Calidria

PLAINTIFF'S EXHIBIT

UC-2563

RG-144

. . . a low cost, versatile
THICKENER and THIXOTROPE
for:

- COATINGS
- ADHESIVES
- SEALANTS
- CAULKS
- MASTICS

UNION
CARBIDE

UCC 023274

Calidria ASBESTOS RG-144

... a highly refined fiber that gives:

Effective Viscosity Control with Thixotropy

"Calidria" asbestos RG-144 is a low-cost thickener and thixotrope that can be used in a wide range of liquid resin systems . . . including epoxies, vinyls, acrylics, and asphaltics. It also gives thixotropic properties to paints and butyl-rubber compounds.

Lower Cost Flow Control

"Calidria" asbestos RG-144 costs much less than competitive thickeners and thixotropes. Thus, although larger additions may be needed to reach a given viscosity or thixotropy, RG-144 offers savings over other thickening agents.

Outstanding Thickener for Epoxies

"Calidria" asbestos RG-144 gives such a large increase in viscosity and thixotropy that up to 50% less material can be used in epoxies compared to other thickeners. This unique asbestos is also effective in amine hardeners for epoxy resins — another advantage compared to competitive thixotropes.

Fast Wetting, Easy Dispersion

Conventional mixing equipment can be used to disperse "Calidria" asbestos RG-144 quickly and easily. In fact, this product wets out and disperses faster than other thickeners.

Better Shelf Life, Less Settling

Systems containing "Calidria" asbestos RG-144 can be stored for long periods without any significant change in viscosity or thixotropy. Settling during storage is minimal, and systems containing RG-144 can be remixed easily. In fact, RG-144 is often used to effectively suspend pigments in paints.

No Shear Sensitivity

Systems containing "Calidria" asbestos RG-144 are not sensitive to shear energy. Overmixing will not destroy the thixotropy of the resin-asbestos mixture.

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Typical Physical Properties

Specific Gravity	2.45	—
Moisture Content	2.0	% max. by weight
Nature of Surface Charge	Electropositive (cationic)	—
pH in Water	9.5	—
Magnetite Content	0.6	% max. by weight
Refractive Index	1.54-1.56	n_D 25°C.
Reflectance	72-76	G.E. brightness
Surface Area	55-60	sq. m. per gm.
Fiber Diameter	0.025	microns
Length/Diameter (Aspect Ratio)	200 average 1000 maximum	—
Oil (DOP) Absorption	120-140	lb. per 100 lb.
Bulking Value	4.8	gal. per 100 lb.
Dry Bulk Density	4.0	lb. per cu. ft.
Wet Bulk Density in Water after dispersion (2.0 g. per liter), 1-hr. settling	900-1,000	ml.

Packaging and Availability

	RG-144 Open Fiber	RG-144 Pellets
Single Package — Weight (3-ply paper bag sealed in polyethylene)	35 lb.	50 lb.
Package Density	17 lb. per cu. ft.	40 lb. per cu. ft.
Single Pallet — Weight — Dimensions	1,400 lb. approx. 56 in. x 46 in. x 58 in. high	2,000 lb. approx. 47 in. x 40 in. x 48 in. high
Pallet Density	129 cu. ft. per ton	56 cu. ft. per ton
Full 50-ft. Carload (available from King City plant)	52 pallets 72,800 lb.	60 pallets 120,000 lb.
Full 40-ft. Truckload (available nationwide)	17 pallets 23,800 lb.	20 pallets 40,000 lb.

"Calidria" asbestos RG-144 is stocked at Union Carbide's shipping locations throughout the United States and is available from several distributors.

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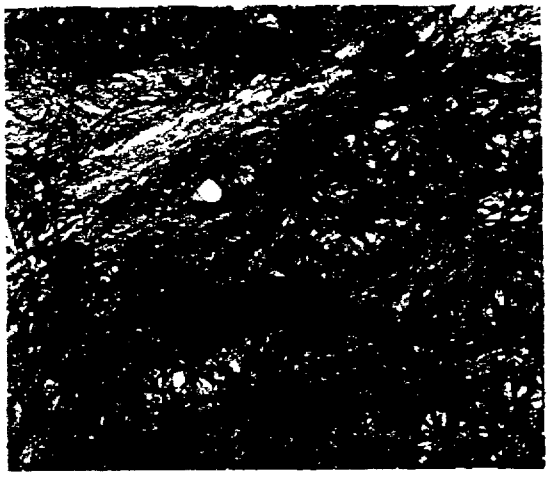
Why is "Calidria" Asbestos Different?

