PLAINTIFF'S EXHIBIT
UC-5439

IN THE CIRCUIT COURT OF THE ELEVENTH JUDICIAL CIRCUIT
IN AND FOR MIAMI DADE COUNTY, FLORIDA

Dennis M. Kavanaugh and
Ingeborg Kavanaugh, his wife,

Plaintiffs,

v.

AcandS, Inc., et al.,

Defendants.

NO. 02-21243

AFFIDAVIT OF JOHN MYERS IN SUPPORT OF DEFENDANT UNION CARBIDE'S MOTION FOR SUMMARY JUDGMENT

(ORAL ARGUMENT REQUESTED)

AFFIDAVIT OF JOHN MYERS

STATE OF CALIFORNIA

COUNTY OF MONTEREY

John L. Myers, being first duly sworn, states on oath as follows:

1. I was hired by Union Carbide in 1951. In 1966, I joined Union Carbide Corporation's asbestos group in Niagara Falls, New York. In 1967, I was transferred to King City, California, to work with Union Carbide's asbestos business. In 1970, I became Marketing Manager for the Calidria business. I held this position until 1981. Thereafter, I became Product and Production Manager. I held that position until the Calidria business was sold in 1985. I am currently Mayor of King City, California.

2. Union Carbide maintains a document repository relating to its former Calidria business ("Repository"). I have reviewed documents from the Repository.

3. The Repository contains records concerning historical communications with Calidria customers. Some of these documents are discussed below and attached as exhibits. These records were kept by Union Carbide in the regular course of business. These records were

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made at or near the time of the occurrence of the matters set forth by, or from information transmitted by, a person with knowledge of those matters. The records attached hereto as exhibits are duplicates of the originals (with the exception of Bates Numbers), which were retained at Union Carbide.

4. Union Carbide began mining and milling asbestos ore near King City, California in 1963. "Calidria" was the brand name of Union Carbide's unique short-fiber raw chrysotile asbestos.

5. Union Carbide first sold Calidria for use in tape joint compounds to Georgia Pacific ("GP") in January of 1970.

6. Union Carbide thoroughly educated its salesmen and others about the health hazards and any regulatory requirements associated with asbestos and directed its salesmen to share this information with customers through phone calls, sales calls, mailings, seminars and meetings.

7. I was personally involved in making sure that our customers knew and appreciated the hazards associated with asbestos. For example, I spoke at a number of seminars and technical meetings in which I discussed the health hazards associated with asbestos. The audience often included Calidria customers and potential Calidria customers.

8. Although Union Carbide communicated regularly with its customers, including GP and USG, regarding its knowledge of hazards associated with asbestos, Union Carbide never had or exercised any control over the formulation, packaging, labeling, marketing, selling, or distribution of any finished GP or USG product containing Union Carbide's Calidria asbestos, including the decision to use asbestos fiber and the manner in which the fiber would be used.

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9. Similarly, Union Carbide was not involved in any decision-making process by which GP and USG decided whether or not to warn GP or USG customers or end users about the hazards of asbestos, and if so, the content of any such warning.

Warning Labels

10. Beginning in June 1968, Union Carbide placed warnings on its bags of Calidria asbestos sold to customers. Warnings were not required on bags of asbestos until 1972. The warnings stated:

WARNING: BREATHING DUST MAY BE HARMFUL
DO NOT BREATHE DUST

11. In 1972, Union Carbide changed the warning on its bags of asbestos to comply with the OSHA regulation, which required that the warning state:

CAUTION
Contains Asbestos Fibers
Avoid Creating Dust
Breathing Asbestos Dust May Cause
Serious Bodily Harm

Toxicology Reports

12. In 1964, Union Carbide's Toxicology Department prepared an "Asbestos Toxicology Report." This report was amended a number of times as more was learned about the health effects of asbestos exposure. This report was passed out, mailed and made available to Calidria customers. A true and correct copy of this "Asbestos Toxicology Report" is attached as Exhibit A.

13. The original "Asbestos Toxicology Report" (with a few revisions) was included in an October 1968 brochure provided to manufacturers of tape joint compounds. A true and correct copy of this brochure is attached as Exhibit B.

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14. Union Carbide thereafter revised its Toxicology Report in 1969, 1970, and 1972 to reflect developments in the knowledge regarding the health risks potentially associated with asbestos.

15. Union Carbide prepared a revised "Asbestos Toxicology Report" in 1969. This revised "Asbestos Toxicology Report," a true and correct copy of which is attached as Exhibit C, was provided to Calidria customers at least by May 9, 1969.

16. A "Status Summary - Mid 1970 Asbestos Toxicology" report was prepared by Union Carbide and sent to customers at least by August 6, 1970. A true and correct copy of this report is attached as Exhibit D.

17. Another report, entitled "Asbestos Toxicology" was prepared by Union Carbide in October of 1972 and sent to Calidria customers. A true and correct copy of this report is attached as Exhibit E. This report attached a number of articles concerning asbestos toxicology, including the National Academy of Sciences publication entitled "Airborne Asbestos," discussed above.

18. The aforementioned Toxicology Reports were distributed to Union Carbide's customers in face-to-face meetings and by mail.

Literature Available for Mailing on the Safe Use of Asbestos

19. In addition to Toxicology Reports, Union Carbide maintained for customer distribution a list of published regulations, reports, and objective scientific and medical literature regarding the potential health risks associated with asbestos, which included, among numerous other items, the 1972 OSHA Regulations, the 1973 EPA regulations, and the National Academy of Sciences report entitled "Airborne Asbestos." Copies of these published regulations, reports, and literature were provided to customers during meetings and by mail.

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20. In 1974, I compiled a list of 29 different pieces of literature that were available for mailing on the safe use of asbestos. I thought that these items would answer most questions on the potential hazards associated with the use of asbestos. On February 12, 1974, I sent a memorandum to our salesmen which attached this list and directed the salesmen to provide these materials to customers and potential customers. This list included the 1971 National Academy of Sciences publication entitled "Airborne Asbestos," discussed above. A true and correct copy of the February 12, 1974 memorandum and the list is attached as Exhibit F.

21. In sum, Union Carbide warned its customers about the hazards of asbestos in a variety of ways, which included: (1) the Asbestos Toxicology Reports: (2) the warnings on the bags; (3) phone calls and sales calls in which we discussed asbestos toxicology and regulatory issues with customers; (4) the mailings that discussed asbestos health issues, the safe use of asbestos and regulatory issues; (5) providing customers with pamphlets and information about the asbestos health issue to provide to their employees, their customers, and their customers' employees; (6) making customers aware of our collection of literature addressing the safe use of asbestos and asbestos toxicological issues available to them upon request; and (7) speaking at seminars and meetings regarding the asbestos health issues.

FURTHER AFFIANT SAYETH NOT.

John L. Myers

JOHN L. MYERS

SWORN AND SUBSCRIBED
before me this 12 day of
January, 2003

Paula Anna Harris

PAULA ANNA HARRIS
COMM. #1243195
NOTARY PUBLIC-CALIFORNIA
PRINCIPAL OFFICE IN
MONTEREY COUNTY
My Commission Exp. Nov. 23, 2003

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ATTACHMENT A

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

ASBESTOS TOXICOLOGY REPORT

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 of asbestosis are known 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. Pelletizing 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 is highly desirable to determine that Threshold Limit Values are not being exceeded. In paper manufacturing, it would be desirable to know the dust concentrations where the asbestos is dumped from bags into the pulp slurry. Concentrations should also be determined where dusting occurs in

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finishing products. While initial dust determinations should be made at frequent intervals, once the level has been established as satisfactory, the frequency may be extended to occasional tests to assure continuation of a satisfactory condition.

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.

It is believed that the addition of asbestos at the proposed levels during the manufacture of paper products would be harmless to the consumer. Total dusting would have to be well in excess of any levels acceptable to the consumer for the asbestos concentration to approach the Threshold Limit Value.

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.

Carl U. Dernehl, M.D.
Director of Toxicology

K. S. Lane, M.D.
Assistant Director of Toxicology

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ATTACHMENT B

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UNION CARBIDE THE DISCOVERY COMPANY

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

October, 1968
F-42258

CALIDRIA, CELLOSIZE, UCAR, and UNION CARBIDE are trade marks of Union Carbide Corporation.

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

"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:	
CELLOSIZE 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:	
"Daxad" 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

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"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_2O)	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 g/100g asbestos)	90 to 100	110 to 120
Wet Bulk, settled vol. (ml.) 10g/250 ml./1 hr.	200	220
Dry Bulk (g/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

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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.

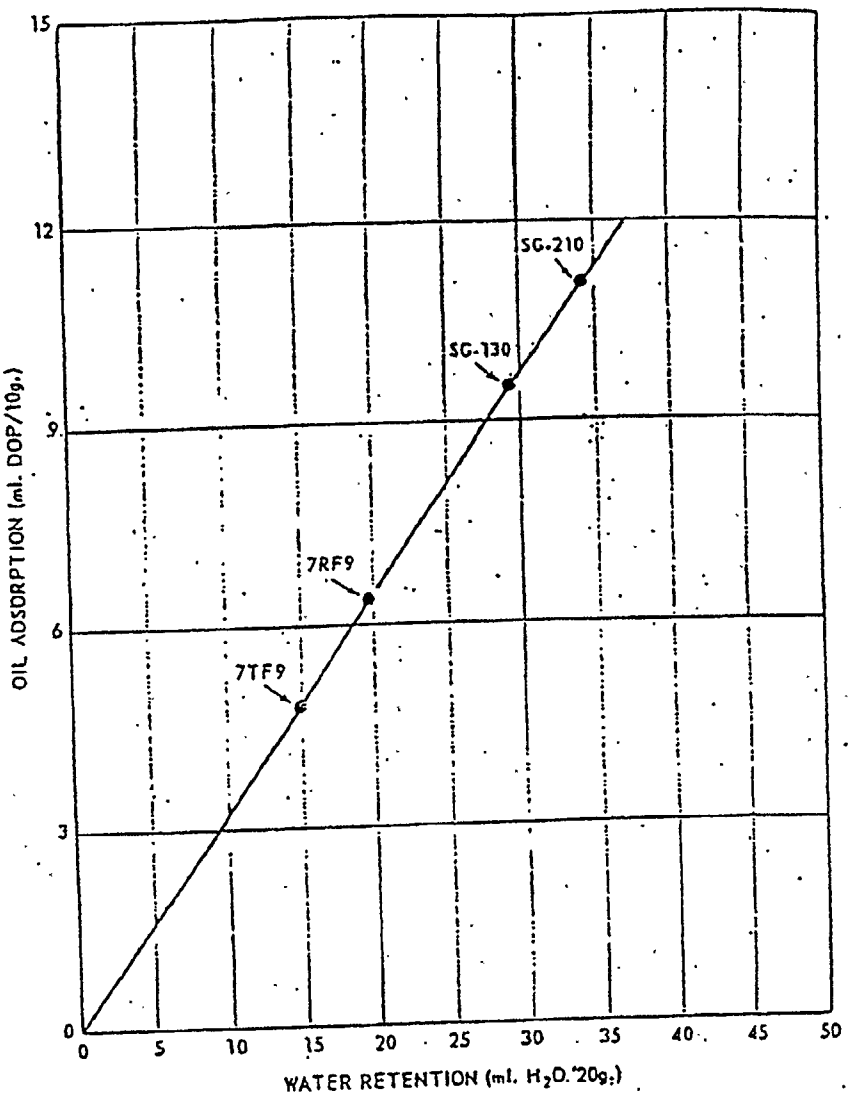
Control of asbestos dust exposure is therefore necessary. The control methods are the standard ones applicable to a variety of dusty operations. They include closed flow systems, wet processes where possible, and adequate exhaust ventilation where openings in the system are necessary. Pelletizing is 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

Sales Offices

United States	ATLANTA, GEORGIA 30309	1371 Peachtree St. N. E. — 404-892-7500
	BALTIMORE, MARYLAND 21207	Beltway Bldg., 6707 Whitestone Rd. — 301-944-8211
	BOSTON, MASSACHUSETTS 02194	300 First Ave., Needham Hgts. — 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, MICHIGAN 48221	10421 West Seven Mile Rd. — 313-341-3131
	HARTFORD, CONNECTICUT 06103	410 Asylum St. — 203-525-9345
	HOUSTON, TEXAS 77027	3839 West Alabama Ave. — 713-621-1000
	INDIANAPOLIS, INDIANA 46220	720 Broad Ripple Ave. — 317-255-3181
	KANSAS CITY, MISSOURI 64141	910 Baltimore Ave. — 816-221-2400
	LOS ANGELES, CALIFORNIA 90058	2770 Leonis Blvd. — 213-583-3061
	MEMPHIS, TENNESSEE 38116	3385 Airways Blvd. — 901-396-5375
	MINNEAPOLIS, MINNESOTA 55416	3033 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. — 212-551-4641
	PHILADELPHIA (MOORESTOWN, NEW JERSEY SALES OFFICE)	215-923-3200
	PITTSBURGH, PENNSYLVANIA 15220	P'kway Center, 875 Greentree Rd. — 412-922-5700
	ST. LOUIS, MISSOURI 63105	10 South Brentwood Blvd. — 314-726-0324
	SAN FRANCISCO, CALIFORNIA 94106	22 Battery St. — 415-982-1360
	SEATTLE, WASHINGTON 98118	4726 Rainier Ave., South — 206-723-8660
	TULSA, OKLAHOMA 74114	2901 South Harvard — 918-742-5524

