Interoffice Memo

CC: J. W. Nestor, Wilm. F&F
C. T. Veale, " "
P. I. Poindexter, " "
L. S. Baker, " " (1)
R. B. Davis, " "
J. A. Klaesmann " "
J. O. Graves, " "
J. P. McAndrews, " "
K. F. Browning, " "
G. I. Mulholland, Flint
P. J. Graham, Exp. Station
O. H. Bullitt, Jr., Laboratory

F. H. MEADLES (23)
DIRECTOR OF PRODUCTION
WILMINGTON F&F

C. W. THEOBALD
DIRECTOR RESEARCH DIVISION
WILMINGTON F&F

RECEIVED
MAY 3 1965
MARSHALL LAB. FILE

H. H. HODGE
EXPORT SALES MANAGER
WILMINGTON F&F

File: 3320

Marshall Laboratory
April 26, 1965

MARSHALL DEVELOPMENT LABORATORY RELEASE LETTER #2045

310-LINE QUALITY ACRYLIC MASONRY PAINTS FOR EXPORT SALES

RELATED RELEASE LETTERS: 1576, R-60

COST CODE - 3360 SUPPORT OF EXISTING BUSINESS

PROPOSAL AND EXTENT OF RELEASE:

This letter proposes the manufacture and sale by Export Sales, of a new line of acrylic emulsion masonry paints based on the use of RC-11005 "IO" acrylic latex. This line of products would be sold in those areas where 387-Line Vinyl Masonry Paints are now sold by Export Sales and would replace these vinyl emulsion paints in those areas.

This line of seventeen products, 310-401 thru-417, consisting of one white and sixteen colors was developed to resist the effects of efflorescence so prevalent on masonry substrates in the Caribbean area, i.e. to improve chalk and fade resistance compared to 387-Line vinyl masonry paint. Export Sales has requested this proposal at this time so that the change-over in qualities, including alignment and initial stocking, could be accomplished this summer prior to a planned promotional program for the Fall painting season.

A complete list of the proposed codes and product names is located in the "Description of Product" section of this letter.

MANAGEMENT DECISION REQUESTED:

Management is asked to decide if the sale of the 387-Line of Vinyl Masonry Paints, whose performance has been generally inferior to minimum expected performance levels, should be discontinued by Export Sales and replaced by sale of the proposed line of acrylic emulsion paints, whose anticipated improvement in resistance to the effects of efflorescence has not yet been fully established. In consideration of this proposal the following points are felt to be pertinent:

(1) The acrylic emulsion paints are not expected to prevent the "efflorescence" of alkaline salts from the concrete substrates. Being more alkali resistant than the vinyl emulsion paints they are, however, expected to have better chalk resistance and color retention under these alkaline conditions. House tests up to seven months old in Puerto Rico are confirming this expected performance.

(2) Approximately 800 gallons of the proposed quality products have been used in Puerto Rico by paint contractors in a trial marketing program. Customer acceptance of initial properties has been well established, based partially on an average 25% increase in coverage compared to comparable vinyl masonry products.

(3) These products use RC-11005 "IO" acrylic latex whose supply is inadequate at present and may not be readily available in the near future. Rhoplex AC-34, G-756 may be used if necessary and will provide equivalent initial properties and equal durability performance based on limited exposure panel evidence. Actual field behavior on houses has not been established with AC-34 material but we expect equal performance based on our general acrylic house paint experience.

(4) Average mill costs are about 7¢/gal. higher than comparable Vinyl Masonry products based on current actual costs of RC-11005. Costs are expected to be equal or slightly less when RC-11005 is produced at the Fort Madison facility.

(5) Reproducibility has not been established on any one of the proposed products although the several 150 gallon batches and one 500 gallon batch of four colors made last fall indicate no unusual problems.

(6) Shelf stability, although satisfactory, is limited to only 8 months on the oldest laboratory batch. The oldest plant batch is just six months old.

(7) Mildew resistance of the proposed products is improved over the line of vinyl emulsion paints.

(8) Chalk resistance and color retention in the absence of alkaline conditions, has been improved thru a change in pigmentation.