"Calidria" products are 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.

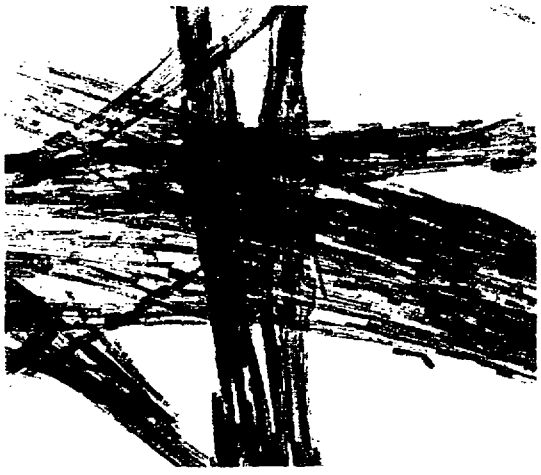
Special hydraulic beneficiation techniques developed by Union Carbide efficiently break down the fiber bundles and remove the rock and impurities from the asbestos fiber. As a result, all "Calidria" products are pure asbestos whose fibers are highly liberated from fiber bundles.



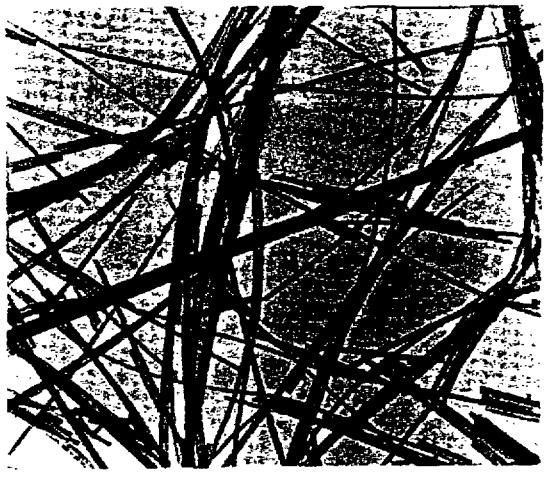
CANADIAN ASBESTOS—AS-MINED — *Individual fi*ber bundles are straight and tightly bonded, surrounded by consolidated rock masses.



"CALIDRIA" ASBESTOS—AS-MINED — Here the fibers are randomly oriented and essentially free of hard rock masses.



"CALIDRIA" ASBESTOS—IF DRY-PROCESSED — Even the most exacting dry processes do not completely break down the fiber bundles into individually liberated fibers.



"CALIDRIA" ASBESTOS—UNIQUELY WET-PROCESSED — Union Carbide's process separates the fibers from the fiber bundles. RG-144 fibers provide an efficient thickener and thixotrope.

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Typical Performance Data in VINYL PLASTISOLS Used as Fabric Coatings

"Calidria" asbestos RG-144 controls the flow behavior of vinyl-plastisol coating materials more efficiently and at lower cost than other thickeners. These coating materials — used in the manufacture of synthetic leathers, rainwear, awnings, and gaskets — are applied by pouring, dipping, and spreading. The plastisol must therefore be a non-viscous liquid that does not penetrate too deeply into the fabric.

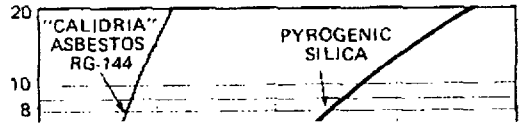
An addition of 0.5% "Calidria" asbestos RG-144 substantially improves the flow properties of a vinyl plastisol containing 50% plasticizer. It also gives excellent thixotropic properties, preventing seep-through and run-off and allowing greater film thicknesses. The film thickness can be easily controlled as the gelled plastisol shows no change in initial coating thickness.

