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Marshall Laboratory
February 25, 1965

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MARSHALL DEVELOPMENT LABORATORY
RELEASE LETTER NO. 2029
808 LINE "IMLARS" VINYL ORGANOSOL CHANNELS

Attached is a rough draft of a release letter prepared at the request of Coil Coating Sales to clarify the status of the two 808 Line products currently being sold to Eastern Products. It is apparent that this information is not properly a subject for release letter action. Rather, it is a recap of a situation which started as a field test which grew to unexpected proportions.

Since we are committed to complete the test program and we have no present intention of extending the Sales or Development of the 808 Line quality, the information assembled appears to serve no basic purpose except to record history and status. Unless advised to the contrary, we do not plan to process the letter through the usual channels. This covering letter will serve to transmit the rough draft for general information to the principal parties involved in Production and Sales and complete the file.

F. E. PIKE

PEP:BCD.
Att.

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Marshall Laboratory
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MARSHALL DEVELOPMENT LABORATORY RELEASE LETTER NO. 6009

300-LINE "ISLAR" VINYL ORGANOSOL ENAMELS

CODE CODE - 1107 - CLASS "C"

NO APPROVAL ACTION REQUESTED

PROPOSAL AND EXTENT OF RELEASE:

The purpose of this after-the-fact no approval release letter is to record pertinent facts leading up to the development and sale of 300-5001 (experimental code 300-B-5112), Interior Beige Enamel; and 300-5002 (experimental code 300-B-5111), Exterior Green Enamel.

The 300-Line was assigned to vinyl organosol enamels with higher plasticizer levels and a more attractive cost than the 200-Line of vinyl enamels. Before all development phases of the 300-Line were complete, an opportunity developed to field test the beige and green color on a steel processing building to be erected by Bethlehem Steel Co. Durability background on related compositions and the size of the proposed building indicated little risk and provided an opportunity to obtain needed application and metal fabricating information on the 300-Line. No release letter was written.

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This building project has expanded far beyond the original estimates and it is now felt the building project will continue into 1966. 7,900 gallons of enamel have been sold to date; it is estimated 2000 gallons will be required to complete the contract. Sale of 808-5001 and 808-5002 to the Eastern Products Co. is required until completion of the Bethlehem Steel building project because of the finish economics and exterior durability uniformity. These enamels will not be sold after termination of this building contract without supplementary release action.

REQUEST FOR MANAGEMENT REVIEW:

A management decision is not required. This release was prepared at the request of Coil Coating Sales to advise management and particularly the Production Division, of the status of this development.

TECHNICAL OPINION:

Since these enamels have been used for some time without serious manufacturing or end use problems there appears to be little technical risk in the continued manufacture and sale of these enamels within the restrictions of this release.

DESCRIPTION OF PRODUCT:

These are high solids vinyl enamels containing solution and dispersion polymers. They fuse with heat to produce durable and flexible coatings for post metal forming use. Because of unsatisfactory adhesion to metal a primer coat is necessary. 60° gloss is limited to a maximum of 10 on primed building panel steel.

APPLICATION:

Application is by reverse rollercoater. 0.8-0.9 mils of 808-Line enamel are recommended over 0.2 to 0.3 mils of 800-5001 primer on properly phosphated hot dipped galvanized steel. This appli-

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cation is usually made on coaters with individual ovens in tandem. Where such equipment is not available coiling and recoiling is necessary.

Baking

830-2001 primer at the designated film thickness requires a bake of 75" at 450°F. and 808-Line requires 85" at 450°F. using .025 inches steel (between 400 and 425°F. metal temperature). Under baking is generally manifested by low enamel gloss. Excessive baking should also be avoided because of adverse effect on durability.

Film Properties

Dry film properties of these enamels, such as durability, flexibility, etc. are characteristic of the vinyl solution enamels currently being offered to the industry as 808 and 809-Line enamel.

Package Stability

Because of the high level of dispersion resin these enamels are more sensitive to elevated storage conditions. When stored at 180°F. viscosity increase is fairly rapid but with solvent reduction the enamel can be used without loss of film quality. It is recommended that high temperature storage be avoided in order to minimize viscosity increase.

After 8 months storage 3 batches of 808-2001 have increased in viscosity from 50 to 75%. All batches of 808-2001 and 808-2002 made during the past year have been used without difficulty from a viscosity instability standpoint.

