



TRADE PRODUCTS LABORATORY  
PROGRESS REPORT  
JULY, 1954

C-19

This is a report on 126 panels on our factory roof at 45° south exposure.

The panels in our backyard and on our rural fence will be reported on at a later date.

Blister resistant paints made with V-855, GRV-1717, U.S.I. DX-159 (now U.S.I. 1400) and paint made by duPont. Exposed in back yard July 23, 1953. All self-primed. All chalking freely and very clean. V-855 and U.S.I. are chalking more than duPont and GRV-1717. No signs of failure other than slight wood failure under GRV-1717 and V-855.

Comparison of Y-1800-X-3 with Y-1800-X-4 also intermixes of 1800-X-3 with Y-1867 from 0% to 100%. (Y-1800-X-4 contains more  $TiO_2$  and oil than X-3) Test started 12/19/52. At 11 months the paints with 50% or more Y-1867 still had a trace of gloss. All were chalking. Now at 20 months, all are flat and clean; no difference in chalking is observed. Whiteness varies with the amount of Y-1867. Y-1867 alone is very white.

Simpson's House Paint versus Toronto Endurance #728, and Cleveland Y-1800-X-3. One coat of Y-1851 and two coats paint tested. Lapped. Test started 9/11/52. Up to 15 months no difference could be seen between the three paints except that Simpson's was chalking and cleaning more than the other two. At 15 months Simpson's was whiter than the others and showed more sparkle making us suspect the presence of mica. (Recently we have discovered this same property in many paints including Y-1800 and Y-1804, so we now attribute it to some type of mineral found in common grades of magnesium silicate.) No change was observed between 15 months and 23 months.

Old Y-1855 versus present formula -- One coat over Y-1851. Exposed 4/3/53. The current formula shows better general appearance and gloss with less chalking and fading.

Leaded Zinc Oxides -- W-35, American Chemet 10LEG and S.W.P. #12-88 were compared in both Y-1800 - Y-1804. Two coats of house paint over Y-1851. Exposed 10/17/52. At almost 22 months there was no difference between them.

Zinc Oxides -- W-33 and AZO Zinc Oxide combined with W-1 were compared with W-6 in Y-1800 and Y-1804 (W-69 formula). Two coats over Y-1851. Exposed 10/17/52. At almost 22 months there is no difference in the zinc oxides, but in each case W-6 shows better color than either lead and zinc combination.

Zinc Oxides -- Eagle Picher #426 and AZO-ZZZ66 Lead free zinc oxide compared with W-33 in Y-1850-F. In this test we also made a comparison of Y-1850-E and F. Two coats over Y-1851. Exposed 10/17/52. When fresh W-33 had slightly better color than Eagle Picher #426. At 7-1/2 months this was also true. At 12 months and 22 months both paints were chalking a little and looked the same. After making these panels we were told that AZO-ZZZ-66 should be compared to W-4 instead of W-33. Our tests bear this out as it started out whiter than the other paints and has stayed that way. Y-1850-E is slightly whiter than Y-1850-F, but there is no difference in the current rate of chalking.

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Lead Silicates in Y-1800-X-3, Y-1804 and Y-2200. Euston Lead Company's #218 and S-158, in combination with W-33 were compared with the leaded zinc normally used in the above three paints. Two coats over Y-1851. Exposed 6/24/52. In each case the W-6 started chalking the earliest and now shows the best color. Both lead silicates are yellowing slightly in each paint but the degree of yellowing is not consistent in the three paints or in the same order as time progresses in the case of Y-2200. No signs of checking or erosion as yet.

Inerts in Y-1800 -- W-11, W-188, Loomis Talcs M.S.K 1 and M.S.K. 2 were compared with each other. Two coats over Y-1851. Exposed 10/17/52. The dirt collection has been so great that it was impossible to evaluate these paints until recently. Now at 22 months W-11 has a yellow cast. W-188 a gray cast. There is no color difference between M.S.K. 1 and 2. No other differences have shown up.

Carmote #849 New England Red Versus Y-1855 -- One coat over Y-1851. Exposed 10/17/52. Carmote has had better gloss and color from the beginning and has retained its color while Y-1855 has faded. Carmote still has a little gloss. The Y-1855 tested was the original formula. It has since been changed to use 100% Kroma Reds. Another panel has been exposed to compare our present Y-1855-A with our old.

Hydrozo -- Y-1800 and Y-500 with and without Hydrozo have been exposed over Y-1851 with and without Hydrozo. Exposed 9/25/52. Up until 13 months both the paints and primers containing Hydrozo could be easily identified by their dirt retention. At 13 months the Y-1800 had cleaned to the point where there was little difference but the difference was still very obvious in the Y-500. Now at 22 months no difference can be seen in the Y-1800 or in the prime coat under the Y-500, but it is still visible in the Y-500 itself.

