R-298

1957 PERFORMANCE TESTS ON WHITE AND YELLOW TRAFFIC PAINT

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Twenty-two paints were put down in the 1957 tests including one white and one yellow from each of ten producers, a white only from another producer, and one yellow experimental paint formulated by the Research Laboratory Division. The sources of the test paints were:

1. Baltimore Paint and Color Works, Baltimore.
2. Boydell Brothers Company, Detroit.
3. Buckeye Paint and Varnish Company, Toledo.
4. Cook Paint and Varnish Company, Detroit.
5. Franklin Paint Company; Franklin, Massachusetts.
6. Glidden Company, Cleveland.
7. Jaegle Paint and Varnish Company, Philadelphia; white only.

   MSHD No. 13A Yellow Experimental Traffic Paint.
8. L. K. R. Chemical Company, Detroit.
9. Patterson-Sargent Company (BPS), Cleveland.
10. Prismo Safety Corporation; Huntingdon, Pennsylvania.
11. Truscon Laboratories, Detroit.

Deposition particulars covering the above white and yellow traffic paints (applied August 14-21, 1957) were presented in Research Laboratory Report 282, the first progress report on this project.

QUALIFICATION TESTS

All paints were tested for conformance with specification requirements for color, reflectivity, consistency, bleeding, and settling; results are presented in Table 1. A review of the results shows that the following paints failed to meet the noted specification requirements and therefore are not eligible for bid requests:

White Paints

No. 96 Low reflectivity and excessive viscosity

Yellow Paints

No. 89 Muddy color of low reflectivity

No. 91 Excessive viscosity

No. 95 Excessive viscosity

No. 103 Not matching color standards, low reflectivity, and low settling index

No. 105 Excessive field drying time.

An interim letter report dated March 27, 1958, listing qualification test results, was issued to the Committee prior to its Spring meeting. Manufacturers of paints not meeting specification requirements were to be notified of their respective paints' shortcomings when requisitions were submitted to them for 1958 performance paints.

FIELD PERFORMANCE RATING

Test stripes were rated in the four test areas eight days after deposition, and at three-month intervals thereafter for one year after deposition.

Ratings from the four test areas, averaged from the findings of the four observers, are tabulated for all test paints in Table 3. These average quality values for the individual paints were then used to calculate the respective weighted ratings, which are also recorded in Table 3.

There was considerable difference in the durability ratings of the test paints, especially in Test Area No. 3 (concrete) on US-127 which has proven especially tough on stripe-life. This is brought out in Figure 1 showing the terminal condition, in Test Area 3 (concrete), of white Stripes 7 to 12 of poor durability flanked by white Stripes 13 to 18 of better durability.

FIELD TEST RESULTS

Table 2 contains a summary of evaluation values for all 1957 test paints, listed in descending order of terminal "Percent of Best" values. Half-year and one-year service factor values for all test paints are tabulated in Table 2, which also contains a column summarizing results of the previously mentioned qualification tests.

The "Qualification Tests" column in Table 2 shows that one white paint and five yellow paints failed to meet all specification requirements and therefore became ineligible for bid requests.

Three of the four road areas used in the 1957 tests were the same as used in the 1956 tests, while the fourth area (bituminous) was transferred from US-16 east of East Lansing to US-127 south of Lansing, because of construction in progress at the former area at the time of stripe deposition.

Apparently this change of locale accounts for generally slightly lower terminal service factor values being obtained in the 1957 tests than in the 1956 tests of paints produced by the same manufacturers. This can be noted by comparing the respective columns in Table 2.

No recommendation is made concerning paints to be selected for bids. If the 50-percent, one-year service factor were used as the minimum acceptable value, then seven white paints and four yellow paints would be eligible for bid requests.

