...an economical, highly effective
THICKENER and THIXOTROPE for

- ☆ Polyester Resins
- ☆ Plastisols
- ☆ Epoxies
- ☆ Phenolic Adhesives
- ☆ Organosols

UNION CARBIDE

THE DISCOVERY COMPANY

PLAINTIFF'S EXHIBIT

UC-3949

A07578

Calidria Asbestos RG-244

UCC 014747

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Calidria ASBESTOS

RG-244

...a chemically modified, highly refined fiber with a mineral coating that gives:

HIGHER VISCOSITY AT LOW LOADINGS—"Calidria" asbestos RG-244 builds more viscosity at a given concentration than pyrogenic silica or other thickeners. Part of this viscosity increase comes from hydrogen bonding between the mineral coating and the resin system—the same way that pyrogenic silica builds viscosity. What makes RG-244 more efficient is that the fibers enhance flow resistance. On a lb.-for-lb. basis, RG-244 builds over twice as much viscosity as pyrogenic silica.

BETTER FLOW AT HIGH SHEAR RATES—"Calidria" RG-244 also improves flow at high shear rates because of its inherent thixotropic characteristics. This property is especially desirable in spray-up applications where less resistance to flow is desired during pumping and spraying.

SAVINGS FROM BETTER PERFORMANCE—By increasing viscosity and thixotropy more efficiently than other materials, "Calidria" asbestos RG-244 allows users to obtain their desired properties with less mineral additive. This reduction lowers costs and reduces any detrimental effect of thickeners on other resin properties.

LOW COSTS TOO—"Calidria" asbestos RG-244 costs less per lb. than similar thickeners. Thus, users save two ways—on unit cost *and* cost performance.

FAST WETTING, EASY DISPERSION—Conventional mixing equipment can be used to disperse "Calidria" RG-244 quickly and easily. In fact, this unique product wets out and disperses considerably faster than most other thixotropes.

BETTER SHELF LIFE, LESS SETTLING—Systems containing "Calidria" asbestos RG-244 can be stored for long periods without any significant change in viscosity or thixotropy. Settling during storage is minimized, and systems containing RG-244 can be remixed easily. In all these respects, RG-244 surpasses most other thickeners.

NO COLOR OR OPACITY—"Calidria" asbestos RG-244 is a highly refined fiber with a clear mineral coating that does not add color to most systems. At the same time, RG-244 has a refractive index that matches many systems, so that it does not add opacity. These features make RG-244 especially well suited for use in clear polyester gel coats.

REDUCED DUSTING—"Calidria" RG-244 is a fibrous material containing a minimum of dust. It therefore reduces dusting during materials handling and additions to resin systems.

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TYPICAL PHYSICAL PROPERTIES

Specific Gravity	2.45	—
Moisture Content	2.0	% max. by weight
Nature of Surface Charge	Neutral	—
Magnetite Content	0.3	% max. by weight
Refractive Index	1.54 to 1.56	n_D 25° C.
Oil (DOP) Absorption	300 to 350	lb. per 100 lb.
Surface Area	>60	sq. m. per g.
Fiber Diameter	0.025	microns
Length/Diameter (Aspect Ratio)	200 avg.	—
Bulking Value	4.9	gal. per 100 lb.
Dry Bulk Density (aerated)	1.0	lb. per cu. ft.

PACKAGING AND AVAILABILITY

Single Package—Weight (3-ply paper bag sealed in polyethylene)	10 lb.
Single Pallet—Weight, —Dimensions (full pallets covered by waxed cardboard)	350 lb. approx. 53 in. x 44 in. x 61 in. high
Full Carload (available from King City plant)	52 pallets 18,200 lb.
Full 40-ft. Truckload (available nationwide)	17 pallets 5,950 lb.

"Calidria" asbestos RG-244 is stocked at Union Carbide's shipping locations throughout the United States and is available from several distributors.

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Why is "Calidria" asbestos different?

