



288900079



CITY Cleveland, Ohio DATE October 30, 1951 FOR Mr. H. W. Dell

SUBJECT PRODUCT DEVELOPMENT REPORT
September 1951

ANSWERING LETTER OF

Some raw materials that were scarce a few months ago, like lacquer solvents and nitrocellulose, are freely available. Others like vinyl resins and Epon resins are temporarily available in larger quantities because of the present fall off in business but the present relief is only expected to be of short duration.

We have a long term shortage of phthalic anhydride which Washington expects will last through the latter part of 1953 or longer. The shortage is not only due to phthalic anhydride production capacity (although eight new plants are being built or contemplated) but is due to a shortage of the basic raw material, naphthalene. Apparently increasing amounts are being used for plasticizers for plastics which is one reason why there is such a shortage in our industry. Only on the West Coast where phthalic anhydride is made from orthoxylene from petroleum is supply in balance with demand and even there it has recently become harder to get.

Our phthalic contracts for 1952 will not be larger than for 1951 which means that we must continue to purchase part of our needs from alkyd suppliers at 30-40¢ per gallon above our costs. The policy of phthalic anhydride producers varies from time to time but at present they require all DO's to be included in contracts which we believe is unfair.

Shortages of lithopone and reduced calcium titanium have disappeared during the last two months but the shortage of rutile titanium continues and we have been told by the largest producer that the industry trend from flat wall finishes (made with lithopone or calcium pigment) to products like Satin requiring rutile TiO_2 will insure a shortage for some time to come. We must make every effort to use as much C pigment as possible.

At present we can buy only 70% anatase and 30% rutile. If we could buy what we need to be competitive we would use 85-90% rutile and 10-15% anatase.

The phthalic anhydride and rutile TiO_2 picture should be thoroughly understood by all formulators because there is evidence that we must contend with shortages for a long time.

Recently there has been a temporary shortage of red lead and white lead due to the fact that world prices were higher than Government prices which

eliminated foreign shipments. While this has been corrected white lead has practically priced itself from the market as long as leaded zinc is available and red lead will only be used where absolutely necessary at present prices.

Phenolic resins are still being limited on a quota basis by the producers.

Can consumption is still limited to 90% of 1950 usage and our consumption of new drums and kits is also limited. Our use of aluminum is controlled by a CMP quota. There is every reason to believe that there will be a growing shortage of metals which will not only effect us directly but which will undoubtedly reduce our sales to many of our industrial customers who make civilian products.

G. H. MUTERSBAUGH

GHM:ms

CLEVELAND

GLD006884

HOUSE PAINT TRENDS

Minutes of Meeting Held 10-22-51 in Mr. Schulte's Office

--*

A meeting was held in Mr. Schulte's office on the afternoon of October 22, 1951 with Mr. Simpson, Mr. Mutersbaugh, Mr. Schulte, Mr. Hayward and the writer being present. As a result of the trip to the DuPont Test Fences and the Titanium Pigment - National Lead Test Fences by Mr. Hayward and the writer, this meeting was held to discuss the points brought out in Mr. Schulte's letter of October 3, 1951 under the subject of House Paint.

Discussion was held on the points in the order given:

1. Recommended formulations for anti-peeling.

DuPont has conducted some extensive tests on this subject. Originally their work on Stain Resistant Paints led to their testing these paints on their blister testhouse. This house was erected on the roof of their Newport laboratory building and has controlled moisture (70% relative humidity and temperature (75°F) inside the House. Duplicate panels are placed on all four sides of the house over various types of insulation and also uninsulated surfaces. Twelve duplicates are exposed of each paint system. The best Stain Resistant Paint and also the best Blister Resistant Paint were made using TiPure FF (anatase titanium/asbestine in Aroplaz 1271 (alkyd vehicle) at 30% P.V. (pigment volume) and 72% TNV by volume. .2% by weight of Phenyl Mercury Oleate was used as a mildew inhibitor based on the total paint.

Second best blistering resistance was obtained by using the above paint as a primer followed by the conventional TiPure R-610 (rutile)/35% zinc oxide /mg. Silicate topcoat.

