Union Carbide trial exhibit Union Carbide 21: Union Carbide CALIDRIA Asbestos Product Brochure: High Purity Chr...
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High purity and proprietary processing make CALIDRIA ASBESTOS superior to any other asbestos



CALIFORNIA CHRYSOTILE
Random orientation, point contact and high fiber content set CALIDRIA Asbestos ore apart from other asbestos sources.

WET-PROCESSING—CALIDRIA Asbestos
Unique process used to produce CALIDRIA Asbestos provides 98 per cent liberated, efficient fibrils.



The four electron micrographs on the left graphically illustrate the wide difference between the random orientation of fibrils of CALIDRIA Asbestos and typical close-packed Canadian fiber structure.

Figure 1 shows the structure of a Canadian fiber bundle. Individual fibers, or fibrils, are all in linear contact and basically straight. There is little or no deviation from the parallel configuration. The texture of chrysotile from the New Idria deposit is the direct opposite.

Figure 2 shows the random orientation of CALIDRIA Asbestos fibrils where each fiber is in only point contact with its neighbor. The high fiber content of Union Carbide's California deposit is one of the several factors that make New Idria ore unique as a raw material for the production of high purity CALIDRIA Asbestos products.

Purity through wet-processing

Union Carbide established that the major factor enhancing the differences between California and Canadian fiber products was in the purity of the beneficiated product.

Of the processing techniques investigated, hydraulic beneficiation proved to be the most logical approach to the manufacture of highly purified chrysotile products.

The wet process is used to produce all CALIDRIA Asbestos products. Although details are proprietary, the process may be described as a treatment which breaks down the fiber bundles and removes the rock and other foreign contaminants of the ore body, leaving essentially pure asbestos.

Figure 3 shows the results of dry-processing New Idria—California chrysotile. Fiber bundles are evident even with the most exacting dry beneficiation methods. Figure 4 shows the results of hydraulic beneficiation, which provides 98 per cent liberated, efficient fibrils of consistently uniform quality.

Major "firsts" in the industry

A distinct result of the Union Carbide wet process is the ability for the first time in the industry to offer an economic pelletized asbestos product. Advantages of this form are: ease-of-handling, reduced dusting, lower shipping rates, and less troublesome and costly storage.

CALIDRIA Asbestos pellets, ⅜ in. diameter by ¾ in. long, can be handled by conventional dry bulk handling systems, representing a major achievement in the asbestos industry.

PLAINTIFF'S EXHIBIT
Union Carbide 21

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CALIDRIA ASBESTOS

sets new standards of performance!