As shown in the graph at the left below, RG-144 provides this viscosity improvement at a much lower cost than pyrogenic silica. In fact, only 0.5% RG-144 produces an equivalent thixotropic index at 3 and 30 rpm as 1% silica, as follows:

	Index
No Thickener	1
0.5% RG-144	4
1% Silica	4
2% Silica	3

"Calidria" asbestos RG-144 is also more effective than pyrogenic silica in preventing the plastisol from seeping through the fabric. In this test, the fabric was stretched over a specially made frame, and 50 g. of plastisol were spread over the material. Any plastisol which seeped through the fabric dripped into a beaker and was weighed after 30 minutes. The results are shown in the table below.

COST OF VISCOSITY IN
DIOCTYL PHTHALATE (DOP) PLASTICIZER



No seepage through the fabric occurred with a plastisol containing 0.5% "Calidria" asbestos RG-144. In contrast, 2% pyrogenic silica was [illegible] through, although [illegible] on a small amount of [illegible] through to the under-

...ams of Plastisol that ...eped through Fabric	
...idria" ...estos ...-144	Pyrogenic Silica
25	25
5	22
0	18
0	9
0	0

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Attention: "Calidria" Asbestos

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Typical Performance Data in VINYL PLASTISOLS Used as Fabric Coatings

"Calidria" asbestos RG-144 controls the flow behavior of vinyl-plastisol coating materials more efficiently and at lower cost than other thickeners. These coating materials — used in the manufacture of synthetic leathers, rainwear, awnings, and gaskets — are applied by pouring, dipping, and spreading. The plastisol must therefore be a non-viscous liquid that does not penetrate too deeply into the fabric.

An addition of 0.5% "Calidria" asbestos RG-144 substantially improves the flow properties of a vinyl plastisol containing 50% plasticizer. It also gives excellent thixotropic properties, preventing seep-through and run-off and allowing greater film thicknesses. The film thickness can be easily controlled as the gelled plastisol shows no change in initial coating thickness.

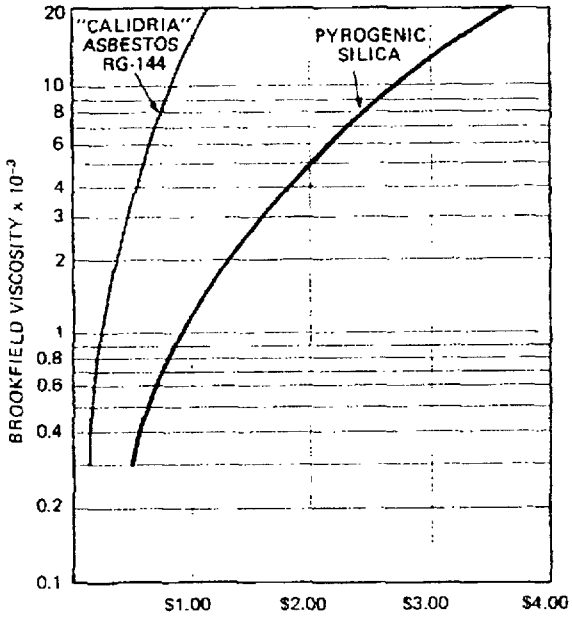
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No seepage through the fabric occurred with a plastisol containing 0.5% "Calidria" asbestos RG-144. In contrast, 2% pyrogenic silica was needed to eliminate drip through, although even at this concentration a small amount of the coating had seeped through to the underside of the fabric.

