these test results we recommend that the posts be coated with paints of better chalk resistance having a thickness of about 2 mils, and that the cap closure be improved. For field trial, the Committee also may wish to choose dimensions more nearly approximating the cedar post which they would replace.

We concur in these recommendations. Price per unit for the plastic posts is \$6.65 for 1 to 99, \$5.95 for 100 to 999, and \$5.25 for 1000 or more. In 1960, at the request of the Committee, the Research Laboratory Division tested a quite similar post produced by the Handley-Brown Co. of Jackson, a predecessor of Handley Industries in manufacture of this product (reported to the Committee in a memorandum dated July 1, 1960 and considered at the meeting of July 6). The post tested then was slightly larger and heavier than the one now being reported. At that time it was estimated that if initial investment per unit were equalized over the 20-year service life to be expected for a plastic post, and the 10-year service life to be expected for a cedar post, total annual expense would be about equal for both types. The same general cost relation between posts of the two types would exist now.

OFFICE OF TESTING AND RESEARCH

E. A. Finney, Director
Research Laboratory Division

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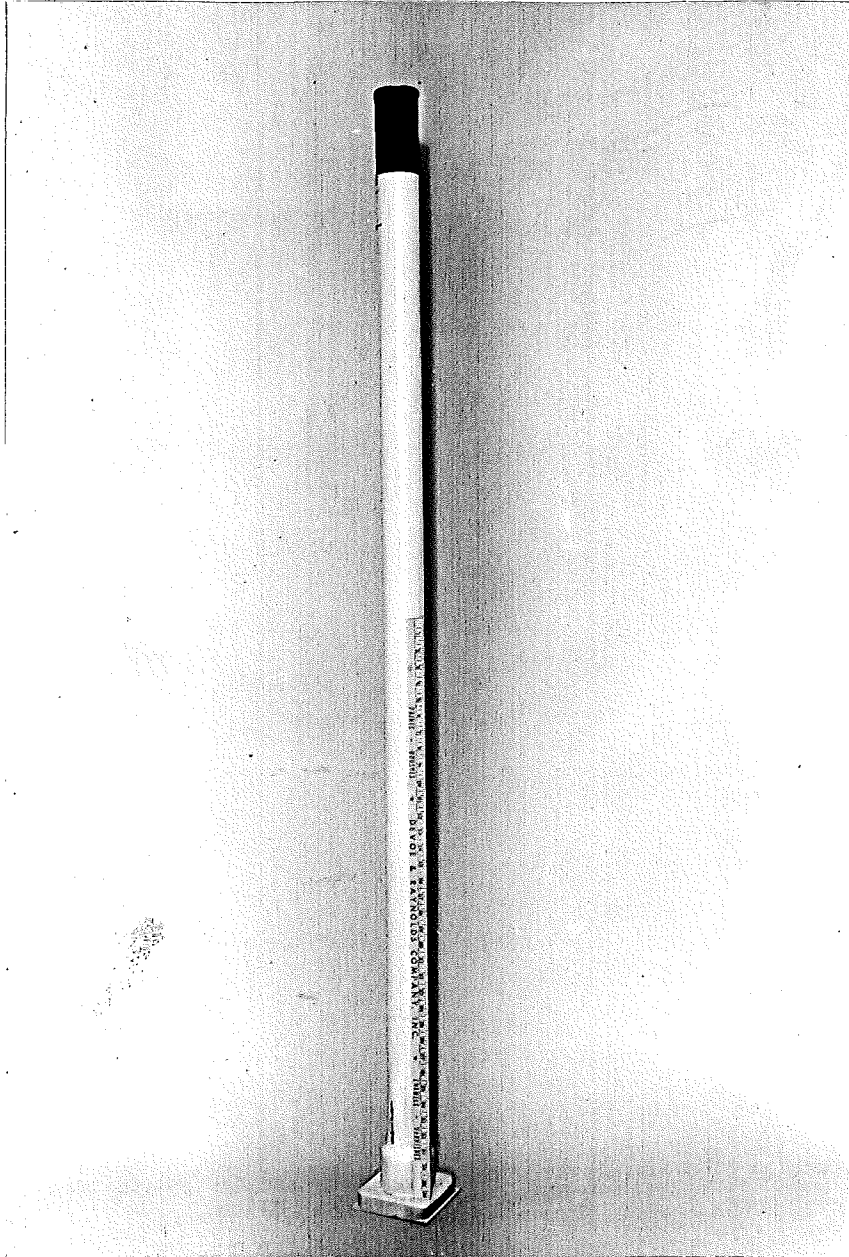


Figure 1. Appearance of polymer plastic post received for evaluation.