Typical Applications in

VISCOSITY CONTROL

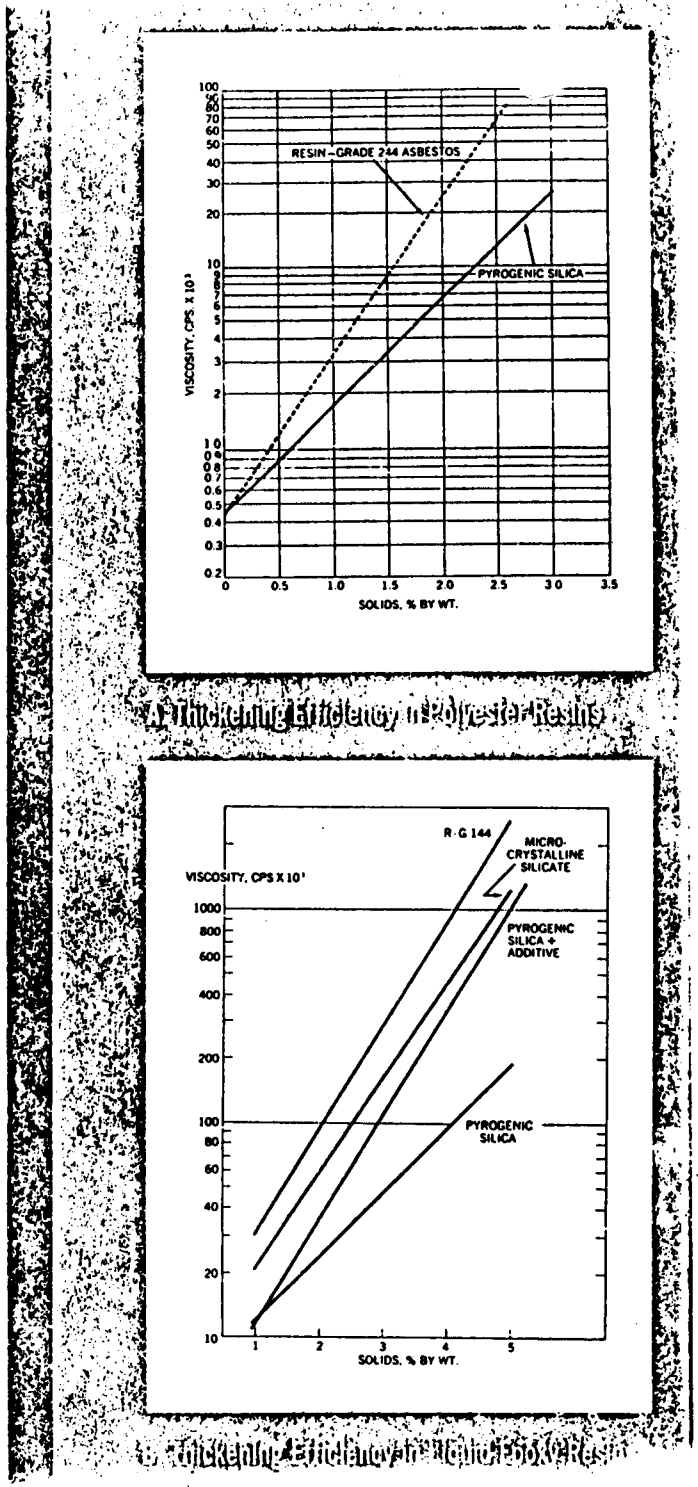
Resin Systems:

Coatings · Adhesives · Sealants · Caulks · Mastics

Aqueous Systems:

Water Thickening · Drilling Muds · Joint Cements

The distinctive properties of CALIDRIA Asbestos offer thickening efficiency quite unlike anything available!



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For complete information on properties, applications and prices, or technical assistance in utilizing

Calidria ASBESTOS

contact the nearest Union Carbide sales office or CALIDRIA Asbestos representative

Atlanta, Ga. 404-633-6161 • Baltimore, Md. 301-944-8211 • Boston, Mass. 617-444-5400 • Buffalo, N.Y. 716-837-6450 • Charlotte, N.C. 704-364-1400 • Chicago, Ill. 312-822-7000 • Cincinnati, Ohio 513-272-0206 • Cleveland, Ohio 216-621-4202 • Clifton, N.J. 201-778-2900 • Dallas, Texas 214-631-0010 • Detroit, Mich. 313-354-0800 • Houston, Texas 713-621-1000 • Indianapolis, Ind. 317-255-3181 • Kansas City, Kan. 913-362-2200 • Los Angeles, Calif. 213-583-3061 • Memphis, Tenn. 901-396-5375 • Minneapolis, Minn. 612-927-4221 • Moorestown, N.J. 609-235-6200 • New York, N.Y. 212-551-3763 • Niagara Falls, N.Y. 716-285-3311 • Philadelphia, Pa. 215-923-3200 • Pittsburgh, Pa. 412-922-5700 • St. Louis, Mo. 314-726-0324 • San Francisco, Calif. 415-765-1244 • Seattle, Wash. 206-723-8660