Affiliates

Pan America	ARGENTINA	Union Carbide Inter-America, Inc., Buenos Aires
	BRAZIL	Union Carbide do Brasil S. A., Sao Paulo, Rio de Janeiro
	CANADA	Union Carbide Canada Ltd., Calgary, Lachine (P.Q.), Toronto, Vancouver, Winnipeg
	CARIBBEAN	Union Carbide Inter-America, Inc., San Juan, Puerto Rico
	CENTRAL AMERICA	Union Carbide Inter-America, Inc., Panama City, Panama
	CHILE	Union Carbide Comercial Chile Ltd., Santiago
	COLOMBIA	Union Carbide Colombia, S. A., Bogota
	MEXICO	Unicarb Comercial, S. A. de C. V., Mexico, D. F., Guadalajara, Monterrey
	PERU	Union Carbide Inter-America, Inc., Lima
	VENEZUELA	Union Carbide de Venezuela, C. A., Caracas
	WESTERN HEMISPHERE	Union Carbide Inter-America, Inc., New York, N. Y.
Eastern	AUSTRALIA	Union Carbide Australia Ltd., Sydney, N. S. W.
	HONG KONG	Union Carbide Asia Ltd., Hong Kong
	INDIA	Union Carbide India Ltd., Calcutta, Bombay, Madras, New Delhi
	NEW ZEALAND	Union Carbide New Zealand (Pty) Ltd., Auckland
	PAKISTAN	National Carbon Co. (Pakistan) Ltd., Karachi
	PHILIPPINES	Union Carbide Philippines Inc., Manila
	SINGAPORE	Union Carbide Singapore Ltd., Singapore
Europe Middle East and North Africa	AUSTRIA	Union Carbide Austria Ges. mbH., Vienna
	BELGIUM	Union Carbide Belgium N. V., Brussels
	FRANCE	Union Carbide Europe s.a., Succursale Francaise, Puteaux-Paris
	GERMANY	Union Carbide Deutschland, GmbH, Dusseldorf
	ITALY	Union Carbide Italia S.p.A., Milan
	MIDDLE EAST	Union Carbide Middle East Ltd., Athens, Greece
	NETHERLANDS	Union Carbide Belgium N. V., Amsterdam
	SCANDINAVIA	Union Carbide Norden A.B., Stockholm, Sweden
	SPAIN	Union Carbide Iberica S. A., Madrid
	SWITZERLAND	Union Carbide Europe s.a., Geneva
	UNITED KINGDOM	Union Carbide U. K. Limited, London, Manchester, Rickmansworth, England
Africa	AFRICA (EAST)	Union Carbide Africa Ltd., Nairobi, Kenya
	AFRICA (SOUTH)	Union Carbide South Africa (Pty) Ltd., Johannesburg, Capetown, Durban, Republic of South Africa

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ATTACHMENT C

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Caltrion ASBESTOS

ASBESTOS TOXICOLOGY REPORT

It has been known for 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.

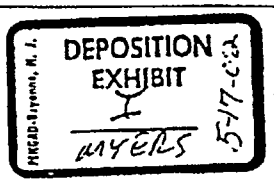
It has been generally accepted that a worker will not develop asbestosis if he is exposed to no more than 5 million particles per cubic foot of air, even if this exposure continues for his entire working lifetime. Although no cases of asbestosis are known to have occurred when exposures have been maintained at or below this level, the ACGIH (which sets the threshold limit value (TLV) in the U. S. A.) has indicated they intend to lower the TLV for asbestos to 2 million particles per cubit foot in an effort to increase the safety factor incorporated in the limit. The U. S. Department of Labor has already issued a regulation under the Walsh-Healy Act placing the TLV for asbestos at 2 million particles per cubic foot for public contracts in which they have jurisdiction. 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 (MPPCF) 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 type of cancer named mesothelioma has been noted to be associated with asbestos exposure in recent years. These tumors, while rather few in number to date, may occur in individuals with histories of only slight exposures, and that as much as twenty to forty years earlier. There is considerable evidence that crocidolite is most frequently associated with mesotheliomas. From the data available it appears that the TLV of 5 MPPCF may not be low enough to protect against mesotheliomas. Research on the problem continues.

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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. Pelletizing 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 is highly desirable to determine that Threshold Limit Values are not being exceeded. In manufacturing industries it would be desirable to know the dust concentrations where the asbestos is dumped from bags into the process. Concentrations should also be determined where dusting occurs in finishing products. While initial dust determinations should be made at frequent intervals, once the level has been established as satisfactory, the frequency may be extended to occasional tests to assure continuation of a satisfactory condition.

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Industrial Medicine And
Toxicology Department
Union Carbide Corporation

5/8/69

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ATTACHMENT D

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THE DISCOVERY COMPANY

b.c. H. E. Byrne
B. L. Ingalls
P. McDaniel
J. L. My
J. A. Ri
A. Steva

Calidria ASBESTOS

RESEARCH AND DEVELOPMENT DEPARTMENT

UNION CARBIDE CORPORATION

4625 ROYAL AVE., P. O. BOX 878, NIAGARA FALLS, NEW YORK 14302

August 6, 1970

Mr. John Juett
International Shoe Co.
Box 3248
Bryan, Texas

Dear Mr. Juett:

The asbestos toxicology information which was promised during my recent visit to Texas is attached. The presentation points out the most pertinent statements, but in recognition of the pitfalls of quoting out of context, also provides the complete articles for your examination.

It has also been learned that we have a man in the UCC Industrial Hygiene Department in New York who makes regular checks on our asbestos plant operation in King City, California. If you think it would be helpful, we would be glad to arrange to have him visit with you in Bryan and possibly also talk with your Union representatives. His asbestos experience is particularly pertinent to your problem.

As we also discussed, International Shoe would have no further interest in asbestos unless it provides worthwhile cost-performance advantage over an alternative approach which does not have the toxicology opposition. From what you have told me about your end use and high shear compounding, I would think that High Purity Pellets will work as well, or quite possibly better than, T-135 Open. The HPP product costs less than half as much as T-135. Current price lists are enclosed.

It was a pleasure talking with you and we hope that this information will make it practical for you to look further at asbestos. If we can be of any assistance, please let us know.

Very truly yours,

H. B. Rhodes

H. B. Rhodes
Technical Services - CALIDRIA Asbestos

HBR/bsn
Attach.
cc: Mr. K. E. Wiley

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STATUS SUMMARY - MID 1970

ASBESTOS TOXICOLOGY

CALIDRIA ASBESTOS
UNION CARBIDE CORPORATION
P.O.BOX 579
NIAGARA FALLS, N.Y. 14302

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INTRODUCTION

Over the past several years a great deal has been said in the public press regarding the potential health hazards of asbestos. Much of this has been based on a classic work of environmental medicine by Dr. Irving J. Selikoff now at the Mt. Sinai School of Medicine in New York City. Although Dr. Selikoff's work covered only a single end use, sprayed asbestos for the insulation of steel frame buildings, it has been extrapolated and interpreted by others to give a widely held impression that asbestos is an extremely dangerous material. This report is intended to provide some of the most recent information on this subject so that objective judgments may be made.

CONCLUSIONS

These references lead to the conclusion that there is a hazard in the use of asbestos. As the McGill study points out, however, even under poorly controlled dust conditions ..."the total number of respiratory diseases attributable to asbestos was very small." Asbestos thus appears to be a typical industrial raw material, i.e., it has some handling hazards but can be used safely as long as reasonable care is exercised. There are explicit government specifications on allowable dust levels that constitute safe handling.

The Union Carbide Corporation Industrial Medicine and Toxicology Department has prepared a more detailed summary of the current state of knowledge on asbestos toxicology. It is attached for reference.

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EXPERIENCE WITH SPRAYED ASBESTOS IN THE BUILDING TRADES

A synopsis of Dr. Selikoff's latest thinking is given in an article in the Engineering News Record of April 2, 1970. A copy of this article is attached for reference with the following quotations particularly pertinent here:

> "From buildings under construction there is often a gentle floating fall of a cottony material. This material that fails to adhere to the steel as it should and blows up, down, around and across a job and sometimes over wide sections of a city on windy days."

> "The resulting storm of asbestos dust is a potential danger to everyone on the job, according to Dr. Selikoff. He has not as yet gathered extensive data on the threat to the general public and will not guess the possible incidence of asbestosis or lung cancer among those not directly working with asbestos but intermittently exposed to it in a casual way."

> "Dr. Selikoff says that products in which asbestos has been bonded into the material, such as floor and ceiling tiles, roofing, siding, and pipe, are not considered a cause of cancer."

This position is also amplified by the following additional quotations of Dr. Selikoff from another source.(1)

SELIKOFF

> Of the eighty-seven men who didn't smoke cigarettes, we didn't expect any to die of lung cancer, because people who don't smoke cigarettes by and large don't die of lung cancer, although a few do. That has been our experience among the asbestos workers as well. We have yet to see in New York City a death due to lung cancer in an asbestos worker who didn't smoke cigarettes. On the other hand, of the two hundred and eighty-three men who had a history of cigarette smoking, we should have expected, as cigarette smokers, two or three deaths due to lung cancer. There have

(1) Men and Molecules, American Chemical Society News Service, 1155 Sixteenth St. N.W., Washington, D.C. 20036

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been twenty-seven. This indicates that there is some combined multiple effect between asbestos and lung cancer. Dr. Hammond has calculated that an asbestos worker who smokes cigarettes has ninety-two times the risk of dying of lung cancer as compared with a person who neither works with asbestos, nor smokes cigarettes. Therefore, if asbestos workers will stop smoking cigarettes, and many have, we can probably eliminate a large part of the risk of lung cancer among them.

NARRATOR

Unfortunately, at this point, there is no simple way to reduce the other possible result of working with asbestos--the appearance, twenty-five to thirty years after the fact, of mesothelioma, the cancer of lung and abdominal tissue, that is now a fatal and virtually incurable disease.

SELIKOFF

We have observed mesothelioma among asbestos workers who do not smoke cigarettes. Therefore, a second approach is necessary: the approach of sharply decreasing the exposure to asbestos. Now, most of these men began work, and were exposed to asbestos, at a time when the risk was not known. Therefore, precautions were either minimal or non-existent. We now know these risks, and, therefore, it is important for us to design measures, knowing these risks, to eliminate them.

It is important to note that Dr. Selikoff worked with men who generally had extended exposure to generally high levels of asbestos. This leading medical expert in the field is advocating that asbestos be handled with reasonable care, not that it be banned.

EXPERIENCE IN ASBESTOS MILLS AND GENERAL ENVIRONMENT

The most recent information in this area was reported in the magazine Asbestos in May 1970. A copy of this article is attached for reference. The results of a three-year survey by a research team from the medical faculty of McGill University provides the following key information:

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> "...at present levels of dust exposure in modern asbestos mills, even 30 years' employment would probably not carry any measurable risk of lung cancer."

> "Two points must be emphasized," declared Dr. McDonald. "First that the dust exposure experienced by these workers occurred many years ago when environmental conditions in the asbestos mills were poorly controlled and second, that the total number of respiratory diseases attributable to asbestos was very small."

> "The two sets of results confirm the association between occupational exposure to asbestos and these two varieties of respiratory cancer. The results are nevertheless encouraging in that they suggest the risk is virtually confined to levels of dust exposure which are controllable, if not already controlled, in most Canadian asbestos mines and mills."

Perhaps the most significant aspect of this work is the finding that:

> "There was no increased number of cases whose contact was limited to residence in the neighborhood of asbestos mines or mills."

It is noteworthy that these workers also find that additional factors beyond asbestos are probably involved in mesothelioma.

> "Close surveillance over the occurrence of suspected mesotheliomas in Canada, so as to better understand their cause. Asbestos exposure has failed to explain most of them and is probably not the only factor when present." Dr. McDonald commented.

ACTION BY THE U.S. GOVERNMENT

Allowable levels of industrial dusts have long been controlled by the Federal and State governments. The latest thinking has been incorporated into the Walsh-Healy Public Contracts Act which went into effect on February 17, 1969. A copy is attached.

This Act reduces the allowable level of asbestos dust from 5 to 2 million particles per cubic foot. Although it has been generally

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accepted that a worker will not develop asbestosis if he is exposed to no more than 5 million particles per cubic foot of air, even if the exposure continues for his entire working lifetime, the reduction in allowable limit represents an effort to increase the safety factor.