TABLE 1

QUALIFICATION TEST RESULTS
1957 Performance Paints

Paint No.	Color	Reflectivity Percent	Consistency K. U. - 77 F.	Drying Time Field - Avg. Minutes	Bleeding Index		Settling Index
					Asphalt	Tar	
	White						
90		85.4	67	44	6.0	5.0	8
92		83.9	80	41	7.3	4.6	8
94		91.5	75	31	5.0	4.5	7
96		78.4	87	23	5.0	5.0	8
98		85.4	71	33	6.0	4.6	7
100		79.6	72	36	8.6	5.0	8
102		83.7	77	40	6.6	4.0	8
104		84.3	68	40	6.0	5.0	7
106		86.5	71	48	5.3	4.3	7
108		84.2	72	25	6.3	4.6	7
110		84.8	72	34	6.3	4.8	7
	Yellow						
89	NP_m*	50.9	68	29	6.3	8.0	8
91	P_g	60.7	88	28	7.3	6.3	9
93	P_g	65.1	74	30	6.0	5.0	7
95	P_g	61.1	86	26	7.0	7.0	8
97	P_g	58.4	80	36	6.6	7.3	8
99	P_o	53.6	73	31	7.3	6.0	8
101	P_o	54.1	80	16	7.3	6.0	8
103	NP_r	44.8	68	34	4.6	7.0	5
105	P_o	56.6	71	56	6.0	5.6	7
107	P_g	57.3	70	38	8.6	6.6	8
109	P_o	54.9	73	32	8.6	6.6	8

*P = passing; NP = not passing
o = exact color match with standard;
g = green side of standard;
r = red side of standard;
m = muddy color.

TABLE 2

SERVICE FACTORS AND TERMINAL RATINGS
1957 Performance Paints*

1956 Service Factor 371 days (a)	Paint No.	1957 Service Factors 195 days	1957 Service Factors 374 days	Percent of Best	Qualification Tests (b)
		White Paints			
- - - -	92	75.5	63.2	100.0	P
60.0	98	79.1	62.7	99.2	P
63.1	100	73.3	60.7	96.0	P
54.6	102	74.0	57.5	91.0	P
54.4	90	70.8	54.3	85.9	P
52.4	106	69.2	53.3	84.3	P
56.5	110	71.2	53.3	84.3	P
57.6	108 (c)	68.3	48.1	76.1	P
57.1	104	65.7	46.4	73.4	P
54.0	96	62.0	45.2	71.5	NP
54.0	94	54.6	36.2	57.3	P
		Yellow Paints			
69.1	97	77.9	66.5	100.0	P
61.6	89	74.0	59.3	89.2	NP
42.3	105	72.9	58.2	87.5	NP
58.0	101 Exp.	73.4	56.8	85.4	P
59.5	107 (c)	74.6	56.6	85.1	P
61.3	109	72.7	56.1	84.4	P
- - - -	91	72.1	53.6	80.6	NP
57.7	99	70.0	53.5	80.5	P
52.0	95	68.7	51.7	77.7	NP
51.4	93	61.3	42.0	63.2	P
59.9	103	57.7	37.4	56.7	NP

* All paints applied at rate of 16.5 gal per mi of 4-in. stripe, with 6 lb of drop-in beads per gal.

(a) Three test areas same as in 1957, one bituminous area different.

(b) P = Passing; NP = Not Passing.

(c) Special beads, not MSHD Type III as all others.

