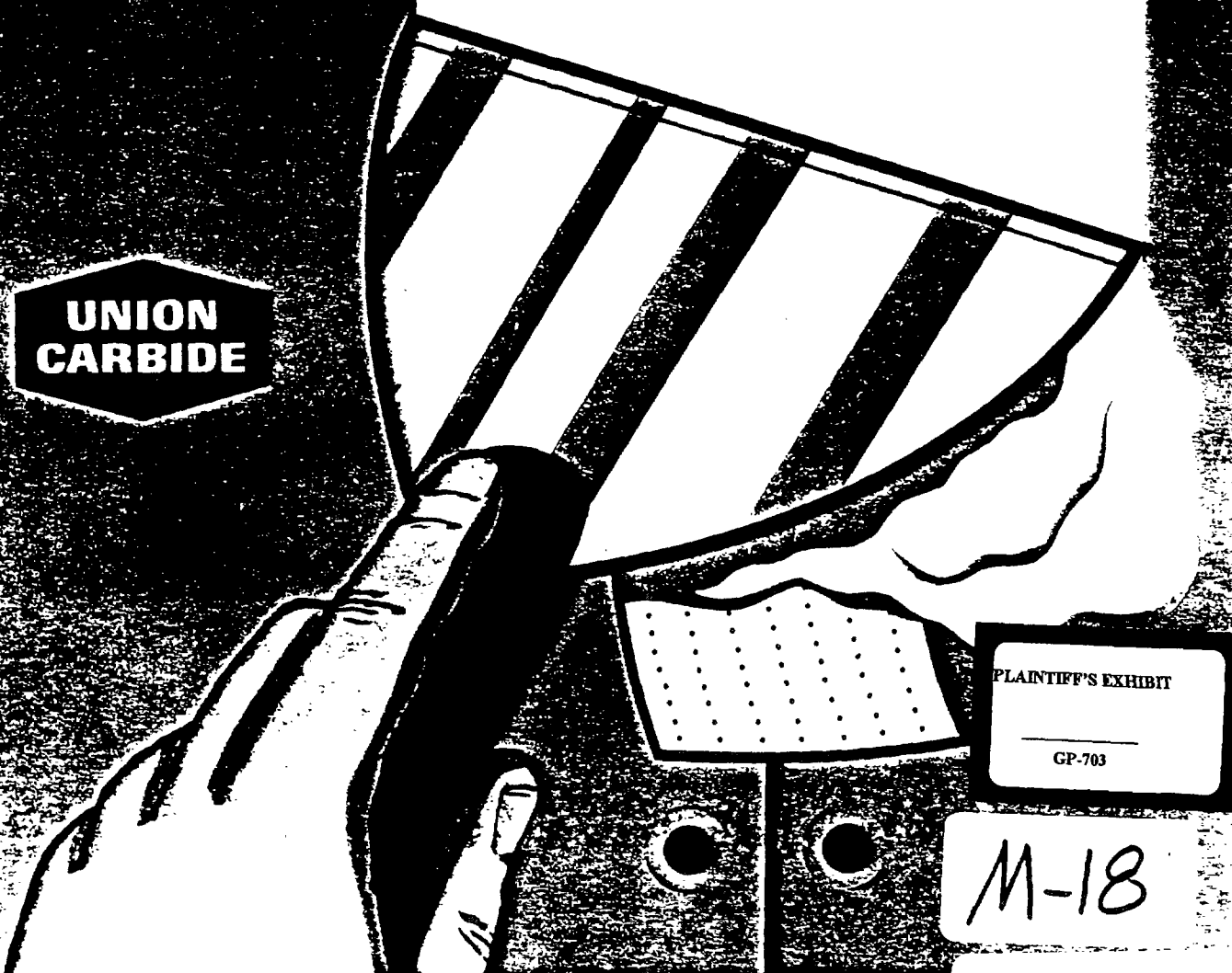


CALIDRIA

ASBESTOS SG-210

...an economical,
highly efficient product
to strengthen
and control viscosity
of dry and ready-mix

...TAPE-JOINT
COMPOUNDS



**UNION
CARBIDE**

PLAINTIFF'S EXHIBIT

GP-703

M-18

SGP 0021222

Calidria **ASBESTOS**

SG-210 for TAPE-JOINT COMPOUNDS

The high-purity, finely ground fibers of "Calidria" asbestos SG-210 offer many advantages compared to other types of asbestos including:

MORE EFFICIENT STRENGTHENING

"Calidria" asbestos SG-210 fibers are ground to a fine size, with over 85% of the fibers less than 325 mesh. The product therefore has a large surface area and more active sites to interact with the inert fillers in the compound. Formulators using "Calidria" asbestos therefore need less material to give dimensional strength to the finished joint.