DUP030022636

TECHNICAL OPINION:

It is our opinion that sale of the proposed line of acrylic emulsion paints is technically sound and we favor approval. In view of the better alkali resistance of the acrylic polymer, the results of the tests to date and the past bad experiences with the 387-Line vinyl masonry paints, it is difficult to conceive of anything but over-all improved performance and improved customer satisfaction with the proposed line of products.

DESCRIPTION OF PRODUCT:

The proposed line of acrylic masonry paints is composed of the following products which were formulated on Export Sales Investigation X-1814 and X-1826.

310-401	651 Hurricane Gray	Medium tints use 1# TiO_2 per gallon from 548-951.
310-402	652 Bahama Blue	
310-403	653 Caribbean Green	
310-404	650 White	White and light tints use 2# TiO_2 per gallon from 548-952.
310-405	655 Palm Green	
310-406	656 Hawaiian Blue	
310-407	657 Oyster White	
310-408	658 Sand Beige	
310-409	659 Inca Ivory	
310-410	660 Bermuda Pink	
310-411	661 Bone White	
310-412	662 Charcoal Gray	Deep colors use 0.2# TiO_2 per gallon from 548-953.
310-413	663 Barbados Brown	
310-414	664 Jungle Green	
310-415	665 Federal Blue	
310-416	666 Tropic Red	
310-417	667 Panama Yellow	Uses 1.3# W-608 Sun Yellow N per gallon from 547-5098

In addition to this line of prepared products, the selection of colors can be increased in two ways: (1) by addition of Du Pont Universal Colorants to #650 White or (2) by intermixes of #650 White with any of the other colors.

These products were developed primarily to alleviate the effects of effloresecing, alkaline salts on the 387-Line vinyl masonry paints in the Caribbean area. The alkaline salts, from the concrete substrate, deposit on the surface of the paint and produce an unsightly appearance, attack the polyvinyl acetate binder and ultimately cause chalking and fading. By using RC-11005 as the binder in the proposed products, the acrylic resin resists attack by alkali and retards failures by chalking to the time when these failures would begin in the absence of any alkaline conditions.

DUP030022637

In addition to this improved alkali resistance, the binder demand of the pigmentation has been reduced thru application of the packing index concept so that a further undetermined increase in durability has been effected.

DURABILITY

To obtain confirmation of this expected performance, Export Sales has conducted a number of field tests on new houses in Puerto Rico via a limited informal trial marketing program. The oldest test is now nearly eight months old. At this time the acrylic white 310-B-20472 (310-404) has shown no failures even though it was deliberately applied without cleaning off efflorescence which had already developed on the concrete walls. The 387-361 white vinyl masonry paint control has started to exhibit efflorescence and slight mildew.

There are approximately 80 new houses varying in age from 2 to 5 months, that have been painted with the proposed 655 Palm Green, 656 Hawaiian Blue, 657 Oyster White and 658 Sand Beige. There are no failures or indications of failures on any of these houses while in another group of 30-40 houses, 5-7 months old 387-Line paints have already started to fade due to efflorescence.

Normal exposures on asbestos cement panels in Florida are 8 months old. The vinyl masonry white has already started to chalk on the 45° south panels and to mildew on the north vertical panels. The acrylic emulsion white has not yet started to chalk or mildew. Similar evidence of superior chalk and fade resistance has been obtained thru 1600 hours exposure on the accelerated weathering cycle ACW-II.

APPLICATION PROPERTIES:

Close observations during application of paint on eight of the test houses showed that initial properties of ease of application by brush and roller, gloss and color uniformity, appearance at laps and touch-up properties are all very good to excellent and equal to the comparable vinyl masonry product. Hiding is very good with an average increase in square foot coverage of about 25%. As an example, in one test the white acrylic paint gave 370 sq. ft./gal. on first coat and 410 sq. ft./gal. on second coat. The 920 White Vinyl paint gave 250 sq. ft./gal. on first coat and 340 sq. ft./gal. on second coat. Both systems were rated very good for hiding. On another building where #657 Oyster White was applied to all interior and exterior walls, only 17 gallons of paint were used whereas experience indicated that 26 gallons of 387-364 Vinyl Oyster White would have been required. This property alone has created a ready acceptance of this line of paints by the few contractors who have used it.

