

PLASTICS AND RESINS

MONTHLY REPORT

SEPTEMBER, 1969

AP00046371

ESCAMBIA CHEMICAL CORPORATION
INTEROFFICE MEMORANDUM

To: Mr. T. L. Carey

Date: October 7, 1969

From: C. L. Wallace

Copies:

Re: PVC Monthly Summary
September 1969

SUMMARY

Total shipments for the month were 3,773 M pounds of prime resin, of which 1,353 M pounds were specialties. Profits for the month are estimated at \$35,000.

MARKETING

Gross shipments for the month were 3,813 M pounds, of which 40 M pounds were off grade, tailings, etc. Sales were down generally with the exception of the co-polymers. Major account outages were: 220 M pounds to accounts serving the shoe trade, one (110 M pounds) to a customer who is still shut down because of the recent flood in Virginia, and 120 M lbs. due to Armstrong phasing out and Kerr Glass not yet in full bottle production. In addition, there are rumors to the effect that 1970 auto production is not starting as heavily as last year and with preliminary sales interest seemingly slanted toward compact rather than "big" cars.

PRODUCTION

Production of prime resin was 4,421 M pounds, exceeding budget by 879 M pounds. Tailings and off-grade totaled 111 M pounds, or 2.4% of production.

Production variance for September is estimated at \$15,000 favorable. Production for October is estimated at 4,000 M pounds.

Production of problem resins (2185 and 6180) showed marked improvement during September.

Production was good for the month, with reactor availability of 87.2% and monomer efficiency slightly below budget at 94%. The two-day shutdown planned in September was deferred until October because of the possibility of rail strikes and a possible strike at the supplier's monomer plant.

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R & D SUMMARY

The most significant achievement this month was the development of a PVC 2185 recipe giving the desired bottle-grade properties without the use of a chain-transfer agent. It was found that a high temperature reaction could be run satisfactorily without having a deleterious effect on bulk density if a low surfactant level were used. This was checked out several times in the pilot plant and then satisfactorily duplicated in two plant trials.

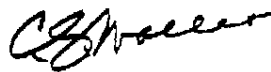
Further trials will be made during the next production run and, if successful, future production will be converted to this recipe.

The basic underlying cause for the low heat stability of PVC 6180 remains elusive, although there is good reason to suspect residual volatiles (vinyl acetate). Efforts to pre-stabilize 6180 during manufacture have been unsuccessful due primarily to the adverse effect of added stabilizer on suspension stability of the pearl recipe.

Laboratory and pilot-plant studies will be continued on PVC 6180 directed toward developing a process for pre-stabilizing the resin during manufacture, correlating accelerated aging tests with bulk car shipment conditions, and gaining a better understanding of the underlying causes for low heat stability.

TECHNICAL SERVICE

Customer service requests for the month were routine in nature. One customer (Ohio Sealer) was aided by a personal visit and is now able to correlate our quality control analysis with their own. A technical presentation on 2185 bottles, compounding and extrusion techniques was also made at Kerr Glass (formerly an Armstrong Cork division) to aid them in the solution of their problems. In addition, information and/or data was furnished to Air Products.


C. L. Wallace

AP00046373

ESCAMBIA CHEMICAL CORPORATION
INTEROFFICE MEMORANDUM

To: Mr C. L. Wallace Date: October 3, 1969

From: G. B. H. Speed Copies:

Re: PVC Production Report
September 1969

SUMMARY

Production of prime resin was 4,421M lbs., exceeding budget by 879M lbs. Tailings and off-grade total 111M lbs. or 2.4% of production.

Production was exceptionally good this month with a minimum number of mechanical breakdowns. Reactor availability was 87.2%. Monomer efficiency was slightly below budget at 94%.

Production of problem resins, PVC-2185 and PVC-6180, showed marked improvement during the month. A total of ten lots of PVC-2185 was produced with only one falling outside the Armstrong Cork tentative specs. All lots have been sampled for approval. A new PVC-2185 recipe from Research was tried and shows promise for reducing the cost and residual volatiles of the resin. The production of PVC-6180 for the month showed the best press plaque results to date. A reduction in residence time in the dryer is believed to be the cause for the improved quality.