"Calidria" products are made from high-purity, short-fiber chrysotile asbestos obtained from a unique deposit about 160 miles south of San Francisco, California. Unlike conventional deposits that extend through the host rock, this deposit is essentially free of hard, consolidated rock masses. Further, the ore assays up to 60% asbestos fiber compared to conventional deposits which contain from 6 to 10% asbestos.

Special hydraulic beneficiation techniques developed by Union Carbide efficiently break down the fiber bundles and remove the rock and impurities from the asbestos fiber. As a result, all "Calidria" products are over 95% pure asbestos whose fibers are 98% liberated from fiber bundles.

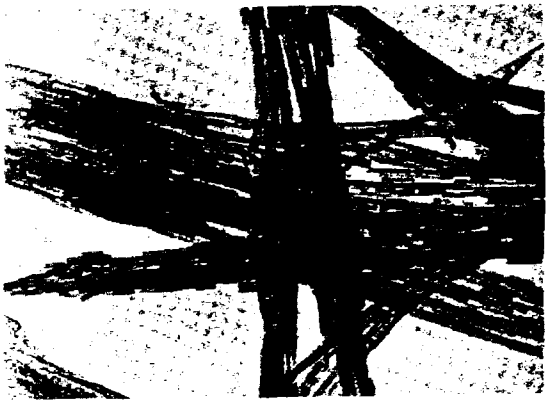
RG-244 is made by additional refining to achieve over 99% purity. The fibers are then chemically coated by a patented process to form this unique, highly efficient thickener and thixotrope.



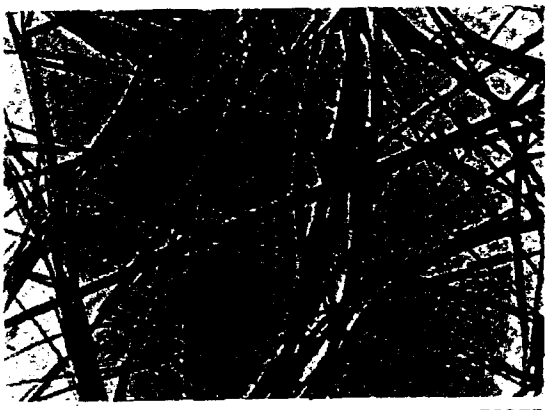
CANADIAN ASBESTOS—AS-MINED—Individual fiber bundles are straight and tightly bonded, surrounded by consolidated rock masses. In this form, the fibers defy separation from each other and from the host rock.



"CALIDRIA" ASBESTOS—AS-MINED—Here the fibers are randomly oriented and essentially free of hard rock masses. Further, the ore assays up to 60% asbestos, considerably more than the Canadian ore.



"CALIDRIA" ASBESTOS—IF DRY-PROCESSED—Even the most exacting dry processes do not completely break down the fiber bundles into individually liberated fibers. Union Carbide technology developed a special wet process to liberate the fibers.



"CALIDRIA" ASBESTOS—UNIQUELY WET-PROCESSED — Union Carbide's process separates 98% of the fibers from the fiber bundles. RG-244 fibers are over 99% pure asbestos and chemically coated to provide an efficient thickener and thixotrope.

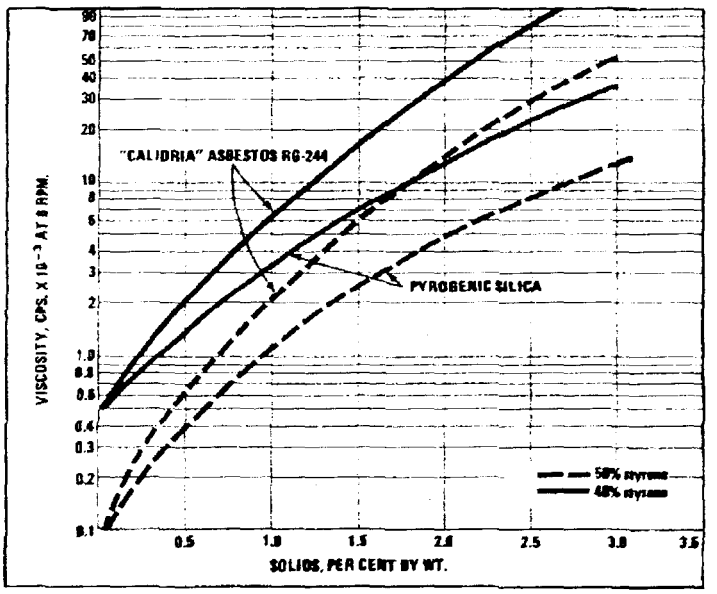
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Typical Performance Data/General Purpose UNPROMOTED Polyester Resins

