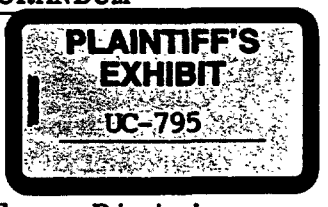
WV-0011 #5

TRIP REPORT MEMORANDUM



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Date: December 28, 1964

Author: C. E. Metten

Subject: Visit to Union Carbide Nuclear Division Research Center to Discuss Asbestos Flooring Felts

SUMMARY This visit was made to the Union Carbide Nuclear Division Research Center, Tuxedo, N. Y. to discuss flooring felts made from asbestos with latex binders. Discussions were held with H. F. Reichard, N. J. Setter, G. S. Jordan, Samuel T. Martin, Blair L. Ingalls, and Gordon C. Dickson. The Nuclear Division is trying to develop a flooring felt which could be made by extruding and calendering rather than by papermaking techniques such as that used by Armstrong and Congoleum Nairn. Their present formulation containing 20 per cent Hycar 1572 latex (believed to be 55/45 butadiene/acrylonitrile) needs greater flexibility. UCAR 110 will be evaluated at several concentrations in an effort to improve flexibility. Standard grade and high purity asbestos from the Nuclear Division will be evaluated in our laboratory as blends with longer fiber asbestos in the hope of increasing stiffness of felt for the Congoleum Nairn application.

DISCUSSION The Nuclear Division's short fiber asbestos is unsuitable for making flooring felt by papermaking techniques. They are currently studying the possibility of making this type material by extruding a putty-like mix of asbestos, latex and water and calendering the extruded sheet. A formulation containing 20% Hycar 1572 has good handling properties but is far too stiff and brittle for this application. A neoprene latex was tried but severe agglomeration or "clotting" during mixing prevented proper extrusion of the mix. Mr. G. S. Jordon was shown data from this laboratory on physical properties of felts made with longer fiber asbestos, and several latexes, by a papermaking process. They agreed to try UCAR 110 which could be used in greater amounts to give better flexibility at equal or lower cost. The more flexible 50/50 styrene/butadiene latex should also be tried in this application when it is available in sufficient quantities. It was also suggested that they add small amounts of a wax to their formulation to improve flexibility and water resistance.

The overall properties of their present system have not been determined, and all the advantages or shortcomings are not known. However, Rubberoid has shown an interest in this approach and they are to meet with them again in January for further discussions.

Samples of their standard and high purity grades of asbestos are being sent to this laboratory where they will be tried as blends with longer fiber asbestos in the Congoleum Nairn flooring felt application. It is hoped that small amounts of this material will increase stiffness and reduce elongation of the felt.

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A brief discussion with Mr. Ingalls and Mr. Dickson revealed that their high purity asbestos is an effective retention aid with cellulose and improves wet strength and tear resistance of the paper. Data from these studies have been given to a member of the Paper group.

EXPERIMENTAL At present, the formulation being used at the Nuclear Division laboratory is as follows:

Standard Grade Fiber JT-100	70
Cape Blue Crocidolite Asbestos	5
Hycar 1572 latex	20
Methocel	5

A total charge of 2500 grams is made in a Muller mixer by first mixing the asbestos and Methocel for 15 minutes, adding the latex and mixing an additional 15 minutes. Enough water is added to give a total of about 50 parts per hundred of asbestos. The mix then has a putty-like consistency. This is ram extruded through a 1/4 by 3 inch die at about 600 psi. The 1/4 inch thick sheet is passed through the calender between teflon sheets and thickness is reduced to about 1/32 inches. The material is then oven dried for 30 to 60 minutes at 75°C. Such a sheet has a tensile strength of 1400 to 2000 psi.

C. E. Matter

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WV-0011 #6

~~W N Stoops~~ Dr Brotherton would you like to see this rept?

any interest in this report

F Johnston

No thanks

WNS

Yes thanks Tom B

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UNION CARBIDE CORPORATION

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Monthly Summary Report
Asbestos Research & Development
January, 1967

TO: (See Attached Distribution List)

FROM: R. G. Woolery

DATE: February 9, 1967

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Pulp and Paper Technical Services

Four Asbestos "T" mill trials were conducted by Technical Service personnel. Two, Allied Paper Corp. and Champion Paper Co., proved to be inconclusive. The other two trials, at P.H. Glatfelter and Howard Paper Co., were successful in reducing furnish cost without loss of specification. Glatfelter had evaluated savings of over $2.00 per ton of paper, and Howard reported savings of over $3.00 per ton of paper produced.

Sample analyses on four unattended (by Technical Service) trials were completed. Insufficient data were available for evaluation in any of these instances. Two were from U. S. customers and two were from trials conducted in England.

