

TRADE SALES
RESEARCH REPORT

SEPT. - OCT. - NOV. - DEC.
1967

DEPOSITION
EXHIBIT

Exhibit 21
12/21/67

GLD004904

N 4074

VR-67019 (VYHD Quality)
178-C-214 (Geon 222 Quality)
178-C-963 (Exon 471 Quality)
VR-61154D (Geon 222 Quality)
VR-65043 (Vacralin Quality)

Samples of these exposed vinyl solutions have been examined and found that 178-C-963 has less adhesion and blushes more than the control. These vinyl solutions will be checked again after 2 months.

SUBJECT: Hi-Build Leadless Primer
NM27006M2322

CONTRIBUTOR: H. Sheets

SUMMARY: The Hi-Build Leadless Primer has been assigned EGL-68324 and a formula has been written up.

Two gallons of the primer have been prepared for the field test application on the tanks at the Cleveland plant.

SUBJECT: Urethane Epoxy
NM27012M2222

CONTRIBUTORS: E. Hood, P. Begany

SUMMARY: Following are the test results so far of a comparison of PB34-67, Flexible Durable Polyurethane, with EGL-65415, White Durable Polyurethane:

1. PB34-67 has better impact and bend resistance.
2. It has better humidity and water immersion resistance.
3. It does not have as good acid resistance.

PB34-67 is formulated from EGL-65415 by replacing 25% of Desmophen 650 with Desmophen 1100.

Four hundred hour Weatherometer tests indicate that PB18-67, Vacralin-Urethane, cured with Desmodure N has excellent exterior durability - much better than Nu-Pon Cote. Work is now being done to increase the solids of this formulation by modification with Krumbhaar K-1717B, which is a ketone base synthetic resin manufactured by Lawter Chemical.

W-944 is the titanium dioxide used in EGL-65415A, White Durable Polyurethane. We have inspected 1-1/2 years Cleveland exposure panels comparing W-944, W-820, Ti-Pure R-902, and Ti-Pure R-960. The durable polyurethane with R-960 definitely had the best exterior durability.

Following are the results so far of our comparative evaluation of epoxy urethane against Nu-Pon Cote and Durable Polyurethane:

1. Exterior Exposure

NC = No Change

Cleveland 6 Mo.Florida 6 Mo.

Epoxy-Urethane
(Y-5251 + 2 coats FJ44-66)

Gloss drop from
85" to 75"

Moderate chalk.

Nu-Pon Cote
(Y-5251 + 1 coat Y-5240)

Moderate chalk,
bad yellowing

Heavy chalk and
bad yellowing

Durable Polyurethane
(Y-5251 + 2 coats EGL-65415)

NC

NC

2. Salt Spray400 Hours

Epoxy-Urethane

1/16" Creepage

Nu-Pon Cote

" "

Durable Polyurethane

" "

3. Sea Water Immersion1000 Hours

Epoxy-Urethane

NC

Nu-Pon Cote

NC

Durable Polyurethane

NC

4. Fresh Water Immersion1000 Hours

Epoxy-Urethane

NC

Nu-Pon Cote

NC

Durable Polyurethane

10% #9 Blisters

5. Humidity1000 Hours

Epoxy-Urethane

NC

Nu-Pon Cote

NC

Durable Polyurethane

NC

6. HardnessPencil Hardness

Epoxy-Urethane

H

Nu-Pon Cote

2H

Durable Polyurethane

2H

7. Conical Mandrel Bend

Epoxy-Urethane

NC

Nu-Pon Cote

NC

Durable Polyurethane

NC

This chart lists hiding by amount of titanium dioxide, 3 mil draw down, and by brushout.

hiding as rated by:

<u>Amount of titanium dioxide/gal.</u>		<u>by 3 mil draw down</u>	<u>by brushing</u>
Du Pont 800	4.19#	Kem 1 Coat	Y-1803
Pittsburgh 1-45	3.40#	Y-1803	Y-5003
Kem 1 Coat	3.29#	Y-5003	Kem 1 Coat
Y-1803	3.20#	Pitts. 1-45	Y-1800
Y-5003	3.00#	Du Pont 800	Y-1801
Moore's 109-01	3.00#	Moore 109-01	Pittsburgh 1-45
*Sears Pure Pure White	2.82#	Pure Pure White	Sears Pure Pure White
Y-1801	2.00#	Y-1801	Moore's 100
Y-1800	2.00#	Y-1800	Moore's 109-01
*Moore's 100	2.00#	Moore's 110-01	Moore's 110-01
*SWP 471	1.95#	Moore's 100	SWP 471
Dutch Boy 110	1.88#	SWP 471	Snowwhite
*Moore's 110-01	1.79#	Snowwhite	Dutch Boy 110
P & L 303	1.70#	P & L 303	Du Pont 800
Pittsburgh 1-54	1.61#	SWP 473	SWP 473
Snowwhite	1.46#	Dutch Boy 111	Dutch Boy 111
SWP 473	1.45#	Dutch Boy 110	P & L 303
Dutch Boy 111	1.38#	Pitts. 1-54	Pitts. 1-54
Pittsburgh 1-57	1.26#	Pitts. 1-57	Pitts. 1-57

This chart lists products in order of ease of brushing.