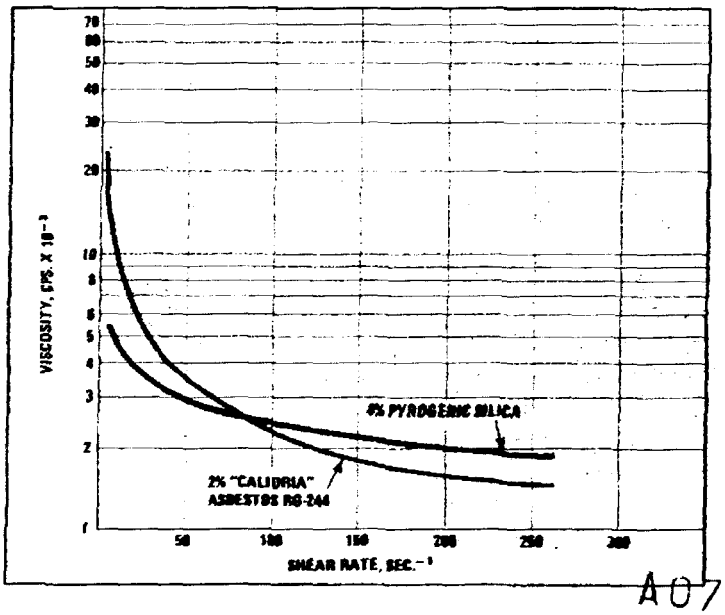
HIGHER VISCOSITY AT GIVEN CONCENTRATION

On a lb.-for-lb. basis, "Calidria" asbestos RG-244 builds substantially more viscosity in these 2 polyester systems than pyrogenic silica. RG-244 builds twice as much viscosity at a 1% concentration and 4 times as much viscosity at 3% concentration. Thus, users can use less RG-244 to obtain their desired viscosity.



HIGHER VISCOSITY AT LOW SHEAR RATES · BETTER FLOW AT HIGH SHEAR RATES

2% "Calidria" asbestos RG-244 gives better thixotropic properties than 4% pyrogenic silica in this unpromoted polyester resin containing about 50% styrene. The RG-244 system has better flow at high shear rates, allowing easier pumping and spray-up. As the shear rate is reduced, the RG-244 resin has better viscosity and sag resistance.



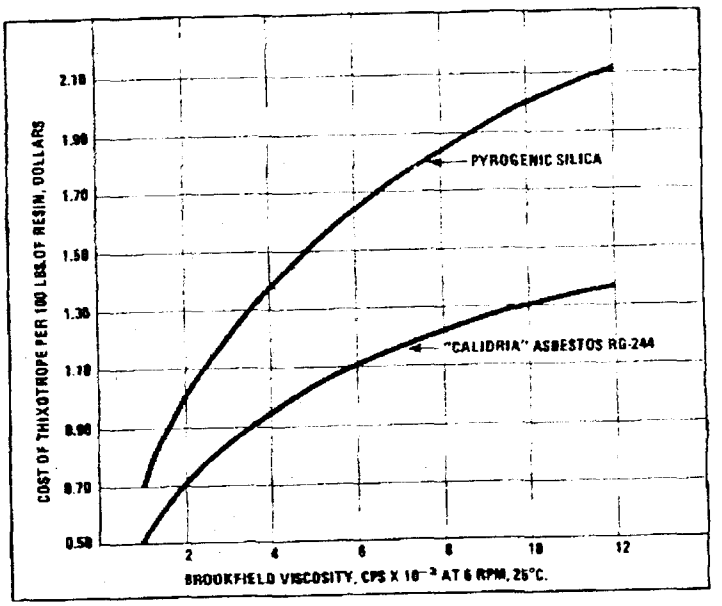
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SAVINGS USING "CALIDRIA" ASBESTOS RG-244 · UNPROMOTED Polyester Resins

