

EVALUATION OF RESINCORE PARTICLE BOARD  
AS A SIGN BACKING MATERIAL



MICHIGAN DEPARTMENT OF STATE HIGHWAYS

EVALUATION OF RESINCORE PARTICLE BOARD  
AS A SIGN BACKING MATERIAL

J. T. Ellis

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E. V. Erickson, Chairman; Charles H. Hewitt,  
Vice-Chairman, Carl V. Pellonpaa, Peter B. Fletcher  
John P. Woodford, Director  
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This project was initiated on August 4, 1969 after samples of "Resincore" and product information were received from the manufacturer, Resinwood Division, Rock Island Corp., Marinette, Wisconsin. The manufacturer indicated that Resincore had been used in roadside sign panels by several county road commissions in northern Wisconsin.

The physical properties of Resincore, which had been determined by the United States Forest Products Laboratory, compared closely with the properties of a similar product "Super Phenol-Black" fiberboard manufactured by the Building Board Division, West Virginia Pulp and Paper, Tyrone, Pa. as reported by J. E. Simonsen in "Comparison of Fiber Board and Plywood for Use in Roadside Sign Panels," Research Project 65 NM-142, Research Report No. R-565, February 1966. The report concluded that although the fiberboard is not as strong or as stiff as plywood it is sufficiently strong for use as roadside sign panels.

The report recommended that before acceptance of Super Phenol-Black as an alternate sign panel material 10 to 20 experimental signs should be fabricated using the fiberboard material and installed in the field where they could be periodically inspected to obtain information on weathering properties. In response to this recommendation, 20 test signs were installed at three locations in the Lansing area in early 1967.

#### Evaluation Program

The subsequent evaluation program of Resincore fiberboard consisted of the following items.

1. The state of Wisconsin, Department of Transportation was contacted for information on their experience or knowledge of Resincore usage in Wisconsin.

2. In lieu of a long term field evaluation of Resincore specifically, the test installations of the similar material Super Phenol-Black were inspected and evaluated. Conclusions and recommendations concerning weathering properties in the field were based on that inspection.

3. Resincore panels covered with reflective sheeting were exposed to accelerated weathering in a weatherometer and in a salt spray chamber along with plywood panels for reference.

#### Result

In response to our request for information, J. R. Schultz, Chief Materials Engineer, Wisconsin Department of Transportation stated in a letter of August 19, 1969 to J. C. Brehler, that his department had a number of

trial sign installations using a Resinwood Co. fiberboard product five to six years previous, but chose not to use the material in preference to plywood because:

1. The preservative oil in the mounting post bled through the fiberboard leaving a dark stain on the face of the sign after two or three years of service.
2. Signs on single posts with Scotchlite faces which did not have back and edges painted warped, with a tendency to wrap around the post. Painted signs and those on two posts (larger sizes) did not warp.

Inspection of the Super Phenol-Black test signs in the Lansing area on April 26, 1972 after about four years of service showed instances of warping and delamination (Fig. 1), and poor adhesion and cracking of the reflective sheeting (Fig. 2). These conditions were not observed on plywood backed signs in the same general areas with approximately the same service time (Fig. 3).

Inspection of the Resincore backed (6 by 8 in.) test panels after 400 hours of exposure in the weatherometer and 200 hours in salt spray along with the plywood backed reference panels, after 600 hours of exposure in the weatherometer and 300 hours of salt spray, revealed swelling of the Resincore primarily around the edges of the panels, but also in the center (Fig. 4). This condition was not observed on plywood panels (Fig. 5).

#### Conclusions and Recommendations

1. Wisconsin's Department of Transportation has expressed dissatisfaction with fiberboard backed signs.
2. A similar material, Super Phenol-Black, has not performed as well as plywood in field tests conducted by the Research Laboratory.
3. Resincore has not performed as well as plywood under laboratory accelerated weathering exposure.

It is recommended that Resincore fiberboard not be considered a suitable alternate material for plywood as a sign backing material.