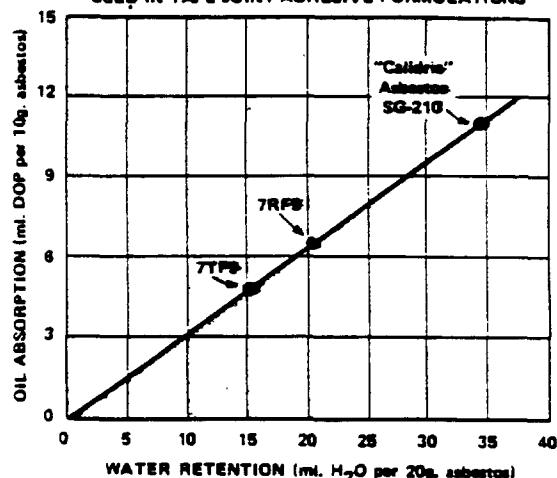
MORE EFFICIENT VISCOSITY CONTROL

The fibers of "Calidria" asbestos SG-210 can absorb vast amounts of water — generally about 400 times their weight. As shown by the graph above, this unique asbestos absorbs from 70 to 125% more water and oil than other types of asbestos. Thus, less "Calidria" asbestos is needed to reach a given viscosity.

40% SMALLER ADDITIONS

This reduction can be made by most users switching to "Calidria" asbestos SG-210 from other types of asbestos. Such a reduction allows substantial savings in the amount of asbestos to be handled and stored. To make up for the weight difference, extra limestone should be added to the system.

**WATER AND OIL ABSORPTION CAPACITY
OF DIFFERENT ASBESTOS PRODUCTS
USED IN TAPE JOINT ADHESIVE FORMULATIONS**



LESS CRACKING

The smaller addition needed with "Calidria" asbestos SG-210 reduces shrinkage problems that often occur with large asbestos additions. SG-210 users have reported that cracking over nailholes and along feathered edges has been minimized.

SMOOTHER, WHITER COMPOUNDS

The tiny particles of "Calidria" asbestos SG-210 give very smooth compounds when spread and dried. The absence of rock dust and abrasive fillers in this asbestos also contributes to the smoothness. There are no impurities that can discolor the system, so that a whiter compound can also be obtained.

CONVINCE YOURSELF

To test the effectiveness of "Calidria" asbestos SG-210, make up a small batch of your present formulation. Add 60% of your normal asbestos addition using "Calidria" asbestos SG-210. Then make up for the difference in weight using limestone. Overall water demand should be about the same but sometimes varies according to the ingredients in the formulation. Withhold about 10% of the water for final viscosity adjustment at the end of mixing. Then test the properties of the formulation made with SG-210 . . . and compare.

Why is "Calidria" asbestos different?

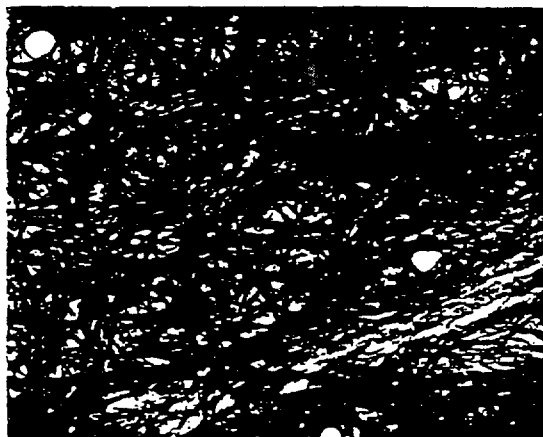
"Calidria" products are made from high-purity, short-fiber chrysotile asbestos obtained from a unique deposit about 160 miles south of San Francisco, California. Unlike conventional deposits that extend through the host rock, this deposit is essentially free of hard, consolidated rock masses. Further,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



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.