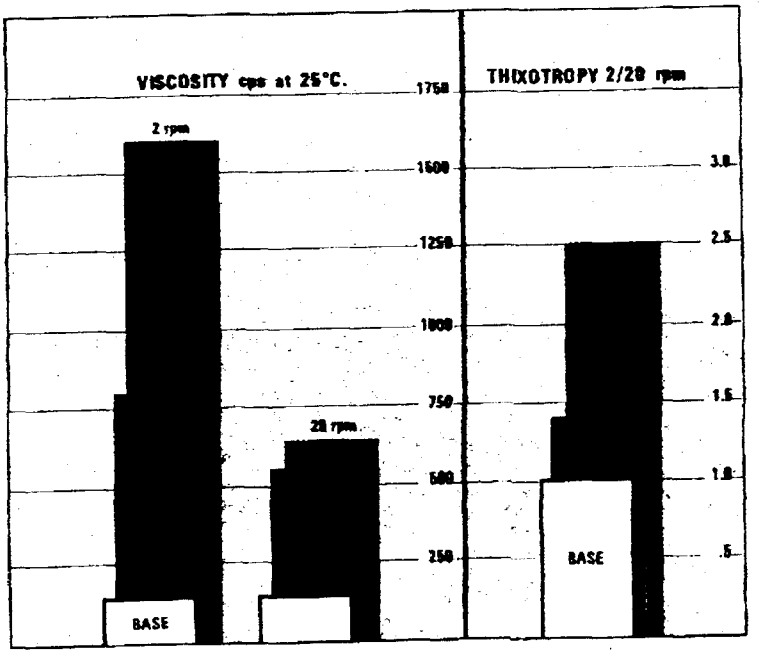
The better performance and lower cost of "Calidria" asbestos RG-244 allow substantial savings. In the typical unpromoted polyester resin system shown at the right, "Calidria" RG-244 builds a given viscosity for about one-half the cost of pyrogenic silica.



Typical Performance Data / General Purpose PROMOTED Polyester Resins

IMPROVES BOTH VISCOSITY AND THIXOTROPY

"Calidria" asbestos RG-244 also effectively improves the viscosity and thixotropy of promoted polyester resins. In many cases, the improved viscosity and thixotropy provided by RG-244 will be sufficient to meet user needs. Should higher values be required, a small addition of ethylene glycol or a similar additive will improve the viscosity, thixotropy, and stability of the RG-244 dispersion. At the right is an example of these improvements in a typical polyester resin containing a cobalt-type accelerator.



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Typical Performance Data/Heat-Curable VINYL PLASTISOL Sealants

"Calidria" asbestos RG-244 improves the viscosity of heat-curable vinyl plastisols without reducing their inherently good adhesion properties. In fact, RG-244 provides excellent anti-sag properties at both low (275 to 375 deg. F.) and high (above 350 deg. F.) fusion temperatures. An example of how RG-244 improves the viscosity of a high-fusion temperature structural sealant without detracting from adhesion is shown below:

FORMULATION FOR HIGH-FUSION TEMPERATURE STRUCTURAL SEALANT

INGREDIENT	PARTS BY WEIGHT
BAKELITE QYOH-2 Resin	100
FLEXOL Plasticizer 10-10	60
FLEXOL Plasticizer 10A	40
EX-1 Extender Plasticizer	10
Barium-Cadmium Stabilizer	2
UNION CARBIDE Silane Y-5162 Adhesion Promoter	0.25
Calcium Carbonate	130
CALIDRIA Asbestos RG-244	5

