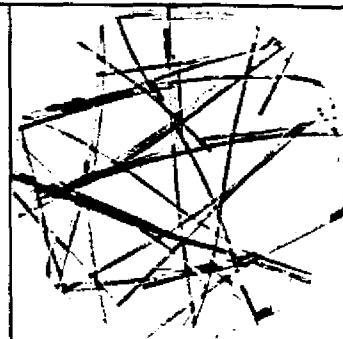


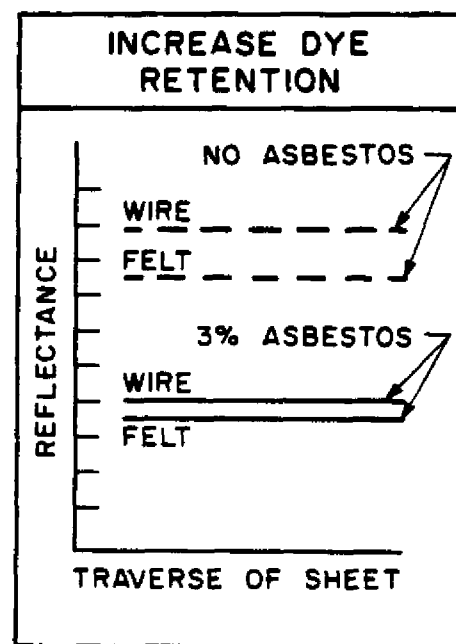
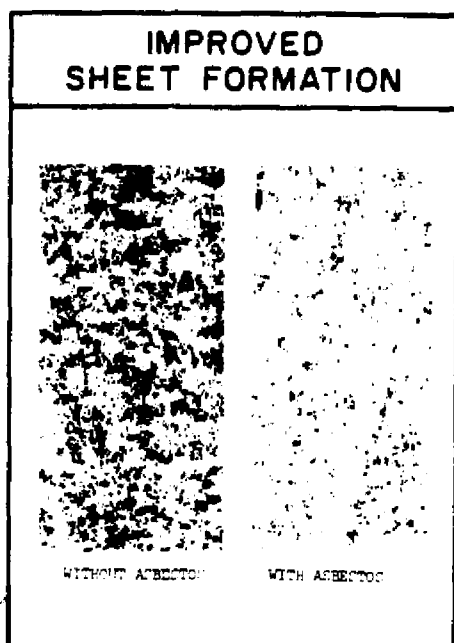
ASBESTOS

INFORMATION



UNION CARBIDE HIGH-PURITY ASBESTOS A NEW WHITE FIBROUS FILLER AND RETENTION AID FOR PRINTING PAPERS

IT PROVIDES:



PLUS

Opacity

Brightness

Reduced Show-Through

Cellulose Fines Retention

Printability Improvements

Reduced Static Electricity Buildup

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SEE ATTACHED MILL TRIAL DATA

RETENTION OF TITANIUM DIOXIDE IN BOND PAPER

Purpose of Trial: Improve Titanium Dioxide Retention to effect either material cost savings or improve the opacity of 37 lb. Bond produced by this paper company.

Type of Paper Machine: Open Fourdrinier — 126" Trim — machine speed 700 ft./min.

Production rate: 70 tons per day.

Furnish (in use):

Furnish Change During Trial:

18% Hardwood-Sulfite	no change
26% Softwood-Sulfite	no change
56% Softwood-Kraft	no change
<u>Additives*</u>	2.4% Asbestos
1.6% Talc	no change
13.0% Clay	to 10.6% Clay
0.4% Emulsified Wax	no change
3.0% Titanium Dioxide	to 2.4% (Post trial retention data indicated that 1% TiO ₂ could have been removed without a loss in opacity).

Savings Resulting From Improved TiO₂ Retention:

Reduction of TiO₂: 1% of 70 tons of paper per day = \$350/day savings.

Cost of 2.4% asbestos (3¢/lb. due to 2¢/lb. clay reduction) \$100/day

Net savings per day due to asbestos retention of TiO₂..... \$250 or \$3.60/ton paper

Annual Savings \$37,800

These savings are for this one grade being produced 150 days per year.

Actually this company has other grades where the same results may be obtained.

Other Gains associated with this mill evaluation:

1. Sewall Effluent was improved in clarity. This unit was handling an estimated one million gallons of excess white water per day and the use of 2.4% asbestos allowed a 35% reduction of solids passing to the sewer. This amounts to reduced stream pollution and more tons of paper per 100 tons of stock.
2. Closure or more uniform formation was indicated by porosity readings.
3. Opacity values increased during the use of asbestos even though clay and TiO₂ quantities were reduced as shown above.
4. Smoothness values were improved.