Y-5003	Excellent
Y-1803	Excellent
Y-1801	Excellent
Y-1800	Excellent
Kem 1 Coat	Very Good
Sears Pure Pure White	Very Good
Pittsburgh 1-57	Good
P & L 303	Good
SWP 473	Fair - Good
SWP 471	Fair
Dutch Boy 110	Fair
Moore's 109-01	Fair
Moore's 110-01	Fair
Dutch Boy 111	Fair - Poor
Snowwhite	Fair - Poor
Moore's 100	Poor
Pittsburgh 1-45	Poor
Pittsburgh 1-54	Poor
Du Pont 800	Poor

GL0004907

	Sears		Sears		Pittsburgh		SWP	
	Pure Pure White		Snowwhite		1-57		Kem 1 Coat	
	Formula	Analysis	Formula	Analysis	Formula	Analysis	Formula	Analysis
Titanium dioxide	2.82 #/gal	75	1.46 #/gal	17.2	1.26 #/gal	15	3.29 #/gal	47
Titanium Calcium								
Zinc Oxide	0.94 #/gal	25	2.94 #/gal	34.5	2.10 #/gal	25	2.49 #/gal	35
Silicates			4.12 #/gal	48.3			0.98 #/gal	14
Carbonates					5.04 #/gal	60	0.27 #/gal	4
Busan								
Silica White Lead								
Carbonate White Lead								
Linseed Oil	0.09 gal/gal	10.7	0.50 gal/gal	73.9	0.49 gal/gal	75	0.51 gal/gal	69
Alkyd Solids	0.26 gal/gal	34.4						
Chlorinated Resin	0.09 gal/gal	13.4						
Solvent & Driers	0.43 gal/gal	41.5	0.22 gal/gal	26.1	0.20 gal/gal	25	0.28 gal/gal	31
% Pigment	35.7	61			61.5		54	
% Vehicle	64.3	39			38.5		46	
NV by weight	73.7	89.9			90.4		86.3	
NV by Volume	56.6	78.4			79.7		71.5	
PVC	21.5	35.7			38.2		28.2	
Calculated wt./gal.	10.5	13.9			13.6		12.9	
actual wt./gal.	11.1	13.8			13.5		12.8	
grind	4-5	5-6			2		3-4	
visc.	86 KU	86 KU			79 KU		89 KU	
gloss	67	75			58		78	
3 month gloss	68	56			26		51	
brushing			Fair-Poor		Good		Very Good	
cost	1.71	2.18			1.82		2.47	
tinted	Yes	No			No		No	

	Pittsburgh 1-54		National Lead Dutch Boy 111		Benjamin Moore 109-01		Du Pont 800	
	Formula	Analysis	Formula	Analysis	Formula	Analysis	Formula	Analysis
Titanium dioxide	.31 #/gal	2.5	1.38 #/gal	15.4	1.64 #/gal	19	4.19	38
Titanium Calcium	4.35 #/gal	24.7			4.20 #/gal	48.6		
Zinc Oxide	2.00	16	2.30 #/gal	25.7	1.99 #/gal	23.1		
Silicates			2.52 #/gal	28.2	0.80 #/gal	9.3		
Carbonates								
Busan								
Silica White Lead			1.37 #/gal	15.35				
Carbonate White Lead			1.37 #/gal	15.35				
Linseed Oil	0.50 gal/gal	32	0.55 gal/gal	77.9	0.49 gal/gal	73.1	0.45 gal/gal	37
Alkyd Solids								
Chlorinated Resin								
Solvent & Driers	0.28 gal/gal	14.8	0.19 gal/gal	22.1	0.22 gal/gal	26.9	0.42 gal/gal	25
% Pigment	--		61.4		61.5		--	
% Vehicle	--		38.6		38.5		--	
NV by weight	84.6		91.8		89.5		75.2	
NV by volume	71.4		80.9		77.6		57.5	
PVC	29.7		32.3		36.2		21.2	
Calculated wt./gal.	12.5		14.5		14		11	
Actual wt./gal.	12.6		14.3		14		11.2	
grind	1-2		4-specky		0		5-6	
visc	79 KU		89 KU		92 KU		72 KU	
gloss	67		67		68		88	
3 month gloss	42		23		43		78	
brushing	Poor		Fair-Poor		Fair		Poor	
cost	1.89		2.53		2.23		2.07	
tinted	No		No		No		Yes	