TEST DATA

Butt tensile adhesion to cold-rolled steel after 45 minutes cure at 350° F.	440 psi
Severs type flow properties Binks orifice (1/8 inch) Time of test: 150 seconds	
Aged 24 hr. at room temperature	63 g. at 40 psi
Aged 72 hr. at 130° F	76 g. at 40 psi
Aged 45 days at room temperature	73 g. at 40 psi
Shore hardness, A scale after 24 hr. at room temperature	76

Dispersion of "Calidria" Asbestos RG-244

ULTRASONIC

Good dispersion of "Calidria" asbestos RG-244 in polyester laminating resins can be obtained with an "Econosonic" disperser operating at 300 psi pressure. Pressures above 300 psi tend to reduce viscosities. In general, "Calidria" asbestos RG-244 requires less energy for adequate dispersion than comparable concentrations of pyrogenic silica.

"COWLES" DISSOLVER

A "Cowles" dissolver can disperse "Calidria" asbestos RG-244 in 5 to 10 minutes at 3500 rpm, using a 3-in. impeller in a 3-quart container. Under these conditions a 1% loading can be mixed for 1 hour while a 2% loading can be stirred for 30 minutes without degrading. Large volumes of RG-244 can be dispersed easily by scaling up the equipment.

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Any of our offices below will be glad to give you complete information on properties, applications, and prices of "Calidria" asbestos.

Calidria ASBESTOS

Marketing and Technical Center

Niagara Falls, New York 14302	P. O. Box 579	716-285-3311

Plant

King City, California 93930	P. O. Box K	408-385-5961

Sales Offices

Atlanta, Georgia 30329	17 Executive Park Dr.	404-633-6161
Baltimore, Maryland 21207	Beltway Bldg. 6707 Whitestone Rd.	301-944-8211
Boston, Massachusetts 02194	300 First Ave., Needham Heights	617-444-5400
Buffalo, New York 14225	3343 Harlem Rd.	716-837-6450
Charlotte, North Carolina 28210	6230 Fairview Rd.	704-364-1400
Chicago, Illinois 60606	120 South Riverside Plaza	312-822-7000
Cincinnati, Ohio 45227	West Street and Madisonville Rd.	513-272-0206
Cleveland, Ohio 44114	1300 Lakeside Ave., N.E.	216-621-4202
Clifton, New Jersey 07012	935 Allwood Rd.	201-778-2900
Dallas, Texas 75207	2710 Stemmons Freeway	214-631-0010
Detroit (Southfield, Michigan Sales Office)		313-354-0800
Houston, Texas 77027	3737 Greenway Plaza Dr.	713-621-1000
Indianapolis (Cincinnati, Ohio Sales Office)		317-255-3181
Kansas City (St. Louis, Mo. Sales Office)		913-362-2200
Los Angeles, California 90058	2770 Leonis Blvd.	213-583-3061
Memphis (Atlanta, Ga. Sales Office)		901-396-5375
Minneapolis, Minnesota 55416	3030 Excelsior Blvd.	612-927-4221
Moorestown, New Jersey 08057	Route 38 and Pleasant Valley Rd.	609-235-6200
New York, New York 10017	270 Park Ave.	212-551-6423
Philadelphia (Moorestown, New Jersey Sales Office)		215-923-3200
Pittsburgh, Pennsylvania 15220	P'kway Center, 875 Greentree Rd.	412-922-5700
Southfield, Michigan 48075	26500 Northwestern Highway	313-354-0800
St. Louis, Missouri 63105	10 South Brentwood Blvd.	314-726-0324
San Francisco, California 94106	One California St.	415-982-1360
Seattle, Washington 96118	4726 Rainier Ave., South	206-723-8660

UNION CARBIDE

THE DISCOVERY COMPANY

UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
270 PARK AVENUE, NEW YORK, N. Y. 10017

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