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Copy to Zaruba et al 8/30/83.—

INDUSTRIAL RELATIONS BULLETIN

DATE	BULLETIN TITLE	RESPONSIBLE DEPT	BULLETIN NO
8/22/83	Industrial Hygiene	Employee Health Services	4
SUBJECT		SUPERSEDES	DATED
Asbestos		Same	7/18/75

Asbestos is a generic term that describes a variety of naturally occurring fibrous, incombustible silicate minerals. Although tremendously valuable to industry, these minerals have been closely linked to asbestosis, a degenerative lung-scarring disease, and to lung cancer. The Occupational Safety and Health Administration (OSHA), therefore, has regulated employee exposure to asbestos since shortly after the agency's inception. OSHA has defined asbestos, established standards for its use, and set permissible exposure limits. The initial airborne asbestos fiber limits have been revised downward. Regulations under the OSHA asbestos standard are covered in 29 CFR 1910.1001. Asbestos exposure in Ontario is regulated under the Occupational Health and Safety Act (Revised Statutes of Ontario, 1980, Chapter 321, August 1982). Exposure limits presently differ under the two regulations; however, industrial hygiene work practices to control dust and fiber in air are the same.

Six fibrous minerals, members of a family called silicates, are recognized as asbestos: chrysotile (white asbestos), actinolite, amosite (brown asbestos), anthophyllite, crocidolite (blue asbestos) and tremolite. Commercially, chrysotile is the most important form of asbestos, accounting for approximately 95% of the asbestos used in North America. Some talc contains various amounts of asbestos.

Asbestos has about 3000 different uses, with approximately two-thirds being used in the construction industry in building products, insulation, friction materials, and textiles. Manufactured products have included reinforced asbestos cement sheets and pipes, patching and taping compounds, floor and ceiling tiles as well as paints, coatings and sealants containing asbestos as reinforcing fillers, pipe linings and fillers for various liquids. Friction products include clutch facings and brake linings for automobiles and trucks, railroad cars, airplanes, and industrial machinery. A variety of other uses are known including theater curtains, fire blankets and other thermal protection, filtration materials and, until recently, dry wall patch compounds and imitation fireplace ashes.

Once incorporated into manufactured items, hazards resulting from asbestos are less probable, as long as the substance is not disrupted. However, the fibers are nearly indestructible, and a potential health risk arises whenever asbestos fibers are set free, resulting in airborne asbestos dust.

Health Hazards

Asbestos exposure can cause asbestosis, cancer of the lungs and digestive tract, and mesothelioma.

Asbestosis is a diffuse fibrotic lung disease caused by exposure to high concentrations of asbestos dust and fiber, usually after several years of exposure. The onset of asbestosis appears to depend on dust and fiber concentration, fiber shapes, type of asbestos, and length of exposure. Usually, the disease becomes evident 20 or more years after the first exposure to asbestos. Once established, however, a highly disabling pneumoconiosis can progress even after exposure has ceased.

Bronchogenic carcinoma (lung cancer) and mesothelioma of the pleura and peritoneum (cancer of membranous lining of the chest and abdominal cavities) are also associated with asbestos exposure. Excesses of cancer of the larynx, stomach, colon, and rectum have also been observed. Some forms of asbestos appear far more hazardous than others. As with asbestosis, there can be a long latent period, generally more than 25 years for mesothelioma. The mechanism of action is not currently known. Asbestos is different from most chemical carcinogens because it is not metabolized. Thus even limited exposures to high levels leads to continuing presence of inhaled asbestos particles or

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fibers within the lung. These can translocate to the abdominal cavity and to other tissues. The prognosis for asbestosis and asbestos-induced cancer is generally poor.

Risks of disease due to asbestos exposure have not been defined clearly for all occupational groups known to have significant exposure. Firm epidemiological data are available only for heavily exposed workers employed in asbestos mining, manufacturing and insulation handling. However, there is evidence that the problem is more widespread than previously believed and that workers from a variety of trades and occupations, including painters, electricians, carpenters, machinists, boiler makers, pipefitters, mechanics, welders, and others, may be at increased risk. The issue of risk of disease from asbestos exposure is further complicated in that smokers who have had asbestos exposure clearly have markedly increased risk of developing lung disease related to asbestos.

Asbestos exposures within Ford Motor Company may occur from:

- Insulated pipe covering for parts washers and cleaners, steam and hot water lines.
- Insulated coverings for boilers and associated parts in powerhouses. Drying oven and furnace insulation. Asbestos blocks, bricks, sheets, and sleeves.
- Clutch and brake linings for various machinery and transportation equipment (power presses, conveyor belts, hi-los, locomotives, tow tractors, trucks, automobiles).
- High temperature gasket materials for manifolds, pipes.
- High temperature blankets, gloves.
- Asbestos-containing parting compounds, certain talcs. Filtration media.

