CLEVELAND

Table I — Gray Paints - Analysis

	Pittsburgh Slate Gray-86	S-W #477 Westchester Gray	Glidden Y-1860
Pigment	54.7%	61.0%	62.3%
Vehicle	45.3%	39.0%	37.7%
	100.0%	100.0%	100.0%
Pigment			
Titanium Calcium	34.2%		
Titanium Magnesium	23.7%	37.0%	
Zinc Oxide	30.0%		
35% Leaded Zinc		45.0%	52.8%
Lithopone			21.1%
Basic Carbonate W. Lead		8.0%	
Magnesium Silicate	12.1%	10.0%	20.6%
Barium Sulphate			5.5%
	100.0%	100.0%	100.0%
Vehicle			
Linseed Oil	51.5%	40.0%	47.5%
Soya Oil	17.2%		26.0%
Heat Treated Linseed		27.0%	
Mineral Spirits	26.5%	18.0%	19.0%
Drier	4.8%	15.0%	7.5%
	100.0%	100.0%	100.0%
Total TiO_2	17.37%	11.1%	

Table II — Properties

	Glidden Y-1860	Pittsburgh 1-86 Slate Gray	S.W. West-Chester Gray 477	DuPont #160 Scotch Gray
Color:	Med. Gray	Similer, bluer.	Much lighter.	Lighter, like S.W.
Wt./gal:	15.5	12.8	13.5	14.0
Body:				
Stormer:	82 KU	93 KU	76 KU	93 KU
#4 Cup:	85 sec.	290 sec.	77 sec.	Too puffy to run.
*Leveling:	Fair-good-typical house paint.	Good	Fair-good-like Y-1860.	Poor
*Gloss	F-good-typical house pt. gloss.	F-G. Similar to Y-1860.	Slightly less than Y-1860.	Like S.W.
Grind:	2-3	4	3	0
Drying:	Overnight. Good thru dry.	Slight overnight tack. Appears to surface dry.	Overnight. Good thru dry.	Trace overnight tack. Tendency to surface dry.

*DuPont paint full of soap particles. Film is rough or granular.

