

Problem 51-457-6
September 27, 1951

John-Manville Research Center
Manville, New Jersey

EXPERIMENTAL MILLBOARD-TYPE SHEET PACKING
BONDED WITH GR-S DISPERSION FOR GENERAL ELECTRIC COMPANY;
MANUFACTURING DETAILS AND TEST DATA

PLAINTIFF'S
EXHIBIT
CSR-16

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-SUMMARY-

Experimental work was conducted at the Manville plant to develop a millboard-type sheet packing bonded with GR-S and having the same degree of softness as Style 83-S sheet packing.

One experimental batch was produced containing Syntex L-850 (GR-S dispersion) as the binder. During the course of this run, no manufacturing difficulties were encountered during mixing or running of the material on the millboard machine. The stock built up well with good fiber distribution, and no tendency to stick to the forming roll was observed.

The results of this experimental run indicate that the manufacture of the subject sheet is entirely practical.

Samples of the above experimental sheet in thicknesses of 1/16 and 1/8 in. were tested and the results tabulated in the body of this report. The following is a summarization of the test results on the experimental millboard sheet packing bonded with GR-S dispersion:

1. Moderate tensile strength, equivalent to standard Style 83-S.
2. Relatively soft sheet packing, equivalent to standard Style 83-S.
3. Good aging qualities.
4. Good resistance to oil and No. 1 Reference fuel.

The entire PE run, consisting of 47 sheets, 60 x 52 x 1/8 in. thick, and 88 sheets, 60 x 52 x 1/16 in. thick, was shipped by Cooper Jarrett Trucking on August 11, 1951, to the Waukegan plant. This material is to be used for orders placed by the General Electric Company.

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This report consists of Summary (1), Tentative Manufacturing Procedure (2), and Test Data (3).

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-TENTATIVE MANUFACTURING PROCEDURE-

FORMULA

	<u>Wet Batch Formula</u>	<u>Dry Batch Formula</u>	<u>Per Cent Composition</u>
Syntex L-850*	944 lb	374 lb	27.1
Accelerator	—	4	0.3
Blue asbestos fiber	1000	1000	72.6
	1944 lb	1378 lb	100.0

*Solids content: 35 to 42 per cent.

SOURCES OF SUPPLY FOR DISPERSIONS AND FIBER

Syntex L-850 purchased from Flintkote Company, Morristown, New Jersey.
Accelerator purchased from Flintkote Company, Morristown, New Jersey.
Blue asbestos fiber purchased from The Asbestos Corporation of America,
Garwood, New Jersey.

MIXING PROCEDURE

- Fiber added to beater partially filled with water.
- Roll lowered to medium tight; stock circulated for 1/2 hr.
- Raise roll and circulate stock.
- Add accelerator and mix 10 min.
- Add L-850 dispersion through screen to remove lumps.
- Entire batch circulated 1/2 hr.
- Approximately 200 g alum dissolved in water and added to beater.
- Drop stock into stock chest and dilute with water to proper consistency.
- Run on millboard machine to thickness to produce required size when calendared dry in B building.

APPROXIMATE THICKNESS OF WET SHEETS

<u>Nominal Thickness of Finished Sheets</u>	<u>Desired Thickness of Wet Sheets</u>	<u>Thickness Range of Wet Sheets</u>
1/16 in.	0.095	0.090-0.100
1/8 in.	0.200	0.195-0.205

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TEMPERATURE MANUFACTURING PROCEDURE

DRYING OF SHEETS

The wet sheets are stacked approximately three high on a tray and dried at a temperature not lower than 130F nor higher than 180F, until dry. Dried sheets are then trimmed to size and calendered in B building to the required thickness by not less than three passes through the calender.

TECHNICAL DATA

Finished sheets	1079 lb	78.3%
Trim scrap	95 lb	6.9%
White water loss	<u>204 lb</u>	<u>14.8%</u>
	1378 lb	100.0%

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-TEST DATA-

MATERIALS TESTED

Experimental 83-S type sheet packing, 1/16 in. and 1/8 in. thick, bonded with Syntex L-850 (GR-S dispersion).

RESULTS OF TESTS:

Normal Tensile Strength in Psi

Conditioned 1 hr at 212F

1/16-in. Sample

1/8-in. Sample

Longitudinal

1590

1422

Transverse

664

654

Average

1127

1038

Tensile Strength in Psi, Oven

Aging 7 Days at 158F

Longitudinal

1699

1537

Transverse

755

767

Average

1227

1152

Oil Aging 5 Hr in ASTM No. 1

Oil at 300F

Per cent of original ten-

sile strength retained

60.1

64.7

Per cent increase in

thickness

9.5

7.0

Swel Test, 5 Hr in 20-10 wt

Moos Temperature

Temperature Creep

3.6

3.7

Per cent swell

nil

nil

Pusey Air-Jetted Pistometer

Hardness, 1/4-in. Ball

0.52 mm

0.67 mm

Weight per Square Yard

2.8 lb

5.15 lb