Production and variance estimates for September and October are as follows:

	<u>September</u>	<u>October</u>
Production (prime), M lbs.	4,421	4,000
Variance (favorable), \$	(15,000)	10,000

The unfavorable variance estimated for October is based on taking a two-day shutdown late in October. Delivery of two new blend tanks and air grids for the product collectors will determine the shutdown date which could be as late as November. The imminent rail strike and a possible union strike at Allied Chemical on October 7 may interrupt vinyl chloride shipments. Monomer inventory is being maintained as high as possible and orders are being preshipped in an attempt to override the anticipated supply problem.

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STATISTICS

	<u>September</u>		<u>August</u>	
	<u>Actual</u>	<u>Budget</u>	<u>Actual</u>	<u>Budget</u>
<u>Prime Production, M lbs.</u>				
Month	4,421	3,542	4,037	3,660
Year to Date	37,073	32,114	32,652	28,572
<u>Off-Grade Production, % of Total</u>				
Month	2.4	4.0	5.4	4.0
Year to Date	4.8	4.0	5.1	4.0
<u>Bulk Production, % of Prime</u>				
Month	52.1	43.8	45.7	43.8
Year to Date	46.5	43.8	38.5	43.8
<u>Shipments, M lbs.</u>				
Month - Prime	4,185	----	3,663	----
Month - Off-Grade	40	----	105	----
Year to Date - Prime	36,482	----	32,297	----
Off-Grade	1,858	----	1,818	----
<u>VCI Efficiency, %</u>				
Month	94.0	94.5	96.4	94.5
Year to Date	94.9	94.5	95.0	94.5
<u>Reactor Availability, % of Available Hours</u>				
Month	87.2	----	81.9	----
Average Year to Date	84.7	----	84.4	----

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October 3, 1969

STATISTICS (Cont'd)

	<u>September</u>	<u>August</u>
Cleaning & Washing		
Reactor	6.9	7.4
Scheduling Charges	1.7	3.5
Changing types	1.5	0.4
Slow Recovery	0.3	0.2
Low Drying Rates	0.4	2.0
Maintenance		
Hydraulic Motor	0	0.1
Instrument	0.1	0.1
Reactor	0.2	---
Dryer	0.9	----
Boiler Failure	---	3.9
Miscellaneous	<u>0.8</u>	<u>0.5</u>
	12.8	18.1

<u>September</u>		<u>August</u>	
<u>Actual</u>	<u>Budget</u>	<u>Actual</u>	<u>Budget</u>
<u>Product Mix, M lbs.</u>			
<u>Prime Resin</u>			
Group I	2,315	1,441	1,478
Group II	606	615	582
Group III	142	269	298
Group IV	201	396	235
Group V	1,157	703	1,444
Group VI	<u>13</u>	<u>118</u>	<u>103</u>
	4,434	3,542	4,140

Off-Grade and TailingsOff-Grade

<u>Type</u>	<u>Quantity, M lbs.</u>	<u>Reason Off-Grade</u>	<u>% of Total Production</u>
3185	6	Contamination	0.1
6180	36	High Sediment No.	0.8
<u>Tailings</u>	59		1.3
<u>Floor Sweeps</u>	<u>10</u>		<u>0.2</u>
Total	111		2.4

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DISCUSSION

1000 Series

Types produced: 1200, 1225, 1230X, 1250

Production runs were normal. No changes in recipe or procedures were required.

2000 Series

Types produced: 2160, 2185, 2200, 2225, 2250

Production runs were normal and no recipe changes were required on the types run except PVC-2185 and PVC-2250. The J9d recipe was used successfully for the production of PVC 2185. A total of ten lots were produced with only one failing the Armstrong Cork specification. All lots have been sampled to Armstrong for approval test. A new recipe supplied by Research was successfully tried on one batch. The new recipe eliminates the use of TCE which should reduce the residual volatiles and cost of the resin. Additional production will be run on the new recipe for customer evaluation. The production of PVC-2250 for the month failed in bulk density for Zapata. Additional recipes have been proposed for increasing the bulk density to the desired range.

3000 Series

Types produced: 3185, 3225, 3250

Production was normal and no recipe changes were required.

6000 Series

Types produced: 6180 and 6240

Operations were routine. The production of PVC 6180 exhibited the best plaque test results to date. The improvement in quality is believed due to a reduction in dryer residence time. The lower residence time was affected by repairing the air slide below the product collector. The repair allowed more air to be drawn through the dryer, moving the resin through faster. A new dryer gear has been purchased to increase the dryer rotational speed, further reducing residence time. The new gear will be tried in October.

