

INTER-OFFICE MEMO

TENNECO CHEMICALS, INC.

TO Route List

AT All Points

DATE November 22, 1967

FROM J. C. Fisher

AT Flemington

COPY TO N. E. Arena

R. T. Bucsko ✓

M. G. Caine

E. Farber

C. W. Johnston

R. H. Marks

L. Medeiros

G. I. Rozand

P. R. Scarito

W. D. Wesely

M. W. Williams

SUBJECT TECHNICAL MEMORANDUM

Handwritten:
"Bucsko File"
"Monomer-VC"

This memorandum has been prepared at the request of M. W. Williams for presentation to Tenneco Manufacturing Company in order to highlight problems connected with the variable quality of Tenneco MVC. A complete report on this problem for use within Tenneco Plastics Division will follow.

Original Signed By

J. C. Fisher

JCF/lac

Att.

NOV 27 1967

COLORITE 005899

TENNECO CHEMICALS, INC.

T M. W. Williams AT Piscataway DATE November 22, 1967
FROM J. C. Fisher AT Flemington COPY TO M. G. Caine
R. H. Marks
SUBJECT TECHNICAL MEMORANDUM - G. I. Rozand
Resin Stability as Related to
Vinyl Chloride Monomer Quality

Statement of Problem

A serious problem with the stability of Tenneco suspension resins became evident in June, 1967. This problem was, and still is, exhibited in both the poorer color of pressed plaques of unstabilized resin and in the early yellowing of stabilized resin formulations. These deficiencies are evident in both homopolymer and copolymer resins produced at both the Burlington and Flemington plants. They have resulted in the loss of substantial resin sales, numerous complaints from customers, and the need to substantially curtail the flexibility of our production scheduling.

It has now been conclusively demonstrated that these resin heat stability deficiencies are caused by the quality of the vinyl chloride monomer being received from Tenneco's Pasadena, Texas monomer plant.

Conclusions

1. The quality of Tenneco MVC has varied considerably over the past eight-month period.
2. The variations in resin quality are due primarily to variations in MVC quality. This variation is apparent with various resins made at both Flemington and Burlington whose formulations contain only one common raw material - the vinyl chloride monomer.
3. The use of MVC from Borden has yielded good quality resin at a time when Tenneco MVC gave poor quality resin.
4. The poor resin color resulting from variations in MVC quality has been the prime cause for difficulties experienced at the following accounts:

Globe Rubber, Armstrong, Congoleum-Nairn,
Ruberoid, Nixon-Baldwin, American Biltrite

Recommendations

1. A significant program must be immediately initiated between Tenneco Plastics and Tenneco's monomer-producing plant to identify and correct those MVC contaminants causing poor resin stability.
2. The quality of Borden's acetylene-based MVC has been evaluated but the quality of both ethylene- and acetylene-based MVC from other producers should be ascertained.
3. Significant quality control tests must be developed and instituted at Pasadena, Burlington and Flemington to insure our production of good quality resin.
4. The possible introduction of contaminants into Tenneco MVC during transit in the recently introduced 38,000 gallon tank cars must be ascertained.

Discussion

The variation in the color stability of both homopolymer and copolymer resins has followed the following pattern:

April 1967 - good stability
May--June 1967 - poor stability
July--Mid-August 1967 - good stability
Mid-August to present - poor stability

An example of this variation in color is shown in the attached Exhibit 1. This exhibit is a Xerox copy of a pressed plaque comprised of typical Tenneco 225-1 homopolymer resin produced at Flemington during the time periods listed above. This same pattern has been found with copolymer and homopolymer resin produced at Burlington during the same time periods.

The evaluation of Borden vinyl chloride monomer versus Tenneco MVC was made at the Burlington plant. Special piping was installed to allow charging of the monomer directly from the tank cars rather than routing, as normal, through the virgin monomer storage tanks. The Borden MVC has now been evaluated versus Tenneco MVC from tank car NATX-38034 in the polymerization of Tenneco 175 resin. A companion comparison of the same Borden MVC is being made against Tenneco MVC from tank car NATX-38037 in the polymerization of Tenneco 315 resin.

M. W. Williams

-3-

November 22, 1967

Using a newly-developed light absorbance test, a comparison of the color stability of Tenneco 175 resin made with the Borden versus Tenneco MVC has been made:

<u>Tenneco 175</u> <u>Lot No.</u>	<u>Monomer Source</u>	<u>Light</u> <u>Absorbance</u>
34582	Borden	0.45
34583	Tenneco (NATX-38034)	0.62