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.

SG-210 is finely ground for use in tape-joint compounds.



"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. The fibers contain virtually no rock dust, abrasive fillers, or impurities that can mar tape-joint compounds.

Use "Calidria" Asbestos T-135 in Acoustical and Texturing Compounds

Containing high-purity asbestos and TiO_2 , "Calidria" asbestos T-135 is a low-cost pigment with secondary thickening action. The titanium dioxide particles are uniformly dispersed along the asbestos fibers and are firmly fixed to the fiber surface by electrostatic attraction. These dispersed TiO_2 particles give maximum optical efficiency and allow T-135 to replace TiO_2 on a pound-for-pound basis. The effective thickening ability of the high-purity asbestos fibers also allows removal of asbestos and partial removal of other thickeners. "Calidria" asbestos T-135 therefore provides savings in many spray-ceiling acoustical and wall-texturing compounds.



UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
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**MARKETING AND
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PLANT: P.O. Box K, King City, California 93930 Tel.: 408-385-5961

"Calidria," "Cellosize," "UCAR," and "Union Carbide" are registered trade marks of Union Carbide Corporation.

PERFORMANCE DATA IN 3 READY-MIX FORMULATIONS

MATERIAL AND ORDER OF ADDITION*	BEDDING-COAT TAPE-JOINT COMPOUND		GENERAL-PURPOSE TAPE-JOINT COMPOUND		TAPE-JOINT TOPPING COMPOUND	
	lbs. per 100 Gal.	% by Weight	lbs. per 100 Gal.	% by Weight	lbs. per 100 Gal.	% by Weight
Thickener	424.16	31.39	421.67	31.35	399.81	28.27
	4.41	0.32	4.41	0.32	6.96	0.49
	1.72	0.13	1.73	0.13	1.84	0.13
	14.01	1.04	14.01	1.04	—	—
No. 1	90.94	6.73	—	—	80.47	5.89
	—	—	97.55	7.25	—	—
	5.23	0.39	—	—	4.62	0.33
	8.74	0.65	8.74	0.65	9.39	0.66
SG-210	39.62	2.92	39.19	2.92	42.17	2.97
	—	—	91.60	6.81	—	—
	184.34	13.66	91.60	6.81	23.36	1.65
	—	—	—	—	93.20	6.60
	35.04	2.60	21.71	1.62	9.24	0.66
No. 1 white	542.17	40.11	—	—	729.53	51.56
	0.88	0.06	—	—	—	—
	—	—	—	—	9.24	0.66
	—	—	4.35	0.32	4.67	0.33
No. 1 white	—	—	8.77	0.65	—	—
	—	—	539.69	40.13	—	—
	1351.26	100.00	1345.02	100.00	1414.50	100.00
TIES						
3rd Tape Resistance	35.1% 700 B.U.		35.1% 600 B.U.		30.66% 840 B.U.	
	100%		100%		100%	
	99%		95%		92%	
	Good		Good		Good	

*gallon mixer at 79 r.p.m.

SGP 0021226

TYPICAL PHYSICAL PROPERTIES

Reflectance (G.E. Photovoltmeter)	69%
Magnetite Content	2% max.
Alkalinity	0.5 to 0.6% of Na ₂ O
pH in Water (5% slurry)	8.5 to 9.5
Surface Area (BET)	50 to 60 sq. m. per g.
Oil (DOP) Absorption	100 to 110 lb. per 100 lb. asbestos
Water Absorption	62 to 65 weight % in filter cake
Wet Bulk Density (settled volume after 1 hour)	220 ml. for 10 g. asbestos in 250 ml. container
Dry Bulk Density	4 to 5.5 lb. per cu. ft.

SIZE DISTRIBUTION

Cumulative retained on 100 mesh screen	0.6%
Cumulative retained on 200 mesh screen	3 to 6%
Cumulative retained on 325 mesh screen	10 to 15%

PACKAGING AND AVAILABILITY

One Package — Weight (3-ply paper bag)	30 lb.
One Pallet — Weight — Dimensions	1,200 lb. approx. 53 in. x 44 in. x 69 in. high
Full 50-ft. Carload (available from King City, Calif. plant)	52 pallets 62,400 lb.
Full 40-ft. Truckload (available from several locations nationwide)	17 pallets 20,400 lb.