UNION CARBIDE

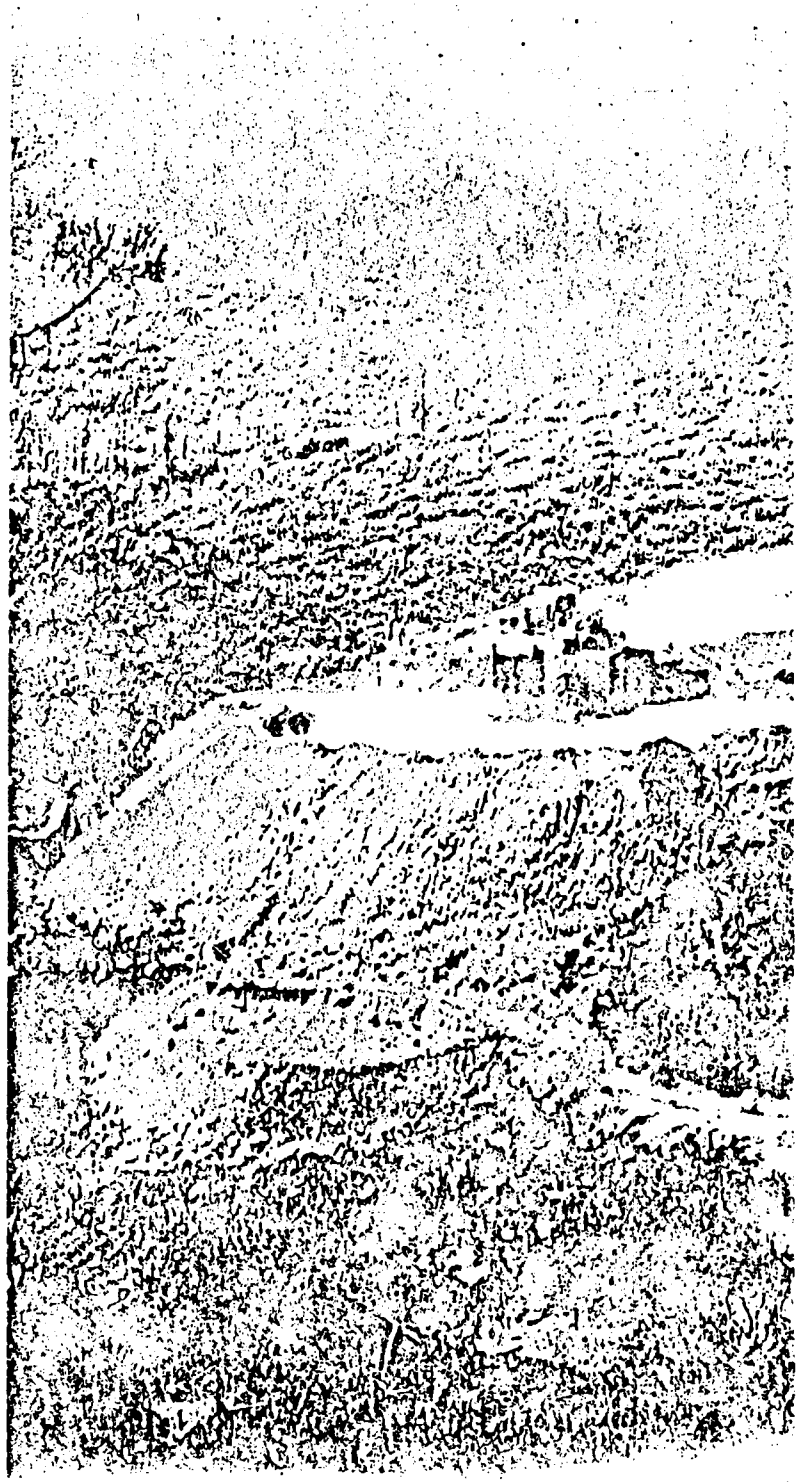
UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
270 Park Avenue New York, N.Y. 10017

Marketing and Technical Center: P. O. Box 579, Niagara Falls, N.Y. 14302

Plant: P. O. Box K, King City, Calif. 93930

71-065

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produced in 3 grades—

DISTINCTIVE CHARACTERISTICS!