DUP030022638

STABILITY

Shelf stability is expected to be satisfactory thru extended periods of aging although the oldest laboratory batch is now only 8 months old. This batch, the several semi-works batches and one plant batch are completely satisfactory in all respects.

COMPETITIVE SITUATION:

Reportedly, building contractors in Puerto Rico have started to request and/or to insist on the use of "acrylic" finishes for new construction as they have learned the acrylics will perform more satisfactorily.

Glidden is the major competitor in Puerto Rico and has had much success with "Spred" House Paint, apparently as a result of recognizable quality improvements. Likewise, in Hawaii, the paint enjoying most sales at present is a low cost acrylic emulsion paint made by Fuller.

TABULATION OF COMPOSITION:

The composition of 310-404, #650 white, as representative of the proposed line, is compared to that of 387-361 #920 White Vinyl Masonry Paint in pounds per 100 gallons of paint.

		387-361	310-404	Change No.
W-88	mica	40	-	1
W-1011	diatomaceous earth, coarse	65	-	1
W-165	diatomaceous earth, fine	40	52	1
W-4	magnesium silicate	-	75	1
W-123	Ti-Pure R-900	160	-	1, 2
W-50	Ti-Pure R-610	-	200	1, 2
G-772	Elvacet 1423, 55% PVA Emulsion	308	-	3
RC-11005	46% IO acrylic emulsion	-	326	3
G-1111	methyl cellulose, thickener	5	5	
C-718	potassium tripolyphosphate, dispersant	7	3	4
H-658	polypropylene glycol, anti-foam	2	-	5
G-782	Balab 748, anti-foam	-	3	5
H-454	10% phenyl mercury oleate	2	3	
H-514	ethylene glycol	20	16	6
H-648	Carbitol	9	-	7
H-284	ammonia	-	3	8
H-506	water	400	387	3
	TOTAL	1058	1073	
Gal. Wt.		10.58	10.73	1
Vol. Solids		30.6%	30.5%	
Pig. Vol. Conc.		40%	39.3%	
Wt. Solids		45.4%	46.0%	
pH		5.5-6.5	9.3-9.6	8

DUP030022639

EXPLANATION OF CHANGES:

(1) Composite pigmentation has reduced binder demand to provide improved durability (chalk and fade resistance) but still provides low sheen with good uniformity of appearance. This pigmentation was selected with the aid of the packing index concept to provide increased amount of binder in excess of that required for dynamic pigment packing.

(2) Titanium dioxide increased to compensate for loss of "dry" hiding in pigmentation of 387-361. Ti-Pure R-610 is used to provide maximum chalk resistance.

(3) Acrylic emulsion replaced polyvinyl acetate emulsion as binder to provide increased alkali resistance. It is also used to effect cost savings due to its manufacture by F&F and because of the high cost of Elvacet 1423 due to low volume usage. Lower solids acrylic emulsion requires less free water in total paint.

(4) Amount of potassium tripolyphosphate to obtain good pigment dispersion and compatibility with Du Pont Universal Colorants is less than needed in 387-361. This reduction will also result in less water sensitivity and better scrub resistance when used on interior surfaces. There is some evidence that less G-718 results is reduced mildew growth.

(5) More satisfactory anti-foam agent is used.

(6) Amount of ethylene glycol needed for freeze-thaw resistance is reduced. Since this is introduced as the carrier for G-1111 in VM-5751, thickener, which is used to adjust viscosity, its amount may vary from batch-to-batch as well the amount of G-1111.

(7) Carbitol, coalescing aid, is not needed in 310-404, especially in the warm climates where it will be used.

(8) Can corrosion resistance is improved by control of pH at 9.3 - 9.6.