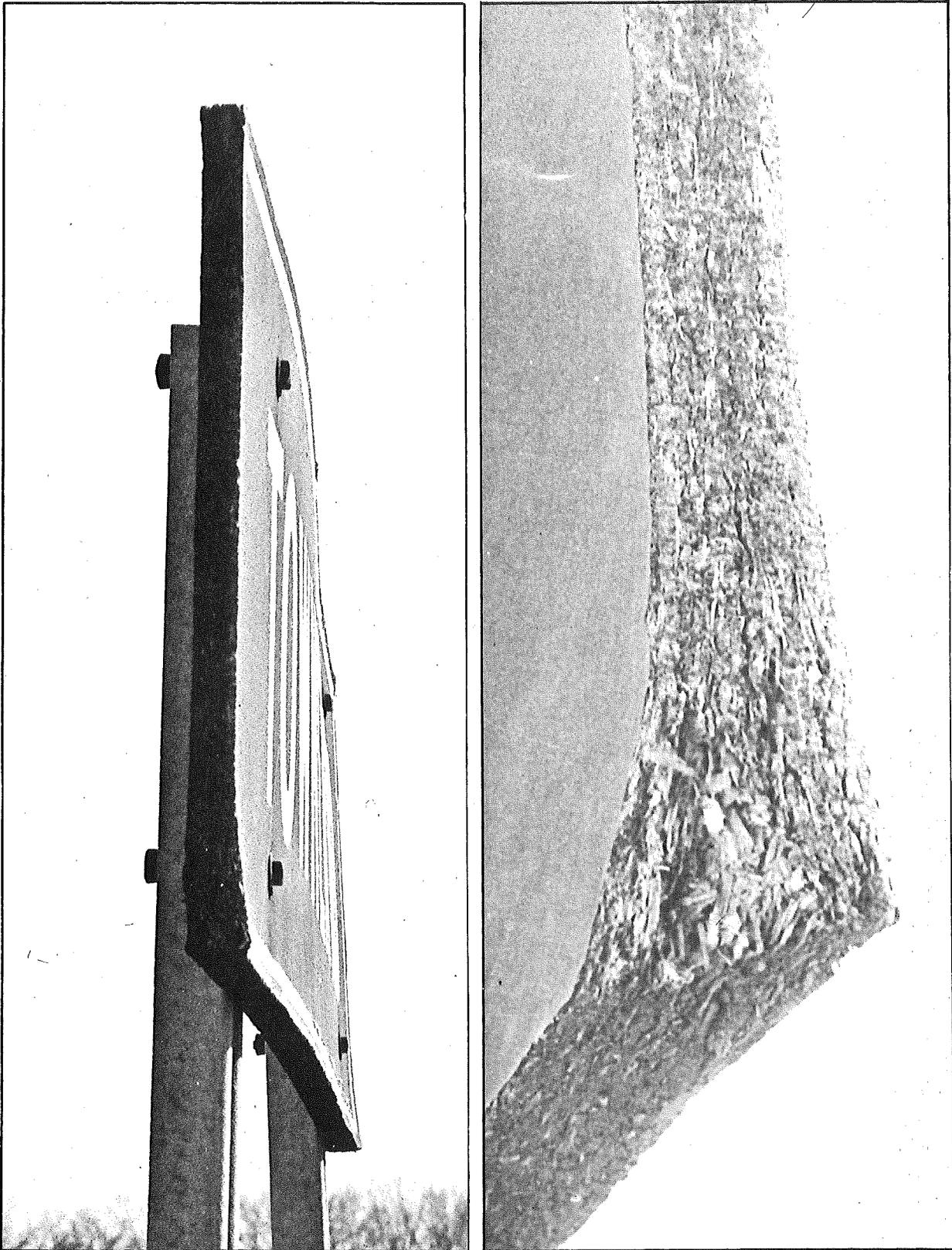


Figure 1. Super Phenol-Black test sign in service shows warping (left) and delamination (right).

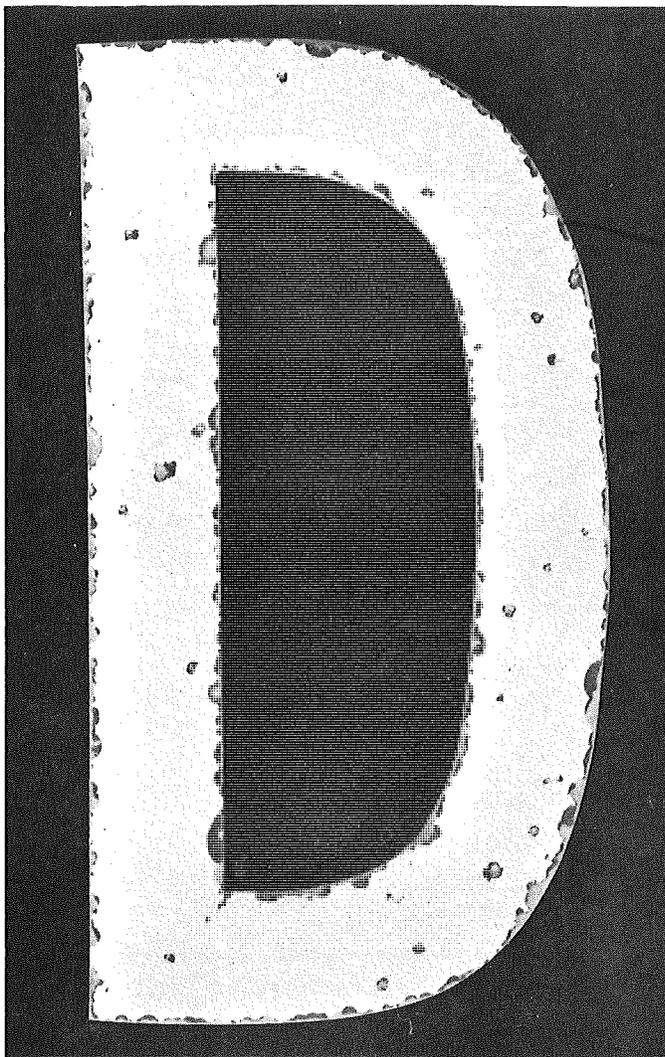


Figure 2. Super Phenol-Black test sign in service shows cracking of the reflective sheeting (above) and poor adhesion of the sheeting to the sign surface (left).

