



E. I. DU PONT DE NEMOURS & COMPANY

FABRICS & FINISHES DEPARTMENT

CC: R. S. Diem, Mar. Lab.

Marshall R & D Laboratory
April 4, 1973

E. E. SWAIN, JR.
B-2373
WILMINGTON

65-LINE PREPARAKOT®
SANDING DUST

Attached is a summary of the experiments I performed to determine the amount of airborne asbestos in sanding dust from 65-Line Preparakote®.

The level, in general, is within 1976 OSHA standards for asbestos (2 fibers/ml longer than 5 microns - time weighted average). Unanswered still are:

- The amount of encapsulated asbestos in the respirable dust
- The effect of the encapsulated asbestos on the lung tissue.

I do not know how to determine the amount encapsulated - one guess - would put the maximum as the proportion of talc and asbestos in the paint solids. However, the amount is going to be less than that since we do not count fibers less than 5 microns in length and a significant portion of the respirable dust would be less than 5 microns in diameter.

If we can be of further help, please contact me.

PROCESS CHEMISTRY SECTION
MANUFACTURING SUPPORT GROUP

Thomas J. Nelson
THOMAS J. NELSON

TJN:jp
4/4/73
ATTACH.

DUP 0903179

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DU 024561

SUMMARY SANDING SAMPLES

#1 - Taken at refinish training center while operator sanding fender.

Asbestos - 2.3 fibers/ml* (7 fibers/100 fields)

#2 - Taken while sanding panels laying flat on bench top. Filter was 6 inches to the side and 2 inches up from bench. 80% of dust particles flowed below filter.

Asbestos - 1.6 fibers/ml. (2 fibers/50 fields)

#3 - Taken while sanding on bench top. Filter 3-4 inches above sander.

Asbestos - 3.2 fibers/ml* (3 fibers/50 fields)

*NOTE: 1976 OSHA limit is 2 fibers/ml., in sample #1 - 6 hours sanding at this level would meet the 2 fiber limit and #3 - 5 hours. Sample #3 was probably higher in dust than operator would receive since the sample was close to source. In both cases - sanding for longer than 5 hours would be unlikely in a refinish shop.

DUP 0903180

DU 024562

Talk given to Insulators on Asbestos at
Repaune Plant on April 5, 1973.

Copy to: C. H. Zinke
4/10/73. C. H. Zinke

1348

DUP 0903181

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DU 024563

DRAFT

EXPOSURE TO ASBESTOS DUST

In the interest of protecting the health of its employees, the Du Pont Company and your Plant Management have established an acceptable level for asbestos exposure. The recommendation for the acceptable level is based upon the information that no health problems related to asbestos will result in anyone who is exposed to this concentration for their working lifetime. The reason this level has been made mandatory is naturally to protect the health of people who are occupationally exposed to asbestos. I am sure some of you have seen Dr. Hubiak from Haskell Lab checking air samples around the shop areas while you were doing your normal jobs. The purpose for these air checks was to determine the concentrations of asbestos fibers in the air and to determine what changes in jobs or equipment were necessary to get and keep the air levels of asbestos at a minimum and an acceptable level. These changes probably have had some effect upon the way in which you perform your job, but they were done to protect your health as well as the health of your fellow employees.

Now, we have talked about what your Plant Management is doing to be sure that you have a place to work that is free from recognized hazards from asbestos. Efforts to protect your health will be ineffective unless you try to minimize your own exposure to asbestos. There are

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DRAFT

EXPOSURE TO ASBESTOS DUST

(Continued)

several things you can do to protect yourself from unacceptable exposure to asbestos dust.

- 1.) Follow established standard practices for handling asbestos.
- 2.) Stop smoking if you do; don't start if you don't. In my opinion, it has been conclusively proven that cigarette smoking is a cause of irritation to the lungs and bronchial tubes and can cause cancer of the lungs and chronic bronchitis and emphysema without any other factors being present.