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DISCUSSION (cont'd)

8000 Series

Types produced: 8200 and 8217

Production was normal. No recipe or procedure changes were made.

Maintenance

Major maintenance incurred during the month is as follows:

1. Clean VCI evaporator condenser.
2. Rewound cooling tower water return pump.
3. Emergency repairs to north product collector damper valves.
4. Replaced south product collector air slide.
5. Repaired broken baffles in south dryer.
6. Repaired VCI unloading compressor.
7. Overhauled air compressor.

G. B. H. Speed
G. B. H. Speed

AP00046378

ESCAMBIA CHEMICAL CORPORATION
INTEROFFICE MEMORANDUM

To: Mr. G. B. H. Speed Date: October 1, 1969

From: D. V. Lowe Copies:

Re: Progress Report - September, 1969
PVC Process Improvements

September progress on PVC plant process improvements is reported in the following sections:

REACTION SYSTEM

Spray Rinse Nozzles

Ten of the Pfaudler spray rinse valves for washing PVC reactors have been put on order as part of AFE 6914 "Additional Monomer Compressor". Contact has been made with the Pfaudler representative to determine operating and maintenance procedures which should be utilized for optimum service in PVC.

PVC Quality Improvement

A. PVC 2185

Two runs were made during the month. Only 10 batches were made during the first run using the normal J9D recipe. The results were good, with bulk density in the 33-34 range. The second run commenced on September 8 to duplicate success of the first. Results were good once again. An attempt to greatly reduce residual volatiles was unsuccessful, the higher drying temperature causing contamination of the resin. However, a recipe introduced by R&D for production of a fine resin with no "ZB" content and good bulk density was successful. Reports were issued (References 1 and 2) summarizing the production.

B. PVC 2250

A production summary (Reference 3) was issued on September 15. The problem was to produce resin with bulk density of 32-34 for Zapata without becoming too coarse and increasing tailings. The various standard recipes were not highly successful in doing

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B. PVC 2250 (cont'd)

this. Later, one experimental batch charged during a PVC 1250 run was successful in making resin with the Zapata properties. It was a modified 2185 recipe (lower temperature, no "ZB", using "CC" instead of "KC") suggested by R&D and will be further investigated.

C. PVC 4185-SP

The report issued on September 10 (Reference 4) detailed the results of this successful run. The recipe was once again T14-1n, with 0.01 parts "OX" for stability and lower "EY" content for a slightly lower bulk density. The bulk density came down nicely and this recipe will be retained unchanged.

D. PVC 6180

The late August run was finished on September 3 and a report (Reference 5) made on September 5. The quality of the run was good. One lot of Y8 type resin was made but heat stability was less than the current Y13g type. One batch was reacted with 0.5 parts of Parapleg G-62 stabilizer but results were poor.

Another run was conducted from September 15 to 25 and quality was excellent. A production summary (Reference 6) was written on September 29. Appearance of Tenak pressed plaques was very good and bulk truck shipments to Nixon-Baldwin continue.

Reactor Rupture Disc Study

Usage of 4" rupture discs under the reactor relief valves amounts to approximately \$3,000 annually. The "Fike" rupture disc representative has suggested use of an improved disc as well as new flanged head assemblies at the point of application. Preliminary economic studies indicate at least minimal support of his proposals so a followup investigation will be made. A trial on one reactor and observation of polymer buildup rates will be followed.

THF Cleaning of PVC Reaction Vessels

Representatives of E.I. DuPont Company visited ECC on September 24 and presented further information concerning the "Tetra-Solve" equipment cleaning system. It has been proposed that chemical cleaning with tetra-

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THF Cleaning of PVC Reaction Vessels (cont'd)

hydrofuran replace manual entry and cleaning of PVC reactors. The meeting was attended by technical representatives of ECC as well as DuPont (Reference 7). Since no major deterrents to feasibility of a THF cleaning and recovery system were uncovered, investigation continues. Presently, the economics of a THF system are being calculated. It is then planned to evaluate preliminary economics and issue a report. A plant scale trial of THF cleaning is anticipated, should the preliminary economics be favorable.

