



DOW CHEMICAL U.S.A.

PLAINTIFF'S EXHIBIT

DOW-541

TEXAS DIVISION
FREEPORT, TEXAS 77541

April 12, 1976

Joseph M. Griffin
Legal Department
47 Building
M I D L A N D

cc: R. L. Buell
F. D. Hoerger
D. J. Roberts

ASBESTOS - WORK PRACTICE HISTORY - TEXAS DIVISION

In response to your telephone call on March 11, I have reviewed the information in our files and am forwarding copies of seven items that reflect our understanding of the health hazards of exposure to asbestos and actions taken to minimize employee risk.

Perhaps this will help you in your effort to determine Dow's liability risk from employee exposures to asbestos. If review of this information generates further questions I will be happy to try to answer them for you.

I have omitted the Asbestos Handling Policy for the Texas Division Chlor-Alkali plants. I understand that the Chlor-Alkali Tech Center is including this in their compilation of information for you.

R. L. Daniel
Environmental Health Services

bbs

Enclosures (7)

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ASBESTOS AND HEALTH

Asbestos is an extremely useful mineral in our society--having more than 3,000 different applications.

Early in this century, a scarring disease of the lungs called "Asbestosis" was discovered. Control standards were established and, to my knowledge, no case of "classical" advanced asbestosis has occurred at our Company. This disease brought early death, usually in less than 20 years after first exposure.

Though there is no reason to believe we have ever exceeded the time-weighted average recommended for control of asbestos-containing dusts, it has now become apparent that these people exposed to the lower levels will develop various other forms of "asbestos disease" after a lapse period of 20 to 30 years. These diseases consist of

- (1) thickening of the pleura or lining of the lungs,
- (2) cancer of the lung,
- (3) cancer of the gastrointestinal tract, and,
- (4) malignant mesotheliomas--a deadly cancer of the lining of the lung or abdomen which is extremely rare except following asbestos exposure.

Studies by our Medical Department indicate that, though we thought our employees were exposed only to safe levels, the changing opinion of what constitutes a safe level has left us with a significant number of individuals who are potential victims of asbestos disease. We should therefore

- (1) institute procedures to minimize future exposure,
- (2) institute medical surveillance of the individuals at risk, and,
- (3) institute a campaign among the previously exposed group to discontinue smoking, which habit vastly enhances the chances of developing cancer of the lung.

Some Divisions have ongoing control programs of excellent quality and I have no doubt their people will gladly share their experience with anyone who has not yet established control.

Continued public information on this topic could eventually result in another case of environmental hysteria--we hope if such occurs we can say everything that can be done has been done. Let us be sure that, in addition to controlling our plant environment, we also insure that we are adding no asbestos dust to the community environment.

Corporate Medical Department
July 17, 1970

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THE DOW CHEMICAL COMPANY

DOW CONFIDENTIAL

TEXAS DIVISION
FREEPORT TEXAS 77541

September 11, 1970

B. J. Kinscl
B-108

cc: O. A. Easton

ASBESTOS INSULATION - STATUS REPORT

As of the date of this report, the Insulator Shop has discontinued the installation of most asbestos-bearing pipe insulation. In cases where the service requirements are greater than 1500°F., we are still installing Kaylo 20, a calcium silicate, asbestos reinforced material. This use is limited, mostly, to tube-turns on LHP cracking furnaces. This work only comprises about 2% of the jobs we currently install. This is expected to continue until an adequate high temperature substitute is found.

All of the Kaylo, a calcium silicate asbestos-filled insulation for temperatures to 1200°F., has been removed from the shelves in the shops and has been returned to locations as directed by Stores. The field stocks are being shipped to Stores as they are located. It is felt that approximately 80% of these field stocks have been removed to date. We are still in the process of locating and eliminating these small amounts of material.

Engineering standards of E & CS and Texas Division are in the process of being revised. It is felt that finalization of these standards will take about eight weeks longer. Contractors are still being allowed to install Kaylo and Kaylo 20 on new construction although most of the new installations are in Carey-temp, a non-asbestos material.

Technical Development is working in the area of finding substitutes for materials which contain asbestos such as transite, haveg, etc.

It is felt at this time that existing safety rules regarding the use of respirators for "hazardous dusts" are adequate to require the use of respirators by all personnel when dismantling the existing insulation materials. Subsequent to additional talks with the Safety Department, we expect to formally communicate with all supervisors involved. The Functional Superintendents have already talked with the Zone Superintendents regarding the use of respirators, when handling these products.

