

PRODUCT DEVELOPMENT REPORT
PAINT, VARNISH & LACQUER LABORATORIES
JULY, 1959

CLEVELAND

NOBIL

DEALING

N13123

GLD37376

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D. REMARKS

1. GL-70790, Red Internal Nu-Pon Cote Pipe Lining, is our latest quality of natural gas transmission pipe lining, and it supercedes RGL-28130, Light Gray Nu-Pon Cote Pipe Lining. The formulation of GL-70790 and RGL-28130 is the same except for the type of hiding pigment and that GL-70790 contains faster solvents for more foolproof application properties.
2. It is interesting to note that RGL-28130 has a considerably lower smoothness factor than GL-70790. The reason for this is the slower solvents in RGL-28130 which make for better film flow.

ACCELERATED GRINDING OF RED LEAD PRIMER

GLO69471-E Red Lead Quick Drying Primer:

R-202 - 1430.0 lbs.	GRV-3198 - 25.625 Gal	VM-432 - .70 Gal
W-188 - 125.0	VR-58052 - 13.875 "	VM-433 - .28 "
W-166 - 26.8	CH-358 - 13.875 "	CH-171 - .28 "
VM-308 - 8.94	O-3 - 3.343 "	
M-62 - 6.70	S-55 - 6.700 "	
M-333 - 4.47	S-106 - 7.800 "	

The above formulation has been made in the past using the conventional pebble mill grinding process. The usual grinding time for a 4-5 grind is 48 hours.

In a recent primer test panel series, the writer included, with the above, a batch made on the air agitator in the laboratory. The quick ground batch proved slightly better than the standard material in salt spray and humidity, and can stability is equal.

Following this test Mr. Caporaso made a small batch on the Cowles dissolver showing that it was feasible to try a plant batch. The first batch in the plant was 100 gallons using the total vehicle as the grinding media. As the temperature approached 100° F., the rate of shear dropped to the point where no further grinding action was noted. The batch had to stand until the temperature dropped back down to approximately 75° F. before the grinding could be continued. Total grinding time required for a 4-5 grind was 9 hours. The second plant batch of 50 gallons was made using only the GRV-3198 and the CH-358 as the grinding media. This batch was ground to 4-5 continuously in 2 hours time.

The constants are as close to theoretical using the accelerated type of grinding as they are using the conventional.

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<u>FIGMENTS</u>	<u>COMMENTS</u>
<u>Y-4557 - Maroon</u>	
14. R-281, R-265 Control	Fair gloss, good color retention, slight darkening
15. R-70, R-265	Fair gloss, fair color retention, slight fade
16. R-286	Fair gloss, fair to good color retention, darkening
17. X2672 Mercadmium	Fair gloss, good color retention (blistering)
18. R-209, X2322 Imperial	Fair gloss, fair color retention, fading
19. Imperial's X2277 and X2433	Good gloss, fair to good color retention, darkening

In general, the six month Florida exposures are performing similar in color retention to 260 hours weatherometer. However, we would estimate that it will take at least nine months Florida exposure to equal 260 hours in the weatherometer. One disturbing factor we note is that molybdate orange darkens more severely in Florida exposure than in the weatherometer. The present pigment combinations now used in Speedenamel are represented by #4, #9 and #16 in the table.

Lead-Free Spred Lustre -- Lead-free shading color combinations will be issued for Y-4657, Y-4659, Y-4661, Y-4660, Y-4641 and Y-4655 temporarily. We will buy out hansa yellow dispersion G5-24-A-215 from Hilton Davis for shading purposes. YW-125 has been established for grinding purposes in deeper colors. We have had flocculation difficulties with YW-125 in VCM quality paints. We are working with an Imperial match for YW-125 which does not flocculate in VCM. Weatherometer exposures are not complete so full approval cannot be given to the Imperial pigment.