Significant asbestos exposure also has its primary effect on the lungs, as we will discuss further, so the use of cigarettes and their effects on the lungs could compound any problem that developed.

- 3.) You should wash your hands, arms, and face, before eating to prevent the inhalation of dust that might be on you.
- 4.) Do not eat in shop area where asbestos dust accumulates.
- 5.) Clean off loose dust from clothing before leaving the plant.

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DUP 0903183

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DRAFT

EXPOSURE TO ASBESTOS DUST

(Continued)

6.) Use and wear all personal protective equipment provided you.

Company standards and protective equipment provided by the Company and designed to protect you from asbestosis and other complications are only as effective as your willingness to do everything possible to protect yourself.

Asbestos has been known to man since the stone ages, having been used to make pottery. The term asbestos comes from the Greek word that means inextinguishable or unquenchable and is a term that embraces a number of fibrous silicate minerals found throughout the world. There are 3 major types of asbestos; the type being determined by the fiber length and physical properties. Crysothile asbestos accounts for 95% of the asbestos production and is the type most used in the United States. Crocidolite and Amosite are the other two major types. Asbestos is the only mineral that can be woven into cloth. Commercial mining of asbestos began in the late 1870's and it is estimated that there are about 3000 different industrial applications for asbestos in the United States today. This ranges from insulation material to brake shoes, in cement, floor tile, and many other uses.

Now let's talk a few minutes about asbestosis. The recognition of asbestosis as a disease goes back to the first century when the Greek Geographer, Strabo, and the Roman

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DRAFT

EXPOSURE TO ASBESTOS DUST

(Continued)

Naturalist, Pliny the Elder, each mentioned a sickness of the lungs in slaves whose occupation was to weave asbestos into cloth. The cloth at that time was used in cremation and was described as the "funeral dress of kings". Very little constructive medical information was obtained or pursued about asbestosis following this. The modern knowledge of asbestosis dates to about 1900 when Dr. E. Montague Murray of London described the fibrosis of asbestosis in the lungs of a man who had worked in the carding room of a factory for 14 years. A few years later, an inspector in the Department of Labor of England, described the illness in a group of employees in an asbestos weaving mill. This was the first report of the epidemiology of asbestosis. Unfortunately, neither he nor Dr. Murray realized the full significance of their findings. The first written report of the illness in the modern medical literature was in 1924, when Dr. W. E. Cooke, an English physician, described a case in a woman who developed symptoms after working for 13 years in an asbestos textile mill. He was also first to describe the difference between asbestosis and other pneumoconioses.

Between 1928 and 1929, Dr. E.R.A. Marwether examined 363 asbestos-textile workers and found that slightly more than 25% showed evidence of pulmonary fibrosis with symptoms.

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DUP 0903185

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DRAFT

EXPOSURE TO ASBESTOS DUST

(Continued)

He also showed that the incidence of fibrosis increased in direct proportion to the number of years of exposure, reaching 81% in the group of workers employed in the industry for 20 years or more. In 1931, as a result of this study, Great Britain passed regulations to control the dust and exposures better than had been done previously. This was the first time that attempts were made to control the exposure of humans to asbestos dust.

On a survey in 1949 in South Africa, a larger mining area for asbestos, an American physician found children developing asbestosis before the age of 12. In checking on their activity, he found that they were employed in a mill and their job was to stand in large jute bags and pack the asbestos fiber down with their feet as the material was being put into the bag.

In 1960, 2 physicians working independently, one in Finland, and one in South Africa, discovered asbestos bodies in the lungs of people who lived near asbestos factories but did not work in them. This was the first indication that asbestos could be inhaled without direct occupational exposure. Many studies have been done since this to substantiate the prevalence of asbestos fibers in the atmosphere.