Third best blistering resistance was obtained by using a zincless primer based upon Fed. Spec. TT-P-25a using a P.V. of 40%. This was followed by the Stain Resistant Paint given above as a topcoat. This is an interesting development and should be followed closely as it is a radical departure from conventional house paint formulations. Repaint studies are being conducted to more accurately establish the value of the stain and blister resistant paints.

Some studies will be made in a limited way on these and other paints at Cleveland. It is interesting to note that the zincless primer used is similar to our Glidden Exterior Base Coat.

2. Recommended formulations to decrease chalking in whites.

It was noted that both DuPont and Titanium Pigment are recommending the use of some rutile pigment to control the chalking of whites. DuPont recommends:

50% anatase/50% TiPure YCR (delayed chalking anatase)
80% anatase/20% TiPure R-610 (full non-chalking rutile)

GLD006885

Much better tint retention is shown by the introduction of 20% replacement of the inerts with lead in the form of BCWL or 45-X as follows:

12/30/26/26/6 - Titanox RANC/zinc oxide/calcium carbonate/
asbestine/BCWL.

Tests will be run to replace the lithopone in Y-1804 Endurance Tint Base with titanium calcium base rutile on an equal volume substitution.

5. Although none of the test fences stressed deep color formulations, we did obtain some information from DuPont on alkyd/oil and straight alkyd trim paints using durable color combinations. (This is tabulated in detail in the writer's report dated 10/15/51).

6. Recommended formulas for high hiding paints such as Imperial and Dutch Boy.

DuPont recommends the following pigmentation:

26/52.3/21.8 Titanium oxide/35% zinc/mg. silicate. (at 30% P.V.)

The titanium is introduced as - 50/50 or 80/20 anatase/YCR or anatase/
R-610.

Titanium Pigment recommends:

25/30/30/15 Titanox RCHT/anatase titanium/35% zinc/asbestine.

It was interesting to note that Imperial on test at Titanium Pigment for approximately 2-1/2 years showed excellent color, medium chalk and freedom from dirt and mildew. It was compared in this test to the Titanium Pigment formula above, which was comparable to Imperial. DeVoe and Vane Calvert One-Coat Paints also included in the test showed dirt and mildew collection.

7. Recommended formulas for primers, including 45-X.

DuPont recommends their tint base formula as shown under (4), also a high hiding primer as follows:

22.3/43.5/34.2 TiPure R-610/35% loaded zinc/mg. Silicate.

Titanium Pigment recommends their MV-401 primer which is a zincless type similar to Y-1851 Glidden Exterior Base Coat. They show a number of tests on this primer replacing the BCWL with 45-X on an equal volume basis. We do not believe that 45-X in primers shows quite as good wood holding properties as BCWL. However, tests will be started at Cleveland to replace BCWL in Y-1851 with 45-X on an equal volume basis.

8. and 9. Check National Lead on their water sensitivity of pigments tests.
Check National Lead on their laboratory blistering tests in re-
lationship to outside blistering.

No information was available on these two points. Titanium Pigment has started some work on Stain and Blister Resistant Paints but has not progressed

very far. It may be a coincidence that their work is being carried along similar lines to the DuPont tests using alkyd vehicles with Titanox A/asbestine pigmentations.

10. Check recommended formulas for improved working.

It is interesting to note that most of the exposures used naphthenate drier combinations. DuPont shows a naphthenate (lead-manganese) drier combination with the additions of M-25 OKO oil and Soya Lecithin (NS grade) to help stabilize body, give better brushing, improved gloss and non-settling. It was also discussed at DuPont that the recent dry weather is the cause of thinness of body on house paints. The addition of .5% water is recommended in the grind. This could readily be incorporated by combining it with the lecithin. Tests will be run to check the above combination of naphthenate driers, M-25 oil, Soya Lecithin and water.

11. What is the trend in respect to oil content?

DuPont does not anticipate any trend upwards and believes 4.25# oil/gallon of paint will be average. Glidden paints are close to this average. National Lead and Titanium Pigment believe trend is slightly upwards and that the average will be between 4.25 to 4.5# of oil/gallon. It should be noted that in general everything being equal that lower P.V. increases dirt and mildew collection.