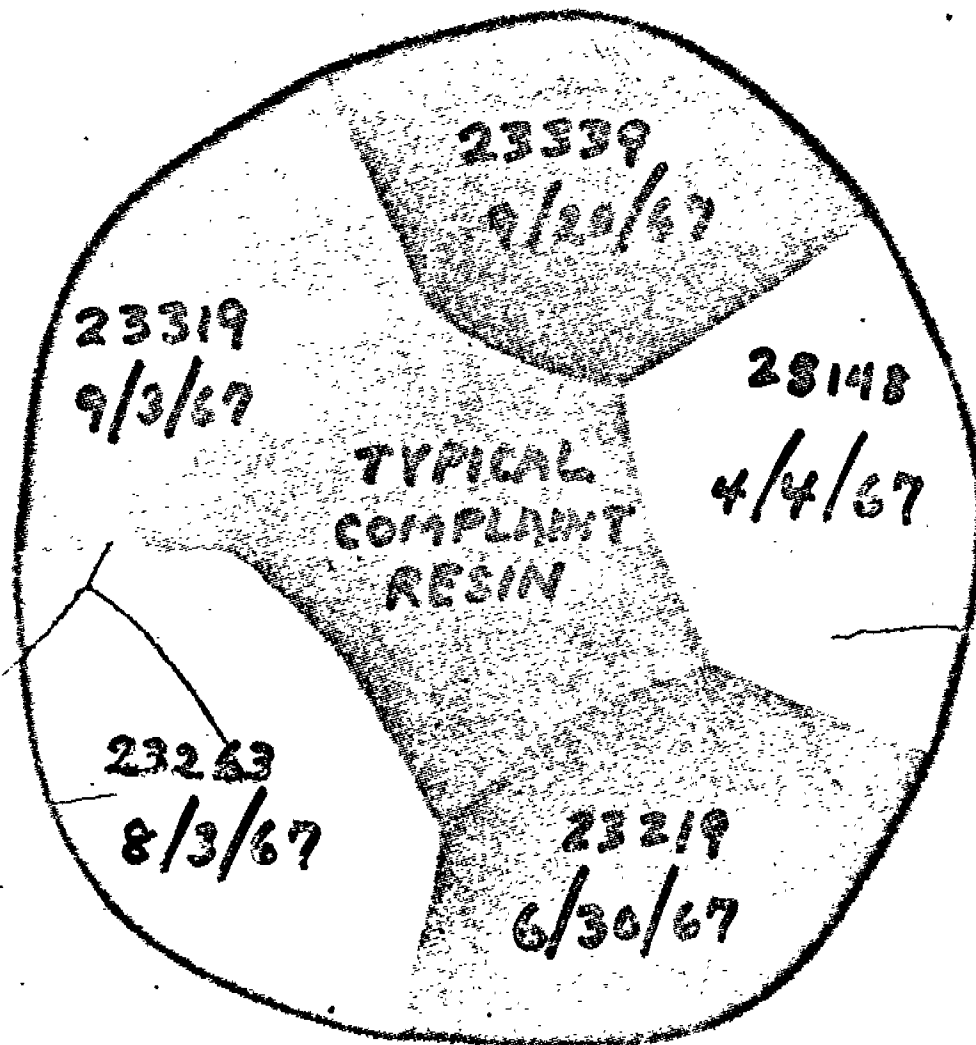
Samples of the Borden MVC and the Tenneco MVC (NATX-38037) are being forwarded to Paul Reed at Pasadena for a comparative analysis.

J. C. Fisher
J. C. Fisher

JCF:em

EXHIBIT 1

PRESSED PLAQUE COLOR
TENNECO 225-1



TENNECO CHEMICALS, INC.

Tenn co Plastics Division

Analytical Control Laboratory Request

Submitted by: GARY LEACH

Date Submitted: 2/28/69

Details of Request: Please run gas chromatographic analysis on the 3 MVC bombs. Please identify the impurities contained as well as the relative amounts. I feel it important to determine if mixing in the weigh tank is sufficient, to give representative sample of contents at the MVC charge pump. This will allow us to take ~~the~~ a minimum no. of daily samples ~~of the~~ while monitoring run quality.

Sample Identification:

Bomb 1

Virgin TENNECO MVC

Bomb 2

Recovered TENNECO MVC

Bomb 3

Mixed Virgin & Recovered MVC.

SAMPLES TAKEN AT COPOLYMER PLANT.

Analytical Results:

Date Completed

Completed by:

L-155 11/68

COLORITE 005904

F. F. Albanese

Flemington

February 17, 1969

G. W. Leach

Burlington

H. B. Carr

H. H. Duhamel

Monomer Quality Monitoring

This will bring you up to date on our plans for sampling monomer. In our recent phone conversation, we discussed setting up permanent sampling facilities and regular sampling to correlate with resin quality for the next month for the homo-polymer and copolymer plants. Since then, I talked with Herb Carr and Fred Karsler concerning their ability to test the samples. They can handle four daily samples in about two weeks. Standardization of the gas chromatograph is the hold up. A "standard sample" must be procured and programmed so that reliable comparisons can be made. Fred is keeping me posted as to the progress so that sampling can begin as soon as possible.

I have written a maintenance order to install permanent sampling stations at the Cuno filters of the virgin and recovered MVC inlet lines in No. 2 and No. 3 plants. This should be completed by Tuesday. Then, the utility operators can take daily samples without problems.

In the meantime, we will be sampling to determine the best sampling spot yet yield the least number of samples per day. I will forward the results of the test to you.

In different conversations with people around Burlington, I have become aware of some problems that occur in the plant which happen one day and not another, or in one reactor and not another. In other words, although nothing has been intentionally changed, large differences in reaction kinetics or resin properties will occur. One possible answer is stratification of impurities in the MVC storage tanks; no one has proven this. However, there is no mixing or recycle equipment on the storage tanks. Also, the concentration of impurities is very low and concentration gradients are weak, such that internal mixing is extremely slow. As soon as Quality Control can analyze the samples, we are going to sample the storage tanks for stratification by means of using the liquid level dip tube. If drastic stratification is indicated from the tests, perhaps sufficient justification can be generated to install a recirculation unit on each of the storage tanks.

This would be a tremendous aid to me in my memor investigation because a sample from a well mixed tank is randomly representative.

GWL/rjl