J. E. Southwick

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8/6/59

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Briefly, Blue Metallic Air Dry Drum Enamel specification issued on March 15, 1956 by Standard Oil Company calls for hand spray application at 18-22 seconds #4 Ford Cup at 77°F. from full body viscosity of 45-55" with xylol or toluol. Reduction is 4-1. Air dry time is 20 minutes to touch and 2-1/2-3 hours to handle. Material will be water resistant and mineral spirits resistant after 96 hours. Weight per gallon will be 8.00# $\pm$ 2#. Dry film gloss is 70° minimum color is a phthalo blue tinted aluminum only. Air dried film will not fracture on a 1/8 inch Mandrel 180° bend test.

Twenty-five drums of SA-3482-A have been manufactured and tentatively approved. New formula contains more conventional pigments. No difficulties with seedy batches have been encountered.

Dispersion test on W-163, W-213, and W-238
Rutile Titanium Dioxides

Purpose of Test:

To study the use of low solids grinding in manufacturing White Nubelite bases with W-163 (National Lead's sulfate type), W-213, Du Pont's chloride type, and W-238 (Glidden's Zopaque R-11 sulfate type) rutile titanium dioxides.

Procedure:

All bases were ground in the same production mill at 35-37% loading. The only variations are the titanium dioxide used and the grinding technique. Enamels were made from the base pastes in the quality of 92-W-9491 White Nubelite, and an evaluation test was made of these enamels using primed Bonderized panels. T.S.D. Report 155-58 has test details.

Experimental:

Pigments tested were W-163, Titanox RA lot A-57-I-6, W-213, Ti-Pure R-110 lot 8863, and W-238, Zopaque R-11 lot 18-A-103. NRV-2937 Prod. 0364-392 was the resin used, and the base formulas were 148-W-975, 148-W-978, and 148-W-979. All low solids, high pigment grinds were adjusted by means of the after grind to the same pigment, vehicle solvent combination as the standard forms.

Grinding Viscosity in Kreb Units at 78°F.

			<u>Plus After Grind</u>
148-W-975(W-163)	Regular Procedure	96 KU	--
148-W-975(W-163)	Low Solids Method	93 KU	87 KU
148-W-978(W-213)	Low Solids Method	93 KU	85 KU
148-W-979(W-238)	Low Solids Method	95 KU	89 KU

Results:

1) W-213, Du Pont's chloride type rutile titanium dioxide, gave best results of the series though all three pigments were quite close in most properties. The initial gloss of W-238, Glidden's R-11 Zopaque, was not as high, and the loss of gloss in the 300 hour weatherometer test was greater.

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- 2) W-213 was outstanding in fast dispersion, reaching a 7-3/4 - 8 reading in only 8 hours using the low solids procedure. By the time the factory added the after grind, the mill was run an additional 9 hours, a total grind and after grind time of 17 hours. The total time should be no longer than 10 hours. The enamel made from this paste gave the best results in the T.S.D. test.
- 3) All 92-W-9225 White Nubelites made from these white bases had a 60° gloss of at least 5 points above the minimum gloss standard of 85 degrees.
- 4) When made into 92-W-9491 White Nubelite, both W-163 and W-213 had a gloss of 81 degrees; W-238 gave a 78 degree reading.
- 5) Glidden's Zopaque R-11 (W-238 Rutile) dispersed a little slower than the standard W-163 and showed lower initial gloss.
- 6) Under controlled conditions, standard Nubelite base, 148-W-975, could be processed in twenty-four hours.

Conclusions:

- 1) By the use of W-213, Du Pont's chloride type rutile, and low solids grinding procedure, a 300% increased yield has been achieved. Under present cost structure, no savings would result. However, a cost study of this low solids grinding technique should reveal a cost savings, as well as increasing our production capacity of White Nubelite bases threefold.
- 2) W-238, Glidden's R-11 zopaque rutile, have equivalent results to the standard W-163, and can be used in formulations where gloss is not critical or maximum weatherability a factor.
- 3) In 92-W-9225 and 92-W-9491 White Nubelite enamels, differences were slight regardless of the titanium dioxide used.

C. F. Butler