B.F.GOODRICH CHEMICAL COMPANY MEETING REPORT

SUBJECT	DATE
Water based coating for beer and beverage can interiors	October 25, 1973

OUTSIDE ORGANIZATION INVOLVED
MBF Chemical - Southfield, Michigan

MEETING PLACE	MEETING DATE
Avon Lake Technical Center	October 23, 1973

BFG PARTICIPANTS	OTHER PARTICIPANTS (NO DISTRIBUTION)	ADDITIONAL COPIES TO C.T.F
BH Leeson Dave Weaver	Jack Allman Andy Lindert	G.L. Wheelock E.J. Sehm J.F. Stuesse-W.A. Schmeing J.R. Robatin W.S. Robertson

RESULTS AND COMMITMENTS:

Dr. John Gardon has replaced Gene Garek as Director of Research. Dr. Gardon was transferred from Research facilities in Rahway, N.J. He was once with Rohm & Haas. He has several papers published on emulsion polymerization based on research he did at Rohm & Haas. He is an expert in polymerization, polymer characterization and coating formulations. He was one of the lecturers in the 1973 University of Utah Coatings Conference which I attended.

Allman and Lindert were here to review the data they have collected on latex samples we have submitted to them over the last two years. They are disappointed that we have been unable to provide them with a water reducible vinyl polymer that can replace Carbide's solution resin. They have looked at 32 coatings based on 12 latex samples we sent for their evaluation. Only 9[illegible]-10-1 (or 31) has shown promise. However, they have not been able to get around the short pot life nor the problem of turbidity development in beer.

In addition to the 12 samples mentioned above which we sent for initial testing by Allman, et al., we have sent 470[illegible] and a carboxylated vinyl chloride/vinyl acetate copolymer. These blushed in the beer pasteurization test. We sent a high carboxyl vinyl-acrylic containing 10 parts of butyl [illegible] convert to a "water reducible" polymer. This, [illegible] resin, also blushed in the pasteurization [illegible] on the same high carboxyl vinyl-acrylic, were [illegible] their evaluation. Both compounds produce non-[illegible], but blushed in the pasteurization test at MBF. [illegible] looked good to us without added thermosets [illegible], a code number we used for 26000138, and [illegible], a code number we used for 267[illegible]6, had to be compounded before some encouraging results were obtained. When a melamine type thermoset and a catalyst were added to 26000138, the baked film exhibited good adhesion, good blush resistance and good barrier properties. When a high boiling ester was added to this compound, the pot life was good. We have an outstanding order for 1 gallon each of 26000138 and 267[illegible]6, chemically stripped.

Allman explained that 80% of American Can business in this area is based on their patented "Diraseam" cement bonded can bodies. This seam can stand a coating cure of 4' at 310 ± 10°F. The seam lets go at higher temperatures. All of our lab data are based on 370°F cures. This accounts for the discrepant results obtained between the two labs. This is the first time we realized

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that they have a serious cure temperature limitation.

We described our approach to the development of a suitable water based coating for beer and beverage cans. Our goals:

- self coalescence
- self curing
- self thickening
- water reducible

Allman insists that a water reducible vinyl with little, or no extractable material is what he expects us to develop. He believes we have the technology to do it. He seems rather impatient and annoyed that after two years in contact with us on this problem we have not come up with the solution. He says that four competitors are ahead of M&T in submitting water based coatings to American Can. All four are making their own polymers. I can only say that I believe our approach will lead to a satisfactory solution to this problem. We are working in a new area and the development will take time.

We have completed the polymerizations and have done the coating tests that we planned for the first phase of our work. Three of the experimentals have exhibited the coalescence and self curing qualities needed. Others have looked good when compounded with thermosets. Curing has been at 370°F, too high to be useful for M&T. We will repeat the tests at 310°F. If any show promise at the lower cure temperature, we will submit to M&T for their evaluation. In addition, through the use of solvents and ammonia, we will determine whether or not any of our experimentals exhibit the desired water reducible characteristic.

We suggested that Carbocet 51[redacted] when compounded with an epoxy resin might have the desired properties. Allman was negative on this idea because of the high cure temperature needed and because of price. He would be willing to look at any variation we might make that would form a blush resistant film when cured at 310°F, however.

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Dave Weaver

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