REPRODUCIBILITY:

Semi-works size batches of 650 White, 656 Hawaiian Blue and 658 Sand Beige and one 500 gal. batch of 657 Oyster White have been made and used in the trial marketing in Puerto Rico. Thru this production mill base 548-952 has been completely aligned and color vector data have been established for these products as well as for 661 Bone White. No other reproducibility data has been developed.

CONTINUING LABORATORY WORK:

Laboratory effort will be required in the following areas to complete this development.

(1) Follow-up on existing exposures and house tests in Phila. and Puerto Rico.

DUP030022640

(2) Assist in the alignment of the complete line.

(3) Develop color vector data on remaining products.

(4) Complete stability information on plant production as batches are available.

(5) Rhoplex AC-34 alternate formulas will be supplied if required.

COST INFORMATION:

Based on current mill costs obtained from Wilmington Cost Department the proposed 310-Line of masonry paints average 7¢ per gallon higher in mill cost than the 387-Line of vinyl masonry paints. Costs will be reduced substantially when production facilities for RC-11005 are in operation at Fort Madison. Exact costs should be obtained from the cost department.

Further economies are possible thru use of less titanium in some of the light tints which now are formulated at about 2# TiO_2/gal.

MANUFACTURING PROBLEMS:

Based on experience obtained to date no unusual problems are anticipated in the manufacture of any of the proposed products.

The only question is the availability of a sufficient amount of RC-11005, "IO" latex, to fill initial stocking orders of about 500 gallons of each color. Up to 30,000 lbs. of latex will be required for start-up with a continuing supply needed for follow-up orders. Export Sales has forecast sales of 100,000 gallons during the first twelve months after release. This will require 326,000 pounds of latex with all production expected to be at Philadelphia and South San Francisco.

In the case that RC-11005 is not available G-756, Rhoplex AC-34 could be used on an alternate basis. This would not be a pound for pound replacement because the specific gravity of the acrylic resin solids is different in each latex. For alternation on an equal volume of solids basis, the following equivalency is used: 1000 lbs. G-756 replaces 887 lbs. RC-11005 and 113 lbs. H-506 water.

TOXICITY AND OTHER HAZARDS:

There are no new or unusual toxicity hazards in the manufacture or use of these products. Mercury, as phenyl mercury oleate, used as preservative is at a level of about .02% on solids, well under that which requires a label warning.

DUP030022641

LABEL INFORMATION:

Export Sales has completed the preliminary design of a new label for this line.

Label instructions and product specifications have been supplied to Export Sales. Use instructions are generally the same as those in use for "Lucite" House Paint on masonry surfaces except that the use of certain durable Universal Colorants with 650 White to produce added colors is recommended.

SIMPLIFICATION:

There are no new raw materials used in these products.

Until such time as domestic Trade Sales discontinues sales of 387-Line Vinyl Masonry Paints or replaces them with the proposed line there will be four additional dispersions and seventeen additional finished products to be maintained.

PATENT INFORMATION:

No patent complications are currently known to be involved in the manufacture and sale of the proposed acrylic masonry paints formulated with IO iminated acrylic latex. The precursor terpolymer is covered by licensed U.S. Patent 2,795,564 issued to Rohm and Haas and is consequently subject to royalty payment under this patent. Conversion of the precursor latex to the iminated product is covered by pending application FFD-3006-A and certain freeze-thaw tolerant latex paints formulated with the iminated acrylic latex are covered by pending application FFD-1218. U.S. Patent 3,113, 038, issued to Interchemical Corporation, discloses imination of acrylic latex and is considered to be pertinent prior art although our operations are not in conflict with the invention claimed.

CONFIDENTIAL INFORMATION:

There are no unusually confidential disclosures in this release letter.

FORMULA CARDS:

Formulas for 310-403, #653 Caribbean Green, 310-407, #657 Oyster White, 310-413 #663 Barbados Brown and their mill bases, as representative of the complete line, are attached to copies of this letter for production and research personnel.

MARSHALL DEVELOPMENT LABORATORY

J. E. Oyler

J. E. OYLER

JEO:mtax
4/26/65

APPROVED: _____ DATE: 4/28/65

APPROVED: _____ DATE: _____

DUP030022642