12. What is the best inert and percentage for whites and tints?

Magnesium silicate is being recommended for first-grade paints.

Calcium carbonate and combinations of carbonate and magnesium silicate are being used in second-grade paints largely. The percentages vary as shown in the pigmentation listed under the various points. Careful selection of the grade of calcium carbonate is necessary. Dirt and mildew are evidently

less prevalent in the case of carbonates, but the tendency towards staining and slitting failures is worse. The zinc oxide content is critical in such formulations.

13. Recommended formulas for fume-proof.

DuPont recommends: 35/42.7/22.3 Titanium oxide/zinc oxide/Mg. silicate. Titanium oxide used is the 50/50 or 80/20 combination.

Manganese, zinc and calcium are recommended for strict fume-proof types and stability in the package is satisfactory. DuPont, however, believes that a lead manganese combination is necessary under adverse drying conditions. They do not believe the amount of lead present causes any difficulty except under very severe fume conditions.

Titanium Pigment recommends: 15/35/25/25 Titanox AA/zinc oxide/asbestine/calcium carbonate.

14. Is it necessary to use lead driers in fume-proof to have drier stability?

Note comments under (13). DuPont claims it is under adverse drying conditions. Titanium Pigment recommends a manganese cobalt combination.

Tests are to be conducted here in Y-1850 Titanozinc using drier recommendations given by both.

15. Is it advisable to have basic lead carbonate as well as basic lead sulfate in a finish coat?

DuPont does not recommend the use of carbonate in the majority of their formulations. 15/35/50 is their typical pigmentation in whites and uses 35% leaded zinc. This is also true of tints.

They are also recommending a number of formulas based upon the use of no lead.

Titanium Pigment likewise shows a number of similar formulations, but in the case of leadless paints as shown under (4) they feel that the addition of BCWL or 45-X aids materially in durability and tint retention.

16. In view of the porosity of weathered surfaces, would it be advisable to replace part of the mineral spirits with a slower boiling fraction such as S-148?

None of the parties involved advised the use of slower solvents. All recommended formulas used mineral spirits as they do not believe slower solvents are necessary.

17. Be sure and obtain the maximum percentage of rutile and type of rutile which can be used in a white to give clean-up on the north side and at the same time minimum chalking.

This point has been brought up under (2).

18. Obtain any data they may have on replacement oils.

Practically all of the formulas shown used linseed oil in various amounts.

In addition the information on asbestos shingle testing was of decided interest. The Pliolite S-5 formulations at DuPont and Titanium Pigment were outstanding on all types of asbestos shingles. The calcicoater type formulations at Titanium Pigment were also noteworthy. These types show good durability at Sayville (3 - 4 years); fair durability at San Francisco (2 years); and limited durability in Florida due to excessive chalking. Improvements in durability are on test incorporating raw linseed oil or alkyd varnish.

It was disappointing to see the exterior emulsion tests at both fences. Various formulas obtained from DuPont, Dow, Goodyear, Bakelite and Rohm & Haas did not show to advantage. Bad discoloration and excessive chalking was evidenced.

HWD/dv

H. W. DELL

GLD006888

PAINT LABORATORY PROGRESS REPORT
SEPTEMBER 1951

Three parlon type primers were recommended by Hercules Powder Company for use on underwater installations. Tests on these primers are to be conducted by the Lead Industries Association along with other recommended primers for this type of exposure. We have submitted a sample of GL61132 to be included in these tests. GL61132 is similar to the #2 primer except that Special GRV1581 has been used to replace the Rezyl 869 on a solid basis. Special GRV1581 is L.I.A. Vehicle #27 made with S138 in place of S43.

The primers to be tested are as follows:

	#1	#2	#3	GL61132
Parlon 20 C.P.	55	33	55	33
Rezyl 869 (100%)		67		
VM660	15		15	
VM654	24		24	
EG51284				103
DiActyl Sebacate	6		6	
Red Lead 97%	224	270	150	270
Stabilizer A5	2.75	1.65	2.75	1.65
S138	118	134	90	60
Solvesso 150	45.7	52	35	52
S40	12.3	14	10	14
Pigment-Veh. (weight)	2.24/1	2.7/1	6/4	2.7/1
Pigment Volume	27%	27%	19.9%	27%
% Solids	65%	65%	65%	70%

These primers are to be thinned with Xylol-80, V.M.P.-20 to brushing viscosity (55-60 sec. #4 Ford Cup).

