

ENV. SCIENCE

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

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TO File AT Saddle Brook DATE July 2, 1976
FROM P. A. Lobo AT Saddle Brook COPY TO Distribution
SUBJECT PVC - VCM Technology
B. F. Goodrich

On June 30, 1976, I met with Mr. Lee M. Puckett, Director, Licensing and Patent Activities, International Department at Goodrich's Cleveland office. Mr. Puckett's department is responsible for licensing Goodrich's chemical technology world-wide. Mr. Arthur Hastings, with whom we have dealt with over the past few years, reports to Mr. Puckett.

The following subjects were discussed:

Slurry Stripping - Goodrich has licensed their continuous suspension resin slurry stripping technology to six firms, two in Europe, three in the U. S. and one in Japan. They have been able generally to strip homopolymer slurries to below 10 ppm VCM content, and the higher molecular weight resins to 1 ppm, or less, without product deterioration. In the low molecular weight range of products, results depend on particle porosity, but 20 ppm is apparently as low as they can practically achieve.

Goodrich believes they have an extremely good technique and that their license fee of \$150M for licensee's total U.S.A. installed capacity is very reasonable. Art Hastings had reported that the results obtained on the Tenneco slurries from Pasadena, which they had stripped in the pilot plant, were quite good; I said I was unfamiliar with the results. As to Tenneco's next step, I said our decision on stripping would be based on the final agreement reached with TACB which at this time probably would not require severe stripping. If the latter was required, then we would have to decide between the Goodrich and Shin-Etsu continuous system. He was unfamiliar with this recent development of Shin-Etsu, since at his last meeting with them in February, Shin-Etsu was still talking about stripping the centrifuge cake. I said that I had not seen enough results from either system to tell which was the best.

Lee Puckett will send me a draft of a license agreement covering the stripping for our review.

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Goodrich has done a substantial amount of work on the development of a stripping procedure for their dispersion latex, but to this point really don't have anything to talk about. They contacted Diamond, after their press release covering a new stripping process for dispersion resins, and found that all Diamond was doing was pumping the latex around into an open vessel. Puckett felt that the technical and licensing people at Diamond were somewhat embarrassed by the over zealous efforts of their advertising department since the "technology" leaves much to be desired. I told Puckett we had developed several feasible approaches to stripping our dispersion resin, but still felt we could come up with a better system, and were continuing to work in this direction.

Clean-Reaction Technology - Mr. Puckett said that at first there was tremendous interest in their stripping technology, in both the U. S. and Europe, but now this has died down with interest accelerating in their clean reactor technology. The latter involves coating the reactor walls with a chemical to avoid polymer buildup, similar to the Shin-Etsu technology. Our manufacturing and engineering people have seen a demonstration of it by Goodrich and are interested in entering into a trial agreement with Goodrich.

Goodrich has found the system excellent for homopolymer and six companies have entered into a trial agreement. Puckett claims they expect to sign up their first licensee, probably Diamond, within the next few weeks. Current practice at Louisville is to clean their new reactors, they have six, once every 125-150 batches when they use their costing system. They use their HRC, the programmed high pressure water cleaning device, to clean the reactors, when this is necessary, essentially obviating any entry into the reactors. Results with copolymer were only fair with cleaning now needed once every four batches for Goodrich's formulation versus after each batch without use of the coating technique. Puckett did not know of any benefits that could be expected with the coating system in dispersion resin manufacture.

I reviewed the draft agreements covering license of this technology citing the following problems from Tenneco's standpoint:

- (1) Term of secrecy was too long; Goodrich will reduce from 15 years.

- (2) No provision for improvement information - Goodrich is concerned with anti-trust aspects of sharing information between big PVC producers in the U. S., he thought one year would be maximum possible.
- (3) No provision for license of sealing compound alone - Goodrich would license this "know-how" for a one time payment of \$40M. He said patent application covering this compound had been filed.
- (4) Patentability of coating agent is that it probably was close to that of Shin-Etsu - Puckett agreed action may be similar, but since chemical species was "different" he felt they would obtain a patent. He did not understand why Shin-Etsu's coating agent would not work on old reactors.
- (5) High license fee (\$500M) when Tenneco wished to use mostly on copolymer and dispersion resins where Goodrich did not have significant results; license draft had no provision to avoid total payment of \$500M - I suggested small down payment with running royalty based on usage with lower rates for copolymer and dispersion than homopolymer which would permit us to stop payment if we stopped production (switch of homopolymer resins to Pasadena). Puckett said he thought he could provide us such terms within a few days and still not conflict with his other licensing proposals.
- (6) Toxicity of coating agent - Puckett will supply us toxicity report.

Miscellaneous - Goodrich has licensed their VCM technology extensively, most recently in Hungary and Russia. They had looked at Carbide's dispersion resin technology briefly and dropped it prior to plant visit. Puckett confirmed that Goodrich licensed Shin-Etsu fluid bed dryers in 1971 and has three or four in service. Mr. Puckett had heard that Rhone-Poulenc has a "good" dispersion process. (This

last remark came up when we were discussing the stability of the latex as an important factor in current dispersion resin technologies.)



P. A. Lobo

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