TYPICAL PER

INGREDIENTS
Water "Cellosize" TJC Bacteriostat Anionic Dispers
"UCAR" Latex "UCAR" Latex Dibutyl Phthalate Ethylene Glycol
"Calidria" Asbestos
Mica, AA Mica, P-80-F Mica, Ser-X Clay, ASP-400
Calcium Carbonate PD #1 Defoam Talcum Powder Water Conditioner Talc Calcium Carbonate
T
TYPICAL PRO
Water Content Brabender Visc Adhesion to W. Nailhole Crack Sandability

*Mixed 1.5 to 2.0 hours

CALIDRIA ASBESTOS

"CALIDRIA" ASBESTOS SG-130 AND SG-210 For Tape Joint Compounds

Lowers Costs Two Ways

CALIDRIA Asbestos acts as a bodying and secondary thickening agent permitting formulation of lower density, more economical tape joint compounds without the sacrifice of performance. CALIDRIA Asbestos is produced by a proprietary manufacturing process that yields unusually high fiber content and more complete fiber liberation from the natural bundles. As a result, CALIDRIA Asbestos goes up to twice as far, pound for pound, as commercial grades of asbestos containing large amounts of other filler materials that have no specific desirable effects on tape joint compound properties.

Reduces Cracking

The fibers of CALIDRIA Asbestos behave as an active lyophobic colloid in aqueous dispersion; by this mechanism CALIDRIA Asbestos increases tape joint compound liquid cohesive strength during drying. Increased liquid cohesive strength greatly reduces the tendency for cracks over nail holes, in thick sections at the center of the joint, and along the feathered edges.

Enhances Sandability

CALIDRIA Asbestos contains mainly chrysotile fiber and is essentially free from abrasive contaminants, such as magnetite and serpentine rock dust. This composition results in a low density product, free from contaminants that interfere with sanding.

Improves Uniformity

Narrow and well-controlled particle size distribution, low alkalinity and high brightness are characteristic of CALIDRIA Asbestos. These properties are consistent from batch to batch and improve the uniformity of tape joint compounds using CALIDRIA Asbestos.

Suggestions for Use of CALIDRIA Asbestos

CALIDRIA Asbestos can be readily used in your present tape joint compound formulation. Add approximately one-half the proportion of asbestos you now use. Increase the proportion of calcium carbonate or other inert filler to make up for the lower quantity of asbestos. You may also be able to use slightly more water in your ready-mix and maintain your present viscosity level. No other changes in your

SGP 0021228

October, 1968
F-42258

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"CALIDRIA" ASBESTOS SG-130 AND SG-210

For Tape Joint Compounds

Suggestions for Use of CALIDRIA Asbestos (Continued)

formulation or manufacturing procedure are required.

CALIDRIA Asbestos SG-130 has the coarser particle size; it finds use for

bedding compounds or perhaps spackling compound. The SG-210 has the finer particle size and is favored for topping compounds, all-purpose compositions, texture paints, and similar formulas.

A Suggested Ready-Mix Tape Joint Compound For Use With CALIDRIA Asbestos

	Parts by Weight Dry Basis
Fillers:	
Calcium Carbonate, No. 1 White (Thompson Weinman)	61.42
Mica, P80F (Western Mica).....	21.00
Clay, ASP-400 (Minerals and Chemicals Philipp Corp.)	4.00
CALIDRIA Asbestos, SG-210 (Union Carbide)	4.58
Binder:	
UCAR Latex 131 (Union Carbide).....	6.60*
Workability Control Agent:	
CELLOSIZ Thickener, TJC Grade (Union Carbide).....	0.50
Drying Control:	
Ethylene Glycol (Union Carbide).....	1.00
Defoamer:	
"Nopco" PD-1 (Nopco Chemical Company)	0.10
Dispersant:	
"Daxod" 30 (Dewey & Almy Chemical Div.).....	0.60*
Bacteriostat:	
"Dowicide" A (Dow Chemical Co.)	0.20
	100.00