We had some minor difficulties with Purchasing's getting us into the Carey-temp business. But these were ironed out quickly. I feel that we are now "over the hump" as far as the change over occurs. There are a great many loose ends which still need to be gathered up. I will keep you informed as we change specifications, types of materials, handling procedures, etc.



F. B. Crouch

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D R A F T

Enclosure - 3

ASBESTOS USAGE - STATE OF MAINTENANCE DEPARTMENT AT PRESENT

Briefly, we feel that the highest exposure rates are experienced by the Insulator Group which handles the material on a day-in and day-out basis, both maintenance and construction. The next highest group would be the Brickmasons who apply the loose asbestos fill used in the mag pot program. Next in the exposure-time-weighted factor would be the persons who occasionally fabricate asbestos-bearing materials such as transite, haveg, and the like. The last on the exposure list would be those persons who occasionally perform demolition of asbestos-bearing insulation within the plants such as removal to facilitate repairs, etc., and handling loose material torn off existing lines prior to sending to the dump grounds.

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Presently, we have discontinued all purchasing of asbestos-bearing insulating pipe covering with exception of certain selected sizes of Kaylo 20, a high temperature pipe covering material, used for temperatures from 1200°F to 2200°F. Only use we are aware of for this material is certain light hydrocarbon plant furnaces tube-turn bends.

We have made a concerted effort to eliminate the small stocks of asbestos pipe covering which are scattered throughout the division. I believe we have accomplished this goal to the tune of about 95% complete. We have also returned all asbestos pipe covering from our supplier (Gulf Supply) back to the manufacturer.

Presently, we believe that only about 2% of the insulators' work within the division is made up of asbestos pipe covering. (\$4,000 to \$5,000 to eliminate all existing stocks.)

Insulating materials we are using to replace asbestos are:

1. Fiberglass - both in "snap-on" and loose blankets, ambient to 350°F.
2. Foamglass - 450° to 800°F - also used where temperatures cycle excessively and for Dowtherm service. 15% more expensive than asbestos.

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3. Careytemp 1500 - ambient to 1500°F - expanded perlite - fiberglass reinforced. Some problems associated with application but best available at present. Same cost as asbestos.

Several other areas we are working on:

1. Have problems with loose fill insulation used when setting mag pots. This generates a terrific amount of dust when asbestos shorts are used. We have found that "Super 48" by "48 Insulations, Inc." mineral wool makes less dust than asbestos shorts and contains only about 10% asbestos. The texture is slightly damp or moist feeling, thus cutting down on the dust problem. When our brickmasons are using this material, they have been wearing respirators. We have been assured by the manufacturers of "Super 48" that by October 16 they will be producing an asbestos-free insulation in bags marked as such. The composition of this material is a mineral wool made from copper slag.
2. Fabricating of asbestos-reinforced plastics such as transite, haveg, micarta, where dusts become a problem in operations such as sawing and grinding. We have no problem with insulators wearing respirators when this work is going on. Saws have been developed with vacuum systems to reduce amount of dust, but we still wear respirators as we still get quite a bit of residual dust.
3. Our foremen have been notified that respirators are to be worn by the employees when significant amounts of insulation are to be removed when demolition occurs. We have not yet made it a firm rule to wear respirators in any situation where dusts of asbestos occur, but I believe this will be only a short time before we do. Due to gathering evidence

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of existing hazards.

The last principal area I want to cover is that of new construction.

We are currently in the process of changing the Texas Division standards which will require the elimination of Kaylo (asbestos-type pipe covering) from the list of approved material. The Construction Department is continuing with all new construction in asbestos in which the material is on the job site, but any other new work will have the Careytemp 1500 or expanded perlite installed in lieu of asbestos. This change took place about the 5th of October.

This is a brief summary of where we stand in the Maintenance program of elimination of asbestos exposure hazards.

F. B. Crouch

/bs

October 13, 1970 —

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ASBESTOS USE - STATUS OF IN TEXAS DIVISION

We recently ran a survey of the use of asbestos in the Division with the object of answering 3 questions - 1) Where is asbestos used 2) What protective gear is being used and 3) What have people been told about asbestos.

Where is asbestos used? In addition to the use of asbestos containing materials ^{for insulation purposes} ~~that have been used~~ throughout the Division, asbestos is used in our chlorine areas for cell diaphragms in cell manufacturing. and repair for facilities and in all chlorine plants for pulping cells. Asbestos is also used in the Mag Cell areas for insulation in pot settings and in numerous other ways for the sealing of leaks in the cells and vent systems.

In addition to the use of new asbestos, we also have the problem of tearing out of insulation throughout the plant as well as the disposing of used asbestos in the chlorine and magnesium areas.

There is also in use materials of construction such as transite and haveg that are asbestos containing materials.