3. MODIFIED PRODUCTS

Resin-Grade 244

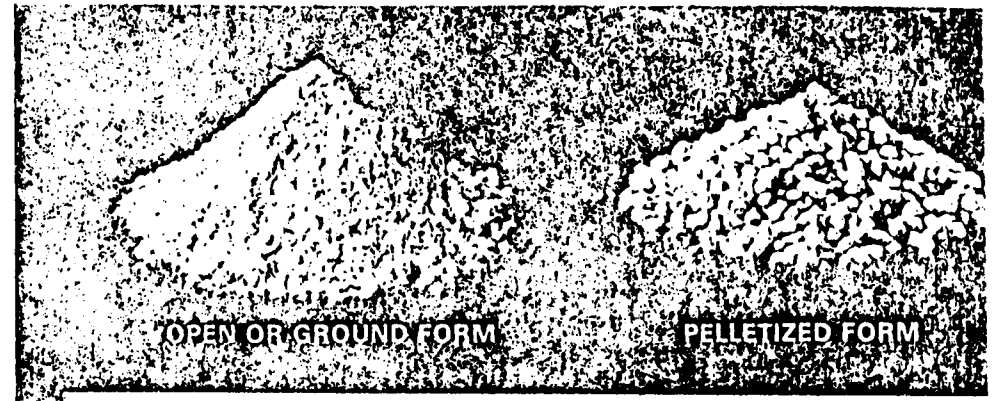
Viscosity Control for Polyester Resin Systems

Resin-Grade 244 was developed for maximum thickening efficiency in a wide range of applications. It offers ease of dispersion with non-settling, stable viscosity, long shelf life and true thixotropy.

Asbestos T-135

Opacifying Agent for Cellulosic Paper

Asbestos T-135 is a titanated High Purity Asbestos. The titania portion of the product does not agglomerate when added to a paper pulp. The result is greatly enhanced opacifying power.



Typical Physical Properties of CALIDRIA ASBESTOS PRODUCTS

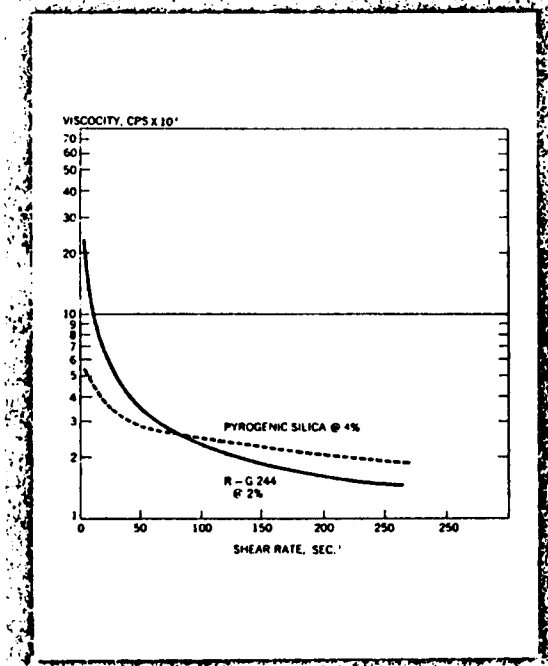
General Properties

Specific Gravity	2.45
Surface Charge	Electropositive (Cationic)
Surface Area	60 sq. meters per gram
Refractive Index	1.54—1.56
Fiber Diameter	0.025 microns
Length/Diameter	200 avg. (1000 max.)