Y-1800-X-2 versus Y-1800-X-3 (addition of W-170) -- Two coats over Y-1851. Exposed 9/25/52. At 14 months both paints were cleaning satisfactorily and X-3 was slightly yellow. Now at 22 months both look clean and white and are chalking to about the same extent. General appearance of each is good.

duPont recommendations for Tint Base with and without phenyl mercuric oleate versus Y-1804 -- Both Grays and Buffs were exposed 11/24/52. Both duPont paints are still very dirty. Y-1804-S is showing more chalking and fading and consequently less dirt collection. Paints with phenyl mercuric oleate look dirtier than those without it. There is no mildew on any panel.

DuPont recommendation for lead free  $\text{CaCO}_3$  house paint versus 1-W-118 and Y-2200 (lithopone type) -- Exposed 12/19/52. At 3 months all were very dirty particularly 1-W-118 and Y-2200. 1-W-118 was also very yellow. At six months Y-2200 was chalking freely while 1-W-118 and duPont were chalking less, but duPont seemed to be cleaning most. No comments made about color at that inspection. At 11 months 1-W-118 and Y-2200 were slightly yellow but duPont looked white. DuPont was not cleaning as much as the others. At 19 months 1-W-118 is yellow and Y-2200 is white. Both are cleaning fairly well. DuPont is so dirty that its color cannot be accurately judged even on cleaned section. This inspection followed a long period of hot dry weather which probably increased the dirt collection. It is possible that in making up the duPont formulation we misinterpreted the type of  $\text{TiO}_2$  to use and that we should have used more W-91.

Endurance Pastel Shades -- A comparison between lithopone type Y-1804-R and Y-1804-S. 20 colors - Two coats over Y-1851. Exposed 7/10/52. At 10 months the Y-1804-R showed definite yellowing while Y-1804-S was very close to its original color. Slight chalking was found on each paint. Since the 10 month inspection the Y-1804-S has shown increasingly more chalking than the Y-1804-R. This gives the Y-1804-S a faded appearance but under the chalk the color is close to the original. The Y-1804-R has continued to yellow and looks quite dirty at present (24 months). The first coat of Y-1804-R where not recoated is eroding. Nodefinite signs of erosion can be seen on the Y-1804-S.

Johns-Manville Asbestos siding painted with Y-1800 and Y-1828 but primed with the following Y-1851, GL-52323, Y-810, GL-61982, RL-8319. Exposed 8/7/52. At two years all primers are holding very well.

Superior Wood Products Tempered Hard Wood primed with Y-1851, GL-52323, and 54-W-4 and coated with Y-1800 and Y-1828. Exposed 8/7/52. At two years the 54-W-4 is checking badly, but the other primers are holding well.

Lead Silicates -- Euston Lead's B-8 and S-138 are compared with 45X and W-6 in Y-1800 and Y-1804. Two coats over Y-1851. Exposed 2/2/53. In Y-1800 the W-6 kept the paint cleaner for the first three months. At nine months all were cleaning satisfactorily and looked the same. Now at 18 months all are chalking about the same. All show slight erosion where first coat of Y-1800 is not covered. This is more pronounced with 45X and S-137 than with B-8 or W-6. The Y-1804 formula used contains W-69. In the Y-1804 the W-6 has definitely better color than the lead silicates although it started chalking earlier. B-8 is the yellowest with 45X following closely. All show some erosion on the first coat of Y-1804. This is worst with 45X and S-137.

Zopaque Rutile  $TiO_2$  -- Several panels showing the W-170 type Baltimore Rutile versus W-170 in Y-1851, Y-1804, Y-1867 were examined. The  $TiO_2$  used was received at different times and the panels were exposed in February, March and June of 1953. The Y-1867 does not show any difference in the pigments as yet, but excessive chalking of the Zopaque Rutile  $TiO_2$  is visible in each of the other paints.

Y-1800-X-3 versus Y-1800-X-4 (increased oil and  $TiO_2$  content). One coat over Y-1851. Exposed 3/24/53. At 3 months X-4 showed greater dirt retention. The same was true at 7 months. At 17 months X-4 is chalking slightly more than X-3 but looks slightly yellower. Both show a small amount of checking probably due to wood failure.

Blister Resistant Paints -- Comparison of duPont formula made by duPont, made with GRV-1717, made with U.S.I. DX-159 and lead and oil. Exposed on roof July, 1953. All self-primed. GRV-1717 was slower to chalk than the other alkyds, but all are now clean. U.S.I. and duPont are very white but GRV-1717 is slightly yellow. Lead and oil is almost black and starting to check slightly.

GL-62791 (Our Present 1-W-119) versus Y-1804-S -- Two coats over Y-1851. Exposed 3/24/53. At three months there was no difference in gloss, color, or chalking. Gloss was gone from each paint. At seven months the Y-1804-S was chalking and cleaning much more than GL-62791. Now at 17 months the GL-62791 is still dirtier and shows less fading than Y-1804-S. No signs of failure.