FINISHING SECTIONAutomatic Product Samplers

The RFE for installation of "Quality Control" automatic sampling devices for both finishing lines was approved. The vendor was then contacted for specific details concerning sizing and operation. The two devices were subsequently put on order for early delivery.

Gravity Feed Chutes for Rotary Dryers

Louisville Dryer Company supplied a layout drawing and quote for two teflon lined gravity feed chutes to replace our wet-cake screw conveyors. The layout was such that the adapting hoppers over their chutes would slope at only 45° to the horizontal (minimum of 60° to the horizontal recommended). The ECC engineering department (Reference 8) prepared a cost estimate for purchase and installation of the chutes and hoppers. When it developed that not even the most radical revision of the proposed layout could negate possibility of PVC "bridging" over the juncture of the chutes and adapting hoppers, the project was tabled.

Replacement of Dust Collector Bags

One sample bag of Heatset Multi-filament Dacron was received for our approval from Southern Press and Filter Media Company. The new style bag is intended to stop "lint-out" of the old style bags into our product. The sample being acceptable, approval was issued to our stores warehouse to obtain all future replacement bags for our Alpine collector and two product collectors from this new source. In addition, a sample bag similar to those currently being used in our bulk transfer collectors has been requested from Southern Press and Filter Media.

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PVC Blend Tank Agitation

The new pitched blade impellers in No. 4 blend tank have become bent due to excessive torque in restarting the agitator following loss of particle suspension in the slurry. To prevent this from occurring with the yet-to-be installed pitched blade impellers for the remaining three tanks, a work request has been written to provide support bracing on the pitched blades. It is hoped this support work can be accomplished prior to the impending PVC plant shutdown, when the new blades must be ready for installation. If 20 H.P. explosion proof motors can be located in the plant prior to the shutdown, it is planned to change out two of the existing 15 H.P. motors on the agitators.

South Product Collector Air Slide

The broken ceramic fluidizing media was removed from the south product air slide. This was replaced with a new canvas media which permits even and efficient fluidization of the product PVC. Very large accumulation of product over the air slide due to poor air fluidization is no longer a problem. Likewise, usage of large quantities of process air to augment the air supply from the small air slide blower is no longer a problem. The original air slide blower was replaced with a slightly larger model, one which is capable of doing the job alone. The blower location was also changed to eliminate pressure drops in turns. One remaining task is to locate the suction to this air slide blower in a clean atmosphere to stop pluggage of the inlet filter.

Revision to South Rotary Dryer Drive

The south rotary dryer is presently running with its original reducer drive sprocket and thus is running at the originally intended speed. (The north dryer has a smaller sprocket and is turning slightly more slowly). To investigate the effect of higher speed of drying on possible improvement of PVC 6180 heat stability, a 20-tooth sprocket was purchased for the south dryer. The gear is now in the plant and will be installed prior to the next 6180 run. It will revise the speed of revolution upward from 4.35 RPM to 4.83 RPM. (The north dryer is turning at 3.63 RPM).

AFE 6917 - PVC Dryer Modifications and Improvements

Assistance was extended to the engineering office in specifying and ordering equipment items for this approved job. The new s.s. rotex screener for the south line is on order as well as the necessary screen clothing. All mesh sizes other than 60, 80, and 100 were ordered in Tuflex material (Monel metal). The 60, 80, and 100 mesh screens were specified in Nylon material

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AFE 6917 - PVC Dryer Modifications and Improvements (cont'd)

similar to our existing screens. Due to reduced screen life, the metal materials are not recommended in the finer mesh sizes.

A purchase requisition is currently being circulated for approvals to place the 600 psig steam heater coils for the south dryer air stream on order from Ridgidbilt Company.

WAREHOUSE AND SHIPPINGTrolley for R.R. Car Vent Bag Adaptor

A cable and trolley system was installed over the bulk car loading spot to assist operators in moving the heavy s.s. adaptor which allows two bags to exhaust conveying air instead of just one. The metal adaptor is bulky and heavy and had been considered hazardous for one man to move frequently while up on top of a car. A minor revision to the trolley system will be requested of the maintenance department before it can be considered a practical solution to the problem. This will be done as early as possible.

RECOVERY AND PURIFICATIONNew Monomer Compressor - AFE 6914

As reported previously, the "XA" and "ZB" metering systems are on order. The new water meter is now in the plant.

