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Marshall Laboratory
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MEMORANDUM REPORT #425

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BACK PRIMING OF HOUSE SIDINGIntroduction:

It has been shown that the water vapor passing through the wall and thence through the clapboard siding is responsible to a large degree for paint blistering and peeling. To prevent this, one suggested corrective measure was back priming of the clapboards with aluminum paint. Aluminum paint lays down a film that by itself is highly impermeable.

This idea is now undergoing a field trial at Syracuse, New York by Mr. Paul Schoeck, house builder.

Presented here are the results of several experiments whereby measurements were made of the moisture passing through aluminum-backed red cedar clapboards. The aluminum paint used in this experiment is 354-751, a mixture of a phenolic resin and aluminum paste.

Conclusions:

The back priming of house siding with one coat of aluminum paint is not an effective moisture barrier. This is due in part to the roughness and irregularity of the unfinished side of the clapboard causing a discontinuous film of paint and partly to the porosity of the wood itself. With two coats of paint a more nearly continuous film of paint is laid down. The permeability of the two coat system is low enough to meet the FHA Specification for a vapor barrier.

Experimental Details:

In Experiment #1, the aluminum paint was applied at two different spreading rates over the backs of red cedar clapboards.

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When dried the panels were shaved down to approximately 1/8 inch thickness. From selected spots on the board, small pieces were cut. These were sealed onto a small glass cup containing water. Also, run along with these were two unpainted sections of clapboard. These cups were then placed in a desiccator in the constant temperature room. Cups were weighed accurately periodically. When loss of water reached a constant rate, the tests were terminated. Results from this experiment show that a single coat of aluminum paint does not make the wood less permeable. These results were somewhat surprising, so to recheck them, we had the builder at Syracuse send us some of his clapboards that have been back-primed on the job.

In Experiment #2 parts of the builder's boards were given another coat of aluminum paint so that the effect of two coats could be checked. Also included in this test were uncoated sections of the builder's boards and sections from the boards used in the previous experiment. Panels were shaved to about one-eighth inch thickness and selected sections cut out to be sealed over glass cups. This time the desiccant was placed inside the glass cup and the wood sealed on top. All the cups were then placed in the constant temperature room and a fan blew air over the cups at the rate of 500 ft. per minute. These particular conditions are specified by the FHA in the manual on moisture barriers. Cups were weighed periodically and tests terminated when a constant rate was observed.

In this set, the rate of moisture passing through the aluminum film was considerably less than in the first experiment, but the conclusions are the same. The amount of moisture passing through the panels with two coats was approximately one fifth of the amount going through bare wood or one coat.

Table is attached.

Details can be found in Notebooks 3801 & 3819.

MARSHALL LABORATORY

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ATTACH:

TABLE
EXPERIMENT #1

<u>Panel</u>	<u>Description</u>	<u>Grains/Sq.ft/Hr./in of Mercury</u>		<u>Average</u>
1	Bare Wood	3.84	Bare Wood	6.97
2	" "	10.10		
3	Painted - 268 sq.ft./gallon	5.76	One coat (268 sq. ft./gal.)	4.44
4	" "	3.12		
5	Painted - 312 sq.ft./gallon	7.40	One coat (312 sq. ft./gal.)	8.50
6	" "	9.60	Overall ave. for 1 ct.	6.45

EXPERIMENT #2

M-1	Panel #3 in Exp. #1	.887		
M-1A	" " " " " "	.225	Lab. panels 1 ct.	.80
	2 cts.			
M-2	Panel #4 in Exp. #1	.719	" " 2 cts.	.23
M-2A	" " " " " "	.235		
	2 cts.			
1	Bare (Syracuse panels)	1.630	Bare wood	1.22
2	" " " " "	.800		
3	1 ct. paint " "	.743	Syracuse panels 1 ct.	1.40
4	" " " " "	1.319	Syracuse panels 2 cts.	.26
5	" " " " "	2.490		
5A	2 cts. " " "	.287		
6	1 ct. " " "	1.053		
6A	2 cts. " " "	.240		