Total Water: about 56 parts by weight per 100 parts dry solids

* Contained solids basis

"CALIDRIA" ASBESTOS SG-130 AND SG-210

For Tape Joint Compounds

Typical Product Characteristics

CALIDRIA Asbestos		
	SG-130	SG-210
Reflectance (G.E. Photovolt)	68%	
Contained magnetite	2% max. ✓	
Alkalinity (as % of Na ₂ O)	0.05 to 0.06	
pH (5% aqueous slurry)	8.5 to 9.5	
Surface area (BET)	50 to 60 m ² /g.	
Oil Adsorption (DOP # 100# asbestos)	90 to 100	110 to 120
Wet Bulk, settled vol. (ml.) 10g/250 ml./1 hr.	200	220
Dry Bulk (#/ft. ³)	7 to 8	5 to 6
Water absorption (wt. % in filter cake)	55 to 60	62 to 65
Size distribution (cumulative % retained)		
Wet Screen mesh size		
100	5	Trace
200	17	3
325	28 to 32	10 to 15

Packaging and Shipping Information

Product Form - Opened (finely ground) chrysotile asbestos fiber.

Packaging -

CALIDRIA Asbestos		
	SG-130	SG-210
One Package	40 lb.	30 lb.
Pallet Weight		
Carload	1,600 lb.	1,050 lb. ✓
Truckload	2,000 lb.	1,500 lb.

Shipping -

Classification - asbestos shorts

Rail point of origin - Welby, California (King City, California)

TOXICOLOGICAL PROPERTIES

It has been known for many years that some persons working in asbestos production were prone to develop a disabling lung disease. In time, this condition became known as asbestosis and was related to exposure to high concentrations of asbestos dust. With further experience, it was found that men could work with asbestos without development of lung disease if

dust concentrations were kept below a certain level. It is now generally accepted that a man can work a 40-hour week for a lifetime without developing asbestosis if the asbestos dust particle count is kept at or below 5 million particles per cubic foot of air. This dust concentration of 5 million particles per cubic foot of air is the Threshold Limit Value for asbestos, and no cases

TOXICOLOGICAL PROPERTIES (Continued)

of asbestosis are believed to have occurred when exposures have been maintained at or below this level, despite large-scale utilization (now approaching one million tons per year in the U.S.A.). This concentration of dust is generally not visible in the average work area unless a beam of light causing a Tyndall effect is present. Usually the dust concentration must be from 8-10 million particles per cubic foot before its presence is visible in average lighting conditions.

Several years ago, it was reported that there was an increase in the incidence of cancerous tumors, especially of the lung, associated with asbestosis. Recently there have been reports of some cancers occurring in individuals exposed to asbestos dust, but who have not developed clinical asbestosis. It is believed by most authorities that these cases have been associated with exposures significantly exceeding the Threshold Limit Value. A major manufacturer of asbestos products who also mines asbestos has not been able to show an increase in cancerous growths in men working where dust concentrations were maintained at the Threshold Limit Value.

Control of asbestos dust exposure is therefore necessary. The control methods are the standard ones applicable to a variety of dusty operations. They include closed