H. G. Hayward

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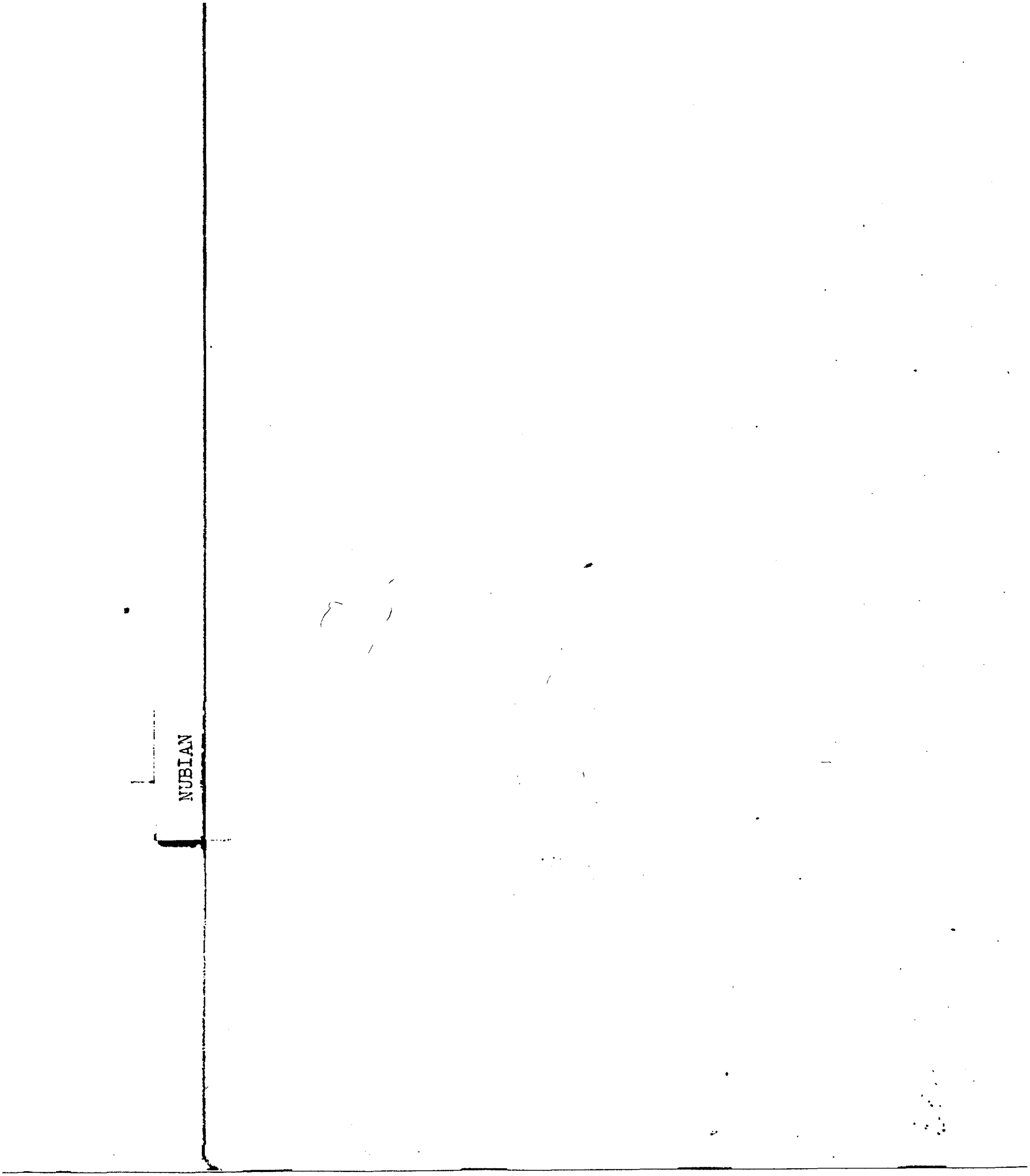
4-24-52



I. Catalyzed Epoxy Coatings

1) Caterpillar Tractor Company
2) General Research
3) Argonne National Laboratory
4) Atomic Energy Commission

II. Polyesters

1) General Research
2) Hotpoint, Inc.
3) Western Electric Company

III. Plastisols

1) Altorfer Brothers Co.
2) Electrical Engineers Equipment Co.
3) Simmons Co.
4) Western Electric Co.

I. Catalyzed Epoxy Resins

1. Caterpillar Tractor Company

The above company submitted specifications for a buff primer and a yellow enamel, both air dry finishes. The specifications were issued 3-27-50, and the specification numbers are I-E-378 and 1-E-379 for the enamel and primer respectively. Four primers and one enamel are being considered. The primer systems are as follows:

Pigments		Vehicles		Pigment/ Vehicle
Red Lead	61.5%	Epon RN-34	82.6%	2.38
Lead Free Zinc Oxide	15.4%	VAGH Vinyl	17.4%	
Mica Micronized A-3000	15.4%			
Titanium Oxide Treated Anatase	7.7%			
Red Lead	18.5%	Epon RN-34	83.2%	2.38
Zinc Chromate	22.2%	VAGH Vinyl	16.8%	
Mica Micronized A-3000	14.8%			
Titanium Oxide Rutile Type	44.5%			
Red Lead	24.1%	Epon 1001	100%	2.07
Zinc Chromate	20.7%			
Mica Micronized A-3000	13.8%			
Titanium Oxide Rutile Type	41.4%			
Red Lead	24.1%	Epon 1064	100%	1.77
Zinc Chromate	20.7%			
Mica Micronized A-3000	13.8%			
Titanium Oxide Rutile Type	41.4%			

The topcoat is a 80% RN-34 and 20% phenolic system. Studies still in progress seem to indicate that better adhesion, film toughness and flexibility can be obtained by replacing part of the Epon RN-34 with a higher molecular weight Epon. The final formulation for the yellow enamel is dependent on the outcome of tests in which 20% of the RN-34 Epon in a 70% Epon RN-34 30% phenolic system was replaced by Epons 1001, 1004, 1007 and 1009.