DRAFT

EXPOSURE TO ASBESTOS DUST

(Continued)

There is still much work being done on asbestos exposure and asbestosis and much work still needs to be done. Medical authorities and industry are becoming more concerned over exposure to asbestos; and better protection and precautions are being developed.

The exact mechanism of asbestosis is unknown, but we believe that asbestos fibers are inhaled and become trapped in the small air sacs of the lungs. Because of the movement of the bronchial tubes with breathing, the fibers work into the lining of the bronchial tubes. They create a chronic irritation here and the body tries to get rid of the irritation and deposits various materials around the fiber to make it less irritating and to try to absorb it. The body mechanisms are not able to remove the fibers so the conglomerate of asbestos fibers and defense mechanisms make up an asbestos body. The chronic irritation to the lung continues and once the asbestos body is deposited, it is always present. Because of the chronic irritation, scarring and scar tissue develop in the lung and reduce the lung's ability to move air. This makes the lung no longer effective as a means of exchanging oxygen; and then chronic lung disease called asbestosis develops. This usually first shows up as shortness of breath. A dry cough then develops and then production of blood-streaked sputum. An occasional inhaled fiber will not cause significant scarring in the lungs to interfere with their function, but constant inhalation of large numbers

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DRAFT

EXPOSURE TO ASBESTOS DUST

(Continued)

of fibers would; and that is the basis for the permissible air concentration being established. Asbestosis does not predispose someone to tuberculosis as does silicosis and anthracosis.

Calculations suggest that asbestos workers who smoke have about 90 times the risk of developing lung complications from asbestos exposure as do men who neither smoke nor work with asbestos. This is the reason for recommending stopping smoking if you do, don't start smoking if you don't.

I think that with the program the Company and your Plant Management have started, and with your cooperation and help, there should not be any health hazards related to asbestos through your working lifetime.

Bruce W. Karrh, M.D.

April 4, 1973

BWK/bjd

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DUP 0903188

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RAFT

EXPOSURE TO ASBESTOS DUST

In the interest of protecting the health of its employees, the Du Pont Company and your Plant Management have established an acceptable level for asbestos exposure. The recommendation for the acceptable level is based upon the information that no health problems related to asbestos will result in anyone who is exposed to this concentration for their working lifetime. The reason this level has been made mandatory is naturally to protect the health of people who are occupationally exposed to asbestos. I am sure some of you have seen Dr. Kubiak from Haskell Lab checking air samples around the shop areas while you were doing your normal jobs. The purpose for these air checks was to determine the concentrations of asbestos fibers in the air and to determine what changes in jobs or equipment were necessary to get and keep the air levels of asbestos at a minimum and an acceptable level. These changes probably have had some effect upon the way in which you perform your job, but they were done to protect your health as well as the health of your fellow employees.

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DUP 0903189

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DRAFT

EXPOSURE TO ASBESTOS DUST

(Continued)

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- 2.) Stop smoking if you do; don't start if you don't. In my opinion, it has been conclusively proven that cigarette smoking is a cause of irritation to the lungs and bronchial tubes and can cause cancer of the lungs and chronic bronchitis and emphysema without any other factors being present.

Significant asbestos exposure also has its primary effect on the lungs, as we ^{had} will discuss further, so the use of cigarettes and their effects on the lungs could compound any problem that developed.

- 3.) You should wash your hands, arms, and face, before eating to prevent the inhalation of dust that might be on you.
- 4.) Do not eat in shop area where asbestos dust accumulates.
- 5.) ~~Clean off loose dust from clothing before leaving the plant.~~

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DUP 0903190

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DRAFT

EXPOSURE TO ASBESTOS DUST

(Continued)

6.) Use and wear all personal protective equipment provided you.