TABLE 3

HIGHWAY PERFORMANCE DATA
1957 Transverse Stripes

Exposure Days	Factor Evaluated	White Paints											Yellow Paints									
		90	92	94	96	98	100	102	104	106	108	110	89	91	93	95	97	99	101	103	105	107	109
8	General Appearance	9.4	9.7	9.6	8.4	9.8	9.8	9.2	9.5	9.6	9.8	9.5	9.2	9.9	9.9	9.9	10.0	10.0	10.0	9.0	9.9	10.0	9.9
	Durability	9.3	9.8	9.5	9.8	9.9	9.9	9.8	10.0	10.0	9.8	9.7	9.7	9.7	9.6	10.0	10.0	9.6	9.9	10.0	9.6	9.8	9.6
	Night Visibility	7.5	6.9	7.2	7.3	8.5	6.7	8.5	7.7	7.8	8.0	7.9	7.9	7.1	7.4	7.4	7.4	6.8	7.4	7.0	7.2	8.0	7.5
	Weighted Rating	8.4	8.3	8.4	8.4	9.2	8.3	9.1	8.8	8.9	8.9	8.8	8.8	8.4	8.5	8.7	8.7	8.2	8.7	8.4	8.4	8.9	8.6
103	General Appearance	6.5	7.6	5.1	5.0	7.6	7.4	6.7	6.5	6.4	7.1	6.9	6.6	7.5	6.5	6.3	7.6	7.0	6.8	6.0	7.4	7.5	7.1
	Durability	9.1	9.4	6.6	7.3	9.4	9.4	9.2	8.9	8.4	9.1	9.3	9.3	9.1	7.3	8.2	9.6	8.7	8.9	8.0	8.9	9.3	9.3
	Night Visibility	6.4	6.5	4.4	5.4	7.3	6.0	6.1	5.0	5.8	5.6	5.9	6.3	6.8	5.3	6.2	6.6	6.6	6.7	4.3	6.5	6.6	6.6
	Weighted Rating	7.5	7.8	5.4	6.1	8.1	7.5	7.4	6.7	6.9	7.2	7.4	7.5	7.8	6.2	7.0	7.9	7.5	7.6	6.0	7.6	7.8	7.7
195	General Appearance	4.4	6.2	2.2	3.2	6.3	5.7	5.3	3.7	4.3	3.8	4.8	5.2	4.8	3.1	4.4	6.7	4.7	4.8	2.5	5.9	5.5	5.4
	Durability	5.9	7.5	2.7	4.4	6.8	7.1	7.0	4.8	5.6	4.4	5.7	7.1	5.4	3.5	5.0	7.6	5.4	6.4	3.1	6.5	6.3	5.6
	Night Visibility	3.7	5.0	1.7	3.2	5.3	5.1	4.0	2.6	3.9	3.0	3.7	4.3	3.9	2.7	3.8	5.4	3.5	4.4	1.5	4.4	4.0	3.9
	Weighted Rating	4.7	6.1	2.2	3.7	6.0	6.0	5.3	3.6	4.6	3.6	4.6	5.5	4.6	3.1	4.3	6.4	4.4	5.2	2.2	5.4	5.1	4.7
276	General Appearance	4.2	6.0	2.1	3.0	5.8	5.3	5.2	3.4	4.5	3.6	4.5	4.7	3.9	2.6	3.6	6.0	4.4	4.4	2.0	5.2	4.9	5.1
	Durability	5.1	6.6	2.1	3.4	5.8	6.4	5.8	3.6	4.8	3.7	4.8	5.9	4.3	2.9	4.1	6.9	4.7	5.1	2.3	5.6	5.3	5.9
	Night Visibility	2.0	3.1	0.9	1.8	2.3	2.7	1.7	1.1	2.1	1.2	1.5	2.8	2.3	1.0	2.5	3.7	2.4	2.6	0.6	2.7	1.8	2.0
	Weighted Rating	3.5	4.8	1.5	2.6	4.1	4.4	3.7	2.3	3.4	2.4	3.1	4.2	3.3	1.9	3.3	5.2	3.5	3.8	1.4	4.1	3.5	3.9
374	General Appearance	3.6	5.6	1.7	2.7	5.1	5.0	4.7	2.5	4.0	2.9	3.8	4.1	3.4	2.5	3.3	6.1	3.7	3.5	1.5	5.0	4.3	4.4
	Durability	4.4	6.1	1.9	2.8	5.3	5.8	5.3	3.0	4.4	3.1	4.1	5.4	3.6	2.5	3.6	6.8	4.3	4.3	1.7	5.2	4.7	4.8
	Night Visibility	1.9	2.7	0.9	1.5	2.6	2.5	1.4	1.2	1.7	1.1	1.6	1.9	1.4	0.7	1.6	3.4	1.7	1.7	0.6	1.8	1.1	1.2
	Weighted Rating	3.1	4.4	1.4	2.1	3.9	4.1	3.3	2.1	3.0	2.1	2.8	3.5	2.5	1.6	2.6	5.0	2.9	2.9	1.1	3.5	2.9	3.0