What protective gear is being used?

In most of the areas where asbestos is being used, either installed or disposed, we now have some form of protective gear in use. Our insulators have been wearing respirators for sometime. Cell Manufacturing folks have had a good protective program for about the last 1½ to 2 years. Recently the Mag folks started using more pro-

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protective gear. I would say that the insulator and Cell Manufacturing and repair people have a good program with good supervisory control. With some of the other crafts who occasionally remove and dispose asbestos materials, the use of protective gear is variable, probably relative to the degree of exposure. Contractors in the Division presently do not wear much in the way of protective gear.

What have people been told?

Asbestos information which our folks have received varies widely. Some have been told little, if anything -- others that asbestos is hazardous to the lungs -- and others that it causes lung problems including cancer. Probably the best informed are those who have been under the periodic examination program where the doctors have apparently discussed asbestos candidly. Contractors probably have been told little about the hazards of asbestos.

Now, I'll turn this over to Jack Crouch who will discuss the effort by the Maintenance folks in substituting some different materials for asbestos containing materials.

RCW/ks
10/14/70
S & LP

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ASBESTOS RECOMMENDATIONS

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1. Develop a Dust-Asbestos informational type program for division employees and contractors. (Similar to other hazardous material programs which have been developed.)
2. Develop and audit safe work procedures for minimizing the generation of asbestos dust. Procedure must include protective gear as a final precaution.
3. Continue to pursue the replacement of asbestos with reasonable economic substitutes. (Recognize that asbestos is probably irreplaceable in certain applications.)
4. Develop procedures for accounting for asbestos used and in monitoring asbestos exposures.
5. Continue periodic physical program on division employees who have reasonable exposure to asbestos.

D. J. Kilian, M. D.
F. B. Crouch
R. C. Walker

RCW/ks
10/15/70
S & LP

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ASBESTOS USAGE IN THE TEXAS DIVISION

WHERE IS IT BEING USED	WHO IS USING IT	HOW USED	PROTECTIVE EQUIPMENT	WHAT TYPE OF PROBLEMS
Chlor-Alkali #1	Class 1 Operators	Pulp Cells - Dry & Wet	MSA Gasfoe mouthbit respirator-usually worn for about 1 1/2 years	Hazardous to health
Chlorine #1	Class 1 & 2 Operators	Pulp Cells-Dry & Wet	MSA Gasfoe Mouthbit-usually - for about 20 years.	Can cause lung problems and to get as bad as 1 year ago
Chlorine #3	Class 1 & 2 Operators, Control C operators, Class 1 Cell Mtc.	Drawing cathodes, pulp cells - dry & wet. MSA Gasfoe mouthbit usually old cells	Acme Duo Seal or Welsh with dust pad. Usually worn for about 1 year.	Causes lung problems
Chlorine #4	Control C & Class 2 day Operators	Pulp cells - dry & wet	Welsh with dust pad - usually worn for about 8 months.	Can cause lung problems including cancer
Chlorine #5	Class 1 Cell Mtc. Drawing cathodes & patch. Class 1 Operators & Utility Pulp.	Draw cathodes, pulp cells - dry & wet. Dismantle old cells.	Acme Duo Seal - usually worn - good control-for about 2 years.	In group consisting of line-up. Can cause lung problems including cancer.
Cell Manufacturing	All Class 2 Operators (82 men rotate)	Draw cathodes. Seldom dismantle old cells	Dustfoe T/ - good control - also in job procedure. Used about 1 year.	Can cause lung problems including cancer
Magistral #1	Plasterers, building operators, running repair, bricklayers, utility.	Filled loose along Cell	Rose & mouth OVAG	Hauling
Magistral #3				
Mag Chlor 1				

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ASBESTOS USAGE IN THE TEXAS DIVISION

WHERE IS IT BEING USED

WHO IS USING IT

HOW USED

PROTECTIVE EQUIPMENT

WHAT WERE THE
LONG TERM EFFECTS

Dow Carpenter Shop - Plant
Wide

Insulators, yard, laborers,
boilermakers, pipe-fitters,
etc.

Mix & apply,
remove the old.

Dust respirators by
insulators for about 2
years. Usually nothing.

Insulators - 4 or 5
long periods of time
by exposure to
nothing.

Plant Wide by Contractors

Insulators, laborers,
carpenters, fitters,
masons, boilermakers,
etc.

Application, destruction,
mix with epoxy, cut siding,
gasket material, stress
relieving.

None

Nothing

FORM B OF ASBESTOS

Insulated Storage

Used in Chlorine Cell cathode drawing and dry pulping, Mag Cell Insulation filler, filler for
Epoxy, etc. Many forms.

