

FILE NAME: Asbestos Information Association (AIA)

DATE: 1958 Apr

DOC#: AIA048

DOCUMENT DESCRIPTION: AIHA Journal Published Asbestos Standard

AMERICAN

Industrial Hygiene

ASSOCIATION *Journal*

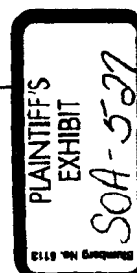
Volume 19

APRIL 1958

Number 2

THE CONTROL OF A LEAD HAZARD IN THE SILVERSMITHING INDUSTRY	73
<i>Leonard D. Pagnotto and Harold Bayley</i>	
INSTRUMENT DEVELOPMENTS IN HEALTH PHYSICS	75
<i>F. E. Adley</i>	
STUDIES ON THE TOXICITY OF n-PROPYL NITRATE VAPOR	83
<i>William E. Rinehart, Robert C. Garbers, Earle A. Greene and Robert M. Stoufer</i>	
NOISE EXPOSURE EVALUATION	84
<i>Edward W. Poth and Carl J. Weinberg (with a Critique by K. C. Stewart)</i>	
THE TOXICOLOGY OF AN ANILINE-FURFURYL ALCOHOL-HYDRAZINE VAPOR MIXTURE	91
<i>Keith H. Jacobson, William E. Rinehart, Henry J. Wheelwright Jr., Martin A. Ross, Jackie L. Papin, Robert C. Daly, Earle A. Greene and William A. Groff</i>	
NUCLEAR SAFETY AND INDUSTRIAL HYGIENE IN THE FABRICATION OF NUCLEAR FUEL ELEMENTS	101
<i>W. B. Harris and L. R. Solon</i>	
THE EFFECTIVENESS OF SAND AS A FILTER MEDIUM	107
<i>R. E. Yoder and F. M. Empson</i>	
CRITERIA FOR ESTABLISHING SHORT TERM PERMISSIBLE INGESTION OF FALLOUT MATERIAL	111
<i>Gordon M. Dunning</i>	
CURRENT PROBLEMS IN THE FIELD OF RESPIRATORY PROTECTION	121
<i>E. C. Hyatt</i>	
RESPIRATORY PROBLEMS IN ATOMIC ENERGY PRACTICE	123
<i>G. W. C. Tail and T. H. Byington</i>	
A DISCUSSION OF THE BUREAU OF MINES APPROVAL SCHEDULES FOR RESPIRATORY PROTECTIVE DEVICES	126
<i>S. J. Pearce</i>	
A COMPARISON OF PERFORMANCE STANDARDS AND TESTS SPECIFIED BY BUREAU OF MINES SCHEDULE 14F AND BY THE CHEMICAL CORPS FOR THE M9A1 MASK	130
<i>Gerald J. Fleming</i>	
RESPIRATORY PROTECTION EQUIPMENT DEVELOPMENTS BY THE U. S. ARMY CHEMICAL CORPS	140
<i>Allan L. West</i>	
THE RESPIRATOR PROBLEM—AN INDUSTRIAL HYGIENIST'S VIEWPOINT	149
<i>Harry S. Jordan</i>	
HYGIENIC GUIDES SERIES	154
NEWS OF LOCAL SECTIONS	164

AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, published bi-monthly for the American Industrial Hygiene Association. Dohrman H. Byers, *Editor*; Jack C. Radcliffe, *Associate Editor*; Lloyd E. Gordon, *News Editor*. Editorial Offices, 1014 Broadway, Cincinnati 2, Ohio. Subscription \$7.50 per year in the United States; \$7.75 per year in Canada; \$8.25 per year in all other foreign countries. Single copies \$1.50. © Copyright, 1958, by The Williams & Wilkins Co. Entered as second class matter at the post office at Baltimore, Md. The American Industrial Hygiene Association Journal reserves the right to edit all advertisements and to refuse advertising copy when it does not meet the high standards adopted by the Association.



C. RECOMMENDED CONTROL PROCEDURES: To prevent exposure to high concentrations of amorphous silica dust, process ventilation and/or enclosure are the best means of control. For some operations a dust respirator approved by the U. S. Bureau of Mines may be satisfactory.

IV. Specific Procedures

A. FIRST AID: None.

B. SPECIAL MEDICAL PROCEDURES:

- (1) Preplacement: Clinical and chest radiographic examinations should be made on all persons prior to job assignment.
- (2) Periodic: Since there is only limited information about the harmful effects of amorphous silica in industry, exposed personnel should have careful periodic medical examinations, including chest x-ray. Pulmonary function testing may be useful.
- (3) Treatment: No satisfactory treatment other than removal from exposure, and therapy for any complicating infection.

V. Literature References

1. COOPER, W. C., et al: Industrial Hygiene Foundation Transaction Bulletin No. 30, 182-194.
2. DRINKER, P. AND HATCH, T.: Industrial Dust. McGraw-Hill Co., Inc. New York, 1954.
3. FRASER, D. A.: *AMA Arch. of Ind. Hyg. and Occ. Med.*, 8: 412, 1953.
4. LAMBIE, J. S.: *Ind. Med.*, 7: 470, 1938.
5. PALICARD, A. AND COLLET, A.: *AMA Arch. of Ind. Hyg. and Occ. Med.*, 9: 389, 1954.
6. SCHEPERS, G. W. H., et al: *AMA Arch. of Ind. Health*, 16: 125, 1957; *ibid*, 16: 203, 1957; *ibid*, 16: 280, 1957; *ibid*, 16: 363, 1957; *ibid*, 16: 499, 1957.
7. SMART, R. H. AND ANDERSON, W. M.: *Ind. Med. and Surg.*, 21: 509, 1952.
8. TEBBENS, B. D. AND BEARD, R. R.: *AMA Arch. Ind. Health*, 16: 55, 1957.
9. U. S. Public Health Service; California Department of Public Health; Nevada State Health Department; Oregon State Board of Health: Progress Report of Study of Pneumoconiosis Hazards in the Diatomite Processing Industry. 1955.