A meeting was held with Nash Engineering Company representatives to discuss operation and maintenance of the Nash two-stage compressor system. The machine appears well suited to our needs. However, at a later date the question arose concerning whether the Nash quote had included a model actually sufficient to handle our flow rate requirements. The people have been contacted once again to evaluate this for us and revise their quote if necessary. A final selection of the actual machine to be purchased awaits this re-evaluation by Nash Engineering. It is planned to check their progress in conducting this re-evaluation on October 1.

Refrigeration System for Purification Condenser

A firm cost estimate for relocation of the "Peewee" refrigeration package unit from the MMA plant to PVC purification service is expected from the engineering department in early October. This would allow purification of recovered monomer at low temperatures and pressures such as

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Refrigeration System for Purification Condenser (cont'd)

polymer formation in the equipment would be very greatly reduced. During September the evaporator condenser tubes plugged with hard polymer once again and the unit was disassembled once again. In addition to greatly reducing this maintenance cost, the package refrigeration unit would provide service to the proposed THF recovery system in the future.

GENERAL PROCESSInvestigation of Van-Air Dryer

For some time, the Van-Air process air dryer has consumed excessive "Dry-O-Lite" dessicant while in operation. The desiccant being moderately expensive, the usage was investigated and it was believed that the temperature of operation was excessive. Estimates were requested and received for piping the two existing compressor aftercooling heat exchangers into parallel and increasing sizing of supply water lines to these aftercoolers so as to further cool the process air supply to the Van-Air dryer. The estimated cost (Reference 9) is \$2,400.

Examination of a similar Van-Air dryer in the DNT plant revealed entering air temperature of 128°F (100°F is the recommended maximum) but at the same time the dryer was loaded to only 29% of rated capacity. Since repairing the south PVC product air slide (which consumed much process air) our Van-Air dryer load has been reduced from 75% to approximately 50% of capacity. Based on these conditions and the oncoming cooler weather, the air dryer has been recharged with "Dry-O-Lite" and is operating satisfactorily to date.

A search for an inexpensive replacement for "Dry-O-Lite" desiccant revealed no possible substitute with cost-saving potential. None of the manufacturers recommended using a simple hygroscopic salt material such as halite (rock salt).

Emergency Procedures - PVC Plant

A complete compilation of new emergency procedures to be followed by plant personnel in case of any minor or major emergencies was completed during early September. All of the finished procedural write-ups were submitted to the office of the PVC Production Manager so that they could be reviewed, published, and then distributed to PVC plant personnel.

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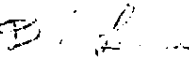
October 1, 1969

Additional 5M Gallon PVC Reactor

A study of increased PVC plant productivity with additional reactor and/or drying capacity and of the potential economics and justification was completed and a report (Reference 10) issued. Yields and economics showed that additional drying capacity above that accomplished by AFE 6917 already approved would not be favorable. Neither was the addition of a 5M gallon PVC reactor with no concurrent drying capacity increase extremely favorable. However, installation of a 5M gallon reactor along with necessary auxiliary equipment and a further drying increase promised an R.O.I. of 16.7-18.9% and potential payout of the \$409M to \$462M initial investment over 3.0-3.3 years. The productivity increase was expected to amount to the equivalent of 6.25MM pounds per year of prime 1225 resin.

Catalogue of 1969 Lot Analyses

A catalogue of results of lot analyses of all PVC resins produced to date in 1969 was established and will be kept up to date as new production is completed. This will be helpful in the future when it is necessary to correlate new performance with old data.



D. V. Lowe

- Reference 1 Memorandum to File from D. V. Lowe, "Production Summary, PVC 2185, August 21 to 24 and September 2 and 3, 1969", dated September 8, 1969.
- Reference 2 Memorandum to File from D. V. Lowe, "Production Summary, PVC 2185, September 8 to 12, 1969", dated September 15, 1969.
- Reference 3 Memorandum to File from D. V. Lowe, "Production Summary, PVC 2250, September 9 to 12, 1969", dated September 15, 1969.
- Reference 4 Memorandum to File from D. V. Lowe, "Production Summary, PVC 4185-SP, September 5 to 8, 1969", dated September 10, 1969.
- Reference 5 Memorandum to G. B. H. Speed from D. V. Lowe, "PVC 6180 Production Summary, July 29 to August 14 and August 24 to September 3", dated September 5, 1969.
- Reference 6 Memorandum to G. B. H. Speed from D. V. Lowe, "Production