Both the primers and enamel are air dry finishes and are catalyzed with ethylene diamine.

The test contemplated will be conducted on 1/8" Metal Prep steel covered with one coat of primer and one topcoat. The test schedules are given below.

1) 1000 hour salt spray
2) 1000 hour humidity
3) Weatherometer
4) Immersion in distilled water
5) Immersion in oil
6) Flexibility before and after ageing.

Both the primers and topcoat have shortcomings regarding some parts of the Caterpillar Tractor Company's specifications, namely, rate of drying to tack-free condition. However, the chances of meeting most of the requirements appear to be very good.

2. General Research

A. Another device to apply catalyzed epoxy finishes in one operation eliminating the manual addition of the catalyst, was tried and found to be promising. The system was devised by Binks and essentially consists of two piston type pumps whose outlet ends are connected together while the inlet sides are separate. With this apparatus it was possible to combine the catalyst and epoxy enamel in the proper ratio and spray a coating on steel that on baking gave a film that was in all respects comparable to that obtained by mixing the catalyst and the enamel manually. Binks are now working on a similar model that can be used in the laboratory and also in the customer's plant for experimental purposes.

B. Various systems of Epon resins with and without VAGH vinyl were tried as primers with red lead pigment and red lead-zinc chromate pigment combinations. Only Epon RN-34 could be used with VAGH vinyls. Higher molecular Epons showed incompatability. Primers from the latter systems increased in viscosity gradually indicating a gelling or kicking-out of the vinyl.

Both red lead and red lead zinc chromate with the Epon RN-34-VAGH vinyl system gave very good primers. These primers when catalyzed with ethylene diamine for air drying possessed the following characteristics.

1) Very good spraying qualities
2) Very good flow, films were free of craters
3) Good adhesion
4) Medium toughness
5) Good flexibility
6) Fast initial dry

A series of tests will be conducted on these catalyzed air dried primer systems applied on sand-blasted steel panels concurrently with an alkyd type air dry schedule and a wash-coat VAGH vinyl system as controls.

3. Argonne National Laboratory

A black air dry enamel, 517-13-A, with a 70% Epon RN-34 and 30% phenolic system was prepared for coating masonite panels. On catalyzing with 6-1/2 l. oz. of NRV-2569/gallon of the enamel and air drying, an alcohol resistant film possessing very good flow and excellent gloss was obtained.

Eight 12" x 12" x 1/8" Masonite panels were finished with this air dry enamel catalyzed as described above. Four of the panels were given a prime coat of SE-4669-C, a Masonite type primer, and one coat of the catalyzed enamel. The other four Masonite panels were covered with two coats of the catalyzed enamel. The first coats in each instance were sanded lightly.

These panels were submitted to Technical Service for evaluation.

A. M. Laurinaitis

4. Atomic Energy Commission

Considerable time has been spent in developing catalyzed epoxy type coatings to withstand medium concentrations of mineral acids, alkali and ketone solvents. This program of development is closely related to the same type of coating that Browne-Morse Company, manufacturers of laboratory furniture, has specified for use on their end products.

Initial evaluation of an RN-34 Epon coating modified with small concentrations of Vinylite resin revealed that its resistance to 3N nitric, sulfuric, hydrochloric acids, 3N sodium hydroxide and methyl isobutyl ketone was entirely satisfactory. The Atomic Energy Laboratories have confirmed our findings but expressed their desire to test this same type coating for "decontamination" properties.

The Technical Service Department has decided to submit a series of catalyzed Epon finishes, both baked and air dry, coated on sand-blasted steel rods and solvent degreased panels to the AEC for a complete evaluation.

Eleven rods and ten panels were coated with the following schedules. All rods received three dip applications; the panels received one to two coats by spray application.