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Asbestos has been known to man since the stone ages, having been used to make pottery. The term asbestos comes from the Greek word that means inextinguishable or unquenchable and is a term that embraces a number of fibrous silicate minerals found throughout the world. There are 3 major types of asbestos; the type being determined by the fiber length and physical properties. Chrysotile asbestos accounts for 95% of the asbestos production and is the type most used in the United States. Crocidolite and Amosite are the other two major types. Asbestos is the only mineral that can be woven into cloth. Commercial mining of asbestos began in the late 1870's and it is estimated that there are about 3000 different industrial applications for asbestos in the United States today. This ranges from insulation material to brake shoes, in cement, floor tile, and many other uses.

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DRAFT

EXPOSURE TO ASBESTOS DUST

(Continued)

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Between 1928 and 1929, Dr. E.R.A. Marwether examined 163 asbestos-textile workers and found that slightly more than 25% showed evidence of pulmonary fibrosis with symptoms.

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DUP 0903192

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DRAFT

EXPOSURE TO ASBESTOS DUST

(Continued)

He also showed that the incidence of fibrosis increased in direct proportion to the number of years of exposure, reaching 81% in the group of workers employed in the industry for 20 years or more. In 1931, as a result of this study, Great Britain passed regulations to control the dust and exposures better than had been done previously. This was the first time that attempts were made to control the exposure of humans to asbestos dust.

On a survey in 1949 in South Africa, a large mining area for asbestos, an American physician found children developing asbestosis before the age of 12. In checking on their activity, he found that they were employed in a mill and their job was to stand in large jute bags and pack the asbestos fiber down with their feet as the material was being put into the bag.

In 1960, 2 physicians working independently, one in Finland, and one in South Africa, discovered asbestos bodies in the lungs of people who lived near asbestos factories but did not work in them. This was the first indication that asbestos could be inhaled without direct occupational exposure. Many studies have been done since this to substantiate the prevalence of asbestos fibers in the atmosphere.

Some investigations have suggested, based on a study in Miami, that asbestos fibers get into the air in significant concentrations from the wearing and automobile brake shoes in large metropolitan areas. This now tends to be confirmed.

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EXPOSURE TO ASBESTOS DUST

(Continued)

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The exact mechanism of asbestosis is unknown, but we believe that asbestos fibers are inhaled and become trapped in the small air sacs of the lungs. Because of the movement of the bronchial tubes with breathing, the fibers work into the lining of the bronchial tubes. They create a chronic irritation here and the body tries to get rid of the irritation and deposits various materials around the fiber to make it less irritating and to try to absorb it. The body mechanisms are not able to remove the fibers so the conglomerate of asbestos fibers and defense mechanisms make up an asbestos body. The chronic irritation to the lung continues and once the asbestos body is deposited, it is always present.

Because of the chronic irritation, scarring and scar tissue develop in the lung and reduce the lung's ability to move ^{the air in the pleura of the lungs & maintain} air. This makes the lung no longer effective as a means of exchanging oxygen; and then chronic lung disease called asbestosis develops. This usually first shows up ^{clinically} as shortness of breath. A dry cough then develops ^{and then production of blood-streaked sputum} and then production of blood-streaked sputum. ^{in the later stages of the disease.} An occasional inhaled fiber will not cause significant scarring in the lungs to interfere with their function, but constant inhalation of large numbers

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DRAFT

EXPOSURE TO ASBESTOS DUST

(Continued)

of fibers would; and that is the basis for the permissible air concentration being established. Asbestosis does not predispose someone to tuberculosis as does silicosis and anthracosis. *uncontrolled asbestos exposure does lead to the development of cancer of the lung and the bronchitis.*

Calculations suggest that asbestos workers who smoke have about 90 times the risk of developing lung complications from asbestos exposure as do men who neither smoke nor work with asbestos. ~~This is the reason for recommending stopping smoking if you do, don't start smoking if you don't.~~

I think that with the program the Company and your Plant Management have started, and with your cooperation and help, there should not be any health hazards related to asbestos through your working lifetime.

Bruce W. Farrh, M.D.

April 4, 1973

BWR/bjd

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DUP 0903195

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