UNION CARBIDE

ASBESTOS T-135 OPACIFYING AGENT

APPLICATION BULLETIN

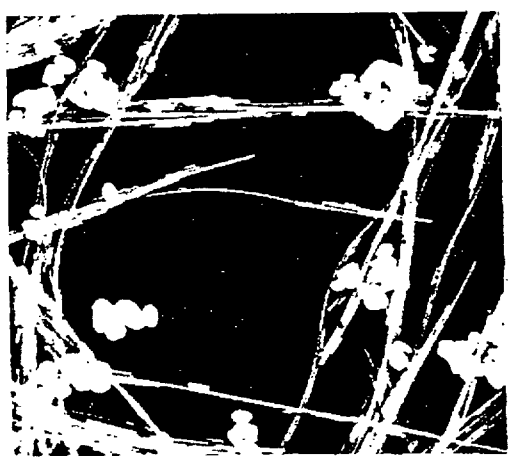
PLAINTIFF'S EXHIBIT

UC-2564

ASBESTOS T-135 OPACIFYING AGENT

- a highly efficient opacifying agent now in mill use. Excellent performance in both dry and waxed or oiled opacity make it useful in offset, envelope, map, book, glassine, pouch, and saturating papers.

- a unique UNION CARBIDE development, a specially titanated high purity asbestos fiber on which TiO_2 is fixed in finely divided form along the filament. It maximizes the light scattering power of TiO_2 by achieving unusually high retention in the dispersed state without agglomeration. Kubelka-Munk tests show T-135 more than doubles the scattering power of TiO_2 in the sheet over a broad range of addition.



Electron photomicrograph (5,600 X) of Asbestos T-135 showing uniform distribution of TiO_2 on asbestos fiber.

- positively charged, the most highly retained pigment known.

- low cost, less than 70 per cent that of TiO_2 per pound. Direct substitution in quality paper grades can save up to $15 per ton of product paper. Economic amounts can be used to improve opacity/ash ratios in sheet where TiO_2 costs are prohibitive.

- available commercially in carload quantities, in a convenient dust-free pellet form.

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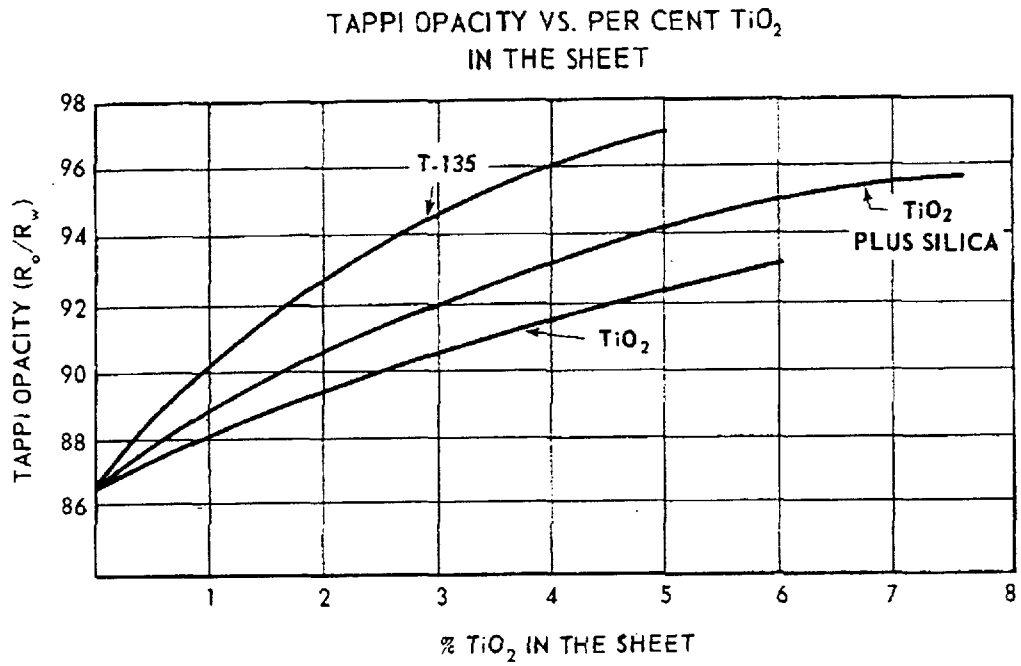
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HOW TO USE T-135

