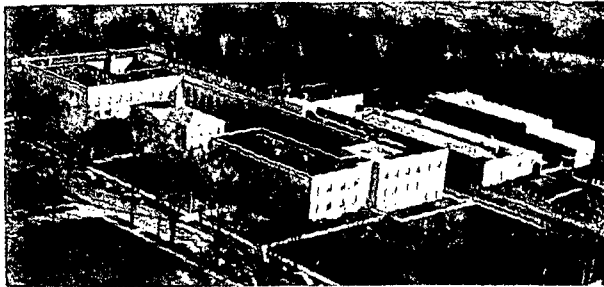


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THE INSTITUTE OF PAPER CHEMISTRY, APPLETON, WISCONSIN

Report Thirteen

Project 2256

Monthly Progress Report

to

U. S. ARMY CHEMICAL CENTER PROCUREMENT AGENCY

Report Period: September 29, 1961 to October 28, 1961

November 25, 1961

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

DEVELOPMENT OF AN IMPROVED DIFFUSION BOARD MATERIAL

Project 2256

Contract No. DA18-108-405-CML-941

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Report Thirteen

Monthly Progress Report

to

U. S. ARMY CHEMICAL CENTER PROCUREMENT AGENCY

Report Period: September 29, 1961 to October 28, 1961

November 25, 1961

Distribution:

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TABLE OF CONTENTS

	Page
SUMMARY	1
STATUS OF PROJECT	1
PREPARATION OF BOARDS FOR EVALUATION OF CK STABILITY	2
Boards Formed from Deresinated Pulp	2
Boards Formed from Wood Conversion Company Pilot Run Pulp With Additions of Copper Oxide	3

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

DEVELOPMENT OF AN IMPROVED DIFFUSION BOARD MATERIAL

SUMMARY

Alternate proposals for extension of the program have been submitted, with the choice based on relative importance of stability under tropical conditions of protection against cyanogen chloride. Experimental work has been suspended until a decision on future course is reached.

STATUS OF PROJECT

The purpose of this program is to impart, to a board previously developed, added features of wet strength, water repellency, and mildew resistance. The original contract had a termination date of October 4, 1961 and called for a laboratory process study with a pilot run and a commercial run on promising formulations. The commercial run has not been made because laboratory and pilot work showed poor stability of CK life when the board is aged at tropical conditions. Since this poor stability seems to be characteristic of the charcoal and also of the untreated boards, there is some doubt that good stability of CK life under tropical conditions can ever be obtained.

Two alternate proposals for extension of the project have been submitted. One covers an immediate production run if it is decided that good tropical stability of CK life is not sufficiently important to delay further development of the other aspects of the board program. The other proposal covers further study of possibilities for improving the stability of CK life under tropical conditions, if it is decided that stability under these conditions is essential; this further investigation would include a review of all available information on the mechanism of CK protection and on the stability of this protective

mechanism, a review of the influence of pulp, sizing, and other variables on this mechanism, and then a determination of the conditions required for obtaining optimum stability.

The termination date of the original contract has been extended without additional funds, thereby permitting a delay of the termination report until a decision is reached on possible continuation. A few additional boards have been prepared to test several ideas for possible improvement in CK stability; these have been submitted to the contract project officer for testing along with those previously described. Other experimental work has been suspended pending a decision on the future procedure.

PREPARATION OF BOARDS FOR EVALUATION OF CK STABILITY

BOARDS FORMED FROM DERESINATED PULP

Previous work on pulps carried out at The Institute of Paper Chemistry has shown that proper treatment with a surfactant manufactured under the brand name of Igepal CO-630 will remove 90-plus per cent of the resin in a pulp. It was thought that a comparison of the CK life activities of aged and unaged boards formed from pulp containing no resin and pulp from which the resin had not been extracted would be of interest, particularly for any future investigation of CK protection.


A small quantity of Wood Conversion Company pilot run pulp was deresinated by agitating an alkaline (pH~10) 4% slurry of the pulp containing 1.0% Igepal CO-630 (based on oven-dry fiber) for one hour at 90-97°C. This pulp was then washed for one hour with hot water to remove the surfactant and dewatered.

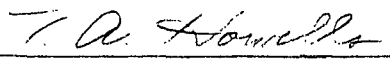
Two boards formed from this pulp, containing no additions other than charcoal, were dried for 3 hr. at 105°C., sealed in polyethylene bags and sent to the Army Chemical Center for aging and testing.

BOARDS FORMED FROM WOOD CONVERSION COMPANY PILOT RUN PULP WITH ADDITIONS
OF COPPER OXIDE

Comments in recently declassified reports received from the Office of Scientific Research and Development suggested the possibility that the presence of excess copper oxide might give some protection to the hexavalent chromium, which seems to be one of the active materials necessary for CK protection. Two boards were formed from Wood Conversion Company pilot run pulp with 2% additions of copper oxide (based on oven-dry fiber) and two boards were formed from the same pulp with 10% additions of copper oxide. These boards were dried for three hr. at 105°C., sealed in polyethylene bags and shipped to the Army Chemical Center for testing. At the Army Chemical Center they are to be tested for CK life unaged and after aging in tropical conditions.

THE INSTITUTE OF PAPER CHEMISTRY


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