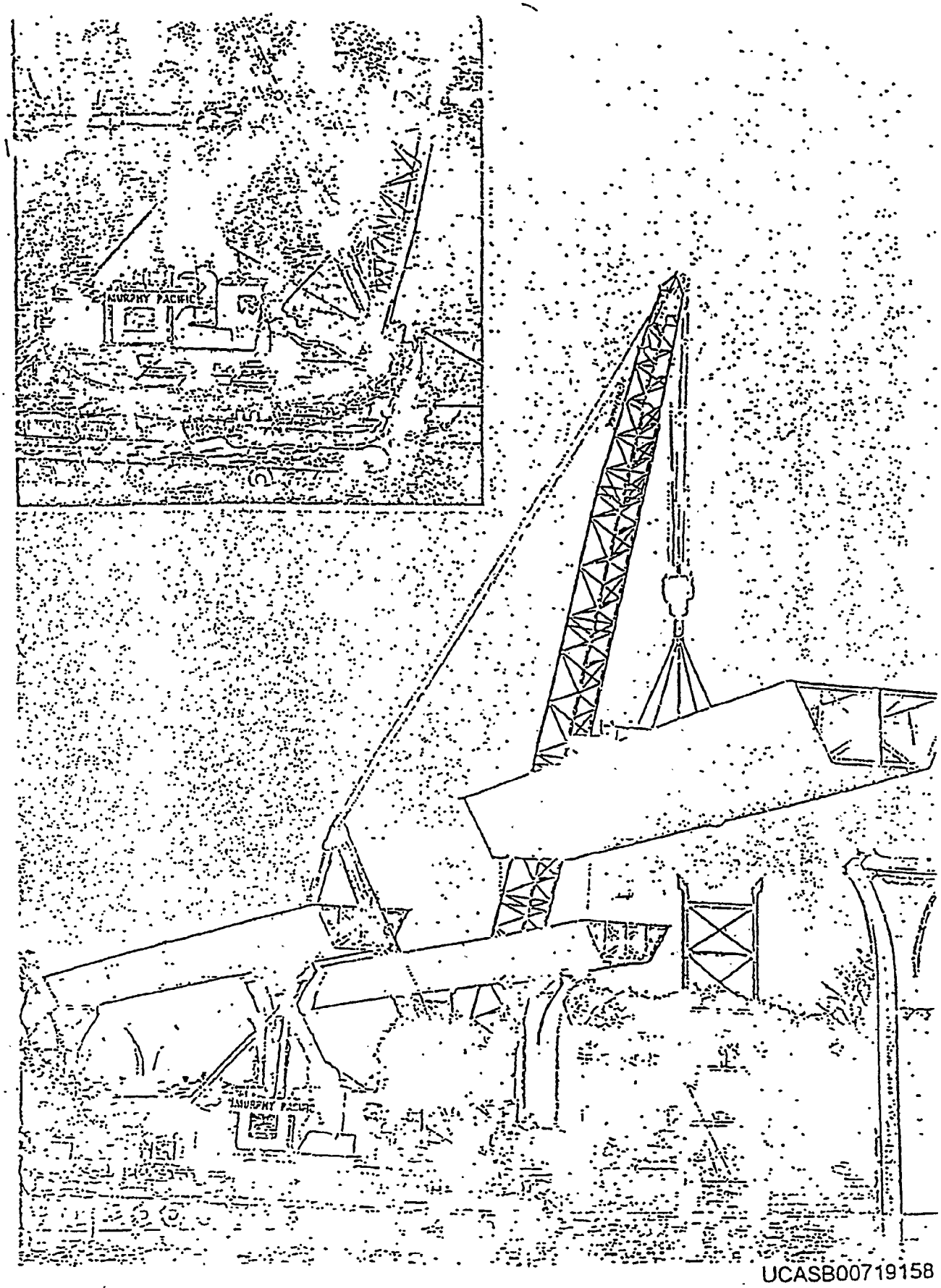
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Engineering News-Record
McGRAW-HILL'S CONSTRUCTION WEEKLY
APRIL 2 1970 / 75¢

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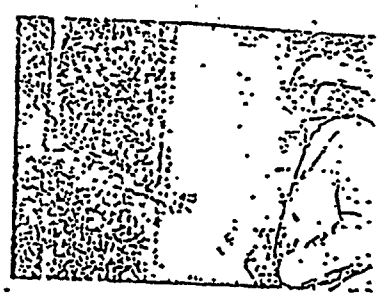
Does sprayed asbestos cause lung cancer?

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Loose asbestos fiber seen as cancer threat to men in building trades



Medical researchers have found strong evidence that sprayed asbestos used in fireproofing steel-framed buildings causes cancer in men who work on these buildings.

The hazards of asbestos are becoming a public issue. New York City is considering regulating its use and a California legislator introduced a bill this year to prohibit installation of asbestos inside air duct systems in public buildings. So far, however, no positive legislative action to control its use or method of application has been enacted.

The most likely victims are the men who spray the asbestos mixture on exposed steel members and ductwork and apparently inhaled the heaviest amounts of asbestos fiber.

Once asbestos fibers enter the pulmonary or gastro-intestinal tract, they never leave the body, never break down. Medical research is making an increasingly strong case against these fibers as a source of cancer.

The asbestos fibers and dust particles, those highly visible during a spraying operation and the millions of microscopic ones, also cause asbestosis, which is associated with lung cancer.

Three physicians have statistically tied asbestos to cancer among workers in or closely allied to the building trades. They are: Dr. Irving J. Selikoff, director of the Division of Environmental Medicine at Mt. Sinai Hospital, in New York City; Dr. Jacob Churg, chief pathologist at Barnert Memorial Hospital, of Paterson, N.J.; and Dr. E. Cuyler Hammond, vice president for epidemiology and statistics of the American Cancer Society.

In 1962 they compiled a list of 632 men who, as of Dec. 31, 1942, had been members of two metropolitan New York City locals of the International Association of Heat and Frost Insulators and Asbestos Workers (IAHFIAW), AFL-CIO, and who had been exposed to asbestos for 20 years or more. Union, medical and insurance records showed that in the 1932-1962 period, 262 out of the 632 had died, seven before 20 years of exposure. On the basis of ages of the study group, the normal death total should have been 203.

Moreover, 45 died of lung cancer, when actuarial tables anticipated only six. And another 50 deaths resulted from other types of cancer. Of this number, 29 died of gastro-intestinal cancer, although only 10 would have been the normal number for this disease.

Still working with the original list, Dr. Selikoff later found that between January, 1963, and March, 1968, of the 370 survivors of the original 632 men, 113 more had died, while standard mortality tables would predict only 50 deaths. Of the 113 deaths, 28 were caused by cancer in the pulmonary tract, eight by gastro-intestinal cancers and 15 from asbestosis, which is a build-up of scar tissue in the lungs resulting from the presence of asbestos particles.

The scarring impairs the lungs so severely that they cannot absorb sufficient oxygen. There is no cure. Death, a strangulating, coughing demise, is the only end.

Dr. Selikoff says that products in which asbestos has been bonded into the material, such as floor and ceiling tiles, roofing, siding and pipe, are not considered a cause of cancer.

The data that scares. The data disclosed by Dr. Selikoff pushed the New York City Department of Air Resources into a start on writing regulations that would regulate the spray application of asbestos for both fireproofing and insulation.

The regulations would require: Before insulating and fireproofing material is applied, the entire floor of the area involved in the operation be cleared of all objects, materials and equipment except that needed to apply the material.

- As the material falls to the floor, fr ments be swept up immediately a placed in special containers.
- Wet sweeping of the area, and vac uming to pick up the material that h dried.
- Enclosure tarpaulins not be d mantled for 24 hours after completi of clean-up unless adequate mechanic means are provided to clean the within the enclosed area.

Great Britain already has strict reg lation of sprayed asbestos fireproofi (see box).

Richard L. Ottinger, a Democra member of the House of Represent tives from Westchester County, N.Y last week latched on to the sprayed-a bestos operation as an environment issue with political appeal.

Ottinger, a cosponsor of the feder Air Quality Act of 1967, charges th New Yorkers are exposed to tons of ca cer-causing asbestos dust every year. H specifically cites the sprayed-asbest method of fireproofing buildings a demands that the federal governme impose regulations governing the use asbestos.

He says the federal Air Pollutio Control Administration can act ne under authority already provided l the Air Quality Act.

The apparent virulence of asbestos more than a table of death rates to O tinger. Five years ago it struck at Mil Kitzmiller, now Ottinger's legislati aide. When Kitzmiller was making r pairs on his house, some loose asbest insulation fell into an open cut on h shoulder.

The cut healed, but one year lat the scar developed a "mean-lookir dark area around it," according Kitzmiller. By last summer, the scar b came painful. Tests showed it was m lignant. Surgery removed the cancer.

Hitting the obvious. Ottinger, ne seeking the Democratic nomination-f U.S. senator from New York, was cal ing attention to a phenomenon seen b

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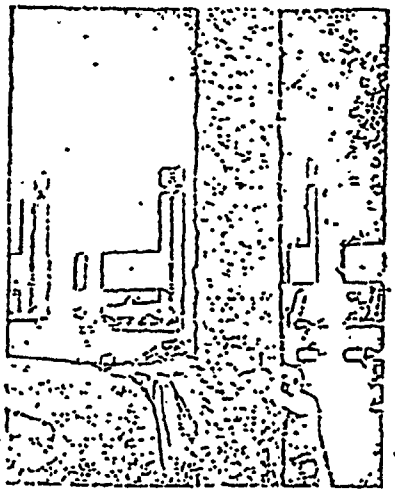
many persons in cities across the country, but understood by a relatively small number. From buildings under construction there is often a gentle floating fall of a cottony material. This is material that fails to adhere to the steel as it should and blows up, down, around and across a job and sometimes over wide sections of a city on windy days.

The fireproofing material is a mixture of asbestos, rock wool and cement. It is contained on the job in a cone-shaped hopper equipped with a worm gear at the bottom that feeds the mix into a hose. Compressed air, at about 22 psi, pushes it through the hose to a nozzle. Approximately 1 in. beyond the nozzle's end, the dry asbestos-rock wool-cement mix interacts with a stream of water running through a second hose.

The wet fireproofing material then is sprayed directly against the steel members previously hosed down with water to improve bonding.

About 200 tons of sprayed fiber material is used on a 30-story building. Depending on weather conditions and measures taken to provide some enclosure, as much as 50% of the sprayed material may be wasted.

The resulting storm of asbestos dust is a potential danger to everyone on the job, according to Dr. Selikoff. He has not as yet gathered extensive data on the threat to the general public and will not guess the possible incidence of asbestosis or lung cancer among those not directly working with asbestos but intermittently exposed to it in a casual way.



Asbestos airborne is source of worry.

The helping hands. Dr. Selikoff has received support from the insulators and asbestos workers international union since mid-1950. The union first provided the health histories of its members. Then in October, 1968, Johns-Manville Corp., of New York City, the largest producer of asbestos in this country, joined with the international union in backing Dr. Selikoff's work with cash. The company and the union provided $362,500 to finance a new program called the Insulation Industry Hygiene Research Program (IIHRP). Dr. Selikoff directs the program out of Mt. Sinai Hospital.

IIHRP's primary purpose is to develop methods of minimizing exposure of all insulation workers to dust and fumes encountered on the job.

The program has already had some repercussions. Chief among them is the sprayed asbestos fireproofing operation at the twin 110-story towers of the World Trade Center in New York City. On this job, which will require an estimated 5,000 tons of sprayed fireproofing, specially designed tarpaulins cover the exterior of the floors being fireproofed. The tarps extend through the window openings and are tucked back under the sprandrels so that material being sprayed will not escape from the area and fall on other floors, or surrounding streets. Moreover, the area being sprayed is closed off inside the building with plastic sheeting so that the materials will not drift into adjacent work areas.

New York City has also taken an initial step by preparing rules to control the application of sprayed-asbestos fireproofing. But the regulations have not gone much further than an initial draft since the city's Environmental Protection Administration and the Department of Air Resources have not had commissioners at the helm for several weeks. The rules, therefore, have not been pushed.

As proposed the regulations would require that sprayed asbestos fireproofing contractors obtain a license. In addition, the area of a building being sprayed would be tightly sealed, the precautions approximating, and in some cases, exceeding those now in effect at the $600-million World Trade Center project.

Should such regulations ever become effective, they would raise costs of fireproofing with sprayed asbestos. A structural engineer reports the costs now range between 30 cents and 60 cents a sq ft.

And another broad estimate came from Mario & DiBonno Plastering Co., Inc., of Great Neck, N.Y., which said the approximate cost of fireproofing a 30-story building is $250,000.

One of the five major companies that make the spray-asbestos material has sought and succeeded in developing a spray-on fireproofing compound that contains no asbestos. The manufacturer, U.S. Mineral Products Co., of Stanhope, N.J., said that the new product, Cafco Type D-C/F, will be on the market in about a month.

It contains mineral wool and proprietary binders it will not identify. It will cost about 10% more than spray-on asbestos fireproofing material.

Company officials say that they developed the new material because of the controversy starting to develop over asbestos.

Great Britain restricts asbestos spraying

The United Kingdom, with extensive statistical material linking asbestos to cancer, only last year cracked down on the use of asbestos in the building trades.

The thorough, detailed and apparently restrictive regulations have all but eliminated asbestos-spray fireproofing as a method, according to an officer in the National Federation of Plastering Contractors. He says that instead of using sprayed asbestos as the fireproofing agent, contractors are boxing asbestos panels around the structural members.

The regulations require:

- Filing by the contractor of an application with the Department of Employment and Productivity 28 days before asbestos is to be applied on a structure.
- Operation of exhaust and ventilating equipment in the area of asbestos application.
- Mandatory use of respirators by workers in asbestos-contaminated areas, and wearing of special clothing. The mask and clothing must be provided by the contractor.
- Storage of asbestos in "suitable containers," marked with blue paint or ink, "asbestos—do not inhale."
- Vacuuming of all surfaces, machines and equipment in areas where asbestos is applied.

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THE INFLUENCE OF ASBESTOS ON HEALTH

Three-Year Survey

The results of a three-year survey by a research team from the Medical Faculty of McGill University into the health of workers in Quebec's asbestos mining industry suggest that, a) present levels of dust exposure in modern asbestos mills, even of years employment would probably not carry any measurable risk of lung cancer.

The influence of asbestos on health has been the subject of intensive research in many parts of the world mainly because of the discovery that, in certain circumstances, exposure to the mineral fiber may be related to cancer of the lung and to mesothelioma, a cancer of the covering of the lung.

Supported by substantial grants from the Institute of Occupational and Environmental Health of the Quebec Asbestos Mining Association as well as from the U.S. Public Health Service, the epidemiological studies formed part of an international research program coordinated by the Union Internationale Contre le Cancer.

Headed by Dr. J. C. McDonald, of McGill University's Department of Epidemiology and Health, the international research team's investigations were aimed at assessing the risks of lung cancer to persons exposed to Canadian Chrysotile asbestos. Another primary purpose was to review all aspects of the health of workers in Quebec's asbestos mines and mills to ensure that it is efficiently protected.

