THE DISCOVERY COMPANY

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PLAINTIFF'S EXHIBIT UC-815

CALIDRIA "HIGH PURITY" ASBESTOS FOR POROSITY CONTROL, PINHOLE REDUCTION, AND IMPROVEMENT IN TWO-SIDEDNESS

Union Carbide's CALIDRIA "High Purity" Asbestos is a unique mineral fiber which has been fully opened so that it consists essentially of pure individual fibrils. It differs from conventional chrysotile because of the unusual morphology of the massive California deposit from which it is mined, and the exclusive hydraulic process by which it is refined. Because of its unusual purity, high concentration of liberated fibers, and low iron content, it can be used in most papermaking systems. Its cationic charge and fibrous geometry provide unusually high retention in a paper web, higher than that of any other mineral filler or pigment. Also, CALIDRIA chrysotile fibers are more uniformly distributed throughout the sheet.

The above properties can result in more uniform filling of the paper web, reduction in porosity and pinholes, and an improvement of two-sided effects, particularly in lightweight sheets where pinholes and low filler retention are frequently encountered.

Porosity and Pinhole Reduction

The dramatic effect of asbestos on porosity is shown in Figure 1. From the plot it can be seen that relatively small additions (1-2%) to the handsheet furnish caused a sharp reduction in porosity (Gurley Densometer).

In commercial practice, paper mills using CALIDRIA "High Purity" Asbestos have eliminated troublesome pinholes in the sheet with asbestos dosages as low as 1 to 1 1/2% (20-30 pounds per ton of pulp).

Reducing Two-Sidedness

Two-sided differences in sheet properties, such as smoothness and printability, are frequently caused by low and/or uneven filler retention. The result is a relatively low concentration of mineral filler on the wire side of the sheet.

The high retention properties of CALIDRIA "High Purity" Asbestos improve the distribution of fillers in the sheet, since much more filler is retained in the wire side. This effect is illustrated in Figure 2, a plot of filler distribution from Beloit Sheet Splitter analyses of a commercial magazine sheet. The filler ratio from top to bottom of the sheet (felt side to wire side) was improved from about 4/1 to about 2/1 by CALIDRIA "High Purity" Asbestos.

The reduction of two-sided effects by CALIDRIA "High Purity" fiber on 47-pound mimeograph paper is shown by data in Table 1. Smoothness, printability and ink transfer were improved by CALIDRIA Asbestos, particularly on the wire side. Also, opacity was increased 2 to 4 points. These tests were run by the Research Institute of the American Newspaper Publishers Association on commercial paper produced in a carefully monitored mill trial.

CALIDRIA ASBESTOS - HIGH PURITY
TYPICAL PHYSICAL CHARACTERISTICS

Specific Gravity	2.45
Moisture Content, % by weight	2
Brightness, % G.E.	74-76
Surface Area, sq. meters per gram	50-70
Particle Shape	Fibrous
Fiber Diameter, microns	0.025
Aspect Ratio, average L/D	200:1
Nature of Surface Charge	Electropositive (cationic)
pH in Water (2% slurry)	9.5
Refractive Index, n_d 25°C	1.54-1.56

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TABLE I

PRINTING EVALUATION DATA*

MIMEOGRAPH PAPER (Uncoated)

