Cross References

(1) Resins
(2) Misc. Primers
(3) VB-3085
(4) 475-1520

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Flint 2, Michigan
November 21, 1947

C-1

To File From TJN

MEMORANDUM REPORT #6

THE POSSIBILITY OF PAINT CRAWLING DUE TO THE USE OF SILICONE FLUID AS A DOPING AGENT.

I. INTRODUCTION

Some time ago it was found that the addition of a very small amount of DC-200 silicone fluid to paints would prevent silking in many cases. Silicone fluid is so successful in preventing silking that it will probably prove to be very useful for this purpose in many products. This memorandum is being written to point out that silicone doping may also have its disadvantages, one of which has already been uncovered.

II. CONCLUSIONS

In some cases where silicone fluid DC-200 is added to a primer and the primer is baked at a high temperature, a paint film flowed over it may crawl due to the presence of the silicone in the primer. Asphaltic top-coats are especially apt to crawl under such conditions. Baking the primer at elevated temperatures accentuates crawling as do higher concentrations of the fluid (amounts tested ranged from .001 to .01% on total). While crawling was encountered only in top-coats over doped, high-bake primers, film irregularities (ripples) occurred in many systems and in one case with a doped primer even when air-dried. In some cases rippling occurred with top-coats other than asphalts.

It is possible that DC-200 can be used in some primers to prevent silking without using so much that crawling of the top-coat is encountered, but it will be necessary to test thoroughly each system into which silicone goes, and to keep the amount of doping below the critical limit for the products involved. The critical limit will probably vary from system to system depending on the composition of the products involved and the way in which they are used.

III. DETAILS

Tables are attached showing some specific systems which have been tested. Table I shows results with dopings about ten times (.01% on total) as great as frequently used to correct silking of the primer. Crawling is encountered in some cases. Table II shows results with an amount (.001% on total) considered adequate to correct silking in many cases. While this latter doping in these laboratory tests did not cause crawling, there is evidence of film distortion of some kind (called rippling) which may be a warning of more serious distortion under adverse conditions.

One specific result not included in the tables is of interest. Mr. E. R. Taylor found that VB-3085 (baked 5 minutes x 450°F) crawled over 475-1520 (baked 25 minutes x 410°F) which contained .0008% of DC-200. Lower dopings were not tested since this is the lowest amount which satisfactorily prevents silking of the primer. Higher dopings made crawling worse. In such a system VB-3085 cannot be used over 475-1520 which has been doped with DC-200 to prevent silking, or conversely 475-1520 cannot be doped with DC-200 if VB-3085 must be used over it.

FLINT LABORATORY

L. B. Darrall

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TABLE I

			VB-3085 25min.x450°F	471-1108 AD	52-1610 25min.x450°F	93-3390 AD
475-1520	-	25min. x 400°F	OK	OK	OK	OK
	.01% DC-200	25min. x 400°F	C	OK	R	OK
475-6199	-	AD	OK	OK	OK	OK
	.01% DC-200	AD	sl. R	R	R	R
681-1491	-	25min. x 400°F	OK	--	OK	--
	.01% DC-200	25min. x 400°F	sl. C	--	R	--
63-108	-	25min. x 400°F	OK	--	OK	--
	.01% DC-200	25min. x 400°F	OK	--	R	--
764-1522	-	25min. x 400°F	OK	--	OK	--
	.01% DC-200	25min. x 400°F	C	--	R	--

C = crawling

R = rippling (a slightly irregular, rippled surface)

TABLE II

			471-1078 20min.x250°F	52-1610 25min.x300°F	253-51252 20min.x180°F
475-6199	-	AD	S	S	OK
	.001%	AD	OK	sl. S	OK
475-6199	-	80 min. x 200°F	S	S	OK
	.001%	80 min. x 200°F	OK	sl. S	OK
475-1520	-	60 min. x 300°F	v. sl. S	S	OK
	.001%	60 min. x 300°F	sl. S	S	OK
475-1520	-	25 min. x 400°F	v. sl. S	S	OK
	.001%	25 min. x 400°F	sl. S	S(worse)	OK
475-1520	.005%	25 min. x 400°F	S(worse)	S(worse)	OK

S = silking