For spray the material should be thinned to 15-18 sec. #4 Ford Cup with the same solvent mixture.

Primers #1 and #3 are to be recoated after 4 hours while Primer #2 and GL61132 should be recoated before one hour or after 16 hours dry to prevent lifting of the first coat.

The topcoat recommended for use on these primers is as follows:

Parlon 20 c.p.	-55
VM660	-15
VM654	-24
Diactyle Sebacate	-6
W170	-49
B7	1
Stabilizer A5	2.75
S138	100
Solvesso 150	39
S40	11

GLD006889

Pigment-Vehicle (weight)	1/2
Pigment-Vehicle (volume)	18%
% Solids	50%

This enamel should be thinned the same as the preceding primers and recoated after 4 hours.

These formulations have given outstanding results in salt spray tests as well as in long water exposure according to the information from Hercules. #1 and #3 are particularly good for this type of exposure.

It was found necessary to make GL61132 with a non-volatile content of 70% in order to get 42 seconds viscosity in a #4 Ford Cup.

#1 formula was found to give a very brittle film. The adhesion of AF14 (anti-fouling) type of paint to #1 primer was found to be good but the system is rather brittle. A Vinyl Aluminum GL61037 when applied over #1 Primer gives a much more flexible film.

#2 formulation gives a tough film. The adhesion of both AF14 and Aluminum Vinylite is good over this primer. The system results in a tough film. #3 is similar to #1 primer although it is a trifle tougher.

Automotive Enamels

GL61120 is a red synthetic truck enamel for air dry application. It dries to handle in 6 hours and hard overnight. Reduction is 4 to 1 with Xylol.

Three shades of brown were formulated for the Studebaker Corp. Panels were finished and submitted to Mr. Mills for approval by Studebaker. These enamels reduce 4 to 1 with Xylol for spray and bake one hour at 250°F over suitable primer.

The three shades are:

Lt. Brown GL61092

Med. Brown GL61091

Dark Brown GL61093

GL61184 is M2J-151 station wagon brown kick pad enamel formulated for Herron Zimmer Corp. for use by Ford Motor. The material reduces 5 to 1 with Xylol for dipping and bakes 10 min. at 300°F.

GL61225 is a baking body enamel formulated for the White Motor Co. in strata blue color. The material reduces 5 to 1 for spray and bakes in an infra-red oven in 11 minutes at 250°F.

GL61133 is a red baking enamel made for International Harvester Co. The enamel has good gloss and covering when reduced 4 to 1 with S138 and baked 20 minutes at 275°F.

ld
10/17/51

K. F. Atwood

GLD006890

Dark Gray Wrinkle For Typewriters - GL61077

A great deal of time has been spent on the formulation of this enamel for Remington Rand to obtain the low gloss, ability to hide machine marks on aluminum castings, and many other detailed characteristics demanded. The problem necessitated the development of a new wrinkle vehicle which promises to be a decided improvement over GRV2048 in providing not only higher solids (60%) but improved stability on aging of the finished enamel.

GL61077 reduces with S6 to spray, and bakes 1/2 hour at 300°F. One drum was shipped for demonstration, and approved.

Roll Coatings Enamels For Rubber Battery Cases

Orange Rubber Case Enamel - GL61127
 White " " " - GL61129
 Red " " " - GL61131
 Yellow " " " - GL61237

Seiberling Rubber presented the problem of coatings to be rolled over the lettering on these cases made of reclaimed rubber. The usual type of enamels used for this purpose failed to adhere to any reasonable extent.

The formulas shown above were finally found satisfactory by the customer, and orders received. They are all based on the following vehicle:

VM386 C	-	4 1/2 Pts.
GRV2045 E	-	2 1/2 "
S64	-	1 1/2 "
S-1	-	1 "
VR51037	-	2 Lbs.
VR51038	-	2 "

Application is by hand roller full body or reduced to suit with S64. They all air-dry over-night.

#17 Ocean Gray R.C. Enamel For Navy Battery Cans - GL61031.