Asbestos

I. Hygienic Standards

A. RECOMMENDED MAXIMUM ATMOSPHERIC CONCENTRATION (8 hours): 5 million particles per cubic foot of air (MPPCF)¹

- (1) Basis for Recommendation: Experience in industry,^{2, 4, 12, 13} and animal experiments.^{3, 7}

B. SEVERITY OF HAZARDS:

- (1) Health: Long continued inhalation of asbestos dust results in a form of pneumoconiosis known as asbestosis. The primary effect of inhalation is an interstitial pulmonary fibrosis. The disease is characterized by asbestos bodies in the lungs and sputum. Based on roentgenological examinations, asbestosis can be classified as minimal, moderate, and advanced. It is a serious disease in some instances, but more frequently it remains nondisabling for many years, even without appreciable symptoms, as long as some other serious disease does not supervene

to cause death.* Chief symptoms of advanced asbestosis are variable cough, dyspnea, substernal chest pains, decreased chest expansion, weakness, emaciation, clubbed finger tips, and curved fingernails. Any appreciable decrease in the amount of asbestos dust in the breathing atmosphere will cause a decrease in the incidence and severity of asbestosis. Individual susceptibility varies.* There have been reports of an increased incidence of lung cancer in persons with asbestosis.⁷

- (2) Fire: None.

C. SHORT EXPOSURE TOLERANCE: Not applicable:

II. Significant Properties

A fibrous magnesium calcium silicate which occurs in various combinations as white, greyish or greenish masses, either compact or of long silky fibers, flax-like and readily separated. About 95% of commercial asbestos is chrysotile, which is derived from serpentine, and is a hydrous magnesium

silicate containing from 12 to 14 per cent water of crystallization.

III. Industrial Hygiene Practice

A. **RECOGNITION:** The spinning and weaving of asbestos, in combination with other textiles for fire proof and heat resistant cloth, results in dust exposure. It may be used by itself or combined with other materials for valve packings, gaskets, boiler lagging and pipe covering, protective clothing, shielding materials, and as automotive brake linings. In the building industry it is used in the manufacture of asbestos cement products, heat insulating, and fire-proofing materials.

B. **EVALUATION OF EXPOSURES:** Asbestos dust may be sampled with the electrostatic precipitator or by the impinger method using alcohol or alcohol and water, as the collecting medium,"* and dust counts made by the standard light field technique.* The recommended maximum atmospheric concentration of 5 MPPCF is based upon the impinger sampling procedure.

C. **RECOMMENDED CONTROL PROCEDURES:** Prevention of asbestosis depends entirely upon preventing exposure to concentrations of dust sufficiently high to produce the characteristic reaction. Enclosure or local exhaust ventilation are the principal means of dust control. U. S. Bureau of Mines approved dust respirators may be worn as protection for some operations.

IV. Specific Procedures

A. **FIRST AID:** None.

B. **SPECIAL MEDICAL PROCEDURES:**

- (1) **Preplacement:** Clinical and radiographic chest examinations prior to job assignment.
- (2) **Periodic:** Exposed personnel should

have periodic clinical examinations for signs and symptoms of asbestosis. These should include examination of the sputum for asbestosis bodies, and chest x-rays of good quality.

- (3) **Treatment:** No satisfactory treatment other than removal from exposure and therapy for any complicating infection.

V. Literature References

1. American Conference of Governmental Industrial Hygienists: *AMA Arch. of Ind. Health*, 16: 261, 1957.
2. CARTIER, PAUL: *AMA Arch. of Ind. Health*, 11: 204, 1955.
3. DOLL, R.: *Brit. J. Ind. Med.*, 12: 8, 1955.
4. DRESEN, W. C., et al: Public Health Bulletin No. 241, Supt. of Doc., Washington, D. C., 1938.
5. DRINKER, P. AND HATCH, T.: *Industrial Dust*. McGraw-Hill Book Co., Inc., New York, 1954.
6. FAIRHALL, LAWRENCE T.: *Industrial Toxicology*. The Williams & Wilkins Co., Baltimore, Md., 1957.
7. KING, E. J., et al: *Thorax* I, p. 188, 1946.
8. LYNCH, K. M.: *AMA Arch. of Ind. Health*, 11: 185, 1955.
9. MCPHEETERS, S. B.: *J. Ind. Hyg. & Tox.*, 18: 229, 1936.
10. PAGE, R. T. AND BLOOMFIELD, J. J.: *Pub. Health Repts.* 52: 1713, 1937.
11. PATTY, FRANK A.: *Industrial Hygiene and Toxicology*, Vol. 1. Interscience Publishers, Inc., New York, 1948.
12. SMITH, K. W., *AMA Arch. of Ind. Health*, 12: 198, 1955.
13. VORWALD, A. J., et al: *AMA Arch. Ind. Hyg. and Occup. Med.* 3: 1, 1951.

Because of space limitations, it is impossible to list all methods of exposure evaluation. The selections have been made on the basis of current usage, reliability, and applicability to the usual industrial type of exposure. Any specific evaluation and/or control problem will involve professional judgment. This can best be done by professional industrial hygiene personnel.

Respiratory protective devices are commercially available. Their use, however, should be confined to emergency or intermittent exposures and not relied upon as primary means of hazard control.

A relative scale is used for rating the severity of hazards: nil, low, moderate, high, and extra hazardous.