Dr. McDonald reported on the findings of a study of mortality and causes of death in some 12,000 industry employees born between 1890 and 1920. The survey showed that the 10% of these employees who belonged to the highest dust-exposure group had an overall death rate about 12% higher than the others, mainly due to asbestosis, lung cancer and other respiratory complaints. The lung cancer death rate in this same group was about three times higher than that of employees with minimal dust exposure. Seventy per cent of this group of employees who belonged to the lowest dust-exposure categories had little or no increased mortality from these diseases.

"Two points must be emphasized," declared Dr. McDonald. "First, that the dust exposure experienced by these workers occurred many years ago when environmental conditions in the asbestos mills were poorly controlled, and, second, that the total number of respiratory diseases attributable to asbestos was very small."

Dr. McDonald then reported on the results of findings from surveys throughout Canada of deaths due to mesothelioma. During the 1960-63 period only 165 fatal cases had been recorded by pathologists throughout the entire country. Field inquiries confirmed that in a minority of cases there was a definite history of having worked with asbestos. Almost all the histories were of exposure in the manufacture and industrial application of the mineral, rather than in the production of asbestos fiber. There was no increased number of cases whose contact was limited to residence in the neighbourhood of asbestos mines or mills.

The two sets of results confirm the association between occupational exposure to asbestos and these two varieties of respiratory cancer. The results are nevertheless encouraging in that they suggest the risk is virtually confined to levels of dust exposure which are controllable, if not already controlled, in most Canadian asbestos mines and mills.

In light of the researchers' findings, it has been decided to continue the research program, with Asbestos Industry support, for a further five years. The extended research program into the health of Quebec's 14,000 asbestos workers will have these main objectives:

(1) To record and analyze deaths and their cause to enable the present approximate estimation of what constitutes a safe level of dust concentration to be more accurately defined.

(2) Close surveillance over the occurrence of suspected mesotheliomas in Canada, so as better to understand its cause. "Asbestos exposure has failed to explain most of them and is probably not the only factor when present," Dr. McDonald commented.

(3) In collaboration with the industry's industrial clinics in Thetford Mines and Asbestos, it is planned to introduce new procedures for the regular periodic medical supervision of asbestos workers, based on the lessons learned during the three-year study just completed.

DECISION-MAKING SYMPOSIUM—The 9th International Symposium on *Techniques for Decision Making in the Mineral Industry* will be held in Montreal, Canada, June 14-19, 1970.

Title 41—PUBLIC CONTRACTS AND PROPERTY MANAGEMENT

Chapter 50—Public Contracts, Department of Labor

PART 50-201—GENERAL REGULATIONS

PART 50-204—SAFETY AND HEALTH STANDARDS FOR FEDERAL SUPPLY CONTRACTS

Safety and Health Standards

On November 6, 7, and 8, 1968, interested persons were afforded an opportunity to submit orally data, views, and arguments on proposals to revise Part 50-204 of Title 41, Code of Federal Regulations, and section 50-201.502 of that title published in the FEDERAL REGISTER on September 20, 1968 (33 F.R. 14258). Interested persons were also afforded an opportunity to submit written data, views, and arguments concerning the proposals.

After consideration of all such relevant matter as was presented by interested persons, Part 50-204 and § 50-201.502 are hereby revised as indicated below. The revised § 50-204.50 republishes the radiation standards for mining published in the FEDERAL REGISTER on December 25, 1968 (33 F.R. 19047), which are presently in effect.

The revisions shall become effective 30 days following the date of publication in the FEDERAL REGISTER.

1. Part 50-204 is revised to read as follows:

Subpart A—Scope and Application

Sec.
50-204.1 Scope and application.

Subpart B—General Safety and Health Standards

50-204.2 General safety and health standards; incorporation by reference.
50-204.3 Material handling and storage.
50-204.4 Tools and equipment.
50-204.5 Machine guarding.
50-204.6 Medical services and first aid.
50-204.7 Personal protective equipment.
50-204.8 Use of compressed air.
50-204.10 Occupational noise exposure.

Subpart C—Radiation Standards

50-204.20 Radiation—Definitions.
50-204.21 Exposure of individuals to radiation in restricted areas.
50-204.22 Exposure to airborne radioactive material.
50-204.23 Precautionary procedures and personnel monitoring.
50-204.24 Caution signs, labels and signals.
50-204.25 Exceptions from posting requirements.
50-204.26 Exemptions for radioactive materials packaged for shipment.
50-204.27 Instruction of personnel; posting.
50-204.28 Storage of radioactive materials.
50-204.29 Waste disposal.
50-204.30 Notification of incidents.
50-204.31 Reports of overexposure and excessive levels and concentrations.
50-204.32 Records.
50-204.33 Disclosure to former employee of individual employee's record.
50-204.34 AEC licenses—AEC contractors operating AEC plants and facilities—AEC-agreement State licenses or registrants.
50-204.35 Application for variation from radiation levels.
50-204.36 Radiation standards for mining.

Subpart D—Gases, Vapors, Fumes, Dusts, and Mists

50-204.50 Gases, vapors, fumes, dusts, and mists.
50-204.65 Inspection of compressed gas cylinders.
50-204.66 Acetylene.
50-204.67 Oxygen.
50-204.68 Hydrogen.
50-204.69 Nitrous oxide.
50-204.70 Compressed gases.
50-204.71 Safety relief devices for compressed gas containers.
50-204.72 Safe practices for welding and cutting on containers which have held combustibles.

Subpart E—Transportation Safety

50-204.75 Transportation safety.

Subpart F—Variations

50-204.80 Variations.

AUTHORITY: The provisions of this Part 50-204 issued under secs. 1, 4, 49 Stat. 2036, 2038, as amended; 41 U.S.C. 35, 36; 3 C.F.R. 330.

Subpart A—Scope and Application

§ 50-204.1 Scope and application.

(a) The Walsh-Healey Public Contracts Act requires that contracts entered into by any agency of the United States for the manufacture or furnishing of materials, supplies, articles, and equipment in any amount exceeding $10,000 must contain, among other provisions, a stipulation that "no part of such contract will be performed nor will any of the materials, supplies, articles, or equipment to be manufactured or furnished under said contract be manufactured or fabricated in any plants, factories, buildings, or surroundings or under working conditions which are unsanitary or hazardous or dangerous to the health and safety of employees engaged in the performance of said contract" (sec. 1(c), 49 Stat. 2036, 41 U.S.C. 35(c)). This Part 50-204 expresses the Secretary of Labor's interpretation and application of this provision with regard to certain particular working conditions. In addition, §§ 50-204.27, 50-204.30, 50-204.31, 50-204.32, 50-204.33, and 50-204.26 contain requirements concerning the instruction of personnel, notification of incidents, reports of exposures, and maintenance and disclosure of records.

(b) Except in the conduct of formal enforcement proceedings provided for in Part 50-203 of this chapter and as otherwise provided in this part, every investigator conducting investigations and every officer of the Department of Labor determining whether there are or have been violations of the safety and health requirements of the Walsh-Healey Public Contracts Act and of any contract subject thereto, and whether a settlement of the resulting issues should be made without resort to administrative or court litigation, shall treat a failure to comply with, or violation of, any of the safety and health measures contained in this Part 50-204 as resulting in working conditions which are "unsanitary or hazardous or dangerous to the health and safety of employees" within the meaning of section 1(c) of the Act and the contract stipulation it requires. Every such investigator or every such officer shall have technical competence in safety, industrial hygiene, or both as may be appropriate, in the matters under investigation or consideration.

(c) Whenever any applicable standard in this Part 50-204 is relied upon by the Department of Labor in a formal enforcement proceeding under section 5 of the Walsh-Healey Public Contracts Act to support a finding of violation of the safety and health provisions of the Act and of a contract subject thereto, any respondent in the proceeding shall have the right and shall be granted the opportunity to challenge the legality, fairness or propriety of any such reliance.

(d) The standards expressed in this Part 50-204 are for application to ordinary employment situations; compliance with them shall not relieve anyone from the obligation to provide protection for the health and safety of his employees in unusual employment situations. Neither do such standards purport to describe all of the working conditions which are unsanitary or hazardous or dangerous to the health and safety of employees. Where such other working conditions may be found to be unsanitary or hazardous or dangerous to the health and safety of employees, professionally accepted safety and health practices will be used.

(e) Compliance with the standards expressed in this Part 50-204 is not intended, and shall not be deemed, to relieve anyone from any other obligation he may have to protect the health and safety of his employees, arising from sources other than the Walsh-Healey Public Contracts Act, such as State, local law or collective bargaining agreement.

(f) Whenever this part adopts by reference standards, specifications and codes published and available elsewhere, it only serves to adopt the substantive technical portions of such standards, specifications and codes.

Subpart B—General Safety and Health Standards

§ 50-204.2 General safety and health standards; incorporation by reference.

(a) Every contractor shall protect the safety and health of his employees by complying with the applicable standards, specifications, and codes developed and published by the following organizations:

United States of America Standards Institute (American Standards Association).
National Fire Protection Association.
American Society of Mechanical Engineers.
American Society for Testing and Materials.
United States Governmental Agencies, including by way of illustration the following publications of the indicated agencies:

UCASB00719162

Union Carbide trial exhibit UC-5439: Affidavit of John L. Myers in Support of Union Carbide's Motion for Summary… Published by AsbestosClaims.Law
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(1) *Atomic Energy Act Sources.* Any employer who possesses or uses source material, byproduct material, or special nuclear material as defined in the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.), and has either registered such sources with, or is operating under a license issued by, a State which has an agreement in effect with the Atomic Energy Commission pursuant to section 274(b) (42 U.S.C. 2021(b)) of the Atomic Energy Act of 1954, as amended, and in accordance with the requirements of that State's laws and regulations shall be deemed to be in compliance with the radiation requirements of this part, insofar as his possession and use of such material is concerned, unless the Secretary of Labor, after conference with the Atomic Energy Commission, shall determine that the State's program for control of these radiation sources is incompatible with the requirements of this part. Such agreements currently are in effect only in the States of Alabama, Arkansas, California, Kansas, Kentucky, Florida, Mississippi, New Hampshire, New York, North Carolina, Texas, Tennessee, Oregon, Idaho, Arizona, Colorado, Louisiana, Nebraska, and Washington.

(2) *Other sources.* Any employer who possesses or uses radiation sources other than source material, byproduct material, or special nuclear material, as defined in the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.), and has either registered such sources with, or is operating under a license issued by a State which has an agreement in effect with the Atomic Energy Commission pursuant to section 274(b) (42 U.S.C. 2021(b)) of the Atomic Energy Act of 1954, as amended, and in accordance with the requirements of that State's laws and regulations shall be deemed to be in compliance with the radiation requirements of this part, insofar as his possession and use of such material is concerned, provided the State's program for control of these radiation sources is the subject of a currently effective determination by the Secretary of Labor that such program is compatible with the requirements of this part. Such determinations currently are in effect only in the States of Alabama, Arkansas, California, Kansas, Kentucky, Florida, Mississippi, New Hampshire, New York, North Carolina, Texas, Tennessee, Oregon, Idaho, Arizona, Colorado, Louisiana, Nebraska, and Washington.

§ 50-204.35 *Application for variations from radiation levels.*

(a) In accordance with policy expressed in the Federal Radiation Council's memorandum concerning radiation protection guidance for Federal agencies (25 F.R. 4402), the Director, Bureau of Labor Standards may from time to time grant permission to employers to vary from the limitations contained in §§ 50-204.21 and 50-204.22 when the extent of variation is clearly specified and it is demonstrated to his satisfaction that (1) such variation is necessary to obtain a beneficial use of radiation or atomic energy, (2) such benefit is of sufficient value to warrant the variation, (3) employees will not be exposed to an undue hazard, and (4) appropriate actions will be taken to protect the health and safety of such employees.

(b) Applications for such variations should be filed with the Director, Bureau of Labor Standards, U.S. Department of Labor, Washington, D.C. 20210.

§ 50-204.36 Radiation standards for mining.

(a) For the purpose of this section, a "working level" is defined as any combination of radon daughters in 1 liter of air which will result in the ultimate emission of 1.3 × 10⁵ million electron volts of potential alpha energy. The numerical value of the "working level" is derived from the alpha energy released by the total decay of short-lived radon daughter products in equilibrium with 100 pico-curies of radon 222 per liter of air. A working level month is defined as the exposure received by a worker breathing air at the working level concentration for 4⅓ weeks of 40 hours each.

(b) (1) Occupational exposure to radon daughters in mines shall be controlled so that no individual will receive an exposure of more than 2 working level months in any consecutive 3-month period and no more than 4 working level months in any consecutive 12-month period. Actual exposures shall be kept as far below these values as practicable.

(2) In enforcing this section, the Director of the Bureau of Labor Standards may at any stage approve variations in individual cases from the limitation set forth in subparagraph (1) of this paragraph to comply with the requirements of the Act upon a showing to the satisfaction of the Director by an employer having a mine with conditions resulting in an exposure of more than 4 working level months but not more than 12 working level months in any 12 consecutive months that (i) under the particular facts and circumstances involved the working conditions of the employees so exposed are such that their health and safety are protected, and (ii) the employer has a bona fide plan to reduce the levels of exposure to those specified in subparagraph (1) of this paragraph as soon as practicable, but in no event later than January 1, 1971.

(c) For uranium mines, records of environmental concentrations in the occupied parts of the mine, and of the time spent in each area by each person involved in underground work shall be established and maintained. These records shall be in sufficient detail to permit calculations of the exposures, in units of working level months, of the individuals and shall be available for inspection by the Secretary of Labor or his authorized agents.