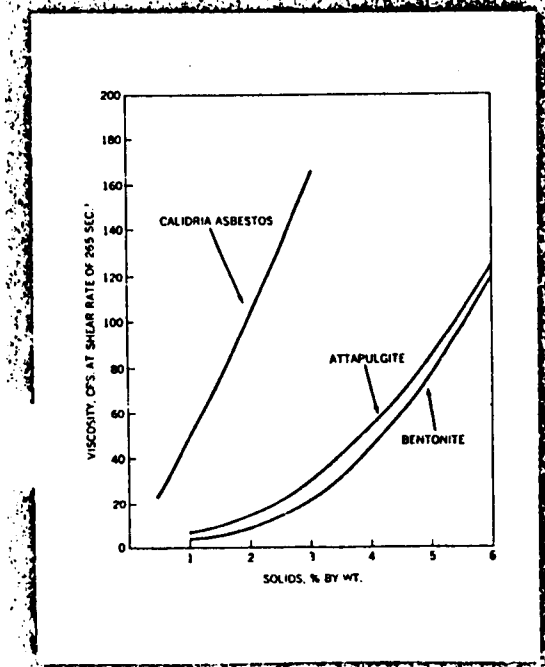
PROPERTY	Fiber Products		Colloidal Products		Modified Products	
	SG-100 Series	SG-200 Series	High Purity Open	Resin-Grade 144	Resin-Grade 244	T-135 Open
% Magnetite	2.0	2.0	0.75	0.6	0.3	0.6
Reflectance	66-68	68-70	72-76	–	–	85-88
Oil Absorption #DOP/(100 # Asb.)	90-100	110-120	–	120-140	300-350	–
Dry Bulk, lbs/ft³	8-10	5-6	5	4	1-5	8
Screen Size, Typical % + 325 Mesh	32	15	NIL	NIL	NIL	NIL
Water Absorption Wt % in Filter Cake	55-60	62-65	–	–	–	–

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Rheological Characteristics in Polyester Resins



High concentration of liberated fibrils, purity, and low abrasiveness provide quality compounds at improved costs.

Typical Applications in REINFORCEMENT

(High mechanical strength makes CALIDRIA Asbestos fibers effective reinforcing whiskers.)

Nylon 6/6 – CALIDRIA R-G144 Molding Compounds

Reinforcement of Nylon 6/6 with CALIDRIA R-G144 asbestos results in compounds with greatly improved tensile and flexural properties and heat distortion temperature. Tensile strength, for example, is more than doubled by the addition of R-G144 at twenty per cent by weight in the molding compound.

Reinforced Nylon 6/6

Test	"Typical" Nylon 6/6	Nylon 6/6 with 20% (wt.) R-G144
Tensile strength @ 73°F psi	10,000	21,300
% Elongation @ 73°F	50	2.4
Modulus of Elasticity @ 73°F psi x 10^{-5}	3	13.2
Flexural strength @ 73°F psi	13,000	32,200
Flexural modulus @ 73°F psi x 10^{-5}	–	15.4
Izod Impact (notched) @ 73°F ft.lb./in.	1.0	0.9
Heat Distortion Temperature 264 psi–°C	66	241

OTHER PROVEN APPLICATIONS:

Cellulose Paper Additive: for pitch control, pigment retention, softening, extending, opacifying (T-135) and improved save-all efficiency.

Water and Waste Treatment: clarifier, aerobic digestion promoter, reducer of BOD and COD, filtration aid and waste oil controller.

Vinyl and Asphalt Flooring: adds to dimensional stability and improves hot strength reinforcement.

Oil Well Drilling Fluids: designed as a viscosity modifier and used to increase carrying capacity and suspending ability of drilling muds.

Tape Joint Cements: fine, consistent, uniform particle size and high bulking factor make for more efficient joint cements for gypsum board applications.

CALIDRIA ASBESTOS

REPRESENTING VARIED PRODUCTS THAT POSSESS THEIR OWN

1. FIBER PRODUCTS

Standard Grade 100 Series

Vinyl Asbestos Floor Tile

Standard Grade 100 series products are obtained primarily by straight-line beneficiation of asbestos ore. They provide high fiber content and high brightness at low applied cost.

Standard Grade 200 Series

Drilling Fluids, Joint Cements

Standard Grade 200 series products are further treated so that the fibers are more open and uniform in size. They are designed for use where fine grind and high bulk are desired.

2. COLLOIDAL PRODUCTS

High Purity Asbestos

Cellulose Paper Additive

A uniform, highly purified non-abrasive fiber product for pitch control, pigment retention, softening, extending and improving save-all efficiency. Excellent performance in water and waste treatment.