- Replace TiO_2 in the furnish pound for pound; frequently 3 pounds of T-135 will replace 4 pounds of TiO_2. Recommended use levels for mill *trial evaluation:*

Present TiO_2 Addition, Per Cent of Furnish	Per Cent TiO_2 Replacement with T-135
2½ or less	100
2½ – 4	50 to 100
Over 4	50 or less

Under certain conditions, amounts above these recommended levels may affect drainage and strength properties.

- Add T-135 pellets to the beater; the energy requirement to repulp T-135 pellets is less than to defiberize pulp lap.

- Reduce, or preferably eliminate, organic retention aids; T-135 performs this secondary function.

- T-135 can be used in both acid and alkaline systems.

Union Carbide trial exhibit UC-2564: Union Carbide Application Bulletin: Asbestos T-135 Opacifying Agent for Paper
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SOME TYPICAL T-135 MILL PERFORMANCE

T-135 has proved itself in more than 40 mills. Examples of mill data tabulated below, indicate the savings using improved T-135 based pigment-filler systems to produce specification grade paper. In some cases specifications were exceeded, indicating opportunity for further cost optimization.

MILL	PAPER GRADE	ORIGINAL PIGMENT-FILLER		IMPROVED PIGMENT-FILLER		DIRECT SAVINGS
		% Added	Cost Per Ton Paper	% Added	Cost Per Ton Paper	
"A"	50 lb. Opaque Offset	6 TiO_2 2 Clay	$27.80	3 T-135 1.75 TiO_2 2 Clay	$18.28	$9.50 per ton of paper
"B"	25 lb. Book Paper	10.9 TiO_2	$47.80	5 TiO_2 3.8 T-135	$34.13	$13.70 per ton of paper
"C"	50 lb. White Opaque Envelope	10 TiO_2 1.25 Extender	$45.72	5 TiO_2 5 T-135	$38.00	$7.72 per ton of paper
"D"	45 lb. White Opaque Book	1.1 TiO_2 2.8 Extender Clay	$9.43	1.0 T-135 1.7 Extender Clay (Unchanged)	$5.92	$3.50 per ton of paper
"E"	50 lb. Offset	4.7 TiO_2 0.6 Extender 3.1 Clay	$23.35	2.2 T-135 2.4 Clay	$8.00	$15.35 per ton of paper
"F"	70 lb. Vellum Opaque Offset	5.4 TiO_2 8.9 Clay	$27.86	2.2 T-135 3.2 TiO_2 7.8 Clay	$24.56	$3.30 per ton of paper

SECONDARY BENEFITS

In addition to direct savings, fibrous T-135:

- Acts as a retention aid for separately added components such as TiO_2, dyestuffs, fillers, etc.
- Improves sheet formation, smoothness, and printability.
- Often yields wax pick increase for starch-sized sheets.
- Markedly improves solids recoveries in the saveall, reducing loss in mill effluent.

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ASBESTOS T-135 OPACIFYING AGENT

TYPICAL PROPERTIES OF T-135

Ash	90% by wt.
TiO_2	35% by wt.
Moisture (105%)	2.0% by wt.
Mg	16% by wt.
Brightness (Photovolt)	86
Surface Charge	Electropositive
pH of 2% Slurry	~ 9.5

SHIPPING INFORMATION

Pellets, having 53 lb. per cubic foot density.
Packed 50 lb. per bag in 3-ply repulpable bags.
Palletized on 1-net ton pallets; overall dimensions of loaded pallet
46" L x 39" W x 48" H.
Shipment by rail: 60 tons per boxcar, from King City, California.
bulk: 100 tons per covered hopper car from King City, California.
truck: 20 tons, from local warehouses.

UNION CARBIDE

THE DISCOVERY COMPANY

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