

Monsanto

FROM
(NAME-LOCATION-PHONE) J. H. Orem - Galt Labs - 1730

DATE : August 25, 1978

cc. M. W. Farrar - R2E
A. W. Morgan

SUBJECT : POLYSULFIDE SEALANTS FOR INSULATED
GLASS WINDOWS

REFERENCE : My memo June 22, 1978
AWM memo August 11, 1978

TO : N. W. Touchette

Recommendation:

Commit one application research man-year in 1979, plus approximately 15% of the group leader's time, to the plasticization of polysulfide sealants for insulated glass. Additionally, there will be a requirement for synthesis work.

Summary:

Formulation technology, especially in the use of fillers and with the type of catalyst, has changed. New, more severe testing techniques have been developed. Progress in these sealants has resulted in our plasticizers, Santicizers 278 and 261, not participating in a significant portion of the growth. We are threatened with further losses as new formulations are developed for current and evolving polysulfide sealants.

Worldwide sales of Santicizer 278 and Santicizer 261 for this application in '77 yielded a gross profit of \$1,000,000 on sales of 3.9M pounds. Through June 1978, gross profit has reached \$625,000; sales climbed to 2.3M pounds.

Application research has developed a program to defend our existing business. Ultimately, the program will strive to provide technology to position our plasticizers/modifiers in new insulated glass sealants.

Details:

The swing from lead dioxide to manganese dioxide catalysts, and the use of high levels of coated calcium carbonate fillers, has made it possible to use chlorinated paraffins in polysulfide sealants for insulated glass windows. Today's chlorinated paraffins are cleaner than those produced in the early 1970's. They do not cause a fog problem. Their price is 26¢ to 30¢ per pound.

Manufacturers of these sealants, the glazers producing insulated windows, and PPG have become very critical of their testing for adhesion and moisture vapor transmission - MVT. We have been advised by Thiokol Chemical and two sealant manufacturers that chlorinated paraffin plasticized sealants are superior to those using benzyl phthalates on adhesion and MVT resistance. This has been confirmed in our testing at the Galt Laboratory.

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Screening and scouting work commenced in early 1978 at Galt used this formulation:

Polysulfide (LP-2 or LP-32)	100
Plasticizer	30
Filler (Hakuenqua)	30
Catalyst (50% MnO ₂)	15

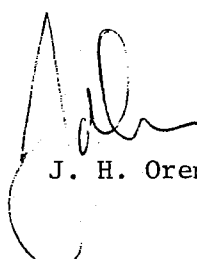
Our most recent discussions with sealant producers has resulted in advice that we revise and use a formulation: 1/3 LP-2 or LP-32, 1/3 plasticizer, 1/3 filler.

Adhesion promoters and addition of lower cost fillers such as Duramite need to be studied. Hakuenqua is a coated filler that is imported from Japan and costs about 30¢ per pound.

There is an exudation problem associated with these sealants - refer to Work Request 78-49 for details. Our hypothesis of the chemistry involved was confirmed by Products Research and Chemicals Corp. (PRC) during a recent discussion.

We have identified the problems, understand the chemistry, have developed several possible routes to solutions and established a dialogue with the rubber producer and leading sealant manufacturers. Now, we need to commit to funding for 1979.

JHO/gls



J. H. Orem