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CONFIDENTIA

INTER-OFFICE MEMO **TENNECO CHEMICALS, INC.**

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To M. W. Williams At Flemington Date May 25, 1972

From H. B. Carr At Flemington Copy to P. Gawason
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File

Subject Quality Control and A&E
Monthly Report - May, 1972

RESIN PLANTS

Raw Materials

1. Antifoam Evaluation - TBP vs. TOF (F. W. Kanzler, H. R. Horton)

Laboratory evaluation work continued in support of the Process Engineering program to find a functionally improved, lower cost, FDA sanctioned replacement for tributyl phosphate (TBP) as an antifoam in the dispersion resin process. Tris octyl phosphate (TOF) was evaluated in latex and 1% sodium lauryl sulfate solution following the scheme outlined in the April, 1972 report. TBP proved superior to TOF in the laboratory testing both as an antifoam and as a defoamer.

2. DHW-80 (F. W. Kanzler, H. R. Horton)

As per the program defined in the memo, H. B. Carr to M. W. Williams, 3/29/72, Quality Control has accomplished the following:

a. A sample library including truck shipment, storage tank and batch mix tank feed samples has been maintained since 4/3/72.

b. Optimum sample storage conditions have been established that involves nitrogen purging glass containers, tight sealing and storage in the dark at ambient temperature. These conditions will be confirmed further by additional bottle polymerizer testing.

c. A bottle polymerizer test based on an emulsion polymerization formulation (modified Dow test) has been optimized that correlates with plant kinetic experience.

As further confirmation of (c) two DHW-80 shipments (5/8/72 and 5/16/72) showed slower bottle polymerizer kinetics (39% and 42% vs. a normal 55% conversion) and also showed slower plant kinetics which required increased initiator

charge. Process Engineering is currently quantifying the kinetics such that on future shipments, the bottle polymerizer data will be utilized to adjust plant initiator levels prior to production runs. The retained samples will be characterized analytically to define differences between the "slow" and control DHW-80.

In-Process Testing

In-Process Magnets (F. W. Kanzler)

The in-process magnets installed by Manufacturing in April were evaluated in May as a possible replacement and as a more accurate indicator of metallic particle contamination in resin than the current Q.C. Syntron-Magnet (high gauss) test. The evaluation, based on weighing metallic particles recovered on the magnets on a 24-hour frequency, did not correlate well with the standard Q.C. test with the exception of high metallic incidences (4-6 count per pound by Q.C. test). The evaluation will next be attempted on a lot basis with careful attention paid to magnet removal techniques; e.g., that the particles are not dislodged.

Finished Resin

1. 17P Resin for Johns-Manville (M. C. Spalding)

Johns-Manville requires a bulk density of 32.5-36.0 lbs./ft.^{3} Pilot Plant studies indicated that buffering the resin slurry pH to levels above 6.5 would provide the necessary bulk density increase to meet J-M's requirement. Q.C. measured slurry pH's during an LOP run and the data were not above 6.5 (ca. 6.0); nor were the bulk density data above the minimum J-M level. Of significance, however, for future buffer trials was the fact that resin produced with sodium bicarbonate added as a buffer gave equivalent electrical properties (and somewhat higher) to standard 225/16R resin. This nullifies concern about 17P cross-contamination harming electrical grade 225/16R.

2. Reactor Jacket Cleaning (M. C. Spalding)

The Flemington Plant has experienced reduced reactor heat transfer since start-up and this has affected cooling and hence, kinetics control. Based on Burlington experience, reactor jackets are known to build up rust, scale and silt. Jacket cleaning of #5 reactor has resulted in a 10% improvement in heat transfer coefficient (50 to ca. 55 as per P.E.).

Analytical work in support of this program has indicated the following:

a. The well water is high in metals, both iron and calcium.

b. The river water is low in metals, but high in solids content, mostly clay and silt.

c. The scale on the reactor jacket is mostly rust buildup, i.e., oxides of iron. This scale or growth is soluble in mineral acids. The jacket did, moreover, contain a substantial amount of silt.

3. Disposition Procedure (H. B. Carr)

A disposition procedure for dispersion resin that includes definition of procedural responsibilities for testing, grading, disposition and release was established with R&D, Manufacturing, Marketing and Inventory Control and was summarized in a memo issued by M. W. Williams. This procedure will sharpen up our handling of dispersion resin production lots as-made and also as-shipped from inventory; namely, IS and II grade material will be shipped in preference to I where this is defined.

4. Haze and Gloss - Dispersion Resin (F. W. Kanzler)

Haze and gloss of fused dispersion resin film are critical requirements of the flooring industry - 12 M pounds annual sales. Q.C. previously has used an eyeball method to assess these properties which was subjective and nonquantitative. During May, a technical memo issued summarizing Q.C.'s development and implementation of a Gardner Haze and Gloss Meter for measuring these properties. Of significance are the following:

a. This instrument provides accurate and reproducible data upon which specifications and in-plant controls may be assessed and established.

b. 1742 resin is a good match for our main competition, Firestone Exon 640 (0.4% haze and 45% gloss vs. 0.5% and 44%, respectively). 1738, however, as expected, is high in haze (4.5%) and low in gloss. (24%).