COST OF VISCOSITY IN DIOCTYL PHTHALATE (DOP) PLASTICIZER



Concentration of Thickener, %	Grams of Plastisol that Seeped through Fabric	
	"Calidria" Asbestos RG-144	Pyrogenic Silica
None	25	25
0.25	5	22
0.50	0	18
1.00	0	9
2.00	0	0

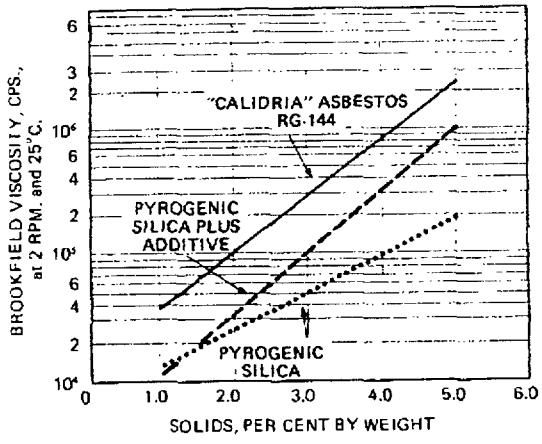
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Typical Performance Data in LIQUID EPOXY RESIN SYSTEMS

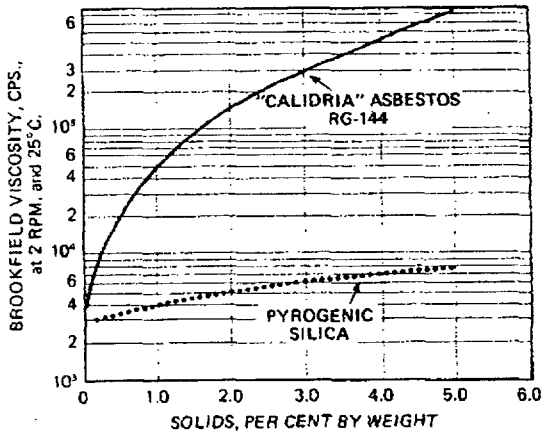
"Calidria" asbestos RG-144 is especially effective in improving the viscosity and thixotropy of liquid epoxy resin systems. The fiber improves these properties in both the resin and the hardener. In fact, RG-144 is so much more effective than competitive thickeners that up to 50% less material is needed to reach a particular viscosity or thixotropy level. Because "Calidria" asbestos RG-144 is also lower in price, its cost performance is outstanding.

The graphs below compare the viscosity and thixotropy increases provided by comparable additions of "Calidria" asbestos RG-144 and pyrogenic silica. RG-144 is shown to be more effective than silica in liquid epoxy resins and amine hardeners. In fact, RG-144 is so effective that additives usually recommended with pyrogenic silica are not needed.

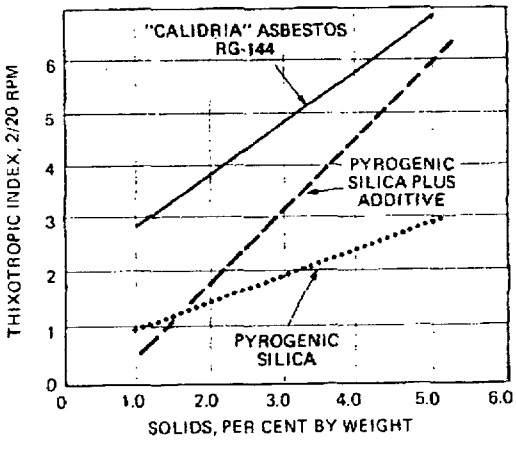
RESIN VISCOSITY – Typical Bisphenol A Liquid Epoxy Resin



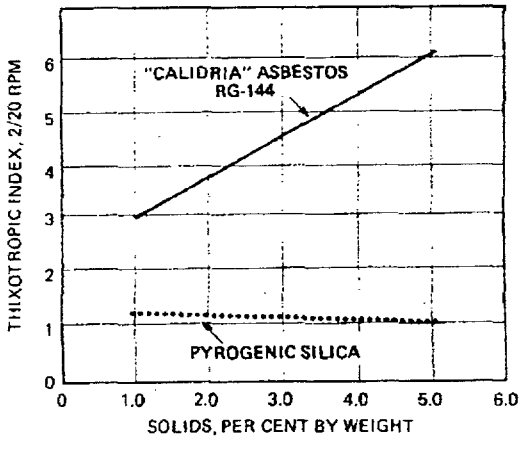
HARDENER VISCOSITY – Typical Minimum Irritation-Potential Amine Hardener



RESIN THIXOTROPY



HARDENER THIXOTROPY



PREPARATION – Thixotropes were added to the liquid resin or hardener at 25°C. and dispersed in a "Cowles" dissolver at 2400 rpm for 5 minutes.
MEASUREMENT – Viscosities were measured on a Brookfield model RVF viscometer at 2 and 20 rpm 24 hours after mixing.