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Employee Exposure

Since we do not manufacture asbestos materials, exposures are primarily limited to those who work with asbestos-containing products. However, these exposures are no less significant. Employee exposure can generally occur during material handling and maintenance of asbestos-containing friction materials. Exposure can occur during grinding, sawing, sanding, drilling, or otherwise disturbing or finishing asbestos-containing products. Demolition, removal, and repair of asbestos coverings and coatings offer other sources of worker exposure. Insulation removal or repair and brake and clutch servicing can be especially hazardous.

Permissible Occupational Exposure Limits (PEL) -- Breathing Zone Concentrations

Eight-hour time-weighted average exposure: 2 fibers longer than 5 micrometers per cubic centimeter of air (2 f/cc >5 μm). Ceiling concentration: 10 f/cc >5 μm.

Ontario TWAE PEL for amosite, crocidolite, and other forms of asbestos are 0.5, 0.2, and 1.0 f/cc >5 μm, respectively. The Ontario ceiling PEL for amosite, crocidolite, and other forms are 2.5, 1.0, and 5.0 f/cc >5 μm, respectively.

Methods of Compliance

- Engineering controls, such as isolation, enclosure, local exhaust ventilation, and dust collection are required and should be used to meet the PEL.
- Compliance with the PEL may not be achieved by sole use of respirators or shift rotation except under special conditions approved by Industrial Hygiene.
- All hand and power operated tools, which may produce or release asbestos fibers in excess of the PEL, must be provided with local exhaust ventilation.
- Insofar as practicable or unless the usefulness of the product would be diminished, asbestos must be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state. Wet methods of control are very effective in suppressing airborne asbestos fiber and dust in pipe and furnace insulation repair and demolition.

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- Employees who may be exposed to asbestos should be trained in safe work practices and informed of the provisions in the OSHA asbestos standard and in this bulletin.
- Every employee engaged in the spraying, demolition, or removal of asbestos-containing material shall be provided appropriate respiratory protection and special clothing (coveralls, hood and foot coverings, and gloves).
- Only approved respiratory protection, suitable for the concentration of asbestos expected, is to be provided. A respiratory protection program is mandatory for certain operations.
- Double lockers and special laundering procedures for asbestos-contaminated clothing are required.
- Special change rooms are required for exposures exceeding the PEL.

Monitoring
Initial and periodic monitoring are required. Sampling frequency shall not exceed every six months for employees whose exposure to asbestos may be foreseen to exceed the PELs for the TWAE or ceiling concentrations.

Medical Examinations
Preplacement, annual, and termination-of-employment medical examinations are required for employees who are exposed to, or were in excess of, 0.1 f/cc seven to eight-hour time-weighted average exposure. Medical examinations should include as a minimum a medical history to elicit symptomatology of respiratory disease, chest X-ray, and pulmonary function tests.

Recordkeeping
Exposure and medical records or any personal, environmental, and/or medical monitoring must be maintained for at least 20 years. Affected employees, their designated representatives, and OSHA and NIOSH representatives, upon request, would have access to these records.

Any employee found to have been exposed to concentrations in excess of permissible exposure limits shall be notified of this in writing within five days of the finding. The employee shall also be timely notified of corrective action being taken.

Signs and Labels
Caution signs shall be provided and displayed in areas where airborne asbestos concentrations may be in excess of the PEL. Signs shall be posted at such a distance to permit an individual to take the necessary protective measures before entering the contaminated area.

Housekeeping
Surfaces should be kept free of accumulations of asbestos if, with their dispersion, there would be excessive airborne concentrations. Additionally, asbestos waste, scrap, debris, clothing, and/or other items contaminated with asbestos should be handled, collected, and disposed in sealed labeled impermeable bags. Asbestos-containing waste must not be incinerated or discharged into community water supplies. Specific information regarding waste disposal should be obtained from the Stationary Source Environmental Control Office (SSECO).

Employee Training
Employee Health Services has developed a slide and cassette tape presentation which summarizes pertinent information relative to asbestos use, handling, hazards, controls, work practices, and monitoring of exposures. This presentation is designed to assist plants in their employee training efforts.

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Information and Industrial Hygiene Services
Further information regarding the OSHA asbestos standard may be obtained from Industrial Hygiene Services, 33-78955. Assistance can be provided regarding employee exposure monitoring and analysis, appropriate respirators, approved vacuum sweepers, engineering controls, and other elements of the OSHA asbestos exposure standard. It is recommended that materials suspected of containing asbestos be submitted to the Industrial Hygiene Laboratory for analysis prior to any handling that could generate airborne fiber and dust. A check list to help identify products containing asbestos is available from Plant Engineering Offices, Manufacturing Staff (Manufacturing Practice No. 303, December 1981, "Employee Exposure to Asbestos Containing Non-Production Materials").