GLD0004909

	SWP. 473		National Lead Dutch Boy 110		SWP 471		Benjamin Moore 100	
	Formula	Analysis	Formula	Analysis	Formula	Analysis	Formula	Analysis
Titanium dioxide	1.45 #/gal	18	1.88 #/gal	20.9	1.95 #/gal	25%	1.19 #/gal	13.6
Titanium Calcium							2.79 #/gal	31.8
Zinc Oxide	*2.90 #/gal	36	2.25 #/gal	25.0	*2.89 #/gal	37	2.39 #/gal	27.3
Silicates	2.99 #/gal	37	2.18 #/gal	24.3	2.96 #/gal	38	1.29	14.1
Carbonates	0.73 #/gal	9					0.10	1.2
Busan								
Silica White Lead			0.96 #/gal	10.7			1.00	11.4
Carbonate White Lead			1.72 #/gal	19.1				
Linseed Oil	0.55 gal/gal	78	0.56 gal/gal	79.1	0.49 gal/gal	70	0.51 gal/gal	75
Alkyd Solids								
Chlorinated Resin								
Solvent & Driers	0.19 gal/gal	22	0.18 gal/gal	20.9	0.26 gal/gal	30	0.209 gal/gal	25
% Pigment	59		61.3		58		61.7	
% Vehicle	41		38.7		42		38.3	
NV by Weight	91		91.8		87.8		89.5	
NV by Volume	81		81.7		73.0		79.0	
PVC	32		31.2		33.0		35.0	
Calculated wt./gal.	13.6		14.6		13.4		14.2	
Actual wt./gal.	13.2		14.4		12.3		13.1	
grind	1-3		3-4		0-4		0	
visc.	82 KU		89 KU		89 KU		90 KU	
gloss	77		48		82		77	
3 month gloss	38		15		48		62	
brushing	Fair-Good		Fair		Fair		Poor	
cost	2.20		2.67		2.26		2.33	
tinted	No		No		No		No	

*Leaded Zinc

*
Leaded Zinc

	Pratt & Lambert 303		Benjamin Moore 110-01		Pittsburgh 1-45		Glidden from Ana Y-1801	
	Formula	Analysis	Formula	Analysis	Formula	Analysis	Formula	Analysis
Titanium dioxide	1.70 #/gal	12.6	0.97	12.4	3.40 #/gal	30.2	0.86 #/gal	1
Titanium Calcium			2.72	34.8			3.91 #/gal	5
Zinc Oxide	2.93 #/gal	21.7	1.94	24.8			2.04 #/gal	2
Silicates	2.35 #/gal	23.5	0.96	15.7	1.27 #/gal	11.3		
Carbonates			1.23	12.3				
Busan								
Silica White Lead								
Carbonate White Lead								
Linseed Oil	* .53 gal/gal	31.8	0.48 gal/gal	69.6	0.12 gal/gal	8.7	0.46 gal/gal	6
Alkyd Solids					0.23 gal/gal	18.5		
Chlorinated Resin					0.10 gal/gal	8.7		
Solvent & Driers	.22 gal/gal	10.4	0.26 gal/gal	30.4	0/39 gal/gal	22.6	0.32 gal/gal	36
% Pigment	57.8		58.7		--		54	
% Vehicle	42.2		41.3		--		46	
NV by Weight	83.5		86.8		77.4		83.3	
NV by Volume	78.4		74.3		60.8		67.6	
PVC	31.5		35.6		25.1		31.5	
Calculated wt/gal	13.5		13.3		11.2		12.6	
Actual wt/gal	13.3		11.5		11.5			
grind	4-5		5		5-6			
visc	89 KU		84 KU		72 KU			
gloss	80		82		88			
3 month gloss			43		78			
brushing	Good		Fair		Poor			
cost	2.20		1.90		1.88		1.97	
tinted	No		Yes		Yes		Yes	

*Safflower Oil

GLD0004911

	Glidden Actual Y-1801
	Formula Analysis
Titanium dioxide	0.85 #/gal
Titanium Calcium	3.84 #/gal
Zinc Oxide	2.00 #/gal
Silicates	
Carbonates	
Busan	
Silica White Lead	
Carbonate White Lead	
Linseed Oil	0.47 gal/gal
Alkyd Solids	
Chlorinated Resin	
Solvent & Driers	0.31 gal/gal
% Pigment	
% Vehicle	
NV by weight	82.3
NV by volume	69.0
PVC	31.3
Calculated wt/gal	
Actual wt/gal	
grind	
visc	
gloss	
3 month gloss	
brushing	
cost	1.84
tinted	

3) A feeder drier evaluation in Y-5003 shows an improvement in dry. Drier studies were made comparing standard Y-5003 with Y-5003 plus 2 lbs. per 100 gallons of litharge and with Y-5003 plus 5 lbs. per 100 gallons of Nuact paste. The litharge shows a 5 hour improvement in dry. The Nuact paste shows a 5 hour increase in dry. The dry recorded here is not dry-to-touch time but is read as complete film dry. All of the paints dried-to-touch in about 7 hours. These paints will be tested for loss of dry in 6 months.