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Percent Solids

	<u>Solids</u>		<u>Coverage at 1 mil</u>
	<u>Wt.</u>	<u>Vol.</u>	
808-1001	58.0	41.0	6.5 ft. ²
808-1002	54.0	39.0	6.6 ft. ²

Cost

Will cost as follows:

808-1001 \$1.24/gallon

808-1002 \$3.73/gallon

Official costs should be obtained through normal channels.

COMPETITIVE SITUATION:

808-1001 and 808-1002 are used exclusively on this project.

DURABILITY:

After 12 months exposure at 45°S. in Florida 808-1002 green enamel is showing definite loss of gloss and color change to a lighter green color. Examination of erected buildings at the Bethlehem Steel site after 6 months exposure (includes encasement) show no color change compared with unexposed parts. It is our understanding that additional building on the Bethlehem Steel site will not represent extension of one building but will be a number of buildings. This should minimize color differences between newly erected and older buildings.

TABULATION OF COMPOSITION:

	<u>800-1001</u>	<u>800-1002</u>
	100 gals.	100 gals.
G-229 Cyalon 410 vinyl chloride	297 (1)	199
G-1141 Vinaplate WMC	71	74
G-116 Vinaplate WMC	5	18
H-186 61 octyl phthalate plasticizer	5	23
H-360 61 isodecyl phthalate plasticizer	63 (2)	38
G-1125 Santicizer G-62 plasticizer	6	21
G-1107 Spem 828	9 (3)	7
H-374 Thermaclate 31	4 (3)	4
H-382 HENKELMAN Flow agent	4	3
G-85 wax	4	4
H-601 Solvesso 150	238	300
H-44 methyl isobutyl ketone	35	57
H-603 isophorone		9 (4)
H-145 diisobutyl ketone	118	79
H-50 titanium dioxide	199	57
H-630 Ferrite yellow	8	
XXXXXXXXXXXX	XXXX	
H-283 carbon black	1	1
H-52 antimony oxide	17 (3)	17
H-754 chromium oxide		88
H-689 organic yellow pigment	181	1
	60/100	46/100
P/B	73/27	73/27
Dispersion vinyl/solution & wt.		

E. I. /5020

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Explanation of Composition:

- (1) C-829 dispersion vinyl resin provides favorable cost.
- (2) H-355 is a less volatile plasticizer than H-185 and has less swelling action on dispersion vinyl resin.
- (3) C-1189, H-374 and W-34 are stabilizers needed for heat stabilization and ultraviolet light resistance.
- (4) H-603 introduced through a pigment dispersion intermediate.

REPRODUCIBILITY:

Six batches each of 808-9001 and 808-9002 have been made at Toledo with acceptable reproducibility. Some variation in solids has resulted but without adverse customer comment.

CONTINUING LABORATORY WORK:

No additional laboratory work is planned. In view of low market opportunities in vinyl coil coating finishes, technical support of this quality is kept on a minimal basis.

PATENT INFORMATION:

No patent complications are currently known to be involved in the manufacture and sale of the proposed vinyl organotin channels. Use of the respective stabilizers for the vinyl chloride homopolymer and copolymers is well known in the coating art. Stabilization of vinyl halide polymer compositions by the presence of antimony oxide in the pigment composition is embraced by U.S. Patent 2, 161,026, now expired. Shell literature discloses the use of epoxy gums and resins as vinyl stabilizers. Several patents issued at least 12 years ago to Metal and Thermit Corporation, supplier of "Thercolite" (1) an organotin stabilizer, relate to organotin stabilizers for vinyl resins and purchase of this material is presumed to provide freedom to use these materials within the teachings of the supplier's patents.

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MANUFACTURING PRELIMINARY:

Conformance to formula manufacturing instructions is very important in order to minimize viscosity instability during manufacture and in the package. No severe or impractical requirements are imposed. Conformance to the mixing instructions with particular emphasis on avoiding long periods of continuous agitation resulting in temperature build up is important. Excessive reducing of 500-2001 needed to meet viscosity specification has on occasion reduced solids as much as 3 percentage points.

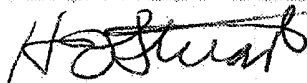
SIMPLIFICATION:

One new white dispersion and a new vinyl gas VS-2001 solution are required. One new raw material (H-358) is required. H-358 has been used for 1-1/2 years without difficulties. After completion of the current building construction at the Bethlehem Steel site we expect to obsolete 619-000, VS-2001, 500-2001, 500-2002 and H-358.

FORMULA CARDS:

Formula cards for 500-2001 and 500-2002, 619-000 and VS-2001 are attached.

PARSONS DEVELOPMENT LABORATORY



H. J. STUART

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APPROVED:

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