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REFERENCES (cont'd)

- Reference 6 Summary, PVC 6180, September 15 to 25, 1969", dated September 29, 1969.
- Reference 7 Memorandum to File from D. V. Lowe, "Conference with E. I. DuPont Representatives - THF Cleaning of PVC Reactors", dated September 24, 1969.
- Reference 8 Memorandum to Mr. F. E. Sommer from S. L. White, "Teflon Lined Chutes to Two PVC Dryers", dated September 24, 1969.
- Reference 9 Memorandum to Mr. F. E. Sommer from S. L. White, "PVC 500 CFM Air Compressor", dated September 22, 1969.
- Reference 10 Memorandum to Mr. G. B. H. Speed from D. V. Lowe, "Productivity of New 5M Gallon Reactor - PVC", dated September 3, 1969.

AP00046386

ESCAMBIA CHEMICAL CORPORATION
INTEROFFICE MEMORANDUM

To: Dr. W. M. Smith	Date: September 26, 1969
From: D. J. Mann	Copies: A. R. Adams G. J. Mantell G. E. Schmauch F. L. Riddle W. K. Clark
Re: Monthly Summary PVC Research & Development <u>September, 1969</u>	

OPERATIONS

1. Polymerization Laboratory

A. Colloid/Non-ionic Surfactant Suspension Systems

Bottle recipes were evaluated to study the effects of different protective colloids and non-ionic surfactants on resin particle size and bulk density. The following colloids were studied at the indicated levels:

Methocel HG60 (50 cps)	0.05, 0.1, 0.2
Methocel HG90 (4000 cps)	0.05, 0.1, 0.2
Methocel HG90 (15,000 cps)	0.05, 0.1, 0.2
Gelatin WP-30	0.1, 0.2, 0.3

Selected PVA colloids are also being evaluated at the 0.05, 0.1, and 0.2 levels.

The non-ionic surfactants were evaluated at the .025 and .05 levels in conjunction with these colloids and were selected to cover a range of HLB values as follows:

	<u>HLB</u>
Tween 61	9.6
Tween 21	13.3
Tween 60	14.9
Tween 80	15.0
Tween 40	15.6
Tween 20	16.7

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OPERATIONS (Cont'd)

Comparing the three Methocel products for suspension properties without the surfactants indicated the following:

1. At the 0.05 colloid level, the most stable suspension was obtained using the 4000 cps material. The other two colloids gave considerable fouling.
2. At the 0.1 colloid level, all three colloids produced resins of similar particle size and bulk density.
3. At the 0.2 colloid level, the lowest viscosity colloid produced a resin that appeared to be slightly finer than the other two. The bulk densities were all fairly high (33-35 lbs./cu.ft.).

Comparing the Methocel colloids with the surfactants indicated the following:

1. With Methocel HG60 (50 cps), as the HLB of the surfactant increased, the particle size and bulk density appeared to decrease.
2. With Methocel HG90 (4000 cps), the surfactants had essentially no effect at the low Methocel level but reduced the bulk density and particle size at the two higher levels as noted above.
3. With Methocel HG90 (15,000 cps), the surfactants appeared to affect the bulk density and particle size as noted above but to a lesser degree.

The gelatin WP-30 alone gave bulk densities in the 20-25 lbs./cu.ft. range (considerably lower than has been obtained in the pilot-plant reactor). The level of WP-30 did not significantly alter the particle size distribution. In all cases the added surfactant increased the particle size and bulk density.

B. 2185

As reported previously, the following chemicals were evaluated as possible replacements for TCE as a chain-

AP00046388

OPERATIONS (Cont'd)

transfer agent in such resins as 2185 where minimum volatile content is very important.

Cis-1,2 dichloroethylene
Isobutyraldehyde
Methylene chloride
Ethyl acetate
3-Chloro-2-methyl propene
Bromo-chloromethane
1,3-Cyclohexadiene
Carbon tetrachloride
Chloroform
Toluene
Benzene
Methanol
Acetone

Isobutyraldehyde produced a resin lower in molecular weight (R.V. = 1.50) than the comparable TCE control (R.V. = 1.68) and also considerably finer in particle size. The solvent 3-chloro-2-methyl propene appeared comparable to TCE in these two properties. The other chemicals were inferior to TCE under the conditions and levels evaluated.