General

R&D Time Accounting

Time cards for the period 1/72-4/72 (484 total) were proofread, corrected and submitted to Systems. An error analysis was issued to all Supervisors and Group Leaders.

COMPOUND PLANT

1. Stauffer Resin (P. Gawason, F. W. Kanzler)

Due to our sold-out PVC position, it has been necessary to purchase Stauffer 225/16R and 250-12 resin types for compound use. With the exception of 2052 compound (Tribase E, lead stabilized) all formulations using Stauffer 250 resin ran successfully. R&D and Q.C. are currently investigating the problem with the Tribase E formulation since other lead stabilized formulations (Tribase EXL, lead-organic complex) ran well. Initial evaluation of the Stauffer 225 type in 6100 compound (Tribase EXL) ran well. We are currently attempting to pin down Stauffer on specifications; primarily, a reduction in 250 resin relative viscosity from 2.50-2.55 to 2.40-2.50 and a coarsening of the resin from 6-10% through 200 mesh to 0-5%.

2. Raw Materials (P. Gawason)

Via the program coordinated with Purchasing, 70% of the current raw material specifications have been upgraded and will be issued. Compound Development is optimizing a mill test that will define proper quality of DS-207 and CR-1 lead stabilizers, the particle size and fluxing-dispersion ability of which is known to affect plate-out in 3805D record compound.

3. Standard Product List (P. Gawason)

The standard product list has been reduced by 50%. Marketing, Manufacturing and R&D were informed that these compounds will be placed in an inactive file and, if older than one year, will require R&D/Marketing review prior to being scheduled. More definitive specifications are being prepared, including color limits, and these will be coordinated with Marketing, Manufacturing and R&D. Further, a revised testing, grading, disposition and release procedure has been established and will issue prior to 6/1/72.

4. Laboratory Equipment (P. Gawason, R. J. Eckman)

a. The laboratory mill (3" x 9") was transferred from R&D, has been installed and is on-stream for color match work - a significant improvement in this area.

b. A CAR has been prepared to purchase a Gardner Color Meter that provides Tristimulus type print-out. This instrument has the capability for accurately measuring color of solids (pigments, dry blend, compound pellets), liquids (stabilizers, plasticizers) as well as opaque and clear compound milled or molded sheets.

c. The laboratory Instron has been serviced and certified to ASTM accuracy. A round robin testing program will commence with A&E in June.

5. Color Matching (R. J. Eckman)

The following is a list of color matches performed on standard product color formulations:

2906-1 Natural 01	American Wire
2300 Natural	Production
T-733 White 245	Brand Rex
X-606 Gray 151	Kessler Products
2602-1 Gray 150 re-match	Olin Conductors
2022 Gray 148 re-match	Production

A&E

1. Resin Group Support (M. C. Spalding)

a. GAF Floor Tile

A compound analysis was made of the foam layer of this floor tile. The tile consisted of a substrate, a foam layer and an overlay. We made a mechanical separation of the foam from the other layers. The composition of the foam was:

Resin System:	55.4%	PVC Homopolymer, R.V. 2.89
THF/CH_3OH Soluble:	31.2%	V-1046
THF Insoluble:	11.9%	TiO_2, Cd and Zn metals

We supply both plasticizer (V-1046 and V-1537) and resin to GAF, and we are anxious to characterize their foam formulation.

b. Solution Grade Resins

The Resin Group has sought to characterize a number of Wacker solution grade resins during this past month. We have on request measured the relative viscosities and acetate levels of a number of these.

2. Compound Development Support (M. C. Spalding)

a. Pantasote W-916 Jacket Compound

A lower raw material cost, competitive analog of this compound is being sought. Analysis indicated that the

resin system comprised 46% of the compound as a 2.34 relative viscosity homopolymer PVC. The plasticizer content represented 26% of the formulation and this was broken down as being 90% DOP and 10% secondary chained hydrocarbon (close match for Escoflex 998). The filler comprised 18% of the compound in a ratio of 3.6 to 1 of Ca to Pb with a small amount of Si. These data have been provided to Compound Development for their review.

b. BFG 2042 (M. C. Spalding)

We do not currently have a compound match for this non UL wire compound which is utilized at Electriflex and Anaconda Wire. A&E found the following:

Resin:	56%, 2.34 R.V. PVC homopolymer
Plasticizer:	32%, DIDP
Stabilizer/Filler:	3% Pb (metal), silicates and titanium dioxide pigment.

Silicates and TiO_2 will be quantified if these data are required.

H. B. Carr

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