Physical Characteristics of the Bond Paper produced:

Percentage Asbestos:	0%	1%	2.4%
Basis Weight (lbs./300 Ft ²)	38.3	37.0	38.0
Machine Direction Tensile	12.6	13.0	13.8
Cross Direction Tensile	8.3	8.0	6.5
Mullen	20.6	20.8	22.0
Tear	32/33	30/33	34/36
Smoothness (Gain)	53	32	31
Opacity (Gain)	82.5	83	84-84.5
Brightness	83	82-83	82
Wax Pick	18/16	18/18	18/18
Caliper	3.23	3.09	3.10
% Ash in the Bond Paper (gain)	10.2	11.3	12.4

*Based on 5050 lb. batch of cellulose fiber

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APPLICATION
RETENTION AID IN PAPER MILL SAVEALL OPERATION

OBJECT: REDUCE SOLIDS LOSSES AND REDUCE RIVER POLLUTION

TYPE OF SAVEALL: OLIVER DRUM TYPE FILTER WITH STAINLESS 60/40 MESH WIRE USING FRESH CELLULOSE PULP AS A FILTER AID.

MATERIAL TO BE RECLAIMED FROM EXCESS WHITE WATER RETURNED FROM THE PAPER MACHINE

- | | |
|---------------------|------------------|
| 1. Titanium Dioxide | 4. Starch |
| 2. Clay | 5. Dye particles |
| 3. Cellulose fines | |

Data for the operation:

Production rate of Paper Machine: 60 tons/day
Machine Speed: 800 fpm Wire mesh — 75x58
Total Filler Content: 6.25% (1.25% TiO₂; 2.5% clay; 2.5% starch)
Furnish: 50% Magnifite Hardwood
 30% Softwood Draft-Spruce
 20% Broke
pH 5.0 with Alum

REDUCTION OF SOLIDS LOSSES USING HIGH PURITY ASBESTOS:

<u>% Asbestos</u>	<u>0</u>	<u>2½</u>
Flow Rate (GPH)	1,000,000	1,000,000
Average Solids in lbs./1000 gals.	3.25	0.55
Number of days/year for this particular condition	200	200
Value of Material \$/ton	100	100

ANNUAL SAVINGS RESULTING FROM THE USE OF ASBESTOS: \$27,000

APPLICATION—RETENTION OF FILLERS

Novel Paper No. 22 for Color Books

Purpose: Improving Retention of Fillers for Improved Opacity, and for Material Savings.

Type Paper Machine: Open-Fourdrinier

} Machine Trim: 132"

Production Rate: 150 tons per day

} Machine Speed: 804 F.P.M.

Systems pH: 4.5 - 5.0

Basis Weight: 32 lb./1000 ft.²

Furnish:

<u>Prior to use of Asbestos</u>	<u>with 2% Asbestos</u>
80% Groundwood	80%
20% Unbleached sulfite	20%
5% Georgia clay	5%
0.3% Tetrasodium Polyphosphate	0.3%
0.4% Zinc Hydrosulfite	0.4%
0.3% Alum	0.3%
2.8% Zeolox	0%
0% Asbestos	2.2% — added

Other additives to the headbox: Kymene 557 — 1.7%.

Retention Results:

% Asbestos	<u>0</u>	<u>2.2%</u>	
% Clay	24	39	
% Total ash	30	43	
% Increase due to asbestos (clay retention)		62%	} 52.5% ave.
% Increase due to asbestos (total ash)		43	

Paper Tests with and without Asbestos:

	<u>0% Asbestos</u>	<u>2.2% Asbestos</u>
Basis Weight (lbs./3000 ft. ²)	32	32
% Ash	4.4	6.5
% Opacity	92.9	93.6
Two-sidedness	1 pt.	0 - 0.5 pts.

Economic Gain and Quality Improvements:

1. High Purity Asbestos (2.2%) replaced 2.8% Zeolox with an immediate cost advantage. With a production rate of 140 ton/day, Zeolox was being used at a cost of \$548/day while its replacement, High-Purity Asbestos, cost \$308/day, yielding a savings of \$240/day. The asbestos also caused an increase in clay retention; a 0.7 pt. opacity gain was achieved allowing either improved quality, or an additional estimated savings of \$390/day if normal specifications are held. Final result was a total daily savings of \$680/day.

2. Reduced two-sidedness during the use of High-Purity Asbestos also gave an improved paper product.

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