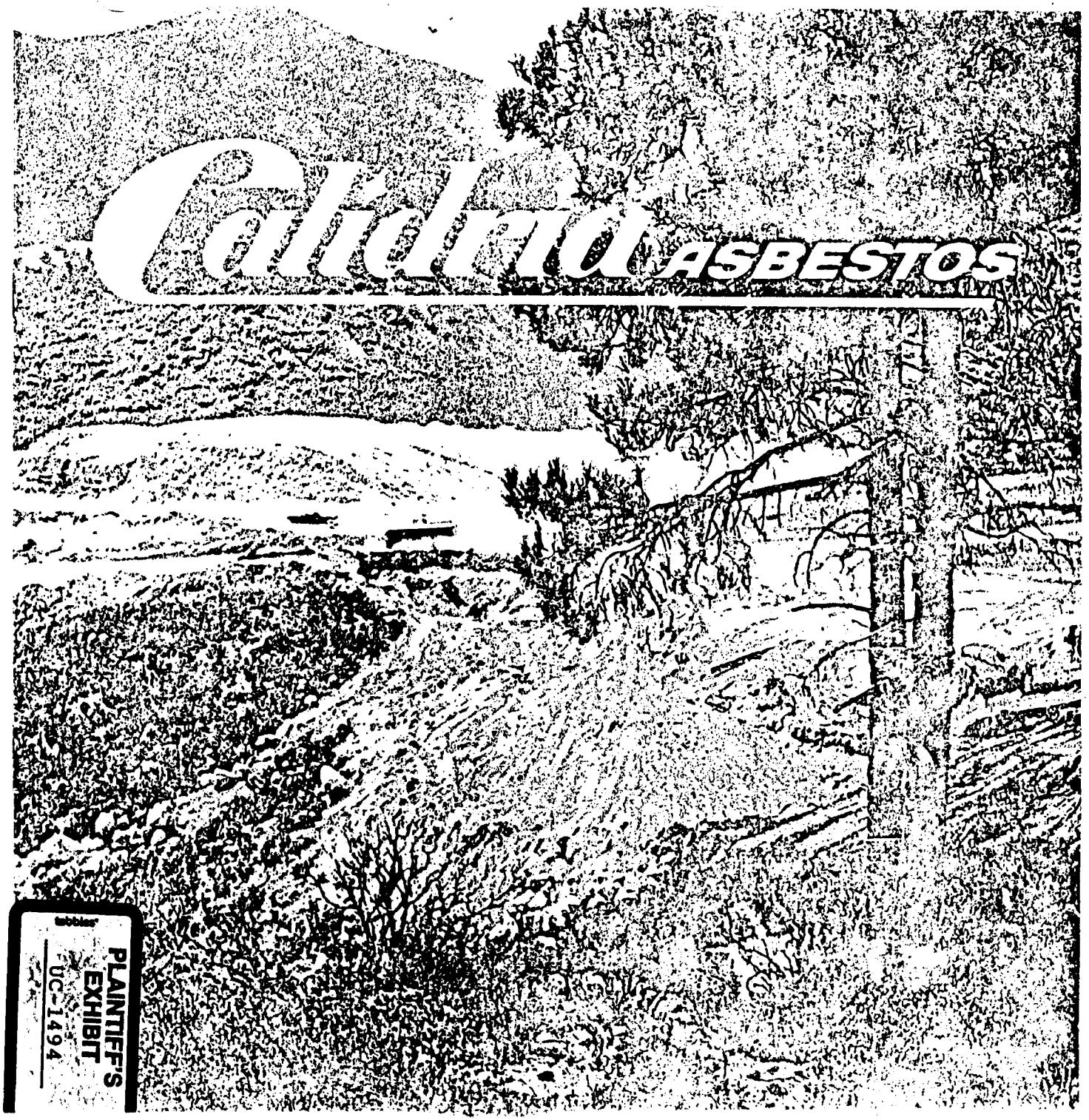
Resin-Grade 100 Series

Viscosity Control, Reinforcement

The Resin-Grade 100 Series are specially produced and refined for the plastics industry. They exhibit unique capabilities because of fibrous geometry, fiber liberation, high purity and low iron.