(2) For other than uranium mines or for surface workers in all mines, and paragraph (1) of this paragraph will i applicable: *Provided, however,* That no environmental sample shows a co centration greater than 0.33 working level in any occupied part of the mine the maintenance of individual occupanc records and the calculation of individua exposures will not be required.

(d) (1) At the request of an employee (or former employee) a report of the employee's exposure to radiation as shown in records maintained by the employer pursuant to paragraph (c) of this section, shall be furnished to him. The report shall be in writing and contain the following statement:

This report is furnished to you under the provisions of the U.S. Department of Labor Radiation Safety and Health Standards (41 CFR 50-204.36). You should preserve this report for future reference.

(2) The former employee's request should include appropriate identifying data, such as social security number and dates and locations of employment.

Subpart D—Gases, Vapors, Fumes, Dusts, and Mists

§ 50-204.50 *Gases, vapors, fumes, dusts, and mists.*

(a) No employee shall be exposed by inhalation, ingestion, skin absorption or contact to any material or substance at a concentration above that specified in the "Threshold Limit Values of Airborne Contaminants for 1968" of the American Conference of Governmental Industrial Hygienists except for the following standards—the values listed in Table I of this section which are the subject of current USASI standards and except for the values of Mineral Dusts—Table II of this section as they appear herein.

(b) In all cases, feasible engineering controls must first be determined and implemented. Methods of control in the working environment include local exhaust ventilation, general room air ventilation for dilution of the contaminant substitution of less toxic material, and isolation or enclosure of the process or operation. In cases where protective equipment or protective equipment in addition to other measures is used as the method of protecting the employee, such protection must be approved for each specific case by a competent industrial hygienist.

TABLE I

	8-hr. time weighted average
Hydrogen Sulfide (237.2–1953)	20ppm
Toluene (237.12–1957)	200ppm
Formaldehyde (237.16–1957)	1ppm
Carbon Tetrachloride (237.17–1957)	10ppm
Trichloroethylene (237.18–1957)	100ppm
Tetrachloroethylene (237.23–1967)	100ppm
Hydrogen Fluoride (237.25–1968)	3ppm
Fluoride Dusts ? (237.26–1968)	2.5mg/M³

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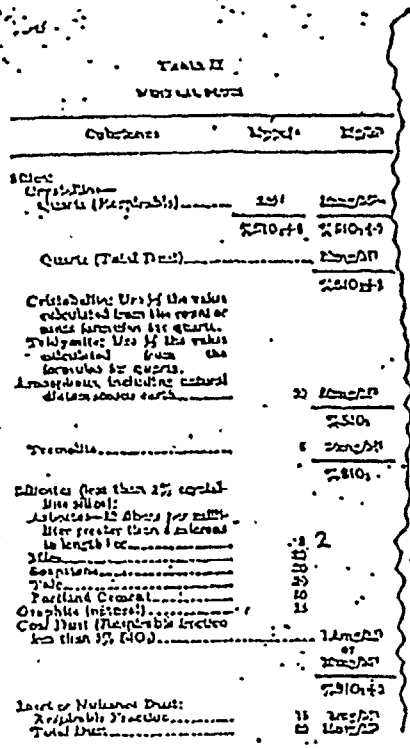


Table II

Permissible Noise

Duration per day, hours	Sound level dBA
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

Exposures to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: $C_1/T_1 + C_2/T_2 \ldots C_n/T_n$ exceeds unity, then, the mixed exposure should be considered to exceed the limit value. C_n indicates the total time of exposure at a specified noise level, and T_n indicates the total time of exposure permitted at that level. Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

Table III

Permissible Limits for Exposure to Various Chemical Contaminants

Substance	Ppm	Mg/m³
Acetaldehyde	200	360
Acetic acid	10	25
Acetic anhydride	5	20
Acetone	1,000	2,400
Acetonitrile	40	70
Acrylonitrile [skin]	20	45
Allyl alcohol [skin]	2	5
Allyl chloride	1	3
Ammonia	50	35
Amyl acetate	100	525
Aniline [skin]	5	19
Arsine	0.05	0.2
Benzene (benzol), see § 1910.1028		
Benzyl chloride	1	5
Boron trifluoride	1	3
Bromine	0.1	0.7
Butadiene (1,3-butadiene)	1,000	2,200
Butanethiol, see Butyl mercaptan		
Butanol, see Butyl alcohol		
Butyl acetate	150	710
Butyl alcohol	100	300
Butyl mercaptan	10	35
Carbon dioxide	5,000	9,000
Carbon disulfide [skin]	20	60
Carbon monoxide	50	55
Carbon tetrachloride [skin]	10	60
Cellosolve, see Ethylene glycol monoethyl ether		
Cellosolve acetate, see Ethylene glycol monoethyl ether acetate		
Chlorine	1	3
Chlorobenzene (monochlorobenzene)	75	350
Chloroform (trichloromethane)	10	50
Chloroprene [skin]	25	90
Cresol, all isomers [skin]	5	22
Cumene	50	245
Cyclohexane	300	1,050
Cyclohexanol	100	410
Cyclohexanone	50	200
Cyclohexene	300	1,015
Cyclopentadiene	75	200
Decaborane [skin]	0.05	0.3
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	50	240
1,2-dichlorobenzene (orthodichlorobenzene)	50	300
Dichloroethyl ether [skin]	15	90
Dichloromethane (methylene chloride)	500	1,740
Dimethyl acetamide [skin]	10	35
Dimethyl formamide [skin]	10	30
Dimethyl sulfate [skin]	1	5
Dioxane (diethylene dioxide) [skin]	100	360
Ethanolamine	3	6
Ethyl acetate	400	1,400
Ethyl acrylate [skin]	25	100
Ethyl alcohol (ethanol)	1,000	1,900
Ethyl chloride	1,000	2,600
Ethyl ether	400	1,200
Ethyl formate	100	300
Ethyl mercaptan	10	25
Ethyl silicate	100	850
Ethylamine	10	18
Ethylbenzene	100	435
Ethylene chlorohydrin [skin]	5	16
Ethylene dibromide	25	190
Ethylene dichloride (1,2-dichloroethane)	50	200
Ethylene glycol dinitrate [skin]	0.2	1.25
Ethylene glycol monoethyl ether (2-ethoxyethanol) [skin]	200	740
Ethylene glycol monoethyl ether acetate [skin]	100	540
Ethylene oxide	50	90
Ethylenediamine	10	25
Fluorine	0.1	0.2
Fluorotrichloromethane (trichlorofluoromethane)	1,000	5,600
Formaldehyde	3	4
Furfural [skin]	5	20
Furfuryl alcohol	50	200
Gasoline	500	1,800
Glycerin (mist)	15	
Heptane (n-heptane)	500	2,000
Hexane (n-hexane)	500	1,800
Hexanone (methyl butyl ketone)	100	410
Hexone (methyl isobutyl ketone)	100	410
Hexylene glycol	25	120
Hydrazine [skin]	1	1.3
Hydrogen chloride	5	7
Hydrogen cyanide [skin]	10	11
Hydrogen fluoride	3	2
Hydrogen peroxide	1	1.4
Hydrogen selenide	0.05	0.2
Hydrogen sulfide	20	28
Hydroquinone		2
Isoamyl acetate	100	525
Isoamyl alcohol	100	360
Isobutyl acetate	150	700
Isobutyl alcohol	100	300
Isophorone	25	140
Isopropyl acetate	250	950
Isopropyl alcohol	400	980
Isopropyl ether	500	2,100
Mesityl oxide	25	100
Methacrylic acid	20	70
Methyl acetate	200	610
Methyl acetylene	1,000	1,650
Methyl acetylene-propadiene mixture (MAPP)	1,000	1,800
Methyl acrylate [skin]	25	90
Methyl alcohol (methanol)	200	260
Methyl bromide [skin]	20	80
Methyl butyl ketone, see Hexanone		
Methyl cellosolve, see Ethylene glycol monomethyl ether		
Methyl cellosolve acetate, see Ethylene glycol monomethyl ether acetate		
Methyl chloride	100	210
Methyl chloroform	500	2,000
Methyl ether	400	1,200
Methyl ethyl ketone (MEK)	200	590
Methyl formate	100	250
Methyl isobutyl ketone, see Hexone		
Methyl mercaptan	10	20
Methyl methacrylate	100	410
Methyl propyl ketone	200	700
Methyl silicate	100	600
Methylene chloride, see Dichloromethane		
Monomethyl aniline [skin]	2	9
Morpholine	20	70
Naphtha (coal tar)	100	400
Naphtha (petroleum)	500	2,000
Naphthalene	10	50
Nickel carbonyl	0.001	0.007
Nitric acid	10	25
Nitric oxide	100	300
Nitrobenzene [skin]	10	50
Nitroethane	100	310
Nitrogen dioxide	10	19
Nitrogen tetroxide	10	19
Nitromethane	100	250
Nitropropane (2-nitropropane)	50	180
Nitrotoluene [skin]	5	30
Octane	500	2,350
Oil mist, mineral		5
Pentaborane	0.005	0.01
Pentachlorophenol [skin]		0.5
Pentane (n-pentane)	1,000	2,950
Perchloroethylene (tetrachloroethylene)	200	1,350
Perchloromethyl mercaptan	0.1	0.8
Perchloromethyl formate (chloroformic chloride)	0.4	0.8
Petroleum distillates (naphtha)	500	2,000
Phenol [skin]	5	19
Phenylethylene (styrene)	100	420
Phosgene (carbonyl chloride)	1	4
Phosphine	0.3	0.4
Phosphoric acid		1
Phosphorus (yellow)		0.1
Phosphorus pentachloride		1
Phosphorus pentasulfide		1
Phosphorus trichloride	0.5	3
Phthalic anhydride	1	6
Picric acid [skin]		0.1
Propadiene (allylene)	1,000	1,650
Propane	1,000	1,800
Propargyl alcohol [skin]	1	2
Propyl acetate	200	840
Propyl alcohol	200	500
Propyl nitrate	25	110
Propylene dichloride	75	350
Propylene glycol monomethyl ether	100	360
Propylene glycol monomethyl ether acetate	100	540
Propylene oxide	100	240
Pyridine	5	15
Quinone	0.1	0.4
Silicon tetrafluoride	5	35
Stibine	0.1	0.5
Styrene (phenylethylene)	100	420
Sulfur dioxide	5	13
Sulfur hexafluoride	1,000	6,000
Sulfuric acid		1
Sulfur monochloride	1	6
Sulfur pentafluoride	0.025	0.25
Sulfur tetrafluoride	0.1	0.4
Sulfuryl fluoride	5	20
Tetrachloroethane [skin]	5	35
Tetrachloroethylene (perchloroethylene)	200	1,350
Tetrachloromethane (carbon tetrachloride) [skin]	10	60
Tetrahydrofuran	200	590
Tetramethyl lead [skin]	0.15	1.5
Tetramethyl succinonitrile [skin]	0.5	3
Tetranitromethane	1	8
Tetryl (2,4,6-trinitrophenylmethylnitramine)		1.5
Thiophene (thiacyclopentadiene)	1	4
Toluene (toluol)	200	750
Toluene-2,4-diisocyanate	0.02	0.14
Trichloroethane (methyl chloroform)	500	2,000
Trichloroethylene	200	1,080
Trichloromethane (chloroform)	10	50
Trichloronitromethane (chloropicrin)	0.1	0.7
Trichlorophenol		1
Triethylamine	25	100
Trimethyl benzene	25	125
Trinitrobenzene [skin]		1
Trinitrophenol (picric acid) [skin]		0.1
Trinitrotoluene [skin]	0.5	5
Turpentine	100	500
Vinyl acetate	10	35
Vinyl benzene (styrene)	100	420
Vinyl chloride	500	1,300
Vinyl cyanide (acrylonitrile) [skin]	20	45
Vinyl toluene	100	480
Xylene (xylol)	200	870
Xylidine [skin]	5	25
Zinc chloride fume		1
Zinc oxide fume		5

Note: Conversion factor

ppm/28.3 = million particles per cubic meter = particles per cc.

* Millions of particles per cubic foot of air, based on impinger samples counted by ACGIH-counting technique.

† The percentage of crystalline silica in the formula is the highest determined from midrange samples, except in those instances in which other methods have been shown to be applicable.

‡ As determined by the impinger size method at 43 l/min using counting technique.

§ As counted by the standard impinger, konimeter count technique.

** Each concentration for mineral dusts in the application of this limit is to be determined from the inverse proportion of the percentage of silica in the dust and the appropriate figure in the first column of this table.

Approximate diameter (unit density sphere)	Percentage tabulated
2	90
2.5	75
3.5	50
5.0	25
10	0

§ 50–204.65 Inspection of compressed gas cylinders.

Each contractor shall determine that compressed gas cylinders under his control are in a safe condition to the extent that this can be determined by visual inspection. Visual and other inspections shall be conducted as prescribed in the Hazardous Materials Regulations of the Department of Transportation (49 CFR Parts 171–179 and 14 CFR Part 103). Where those regulations are not applicable, visual and other inspections shall be conducted in accordance with Compressed Gas Association Pamphlets C–6–1963 and C–8–1962.

§ 50–204.66 Acetylene.

(a) The in-plant transfer, handling, storage, and utilization of acetylene in cylinders shall be in accordance with Compressed Gas Association Pamphlet G–1–1966.

(b) The piped systems for the in-plant transfer and distribution of acetylene shall be designed, installed, maintained, and operated in accordance with Compressed Gas Association Pamphlet G–1.3–1959.

(c) Plants for the generation of acetylene and the charging (filling) of acetylene cylinders shall be designed, constructed, and tested in accordance with the standards prescribed in Compressed Gas Association Pamphlet G–1.6–1966.