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Manufacturers of washers and industrial vacuums equipped with high efficiency filters and approved for asbestos dust control include:

- Ford "Rotunda" Brake Vacuum (34-0009)
- Ford "Rotunda" Brake Parts Washer (65-0016)
- "Tornado ToxVac"
  Breuer Electric Manufacturing Company
  7401 West Lawrence Avenue
  Chicago, Illinois 60656
  (312) 867-5100
- "Hako Minuteman"
  Hako Minuteman
  111 South Route 53
  Addison, Illinois 60101
  (312) 627-6900
- "Nilfisk"
  Nilfisk of America, Incorporated
  201 King Manor Drive
  King of Prussia, Pennsylvania 19406
  (215) 277-3900

Other vacuums would be acceptable provided they meet filtration efficiency specified in the OSHA asbestos standard.

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INDUSTRIAL RELATIONS BULLETIN

DATE	BULLETIN TITLE	RESPONSIBLE DEPT	BULLETIN NO
8/22/83	Industrial Hygiene	Employee Health Services	4a

SUBJECT	SUPERSEDES	DATED
Asbestos Brake and Clutch Servicing --- (Supplement to Bulletin No. 4)	New	

The following procedures are recommended to minimize asbestos dust exposures during brake and clutch servicing of trucks, tractors, trailers, automobiles, locomotives, forklifts, and tow tugs. Strict adherence to these procedures will eliminate exposures of mechanics to asbestos during brake and clutch servicing.

1. An area should be designated for all brake and clutch repairs. The normal maintenance area for tug tractors and forklift trucks could serve as the designated area for these plant vehicles. Entrances into this area shall be posted during brake and clutch servicing with an asbestos exposure warning sign:

   ASBESTOS
   Dust Hazard
   Avoid Breathing Dust
   Wear Assigned Protective Equipment
   Do Not Remain in Area Unless Your Work Requires It
   Breathing Asbestos Dust May Cause Asbestosis and Cancer

2. Only essential personnel should be present in the immediate maintenance area during brake and clutch servicing.

3. During brake servicing, an air purifying respirator, either single-use or with replaceable particulate filter(s), as approved by Industrial Hygiene and Mining Enforcement and Safety Administration (formerly Bureau of Mines) or NIOSH, shall be worn during all procedures starting with removal of wheel and including reassembly. During manual clutch servicing, such a respirator shall be worn during removal and cleaning of clutch, pressure plate, and housing assembly, and during installation of new clutch assembly.

4. Dust shall first be cleaned from brake drums, brake backing plates, brake assemblies and clutch assemblies using an industrial type vacuum cleaner equipped with a high efficiency filter system (>99% efficiency for 0.3 μm diameter aerosols). After vacuum cleaning, any remaining dust shall be removed using a rag soaked in water and wrung until nearly dry. Under no circumstances shall compressed air or dry brushing be used for cleaning. (See Industrial Hygiene Bulletin No. 4 for approved vacuum cleaners.)

5. During arcing and riveting operations, an approved respirator, as described in (3) above, shall be worn. Grinding (arcing) machines shall be provided with local exhaust ventilation such that exposures are maintained below the OSHA asbestos standard (29 CFR 1910.1001). At a minimum, dust bag of the arcing machine shall be removed and replaced with hose of high efficiency industrial vacuum described in (4) above.

6. During removal of vacuum bags, an approved respirator, as described in (3) above, shall be worn. Industrial vacuum cleaner bags containing asbestos dust, cloths used for wiping brake and clutch assemblies, and other asbestos-contaminated debris shall be sealed in plastic bags and labeled with following warning label printed in letters of sufficient size and contrast to be readily visible and legible:

   CAUTION
   Contains Asbestos Fibers
   Avoid Breathing Dust
   Breathing Asbestos Dust May Cause Asbestosis and Cancer

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f. (continued)
All asbestos waste must be disposed in accordance with OSHA asbestos regulations and the appropriate sections of Subpart B - National Emission Standard for Asbestos, Title 40 - Protection of the Environment, Chapter 1, Environmental Protection Agency. Asbestos-containing waste must not be incinerated or discharged into community water supplies. Specific information regarding waste disposal should be obtained from the Stationary Source Environmental Control Office (SSECO).

7. All floor cleaning in areas where brakes and clutches are repaired should be done with the high efficiency industrial vacuum cleaner as described in (4) above. Grinding (arcing) machines shall also be cleaned with this vacuum cleaner and any remaining dust wiped with a damp cloth. An approved respirator, as described in (3) above, shall be used during this cleaning.

8. Although adherence to above procedures should minimize contamination of work clothing, it is recommended that the appropriate portions of OSHA regulations on asbestos concerning special clothing, change rooms, etc. be followed. duPont "Tyvek" disposable coveralls are acceptable for these asbestos-product maintenance operations.

9. Industrial hygiene work practices in this bulletin and the OSHA asbestos exposure standard should be provided to all employees with potential exposure to asbestos at brake and clutch servicing and reviewed with their designated representatives.

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