This formula was made for the Ohio Can and Crown Co. to comply with specification MIL-P-1265 (amendment I) for use on the exterior of black iron battery cans for the Navy. A 40 gallon batch was approved. It reduces 16 to 1 with S106 to roll coat and bakes 15 minutes at 300°F. For this end use it is subsequently recoated with a roll coating flat varnish (GL50661-A).

ld
 10/19/51

L. Musser

GLD006891

TRADE SALES PROGRESS REPORT
SEPTEMBER 1951

House Paints:

A new study of competitive house paints and a review of Glidden formulations has been initiated. With lead metal subject to higher prices and control the use of lead silicate is of interest. We note that titanium calcium pigments are also being used more.

The physical properties such as viscosity and brushability are of interest. With house paint market more competitive we note more critical comments from the field.

Many of these competitor's paints were tested two to three years ago and 30 month exposure periods have just been completed. Any changes in formulation will be found interesting.

Imperial House Paint formula is to be changed to eliminate the slow drying "out of tack". The initial set to touch is not too bad but the period until free from tack has been too long when there has been an excessive amount of dirt or bugs in the air.

Enamels:

Six new colors have been added to the Japalac line.

Maintenance Enamels:

With the freeing up of Fical we have reformulated several of the Day-Lite Enamels such as Wet Wall Primer & Sealer, Wet Wall Semi-Gloss and Flat Enamels, also the regular Semi-Gloss 12-160 and Gloss 12-161.

Graphic Arts:

Work has continued on the Flat Process Colors as to method of manufacture. The use of a Baker Perkins mixer would appear possible based on laboratory grinds. Another method in which the grinding could be done on a pebble mill in large quantities with additions made after removal from mill to obtain heavy consistency has been found. This will need be tried on all colors and more data on package stability determined.

It would seem desirable to check the possibility of the Hi-R type mill. A small laboratory mill is available for experimental trial use from the agent.

Factory Letters

Cement paints for F.A.C.A. Laboratory Wind Tunnel. Test sections of finishes were applied to the cement wind tunnel at the Cleveland F.A.C.A. Laboratory as follows: Area was first divided into two general sections. #1 Section was given a wash of 10% muriatic Acid. #2 Section was given both a wash of the muriatic Acid wash and a wash of Magnesium Silico fluoride solution (2 lbs. per gallon of water). Three different primers "A", "B" and "C" were then applied over the sections I and II as treated above. Each primer was tinted to a light shade of Lemont Stone Primer "A": Liquid Cement Coating Y1000, reduced 1 to 1 with Y1013 Liquid Cement Coating Thinning Liquid. Primer "B" Exterior Base Coat applied full body. Primer "C" Satin Vapor Barrier Y3416. The finish coats were cross brushed over the primers and were as follows. Finish Coat "D" Liquid Cement Coating Y1000 tinted to shade

GLD006892

of Lemont Stone. Finish Coat "E" Endurance Lemont Stone Y1823. Finish Coat "F" Pure Oil Gray 1-E-88.

These tests will be examined periodically until the N.A.C.A. Laboratory are ready to go ahead on their painting project.

Lustreless Olive Drab Paint GL-61021 was developed for L.C. Worman Co., Toledo, Ohio. It is a heavy bodied case paint which will take a 2:1 reduction with S-42 for spray application. It is so formulated that it can be made in pebble mill. An initial order of 16 drums was received.

Alpaste #120 Aluminum Paste was compared with M337 for use in Y540, Y546, and Y592. Gassing tests are being run. Other tests show the Alpaste #120 Paste to be satisfactory.

Light Buff Gray Liquid Cement Coating GL-61054 formulated for Koertz Glass & Paint Co. on order of 300 gallons.

Raw Materials:

Quincy #1 Calcium Carbonate was tested against W63 in a Flat White 19W1002. This formula was chosen because a large quantity of W63 is used. Quincy #1 was satisfactory except for color, therefore we do not recommend it as a general replacement for W63.

O320 Drisoysa (Body G-I) was found to be a satisfactory replacement for OZ68 in white enamels such as Japalac.

ld
10/16/51

H. G. Hayward

GLD006893