§ 50–204.67 Oxygen.

The in-plant transfer, handling, storage, and utilization of oxygen as a liquid or a compressed gas shall be in accordance with Compressed Gas Association Pamphlet G–4–1962.

§ 50–204.68 Hydrogen.

The in-plant transfer, handling, storage, and utilization of hydrogen shall be in accordance with Compressed Gas Association Pamphlets G–5.1–1961 and G–5.2–1966.

§ 50–204.69 Nitrous oxide.

The piped systems for the in-plant transfer and distribution of nitrous oxide shall be designed, installed, maintained, and operated in accordance with Compressed Gas Association Pamphlet G–8.1–1964.

§ 50–204.70 Compressed gases.

The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, rail tankcars, or motor vehicle cargo tanks shall be in accordance with Compressed Gas Association Pamphlet P–1–1965. Compressed gas cylinders, portable tanks, and cargo tanks shall have pressure relief devices which shall be installed and maintained in accordance with Compressed Gas Association Pamphlets S–1.1–1963 (with 1965 addenda) and S–1.2–1963.

§ 50–204.71 Safety relief devices for compressed gas containers.

Compressed gas cylinders, portable tanks, and cargo tanks shall have pressure relief devices installed and maintained in accordance with Compressed Gas Association Pamphlets S–1.1–1963 and 1965 addenda and S–1.2–1963.

§ 50–204.72 Safe practices for welding and cutting on containers which have held combustibles.

Welding or cutting or both on containers which have held flammable or combustible solids, liquids, or gases, or have contained substances which may produce flammable vapors or gases will not be attempted until the containers have been thoroughly cleaned in strict accordance with the rules and procedures embodied in American Welding Society Pamphlet A–6.0–65, edition of 1965.

Subpart E—Transportation Safety

§ 50–204.75 Transportation safety.

Transportation in connection with public contracts, as listed in § 50–204.3(a)(3) shall be conducted in accordance with the U.S. Department of Transportation requirements. Where such requirements do not apply, Chapters 10, 11, 12, and 14 of the Uniform Vehicle Code of the National Committee on Uniform Traffic Laws and Ordinances, 1962 Edition, shall be used.

Subpart F—Variations

§ 50–204.80 Variations.

(a) Upon the written request of any interested person, the Director of the Bureau of Labor Standards may in particular cases apply variations from the provisions of this part in enforcing the Walsh-Healey Public Contracts Act following consideration of the particular facts and circumstances involved whenever he is satisfied that the safety and health of employees is equally protected by such variations.

(b) The provisions of this section shall not apply to §§ 50–204.35 and 50–204.50, which contain separate and specific variations procedures.

2. Section 50–201.502 is revised to read as follows:

§ 50–201.502 Record of injuries.

(a) Every person who is or shall become a party to a Government contract which is subject to the provisions of the Walsh-Healey Public Contracts Act and the regulations thereunder, or who is performing or shall perform any part of such contract subject to the provisions of such act or regulations, shall maintain the records specified below which shall be available for inspection by authorized representatives of the Secretary of Labor:

(1) Records of all injuries to employees, including a brief description of the manner of occurrence and the date and duration of disability.

(2) Records of injury frequency rates, calculated annually on a calendar year basis commencing the first of January of each year, as defined in United States of America Standards Institute, Z16.1–1967 "Method of Recording and Measuring Work Injury Experience."

(3) Records of injury severity rates, calculated annually on a calendar year basis commencing the first of January of each year, as defined in United States of America Standards Institute, Z16.1–1967 "Method of Recording and Measuring Work Injury Experience."

(b) The records required in paragraph (a) of this section shall be kept on file at least 3 years from the date of entry.

(c) Where records are kept on a fiscal or insurance year basis, they shall be accepted as being in compliance with subparagraphs (2) and (3) of paragraph (a) of this section.

(Sec. 4, 49 Stat. 2036; 41 U.S.C. 38a)

Signed at Washington, D.C. this 10th day of January 1969.

William Wirtz,
Secretary of Labor.

[F.R. Doc. 69–343; Filed, Jan. 16, 1969; 8:45 a.m.]

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THE DISCOVERY COMPANY

Unitrin ASBESTOS

ASBESTOS TOXICOLOGY REPORT

It has been known for 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 has been generally accepted that a worker will not develop asbestosis if he is exposed to no more than 5 million particles per cubic foot of air, even if this exposure continues for his entire working lifetime. Although no cases of asbestosis are known to have occurred when exposures have been maintained at or below this level, the ACGIH (which sets the threshold limit value (TLV) in the U. S. A.) has indicated they intend to lower the TLV for asbestos to 2 million particles per cubic foot in an effort to increase the safety factor incorporated in the limit. The U. S. Department of Labor has already issued a regulation under the Walsh-Healy Act placing the TLV for asbestos at 2 million particles per cubic foot for public contracts in which they have jurisdiction. 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 (MPPCF) 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 type of cancer named mesothelioma has been noted to be associated with asbestos exposure in recent years. These tumors, while rather few in number to date, may occur in individuals with histories of only slight exposures, and that as much as twenty to forty years earlier. There is considerable evidence that crocidolite is most frequently associated with mesotheliomas. From the data available it appears that the TLV of 5 MPPCF may not be low enough to protect against mesothelioma. Research on the problem continues.

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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. Pelletizing 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 is highly desirable to determine that Threshold Limit Values are not being exceeded. In manufacturing industries it would be desirable to know the dust concentrations where the asbestos is dumped from bags into the process. Concentrations should also be determined where dusting occurs in finishing products. While initial dust determinations should be made at frequent intervals, once the level has been established as satisfactory, the frequency may be extended to occasional tests to assure continuation of a satisfactory condition.

Pre-employment and periodic physical examination 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.

It is believed that the addition of asbestos at the proposed levels during the manufacture of products would be harmless to the consumer. Total dusting would have to be well in excess of any levels acceptable to the consumer for the asbestos concentrations to approach the Threshold Limit Value.

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.

Industrial Medicine And
Toxicology Department
Union Carbide Corporation

5/8/69

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ATTACHMENT E

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PLAINTIFF'S EXHIBIT UC-5439

INTERNAL CORRESPONDENCE

MINING AND METALS DIVISION

P. O. BOX 579, NIAGARA FALLS, N.Y. 14302

To (Name) Mr. W. N. Johnson
Division Mining & Metals
Location New York, New York

Date February 18, 1972

Originating Dept. CALIDRIA Asbestos - Marketing
Research and Development Department

Answering letter date

Copy to NF-File

Subject Interim Toxicology Report

The enclosed is our version of your proposal for the Subject dated 2/1/72. If you concur with the enclosure, please obtain the necessary management, medical and legal approvals for us to use it for general mailing.

We are receiving numerous inquiries and must have something NOW which has "Corporate" approval.

John L. Myers

/cvb
Enclosure

Bill - Also enclosed is a copy of the OSHA material Safety Data Sheet which we are sending to many customers. Any comments on it?

John

Union Carbide ASBESTOS

THE DISCOVERY COMPANY

UNION CARBIDE CORPORATION • MINING & METALS DIVISION • P.O. BOX 579 • NIAGARA FALLS, N.Y. 14302 • TEL: 716-285-3311

TO: Our Customers

The enclosed is a preliminary report to answer some of your immediate questions regarding the use of asbestos and products containing asbestos. A more comprehensive report will be issued as regulations are clarified and as new information is available.

Copies of the following items are available from this office:

"Airborne Asbestos" National Research Council, 1971
"Questions & Answers" Asbestos Information Association/North America
Dust Collecting & Counting Information
Respirator Requirements
Federal Register copies of Existing and Proposed Regulations

Please contact us if you have any specific questions or particular problems, or if you would like a copy of any of the above.

John L. Myers
Marketing Manager

/cvb
Enclosure

UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
4625 ROYAL AVE., P.O. BOX 379, NIAGARA FALLS, NEW YORK 14302

RESEARCH AND
DEVELOPMENT
DEPARTMENT

Recently, both governmental agencies and the public press have viewed with alarm the potential health hazards of asbestos. The false impression has been given that asbestos is an extremely dangerous material with immediate and dire results following contact or inhalation. It has been known for over sixty years that inhalation of high levels of asbestos dust for extended periods can cause a disabling and sometimes fatal fibrosis of the lungs. More recently, other serious effects, such as cancer, have been associated with occupational exposures. It has also been recognized that the general public is probably exposed to extremely low concentrations of airborne asbestos arising from both industrial emissions and natural sources. This has led to some speculation by the scientific community and a great deal of emotionalism by the general public which pictures asbestos as a deadly trace poison and demands for very stringent controls have resulted.

There have been some major dust problems such as emissions from asbestos slurry spraying for fire proofing and acoustical control during building construction. Such major emissions can and should be avoided. However, after extensive study of all available data in 1971, a distinguished committee of the National Academy of Sciences* concluded that "at present, there is no evidence that the small numbers of fibers found in most members of the general population affect health or longevity." They did, nevertheless, recommend emission controls to define and control the major sources of man-made asbestos emission into the atmosphere.

When inhalation of asbestos has been great enough to cause asbestosis, an increased occurrence of lung cancer has also been found. There is no evidence, however, that low levels of exposure increase the incidence and there is strong evidence that the safe TLV standard for asbestosis is also adequate to prevent cancer. A synergistic effect of cigarette smoking and asbestos exposure was strongly suggested by a study of insulation workers.** Anti-smoking campaigns are, therefore,

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*"Airborne Asbestos" 1971 National Research Council

**Selikoff, J.J., E. C. Hammond and J. Churg. Asbestos Exposure, Smoking and Neoplasia, JAMA 204: 1060112, 1968.

recommended for asbestos workers. The reasons for the synergism are not known and could include transportation of cigarette-smoke carcinogens by asbestos fibers as well as other factors. Selikoff* did observe that "We have yet to see in New York City a death due to lung cancer in an asbestos worker who didn't smoke cigarettes."

As mentioned by the earlier noted Committee of the National Research Council, mesothelioma or primary malignant tumor of the pleura and peritoneum are exceedingly rare. They are so rare that until recent years some medical authorities have even questioned their existence. Although the extensive publicity they have received may give the impression that they are commonplace, there are less than 2000 cases in all recorded medical history.

Asbestos is too important in our technology and economy for its essential use to be stopped. But, because of the known serious effects of uncontrolled inhalation of asbestos minerals in industry and the uncertainty as to the shape and character of the dose-response curve in man, it would be highly imprudent to permit unrestricted additional contamination of the public environment with asbestos. Continued use at minimal risk to the public requires that the major sources of man-made asbestos emission into the atmosphere be defined and controlled. In the absence of such controls, local fiber concentrations might at times approach those in occupational sites. Analytical methods and epidemiological data are inadequate for the development of ambient air standards, but emission controls are needed and appear feasible. The United States is currently in a period of great emphasis on occupational safety and environmental control. There seems to be no real question that some such controls are long overdue. As in most reform movements in the past, however, there is a pronounced tendency to go to extremes. It is in such an atmosphere that the Federal Government and a number of state governments are enacting legislation to control the use of asbestos.

The federal rule making comes from two sources, that relative to occupational exposures from the Occupational Health and Safety Administration (OSHA) and that relative to environmental discharges from the Environmental Protection Agency (EPA). At the present time, the only new federal regulations in force are a set of emergency standards published by OSHA on December 7, 1971. Proposed permanent standards were published by OSHA on January 12, 1972 and proposed environmental standards were published by EPA on December 7, 1971. Both of these proposed standards are subject to public hearings and written arguments and it will be a number of months before the final versions are settled. Since the OSHA standard of December 7, 1971 is in force, it is useful to outline its main provisions. The following discussion is intended to describe in general terms the main requirements of the standard. It is not a legal interpretation or opinion.

The new OSHA standards published in the Federal Register, Vol. 36, No. 234, December 7, 1971 (article 1910.93a) set a maximum allowable

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*Selikoff, J.J., E. C. Hammond and J. Churg. Asbestos Exposure, Smoking and Neoplasia, JAMA 204: 1060112, 1968.

Threshhold Limit Value (TLV) for occupational exposure to airborne asbestos of 5 fiber/ml. greater than 5μ in length over an 8-hour time-weighted average. Exposures are not to exceed 10 fibers per ml. up to a total of 15 minutes per hour for up to 5 hours in an 8-hour day. Application of engineering methods to achieve dust control to the prescribed levels is mandated where feasible. If this does not reach the allowable TLV, appropriate respiratory protective devices must be worn as summarized below.

ASBESTOS DUST RESPIRATORY PROTECTION

Airborne Concentration (1)			
8 Hour Exposure (2)	15 Minute Exposure (3)	Required Mask Type	Typical Mask
5 max.	10 max.	None Required	-------
25 max.	50 max.	U.S. Bur. of Mines Schedule 21B. Negative pressure on breathing. Covers nose and mouth.	Willson Model 1 with R-520 Filt and M-S-A No. 86432 with Type H, Ultra-Filter.
250 max.	500 max.	U.S. Bur. of Mines Schedule 21B Powered filter positive pressure.	-------
Over 250	-----	U.S. Bur. of Mines Schedule 19B Type C positive pressure, air supplied.	-------

(1) Fibers per milliliter greater than 5 microns in length, as determined by the membrane filter method at 400-450X magnification (4 millimeter objective) phase contrast illumination.

(2) 8-Hour time weighted average.

(3) 15 Minutes in an hour for up to 5 hours in an 8-hour day.