Insulated Block (KATID-20 etc.)

High temperature (2200°F) insulation by Owens-Corning. Now used only for Greater than 1000°F
service pipe insulation. Cutting must be done.

Fire-slice

Cut in shop and on the job. Siding.

Acrylic

Acetone filled Phenolic Resin. Do much grinding. Are able to replace much if not all with
Benzene.

Wax

Used as gasketing, etc.

Gloves

For handling hot materials.

Gaskets

As filler and by itself.

JH/KCS
10/15/10

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H A N D B O O K
F O R
H A N D L I N G
A S B E S T O S M A T E R I A L

THE DOW CHEMICAL COMPANY
TEXAS DIVISION

Maintenance Department
Supporting Services

July 1972 Rev.

396496

HANDBOOK FOR HANDLING ASBESTOS MATERIALS

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PURPOSE AND DESCRIPTION

The purpose of this handbook is to outline the safe handling procedures of various asbestos materials used in the Texas Division. The intent is to minimize future exposure of employees to asbestos dust in any form through the proper use of safe work procedures.

Asbestos is widely used as structural wall board, insulation, and roofing material. Asbestos fibers are used as a mechanical reinforcing matrix in insulation, roofing paper, certain piping systems, etc. However, Dow Engineering Specifications were revised to exclude asbestos-containing insulation prior to installation of Federal regulations controlling the use and handling of asbestos. Eventually, the use of asbestos will be eliminated as the ultimate solution to the problem.

When working with materials which contain asbestos fiber, care must be taken to eliminate as much loose dust as possible. Wetting, isolating the work area, or other suitable procedures to eliminate the dust hazard are absolutely necessary. The main problem areas will be in removal of old, deteriorated insulation and the sawing of Transite. The OSHA standards which are effective July 7, 1972, define the precautions required for asbestos handling and the allowable safe working limits.

Should a hazard exist, and these procedures are not sufficient, contact the superintendent of the Plant A or B Functional groups.

Exceptions or variations to the procedures which follow can be obtained only by the above responsible superintendents.

SAFETY

The intent of THE DOW CHEMICAL COMPANY is to comply with all Federal and State regulations and to minimize the exposure of their employees to hazardous dusts. In order to accomplish this, substitutes for asbestos-containing materials will be used wherever possible. Respiratory protection, dust collectors, blowers, etc., will be mandatory where asbestos containing materials must be handled.

Materials described herein are furnished in blocks (or lags), shapes, curved segments, pre-formed pipe and fitting covers, flat and corrugated sheets and the asbestos as loose material.

When handled, formed, cut, sawed, or mixed into mortars, a fine dust will be loosed in the air which may be breathed into the human respiratory system. (Respiratory protection shall be used, not just for asbestos, but other mineral dusts as well, eg. mineral wool, silica, etc.)

The health of those who breathe asbestos dust may be seriously affected. Results can be similar but more serious than those caused by the more commonly known materials such as silica and coal dust. This phenomena has been observed for many centuries. Current medical discoveries show that handling of asbestos by a confirmed cigarette smoker is especially hazardous in the area of potentially serious lung disorders. It is recommended that those persons handling asbestos not smoke cigarettes in any quantity.

The two nose and mouth dust respirators which have been approved by the Safety Department are: (1) MSA Dustfoe 77, Dow Stock No. 15-26005, Cartridge No. 15-23774, and (2) Wilson Dust Respirator, Dow Stock No. 15-25460, Cartridge No. 15-23790.

Disposal of asbestos will be in polyethylene bags, Dow Stock No. 15-05080 for large bag and 15-04170 through 15-04185 for small bags.

As required, special protective clothing such as coveralls, head covering and gloves will be provided. Such requirements will be determined by the Division Monitoring Program

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Two lockers will be provided, so separated or isolated as to prevent contamination of the employee's street clothes from his work clothes.

Asbestos-contaminated clothing shall be placed in labeled, polyethylene bags for shipment to the laundry.

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USE OF HANDBOOK
FOR
HANDLING ASBESTOS MATERIALS

The Safe Work Procedures outlined in this handbook are minimum requirements for working with asbestos containing materials.

In some cases, job conditions may dictate more stringent requirements. These could include completely wetting down the area with water when removing old insulation, or completely isolating the work area with tarpaulins, etc.

Because Dow's Engineering Specifications have been revised to exclude use of asbestos-containing insulation, most of the Safe Work Procedures in this section of the Manual will seldom be referred to for new installations.

These procedures are to be used in conjunction with Plant Safety Rules, Maintenance Standard Safe Work Procedures for the Area, and Safety Standards.

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