C. 6180

Attempts were made in the laboratory to determine the effect of recovered monomer (VCl) on the 6180 production. A series of ten bottles was run in which various amounts of fresh monomer were replaced with recovered monomer. The resins were oven aged for a total of 235 hours at 120°F. The number of black specks were counted and compared with the initial count. All resins appeared to behave very similarly and no significant differences were noted between any of the resins.

The plant consistently makes off-grade 6180 with recovered monomer. It is believed that the difference between plant and laboratory results might be in the volatile content. Laboratory polymers are thoroughly dried before testing whereas plant resins contain considerable vinyl acetate. Further studies to clarify the effect of residual volatiles are in progress.

AP00046389

OPERATIONS (Cont'd)

D. 6145 and 6145X

Samples of each of the above two resins were prepared and sent to Dr. R. K. S. Chan for solution studies.

2. Pilot Plant

A. 2185

The most significant achievement this month was the development of a 2185 recipe giving the desired bottle-grade properties without the use of TCE chain-transfer agent. It was found that a high temperature (153-155°F) reaction could be run satisfactorily without having a deleterious effect on bulk density by using a low Ultra-wet surfactant level (0.035). This was checked out several times in the pilot plant and then satisfactorily duplicated in two plant trials (batches).

This recipe will be used at the start-up of the next 2185 run.

B. WP-30

Two hundred pounds of coarse, high bulk density resin were prepared for grinding trials at Williams Patent C & M Company using a WP-30 colloid suspending system. An eight-pound sample of this resin (designated 1200-X) has been shipped to the Williams Company for their preliminary evaluation.

C. 6180

Efforts to prepare a pre-stabilized 6180 in the reactor have been unsuccessful due primarily to the fact that the pearl polymerization system does not have sufficient stability to hold the added stabilizer. Gross fouling occurred in all cases.

3. Properties Laboratory

The following competitive resins were evaluated as plastisol extender resins versus 8200:

AP00046390

OPERATIONS (Cont'd)

Diamond 7-44
Diamond 7401*
Rucon B-24S
Exon 603*
Exon 654*

PVC 8200 has particle size distribution size and viscosity properties similar to Diamond 7-44. Fusion appears to be somewhat better than the Diamond resin in that a faster development of physical properties occurred at all temperatures evaluated.

The Rucon B-24S extender resin was fairly coarse (74% on 200 mesh) and gave rough films. The fusion/viscosity properties were satisfactory.

All the dispersion resins had high viscosity and fast fusion properties.

SAMPLES

See 2-B above.

A 55-gallon drum of 2185 wet cake was shipped to the Williams Patent C & M Company on September 12, 1969.

CUSTOMER VISITS

Because of the relatively high percentage of PVC 6180 production which has been withheld from shipment to Nixon-Baldwin in an effort to eliminate rejections, a visit was made to Nixon-Baldwin in early September along with Messrs. F. G. Mendrey and J. D. Kramer to discuss specifications and quality control methods. As a result of this most worthwhile visit, the following conclusions were reached.

1. Although Nixon-Baldwin runs speck counts in both the dry resin and pressed plaques, only the latter has real meaning in terms of their acceptance/rejection of the shipment, the reason being that Nixon-Baldwin does not consider low dry-resin counts meaningful without a companion plaque count.

*Dispersion resin

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CUSTOMER VISITS (Cont'd)

2. The results of quality control tests by Nixon-Baldwin on samples of ten lots of resin delivered in conjunction with our visit established the fact that Escambia has been overcritical in the grading of PVC 6180 for shipment to Nixon-Baldwin. Thus, a higher percentage of current production can be considered as qualified for N-B use.
3. This percentage would increase still further if N-B could be convinced that the testing of plaques prepared from compounded (stabilized) rather than raw 6180 resin is more representative of their manufacturing process.
4. Until the basic cause of the reduced resin thermal stability can be determined and corrected or a method developed to pre-stabilize the resin during manufacture, the probability of bulk rail-car rejections is too high to justify the resumption of this type shipment.

An interim approach to the problem is the development of an accelerated aging test which accurately simulates resin exposure during rail-car shipments.

GENERAL

Mr. William Harp joined the PVC R & D group on September 29, 1969, as a pilot-plant technician.