Reference: "American National Standard Practice for Respiratory Protection Z88.2-1969"

In addition to the basic requirements just described, there are special provisions covering certain specific operations and the use of certain tools. These come into effect when the TLV is exceeded and include the use of hand or power operated tools which produce asbestos dust, the spraying of asbestos, and the demolition of structures containing asbestos. When the TLV is exceeded the tools must be fitted with local exhaust ventilation. Asbestos cement, plaster, etc. must also be mixed in closed bags or other containers, asbestos waste and scrap must be collected and disposed of in sealed containers, and the cleanup of asbestos dust must be done by vacuum cleaning.

If your employees are exposed to asbestos dust, a survey should be made to determine actual fiber counts. Assistance in making a survey can be obtained from State Industrial Hygiene Departments and qualified commercial groups.

The proposed EPA regulations for fabricating and manufacturing operations include:

1) Registration of any operation which could emit asbestos fiber. This registration is simply name and address of the owner or operator and a brief description of the operation and of equipment used to measure and control emissions.

2) The use of fabric filters, or the equivalent, on forced gas streams of particulates and on any visible emissions.

3) Visible emissions from operations directly open to the atmosphere are not allowed.

4) Prohibiting the spraying of any product which contains asbestos in an area directly open to the atmosphere.

These regulations are proposed, rather than final, but will be enacted probably with modification, on or about June 4, 1972. The prohibition against "spraying", per se, is far too restrictive; and we feel that the final regulations will include a definition of spraying which includes only products containing high asbestos levels and/or those in which the asbestos is not held by an efficient binder.

Many industrial materials have been listed as "airborne contaminants" and threshold limit values established by OSHA. Standards have been set, for example, for silica, styrene, mica, talc, coal dust, etc. Amorphous silica, for example, has a TLV of 20 million particles per cubic foot. Should that level, which is visible, be exceeded respirators are required. OSHA has advised industry that five materials (lead, carbon monoxide, silica, cotton dust and asbestos) will receive special attention as "Target Hazards."

The fact that considerably less Calidria Asbestos is needed for many applications vs. Canadian asbestos or pyrogenic silica should not be overlooked. In addition to the advantage of reduced volume handling, there is simply less volume to cause dust problems. Union Carbide is the only source of pelletized asbestos and most "Calidria" products are available in pellet form. Pellets reduce or eliminate dust, cost

less to ship and warehouse because of high bulk density, and are amenable to bulk shipment in hopper cars or trucks. They can be handled in-plant by conventional conveying systems.

Chrysotile asbestos is a unique raw matetial and valuable to the national economy. It has been the experience of Union Carbide, both as an asbestos producer and consumer, that the Threshold Limit Values can be obtained with appropriate dust control techniques. Like most industrial raw materials, asbestos presents certain toxicological hazards and should be handled with respect, not fear: It does not now present any real hazard to the general population and realistic regulations and controls can protect both the worker and the public. Union Carbide Corporation endorses such regulations and controls.

ATTACHMENT F

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4.1.5.3

ASBESTOS TOXICOLOGY

STATUS SUMMARY

October 1972

Union Carbide trial exhibit UC-5439: Affidavit of John L. Myers in Support of Union Carbide's Motion for Summary… Published by AsbestosClaims.Law
ACL Doc 19873 · Page 46 of 65 **asbestosclaims.law/library/19873/46**

ASBESTOS TOXICOLOGY

October, 1972

Introduction

Many people have become justifiably uneasy about the toxicological aspects of asbestos and recent federal regulations regarding its use. Unfortunately, the publicity given to this governmental activity has tended to be of a sensational nature and has done little to place the question of asbestos toxicology in logical perspective. We take this opportunity, therefore, to state our firm belief that Union Carbide Corporation can comply with the regulations. Installation of additional dust control equipment at our plant to achieve compliance is substantially complete. Moreover, we believe that our customers can, without undue burden, comply with these regulations as they apply to their operations.

With regard to the toxicity of asbestos, it is important to note that asbestosis and statistical excess occurrences of bronchogenic carcinoma have occurred only in connection with massive long term exposures to asbestos dust. The risk of this type of exposure is usually in asbestos mines and mills and in manufacturing operations such as floor tile plants where asbestos usage may vary from 15,000 to 30,000 tons per year. The risk of long term massive exposure is generally not typical of operations utilizing the specialty type "Calidria" Asbestos products.

The purpose of this short report, therefore, is to provide the "Calidria" Asbestos user and potential user with a reasonable picture of the toxicology situation and a copy of the final OSHA regulations on asbestos usage. Some limited information on handling procedures and control of dust generated by cutting and grinding that may be of particular interest for the small user is also included.

It would be impractical and redundant for us to attempt to interpret, in a short report, the great mass of published matter, scientific and otherwise, that has appeared on both sides of the asbestos question. Instead, a small number of relevant articles have been selected and arranged by subject. It includes:

Toxicology Information

1. Asbestos and Your Health

   Some direct answers to toxicology questions. Published by the Quebec Asbestos Information Service.

2. Airborne Asbestos

   The Summary and Conclusions section of a comprehensive study on asbestos toxicology by the National Academy of Sciences. The key conclusion is that the general public is in no immediate danger from asbestos which is in sharp contract with much of what appears in the popular press. The complete report is available on request.

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3. Response to Article in Wall Street Journal

When the OSHA regulations were published, the Wall Street Journal chose to attack them in an article that presented a very distorted picture of the facts, typical of much of the newspaper coverage of the question. This is the response to the article.

4. Several reprints from recent newspaper articles. Coverage is more objective.

5. The testimony of Dr. Wright before OSHA at the hearings on the proposed regulations.

This is included for those seriously interested in the background of the toxicology questions.

OSHA Regulations

1. Report Series on OSHA - June 26, 1972

Industry comment on the regulations and a brief summary of the main features.

2. Safety and Health Reporter - July 17, 1972

Plans and progress on regulations similar to asbestos on other substances.

3. OSHA Regulations on Asbestos

4. "Calidria" Asbestos Material Safety Data Sheet

Dust Control

1. Transfer Devices

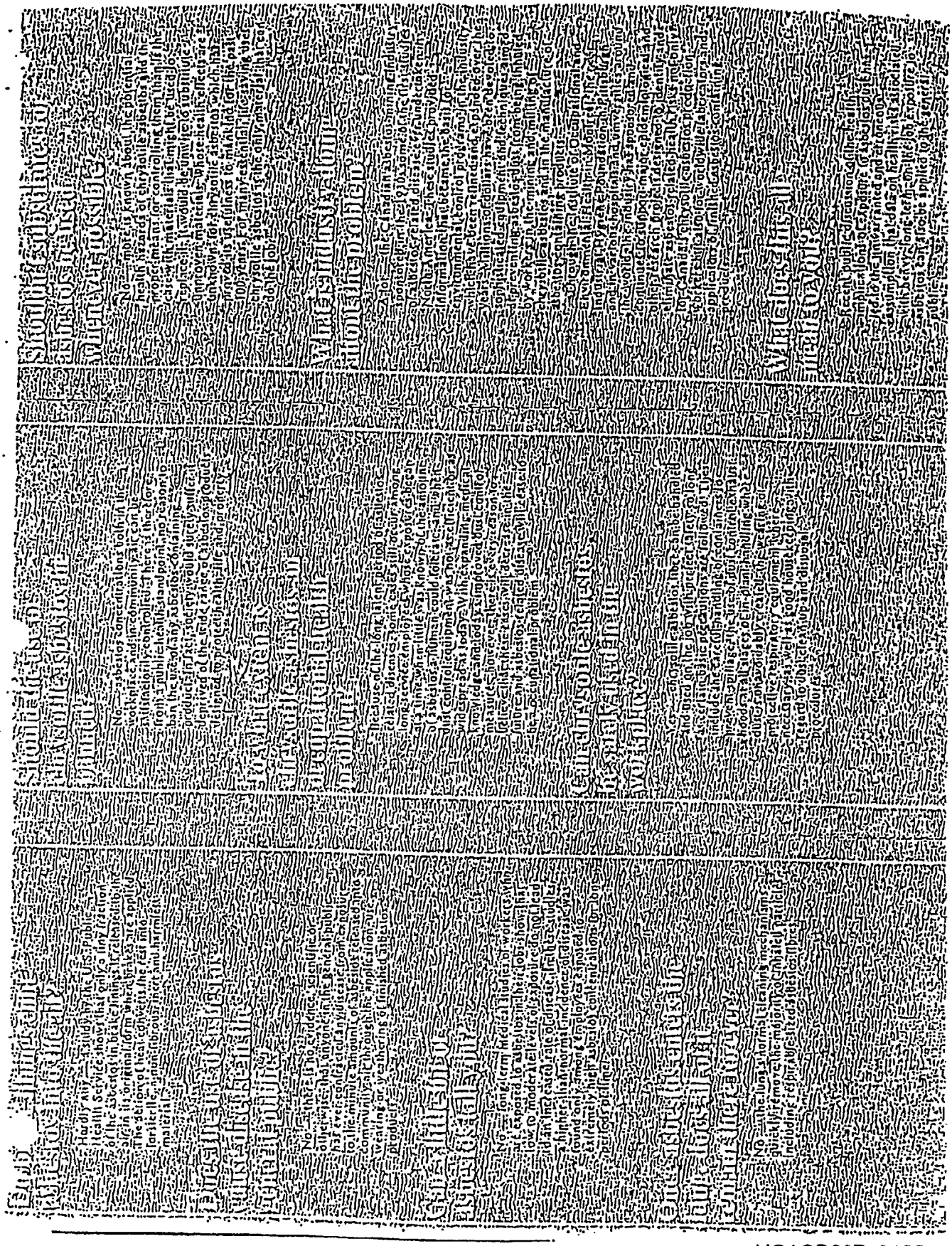
Two apparatus arrangements developed by Dow Chemical to transfer their light Saran Microballoons. Similar devices have been successful for several small "Calidria" Asbestos users.

2. Vacuum Grinding Equipment

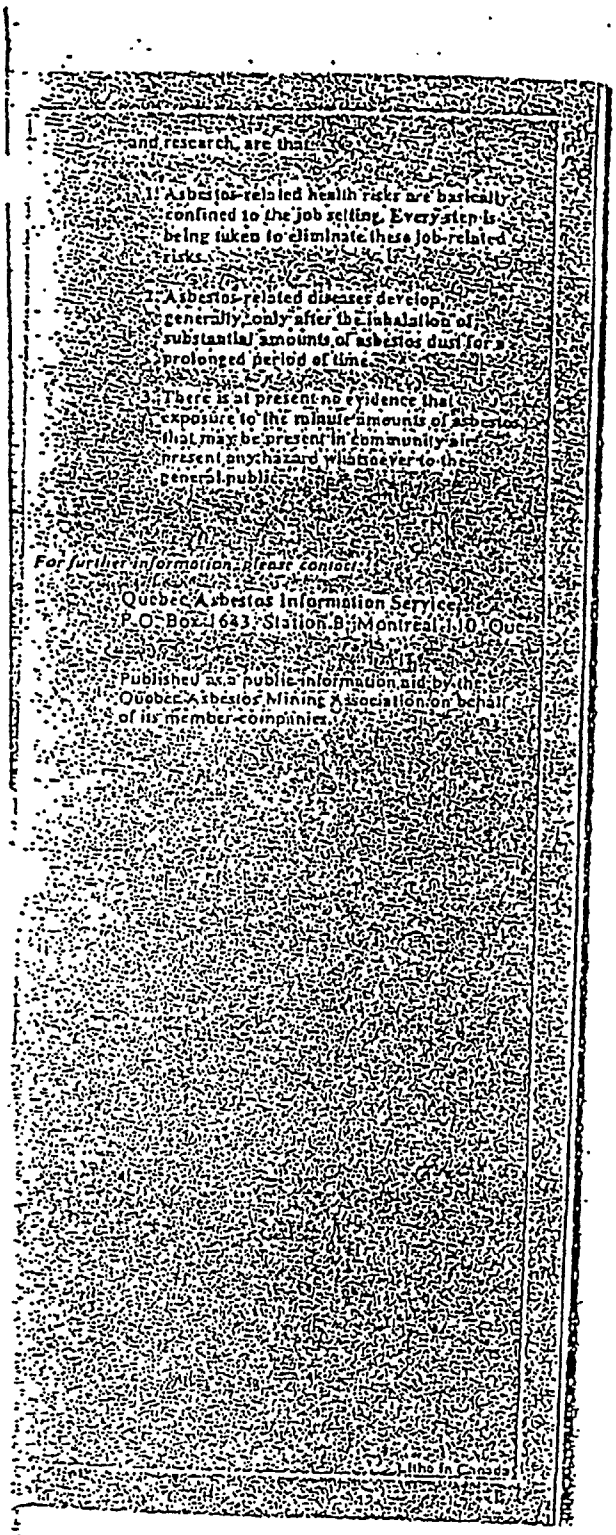
In some applications plastics containing asbestos are abraided. Small amounts of fiber may be released. Here is one convient way to control the dust.

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and research, are that:

1. Asbestos-related health risks are basically confined to the job setting. Every step is being taken to eliminate these job-related risks.

2. Asbestos-related diseases develop generally only after the inhalation of substantial amounts of asbestos dust for a prolonged period of time.

3. There is at present no evidence that exposure to the minute amounts of asbestos that may be present in community air present any hazard whatsoever to the general public.

For further information, please contact:

Quebec Asbestos Information Service
P.O. Box 1633, Station B, Montreal 110, Que.

Published as a public information aid by the Quebec Asbestos Mining Association on behalf of its member companies.