On January 19, 1967, a paper entitled "The Role of Chrysotile Asbestos in Controlling Pitch" was presented at the Swedish Pulp and Paper Engineers' Conference in Stockholm, Sweden. From 25-30 engineers were present which represented about 20 paper companies in Scandinavia. Judging from the audience response, it would appear that asbestos will get wide attention as a result of this presentation.

Assistance to Sales was provided in the form of calls to paper companies. In Europe, calls were made with Dr. T. J. Hall and Mr. P. Cheston in England, Sweden, and Germany. International Paper Company, Tonawanda, New York, was also visited to discuss the use of Asbestos "T" in their product line.

The Pulp and Paper Orientation Program held at the South Charleston Technical Center January 10-12, was attended by members

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of the Asbestos Technical Service Group. The seminar was well organized and very informative for those who attended.

The final plans and arrangements are under way for the Annual TAPPI Convention and booth display.

G. L. Dickson

Plastic Applications

Progress continues to be made in reinforced vinyl products. Polyplastics United has confirmed the FAA acceptability of a rigid vinyl (VYNA) containing 20 phr RG-144 asbestos for aircraft applications. Polyplastics estimates their requirements at 50,000 lb. per month of the vinyl as a replacement for competitive ABS previously used.

Up to 20 phr RG-144 can be added to a DOP plasticized PVC (QYTQ) with increasing toughness, no loss in optical clarity, and only slight color development. Addition of 15 phr RG-144 in a PVC pipe compound showed improved tensile, modulus, and Izod impact.

Laboratory efforts have continued in an effort to establish methods for evaluating the stability of filled polypropylene samples. Thermal gravimetric analysis technique shows the most promise; however, verification of the initial data is required.

R. E. Byrne

Asbestos Fiber Research

Adsorption of the calcium soap of linoleic acid from an aqueous suspension by High Purity Asbestos was determined this interim. Essentially, all the soap was adsorbed up to asbestos-to-soap ratios of 13:1. Beyond this point, only a portion of the soap was adsorbed. The percentage adsorbed of the excess soap was found to be a function of the pH. Lower pH's corresponding to higher surface charge on the asbestos were found to be the most effective. These studies are part of a program designed to study the effect of asbestos on pitch control in the paper and pulp mills.

The optimum terminal pH for the silica recovery in the production of RG-200 product was found to be about pH 8.0 (81% silica recovery). The material prepared at pH 8 also thickened polyester resins better than material made at other pH values. The effect of temperature was also investigated. No improvement was observed in the RG-200 product prepared at temperatures up to 60°C.

The isoelectric points of antimony oxide and crocidolite were determined as pH 3-4 and pH 3, respectively. Above these pH values, both minerals were electronegatively charged.

The effects of sodium carboxy methyl cellulose on the rheological properties of asbestos slurries were examined. The apparent viscosity of a 0.5% asbestos suspension is decreased by about 50% when 2% by weight of asbestos of CMC is added. The viscosity value remained fairly constant as the CMC content is further increased up to 7.5%. The filtration rate is not significantly reduced until 10% CMC based on the asbestos is added where an appreciable effect is observed. Indications are that the CMC is strongly adsorbed on the asbestos surface causing deflocculation. Above 1.5% CMC by weight of asbestos the surface charge on the fiber becomes negative. Filtering, drying, and redispersion of the CMC-treated asbestos does not alter the negative charge.

Asbestos Development

Four successful pilot plant runs were made to produce RG-200 product by a simplified technique. The procedure consisted of repulping a 2% High Purity Asbestos slurry at pH 4.5 (with acetic acid) in the Fitzpatrick impact mill with a 0.006-inch screen. Sodium silicate was added to pH 8.0 in an agitated tank. The product was pressure filtered, extruded, dried, and opened. All runs produced viscosities in excess of 30,000 cps (2% RG-244 in Paraplex-styrene mixture). Five samples were dry opened in the Mikropulverizer at various energy imputs with no significant effect on its properties. Quality control methods for the various points in the RG-244 production circuit are also being investigated. The problems relating to extruding and drying the RG-200 product have been fully resolved.

Efforts are being continued to satisfy Longview Fiber Company's desire to replace our opened product with a readily repulpable cracked pellet. Handsheet samples from their laboratory have been received as a guide for product evaluation.

Technical Service was supplied to Oxford Paper Co. to assist in their efforts to treat process water. Laboratory studies employing a rapid sand filtration setup indicated that a mixture of 25 ppm asbestos and 25 ppm alum was a reasonable starting point for a plant trial. Samples of Oxford water so-treated were measured as having a light transmittance of 99.5%. A standard of distilled water as 100% light transmittance was the basis of evaluation.

R. G. Woolery

RGW/bsn

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