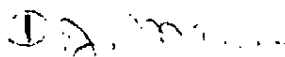
FUTURE PLANS

1. Laboratory and pilot-plant studies will be continued on PVC 6180 directed towards developing a process for pre-stabilizing the resin during manufacture, correlating accelerated aging tests with bulk-car shipment conditions, as well as gaining a better understanding of the underlying cause(s) of the reduced heat stability.
2. Studies will continue on the evaluation of FVP-type, hydroxy-alkyl cellulose, and gelatin (WP-30) suspending agents for both micropearls and plastisol extenders. Several recipes will be tested in the pilot plant.
3. The evaluation of competitive plastisol extenders versus PVC 8200 will be completed and a special report prepared.

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FUTURE PLANS (Cont'd)

4. Efforts will continue to prepare a series of vinyl chloride copolymers containing 2-10% isobutylene. A program plan will be developed for the laboratory characterization of these resins directed towards their use in rigid bottles and containers.
5. The evaluation of Vazo-52 and Liladox polymerization initiators will be undertaken as soon as samples arrive.


D. J. Mann

ESCAMBIA CHEMICAL CORPORATION
INTEROFFICE MEMORANDUM

To: Dr. W. M. Smith

Date: September 26, 1969

From: W. K. Clark

Copies:

Re: Monthly Summary
Technical Service
September, 1969

1. Customer Service

- A. E. F. Whitmore - Revolan Systems - Recommended starting formulations for strippable coatings incorporating our PVC 6145 or PVC 6180. (Reference 1)
- B. Ohio Sealer and Chemical Company - This customer has been experiencing problems with our PVC 4185-2S. Paul Baker and Peter Browne made a joint trip to this customer's plant on September 3, 1969. As a result of this trip, they are now able to reproduce our quality control analysis in their own lab. (Reference 2)
- C. Kerr Glass (Armstrong) - This customer is purchasing our PVC 2185 for dry blend extrusion blow molding of hair tonic bottles. In order to set the stage for closer cooperation in their expansion program, we made a technical presentation of our capability to aid them in solution of their problems.

2. Customer Service to Air Products and Chemicals, Inc.

- A. W. M. Smith - Information relating to "Ultrasonics in Chemical Reactions" was discussed in memorandum of reference. (Reference 3)
- B. W. M. Smith - Patent Case F-505 - At the request of Dr. Smith, this Case was reviewed and dissenting opinion of examiners' views presented. Since this Case was abandoned, we will attempt to refile on this concept. (Reference 4)
- C. W. M. Smith - Comments on the proposed laboratory are recorded in memorandum of reference. (Reference 5)

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2. Customer Service to Air Products and Chemicals, Inc. (Cont'd)

- D. D. G. Manly - Medical Products Division - Discussions on the costs and requirements of conductive coatings for the Medical Products Division were held. A preliminary investigation of the feasibility of producing a complete anesthesia package was made. Further pursuit of this will be delayed until a medical products research group is formed. (Reference 6)

3. Miscellaneous

- A. A new screw has been ordered for the 3/4" Killion extruder. This will enable us to develop a method of testing the quality of resins intended for the blow-molding applications. Inherent in this program will be development of dry blend technology.
- B. Evaluated two Firestone resins (Exon 9300 and 9330) for comparison with our PVC 1225 and 1250. (Reference 7)
- C. We have hired a technician for the Tech Service Lab. He is currently working in the PVC Quality Control Lab and is tentatively scheduled to transfer to our department on October 13, 1969.

4. Samples

A total of 32 PVC samples (226 pounds) was sent to 17 customers.

W. K. Clark

Reference 1	Letter to Mr. Omar Iglesias from W. K. Clark dated September 9, 1969
Reference 2	Memo to W. K. Clark from P. R. Browne dated September 10, 1969
Reference 3	Memo to W. M. Smith from W. K. Clark dated September 2, 1969

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Dr. W. M. Smith

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September 26, 1969

Reference 4

Memo to W. M. Smith from W. K. Clark dated
September 2, 1969

Reference 5

Memo to W. M. Smith from W. K. Clark dated
September 9, 1969

Reference 6

Memo to D. G. Manly from W. K. Clark dated
September 10, 1969

Reference 7

Memo to C. L. Wallace from P. R. Browne dated
September 11, 1969

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