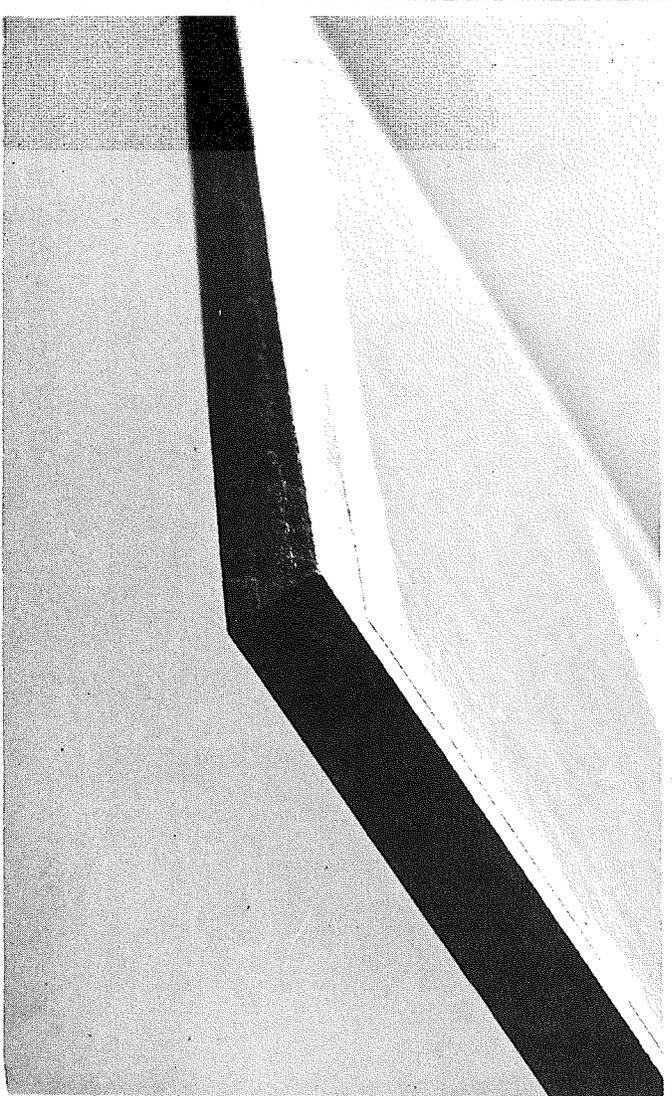


Figure 3. A plywood backed sign, in service for approximately the same length of time as the fiber-board test signs, shows no warping, sheeting cracking, or delamination.

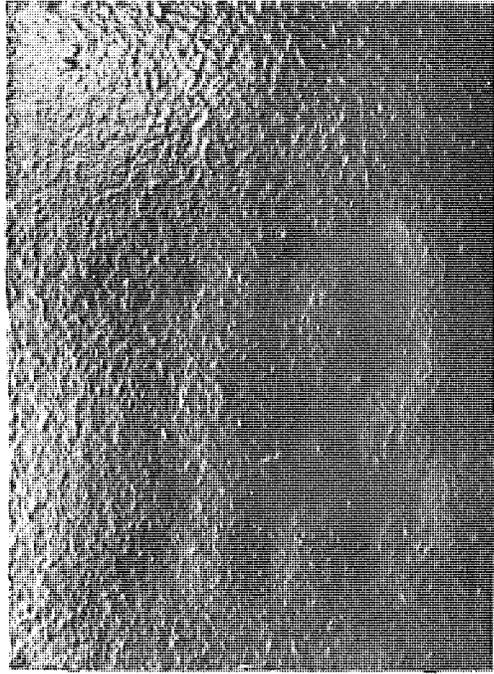


Figure 4. "Resincore" test panels showing swelling around the edges (left) and swelling in the center (right) after weatherometer and salt spray exposure.

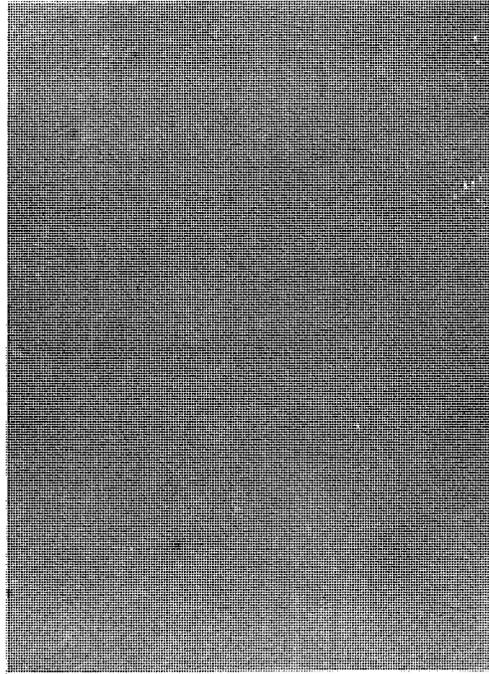


Figure 5. Two typical plywood test panels after weatherometer and salt spray exposure.