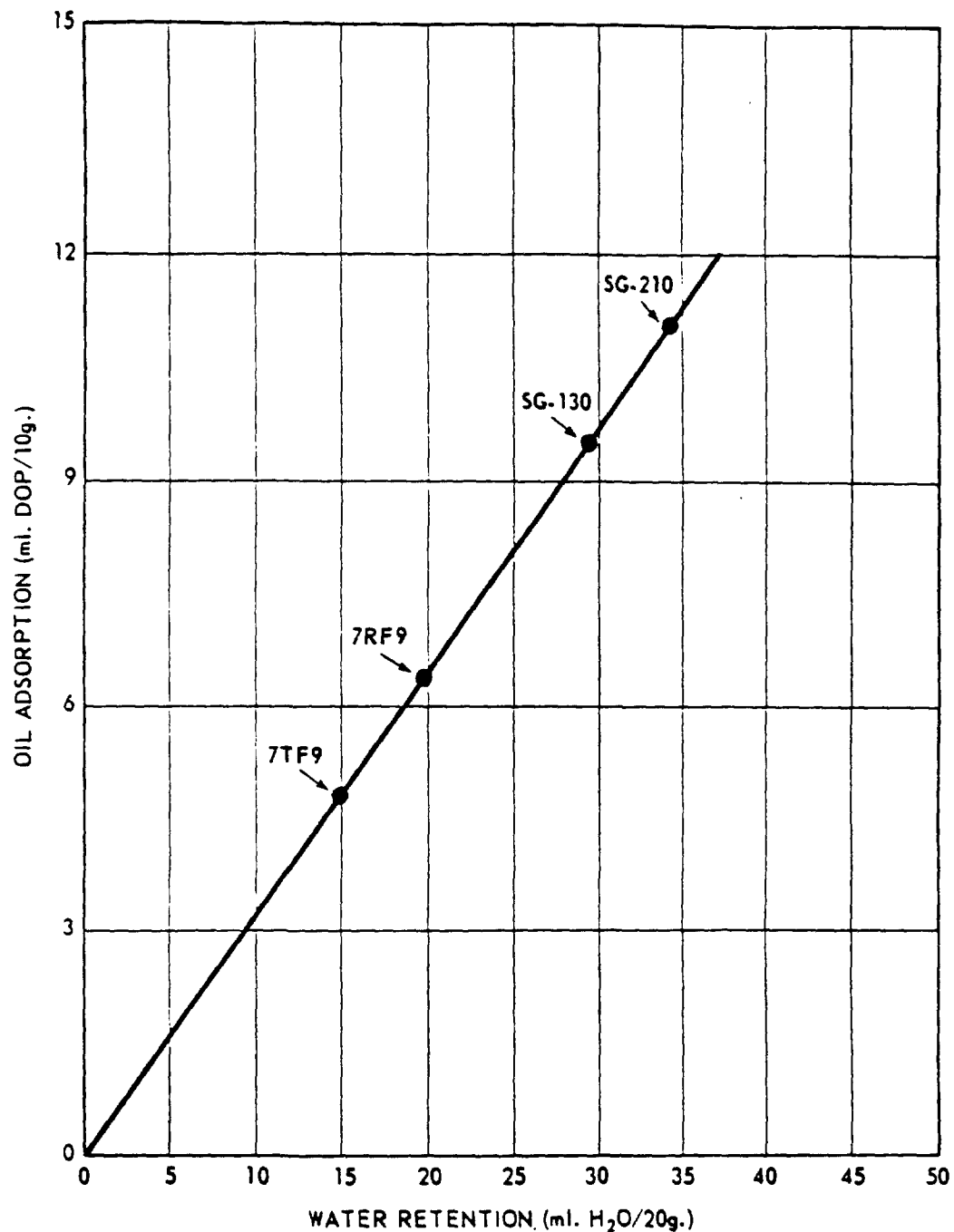
flow systems, wet processes where possible, and adequate exhaust ventilation where openings in the system are necessary. Pellerizing is sometimes used to improve the handling characteristics of otherwise dusty materials. Where satisfactory containment to stay within the Threshold Limit Value is impractical or impossible, efficient and reliable respirators are available for the protection of the employee. A program of environmental monitoring in manufacturing operations is highly desirable to determine that Threshold Limit Values are not being exceeded. Employees should wear respirators where dusting occurs in finishing products such as sanding taped joints.

Pre-employment and periodic physical examinations of workers are desirable. These should include chest X-rays to insure that the worker has no chest condition prior to work with asbestos and to determine that no lung changes are resulting from work with asbestos.

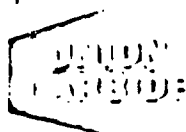
In conclusion, while asbestos dust in excess of the Threshold Limit Value is potentially harmful, as are many other dusts encountered in industry, it is as readily controlled as other such dusts and it can be used safely with appropriate precautions.

"CALIDRIA" ASBESTOS SG-130 AND SG-210

For Tape Joint Compounds



RELATIONSHIP BETWEEN WATER & OIL ADSORPTION
CAPACITY OF SOME ASBESTOS PRODUCTS
FOR TAPE JOINT ADHESIVE FORMULATIONS



THE DISCOVERY COMPANY

UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
270 PARK AVENUE, NEW YORK, N.Y. 10017

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SGP 0021233

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