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PLAINTIFF'S EXHIBIT UC-1494

A unique and versatile fiber with proven applications as an

- Extender
- Thickener
- Reinforcer
- Opacifier

An unlimited source of new ideas for utilizing asbestos

UNION CARBIDE

The Discovery Company

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WHAT IS

Calidria ASBESTOS

CALIDRIA Asbestos, a product of Union Carbide, is a chrysotile asbestos obtained from a unique, short-fiber deposit located in the New Idria area of the Diablo Mountain Range in central California, approximately 150 miles south of San Francisco.

New Idria ore is essentially free of hard, consolidated rock masses typical of asbestos ores from the Quebec region—generally conceded to be the center of the established free world industry. Further, this ore assays up to 60 per cent asbestos fiber compared to Canadian ore which ranges from 7 to 15 per cent.

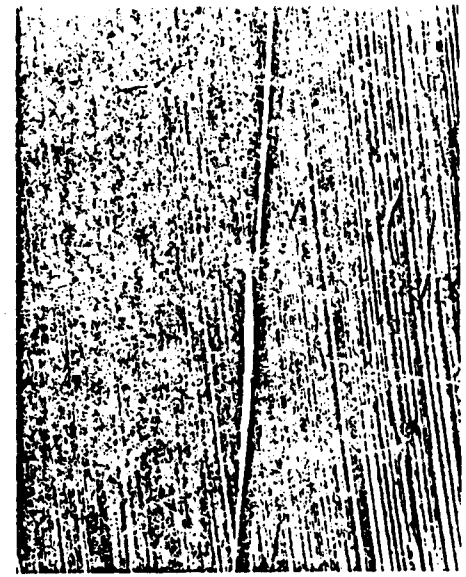
Through special mining methods and processing techniques developed by Union Carbide, New Idria ore is converted into CALIDRIA Asbestos products with many superior advantages. Their unusual properties have been instrumental in the introduction of unique, economical products of high purity which have found application in an entirely new spectrum of industrial uses.

Union Carbide's California deposit is one of the world's largest sources of high-grade asbestos ore, assuring continued supply for development and expansion of CALIDRIA Asbestos materials.

Where is it being used today?

Listed are the primary, conventional, and specialized application areas where the high purity, non-abrasiveness, high brightness and end use efficiency of CALIDRIA Asbestos are contributing to better products and lower costs:

- Viscosity Control Additive
- Thixotrope
- Extender
- Reinforcing Agent
- Pollution Control Agent
- Thickener
- Co-Flocculant
- Opacifier
- Softener
- Bulking Agent



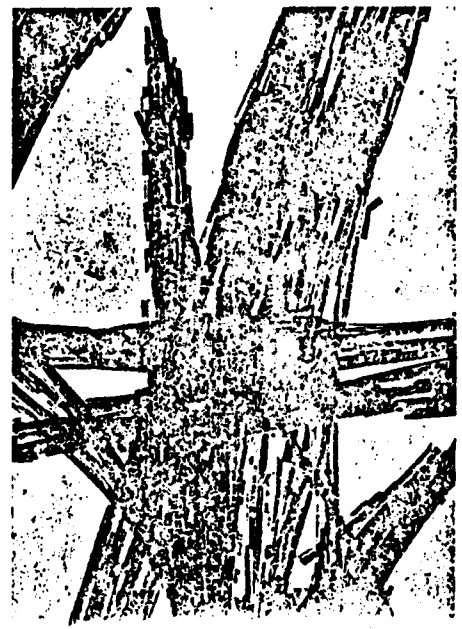


1. **CANADIAN CHRYSOTILE**
Individual fiber bundles are straight and tightly bonded. Deviation from the parallel configuration is minimal.

2.

3. **DRY-PROCESSING—California Chrysotile**
Fiber bundles in California asbestos are still evident even with the most exacting dry processes.

4.





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