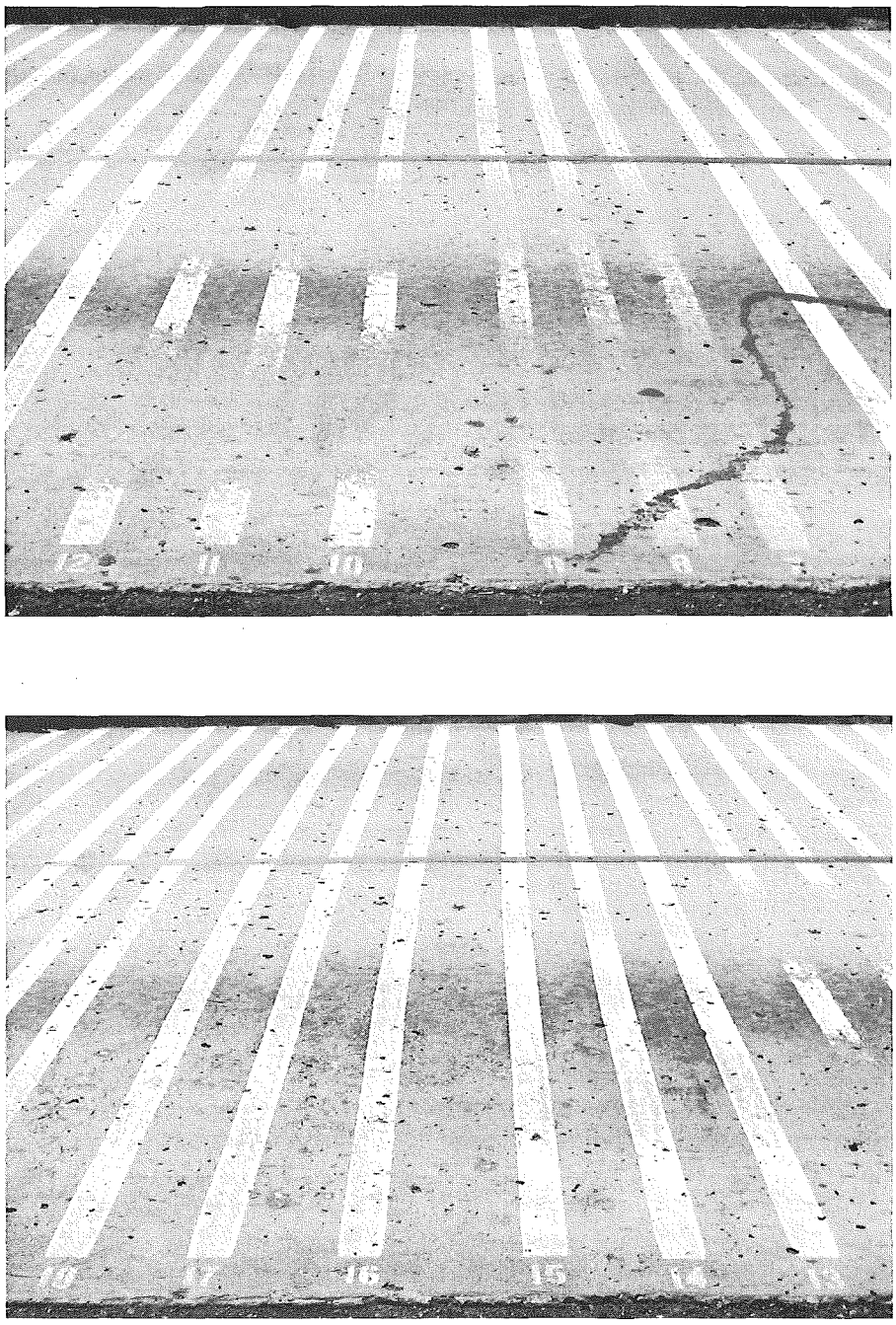

Figure 1. Some 1957 White Stripes after one year's exposure in Test Area No. 3 (concrete). Poor Stripes 7-12 (top) were flanked by Stripes 13-18 of better durability (bottom).