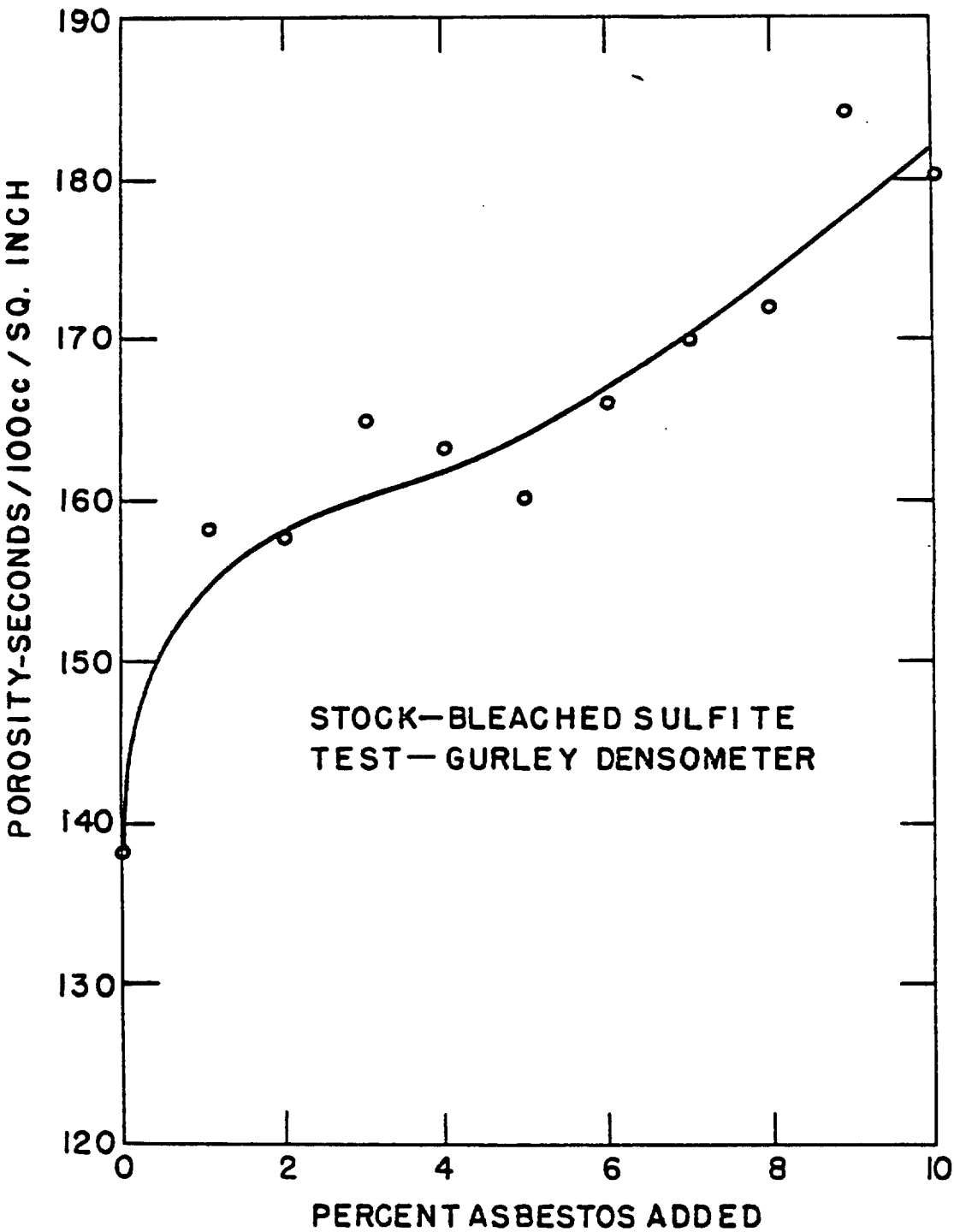
(Paper Conditioned at 72°F and 45% R. H.)

	Control Sample (No Asbestos)	Samples Containing CALIDRIA Asbestos @ 2%	3%	% Improvement
Basis Weight (lb./ream)	47	47	47	-
Opacity (per cent)	87.32	91.2	89.56	Higher, 2-4 points
Smoothness (felt side)	296	257	295	Inconclusive
cc air/min. (wire side)	386	263	322	Smoother
Printing Hardness (per cent)				
(Felt Side)	56.32	56.74	53.46	-
(Wire Side)	53.06	52.86	56.42	-
Ink Transfer (per cent)				
(Felt Side)	33.90	39.60	37.48	9-11
(Wire Side)	26.28	31.28	30.00	14-19
Printability (per cent)				
(Felt Side)	55.50	56.92	57.26	3
(Wire Side)	47.70	53.94	53.94	13

*The average value shown for each characteristic evaluated represents 25 tests on a minimum of ten sheets for trial or control condition. Tests were run by the Research Institute of the American Newspaper Publishers association.

FIGURE 1

EFFECT OF ASBESTOS CONTENT ON HANDSHEET POROSITY.



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Union Carbide trial exhibit UC-815: Union Carbide Mining & Metals Division Product Bulletin on Calidria "High Purity...
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FIGURE II

SPLIT SHEET ANALYSES
GRADE—MAGAZINE PAPER