4) An exposure series comparing Vancide PA, Dow 1013 and Super-Adit at 7.2¢, 9¢, and 13.5¢ per gallon has been made and exposed at Cleveland, New Orleans, and Baltimore. This series was exposed on 4 ft. yellow pine siding. Y-1800-G, Y-1803, and Kem-1-Coat were included as standards. The mildewcide ladders were run in Y-1801 and Y-5003. Both the alkyd and oil version of Kem-1-Coat were used as controls.

SUBJECT: Glid-Tone Varnish Stains - Y-1201, Y-1202, Y-1203

CONTRIBUTORS: D. Sutherland, J. Davis, J. Southwick

SUMMARY: The San Francisco plant has satisfactorily completed the manufacture of the initial batches of the varnish stains that have been revised to comply with Rule 66. This is an entirely new formulation that affords the opportunity to eliminate some specialized varnish cooks from inventory, i.e., V-525 (V-357), V-533 (V-306-C) and V-755 (V-405).

The new formulation is composed of V-2390 (V-863) and V-2283 (V-891), both alkyds, in conjunction with V-415 (replaces V-46). A new gilsonite solution, V-739, has been introduced to replace V-755. The V-739 is easier to manufacture and easier to incorporate in the stains.

We recommend that the new formula be adopted nationally. Besides the obvious inventory advantages, the new material has a substantially lower raw material cost.

If desired the V-415 may be cold-cut in large quantities and used as required, or the resin may be cold-cut in each individual batch - this is entirely up to each production man and the economics involved. It will be necessary, however, to deplete the inventories of the obsolete raw materials, or have an alternate disposition, before manufacturing the new varnish stains.

SUBJECT: D-142, Burnt Sienna Replacement In Glid-Tone Stains
NT26042T4262

CONTRIBUTORS: J. Davis, J. Southwick

OBJECTIVE: To find a suitable replacement for D-142 (Burnt Sienna) which is becoming increasingly difficult to obtain and is used in a number of the Glid-Tone Wood Stain colors.

SUMMARY: A sample of D-142 (BS-6653, Lot 26) from the Chas. Pfizer Company, which, according to them is off specification, was tested in Y-244, Modern Red Mahogany Stain and found to be acceptable.

Also received from Pfizer was a sample of 7852 Burnt Sienna which was a possible replacement for D-144, old code R-21. This was rejected due to the dirtier color of the Pfizer material. Four samples were received from Reading where D-144 was used as replacement for D-142. These samples; Y-244 Modern Red Mahogany, Y-245 Walnut, Y-252 Maple, and Y-258 Fruitwood were tested versus the standards. Results showed in all cases a slightly dirtier, browner tone than the standard but we feel not enough to bring complaints and, therefore, R-144 is temporarily approved as a direct replacement for D-142 in pebble mill batches only. Work will continue to find a final replacement for the D-142.

SUBJECT: Glidden Manufactured Odorless Flat Wall Resin RCR-6507 & Cargill 72245 Versus Standard F-2233
NT27006T4363

CONTRIBUTORS: J. Davis, J. Southwick

SUMMARY: RCR-6507 and the Cargill resin were tested in Y-5718, White Tint Base versus the standard resin F-2233 (ADM). The results show the Glidden material to be equal to the standard in application, enamel holdout, hiding, tint strength, flow, and uniformity. The viscosity of the paint made using the Glidden vehicle is 90 KU's, the minimum for this formulation, while the standard has a viscosity of 113 KU. The lower viscosity of this material can be corrected with minor formula adjustments if necessary. Another pilot plant batch of this material is to be made.

The Y-5718 using the Cargill material has a satisfactory viscosity of 97 KU. As in the Glidden material all properties of the Cargill are acceptable in comparison to the standard with the exception of hiding and tint strength, which is high, and enamel holdout which is slightly poorer, indicating the inability of this resin to maintain as high a PVC as the standard. These problems are easily corrected with the addition of 2-1/2% more resin which lowers the PVC slightly. All materials have excellent package stability after 10 days. All paints have excellent odorless qualities.