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The exceptional shelf life of epoxy systems containing RG-144 is shown in the chart below. A bisphenol A epoxy was stored for 6 months without any significant change in viscosity or thixotropy.

SHELF LIFE OF BISPHENOL A EPOXY CONTAINING 4 PARTS OF "CALIDRIA" ASBESTOS RG-144 PER 100 PARTS OF RESIN

	24 hours	7 days	30 days	45 days	6 months
Brookfield Viscosity, cps at room temperature					
2 rpm	464,000	430,000	480,000	480,000	450,000
20 rpm	86,800	76,000	97,200	98,000	100,000
Thixotropic Index, 2/20 rpm	5.3	5.7	5.1	4.9	4.5

Typical Performance Data in BUTYL RUBBER CAULK

"Calidria" asbestos RG-144 meets the heavy demands of a thixotrope used in caulks that are predominantly rubber and find many applications as sealants. The product disperses quickly with minimum dust. It can be added at any time and in small increments, and it is not sensitive to overmixing. This gives the formulator wide latitude for balancing operating errors, equipment problems, cost, and performance. Few thixotropes can offer this versatility.

"Calidria" asbestos RG-144 also minimizes the side effects of using a thixotrope, such as adhesion loss, package stability, and channel cracking. This is partly due to the fiber shape of the product and also the greater ease of balancing the compound.

When RG-144 is added to a caulk batch, the caulk takes on a "whipped cream" texture which does not affect the porosity of the compound. The asbestos effectively increases gunning ease and extrusion rates and does not cause clogging.

A typical starting formulation, as recommended by Rubber Research Elastomerics, Inc. of Minneapolis, is:

10 parts	Butyl Rubber (80% solids)
1 part	Titanium Dioxide
15 parts	Calcium Carbonate
1½ parts	"Calidria" Asbestos RG-144
2 parts	VMP Naphthas

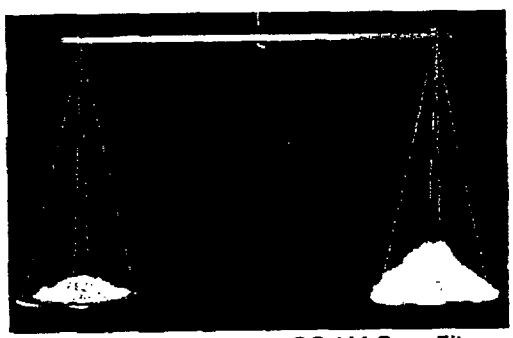
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Available in Pellets Too ... for Reduced Dust and Lower Costs

"Calidria" asbestos RG-144 is available as high-density pellets that minimize dust generation and reduce storage and shipping costs.

These 3/8-in. by 1/8-in. diameter pellets are packaged in 50-lb. shrink-wrapped bags on 2000-lb. pallets or they can be shipped in bulk-hopper cars holding about 90 tons. The pellets can be handled by conventional bulk-handling equipment.

"Calidria" asbestos RG-144 pellets require greater shear energy for optimum mixing, although a Cowles-type mixer is usually adequate.



RG-144 Pellets RG-144 Open Fiber

Two Forms of "Calidria" Asbestos RG-144 . . . Both Weigh the Same

Calidria ASBESTOS

INFORMATION ON PROPERTIES, APPLICATIONS, AND PRICES

Northeast	P.O. Box 579, Niagara Falls, New York 14302	716-278-3371
South	17 Executive Park Drive, Atlanta, Georgia 30329	404-633-6161
Midwest	P.O. Box 579, Niagara Falls, New York 14302	716-278-3355
West	100 Oceangate, Long Beach, California 90802	213-435-3721

MARKETING AND TECHNICAL CENTER

P.O. Box 579, Niagara Falls, New York 14302 716-278-3369

PLANT

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