Litho in Canada

UCASB00719130

A I R B O R N E A S B E S T O S

A Report Prepared by the

Committee on Biologic Effects of Atmospheric Pollutants

of the

Division of Medical Sciences, National Research Council

National Academy of Sciences

National Academy of Engineering Washington, D.C. 1971

UCASB00719131

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

PATHOGENICITY OF ASBESTOS MINERALS

Any of the commercially used asbestos minerals, when inhaled in sufficient numbers, as in uncontrolled occupational exposures, can cause disabling fibrosis of the lungs. An association between occupational exposures to asbestos and bronchogenic carcinoma has been established, but the dose relationship and the role of cofactors have not been defined. Evidence of a causal association between some but not all exposures to asbestos fibers and diffuse malignant mesotheliomas of the pleura and peritoneum is substantial, but evidence of such a relationship with other tumors is inconclusive. Although the different types of asbestos differ in some of their biologic effects, no type can be regarded as free of hazard. The hypothesis that asbestos fibers act as cofactors or carriers of carcinogens is attractive, but as yet unproved.

EVIDENCE OF HUMAN NONOCCUPATIONAL EXPOSURES TO ASBESTOS

The demonstration of ferruginous bodies, similar to those found in asbestos workers, in a large proportion of randomly selected lung specimens in many parts of the world is presumptive evidence that persons with no occupational contact may have inhaled and retained asbestos. Proof has come in some areas with positive identification of chrysotile asbestos fibers. Analyses of community air for asbestos have been too limited to define the sources, concentrations, and distribution of fibers in the environment. The fiber concentrations that have been demonstrated in ambient air are small, compared with those in industry, but data are inadequate for definitive comparisons.

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ESTIMATION OF RISK IN HUMAN NONOCCUPATIONAL EXPOSURES TO ASBESTOS

The most important question in the case of persons with nonoccupational exposures to asbestos is whether there is an increased risk of malignancies. Industrial experience indicates that there is no likelihood of significant asbestosis in nonoccupational exposures. The major potential for risk appears to lie in those with indirect occupational contacts, household contacts, or residence in the immediate neighborhood of asbestos sources; and even there, the actual risk is poorly defined. But the fact that there appears to be a gradient of effect in such groups suggests that there are levels of inhaled asbestos without detectable risk. It is not known what range of respirable airborne asbestos fibers will ultimately be found to have no measurable effects on health. At present, there is no evidence that the small numbers of fibers found in most members of the general population affect health or longevity.

NEED FOR AND FEASIBILITY OF CONTROLS

Asbestos is too important in our technology and economy for its essential use to be stopped. But, because of the known serious effects of uncontrolled inhalation of asbestos minerals in industry and uncertainty as to the shape and character of the dose-response curve in man, it would be highly imprudent to permit unrestricted additional contamination of the public environment with asbestos. Continued use at minimal risk to the public requires that the major sources of man-made asbestos emission into the atmosphere be defined and controlled. In the absence of such controls, local fiber concentrations might at times approach those in occupational sites. Analytic methods and epidemiologic data are inadequate for the development of ambient air standards, but emission controls are needed and appear feasible.

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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.

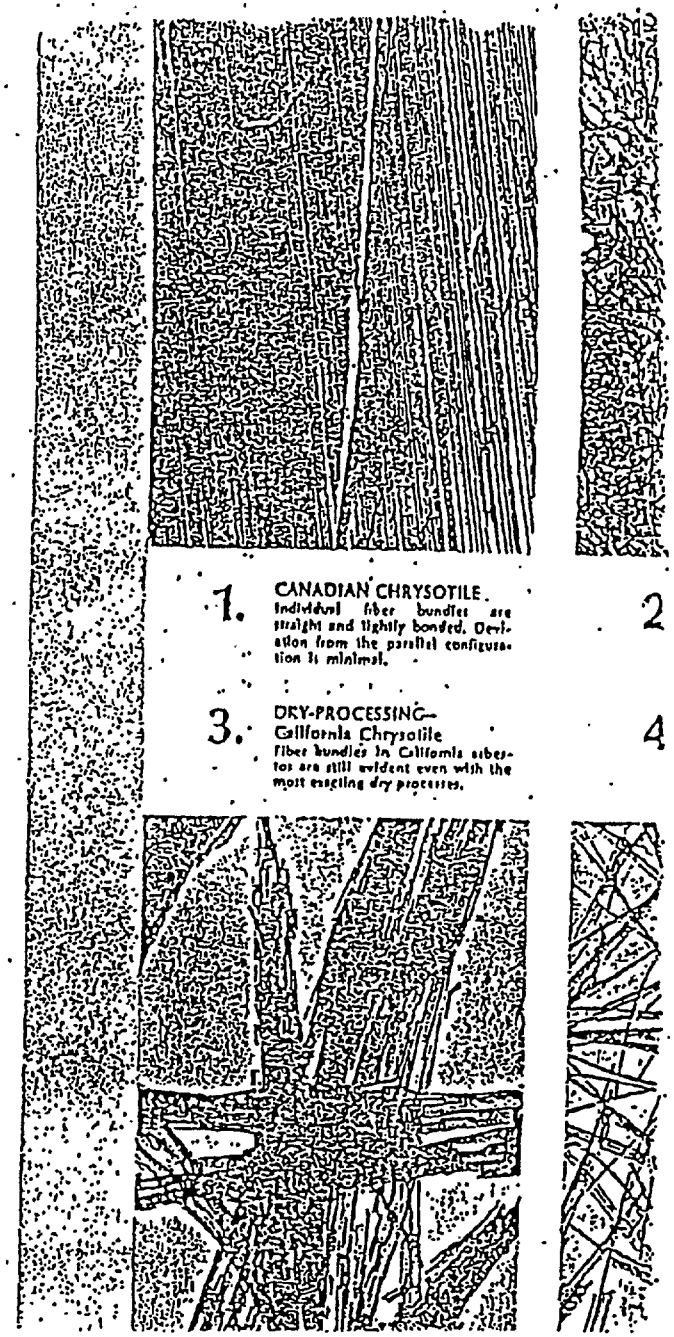
Union Carbide's California deposit is one of the world's largest sources of high-grade asbestos ore, assuring continued supply for development and expansion of CALIDRIA Asbestos materials.

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

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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 are apart from other asbestos sources.

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

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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

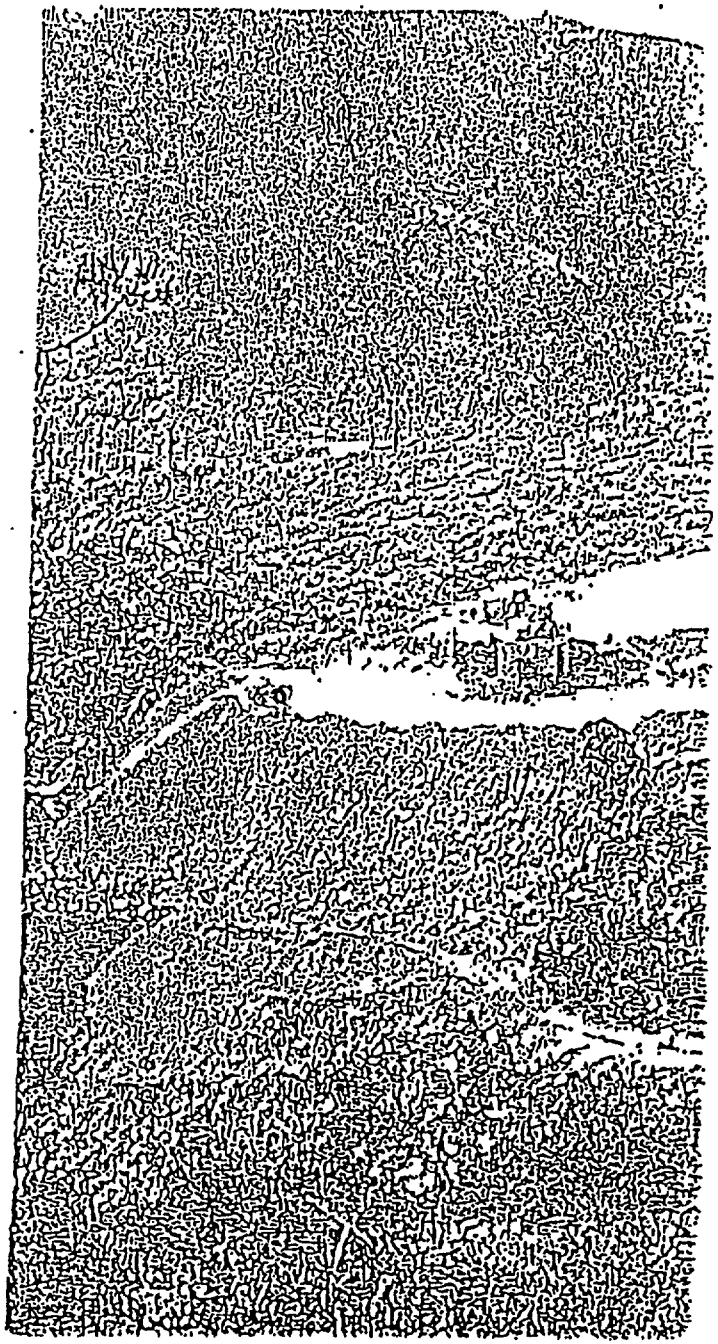
UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
270 Park Avenue New York, N.Y. 10017

Marketing and Technical Center: P. O. Box 579, Niagara Falls, N.Y. 14302
Plant: P. O. Box K, King City, Calif. 93930

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71-085
M-5/71

CALIDRIA is a trade mark of Union Carbide Corporation.



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Calidria Asbestos

REPRESENTING VARIED PRODUCTS THAT POSSESS THEIR OW

1. FIBER PRODUCTS

Standard Grade

100 Series

Standard Grade

200 Series

Vinyl Asbestos Floor Tile

Drilling Fluids, Joint Cements

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 products are obtained primarily by straight-line beneficiation of asbestos ore. They are designed for use where fine grind and uniform, open bulk are desired.

2. COLLOIDAL PRODUCTS

High Purity

Resin-Grade

Asbestos 100 Series

Cellulose

Viscosity Control, Additive

Paper Reinforcement

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

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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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	"Typical" Nylon 6/6	Nylon 6/6 20% (vol.) 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 size-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.

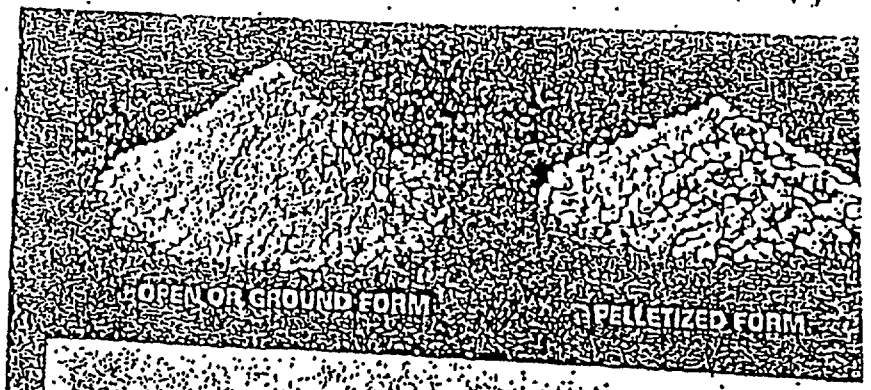
Tape Joint Cements: fine, consistent, uniform particle size and high bulking factor make for more efficient joint cements for gypsum board applications.

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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	0.73	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	300-330	—
Dry Bulk, lbs/ft³	8-10	5-6	5	4	1-5	8
Screen Size, Typical % + 325 Mesh	33	13	NIL	NIL	NIL	NIL
Water Absorption Wt % in Filter Cake	55-60	62-65	—	—	—	—

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ATTACHMENT G

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T. E

INTERNAL CORRESPONDENCE

MINING AND METALS DIVISION

P. O. BOX 579, NIAGARA FALLS, NEW YORK 14302

To (Name) T. P. Norris
Division J. E. Walsh
Location

Date February 12, 1974

Originating Dept. "Calidria" Asbestos - Marketin

Answering letter date

Subject "Safe Use" Literature

Copy to R. E. Byrne
G. L. Dickson
B. L. Ingalis
H. B. Rhodes
W. C. Thurber

PLAINTIFF'S EXHIBIT

Enclosed are copies of some items in our files to answer most questions on the potential hazards associated with the use of asbestos. The attached sheet lists all available items and you should request what you need, but don't overload your files. I thought you were aware of these items, except for the most recent one or two, but some recent ROC's indicate we may have been remiss in properly supplying you.

Two important points to remember:

1) The mere presence of asbestos in a plant does not constitute a hazard or a cause for OSHA citation. Asbestos fibers in the breathing zones of employees does present a potential hazard.

2) Asbestos has not been banned by the federal government except for EPA's restriction on certain insulation products to be sprayed.

If you have any customers who need a full "presentation" to attempt to preclude fear or prohibition of asbestos we will be glad to help from here.

John L. Myers

Enc.

/ds

ALL-STATE LEGAL PLAINTIFF'S EXHIBIT WK UC 5344

A17593

COMPANY _____ MAN'S NAME TEL/TPN

DATE 3/12/74

LITERATURE AVAILABLE FOR MAILING ON THE SAFE USE OF ASBESTOS

1. Material Safety Data Sheet & Typical Chemical & Spectrographic Analysis of "Calicria" Asbestos
2. Testimony by George W. Wright, M.D. before U.S. Dept. of Labor, Occupational Safety & Health Hearing on Proposed Occupational Asbestos Standard, March 14-17, 1972
3. Testimony by J. Corbett McDonald, M.D. - same as above
4. OSHA Regulations - 6/7/72
5. EPA Regulations - 4/6/73
6. NY Times Article and Rebuttals (Article - 1/21/73, Rebuttals - 2/25/73)
7. AIA Response to the Wall Street Journal - 6/15/72
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