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INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASES

Course Outline and Digest of Lectures

Coordinator

Edward R. Grammiss

Visiting Instructors

Henry D. Sayer
Leonard Greenburg, M. D.
John M. McDonald, M. D.
Joseph B. Ficklen
Roy S. Bonsib
Louis Schwartz, M. D.
Cassius H. Watson, M. D.

J. G. Harris, M. D.
Reuel C. Stratton
Fred W. Sehl
F. A. Patty
B. F. Postman
Myron A. Snell
J. Dewey Dorsett

A. J. Lanza, M. D.



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INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASES
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Unit No. 12
"Ventilation"
by B. F. Postman
Industrial Hygiene Engineer
Connecticut State Department of Health

The adequacy of proper measures for the prevention, control, or elimination of occupational diseases in our industrial life has up to recently been avoided or evaded. This was mainly caused by ignorance of the potentialities of the problem and lack of co-ordinated means for combatting it. However, the intense interest which has been aroused relative to occupational diseases is already productive of economical and practical means for the proper application of preventive measures, the third basically important member of a constructive occupational disease control program, the other two being: first, investigation and diagnosis of the causative factors; and second, determination of the extent of the exposure together with such contributory exposures as may enhance the severity.

One important thought should be emphasized at this time: with few exceptions, practically every type of toxic or nuisance material utilized in or resulting from industrial processes can be handled with safety if proper and adequate controls are provided and used for the protection of the health of the industrial worker.

The development of any type of engineering control for the protection of industrial health must be based on:

1. A specific job analysis of the operation or operations performed.
2. A study of operator technique.
3. Engineering and scientific data for developing control of the hazard involved.

One fact should be thoroughly understood: every contemplated system must be a tailor-made, individually designed job based on the following items:

- a. What material is to be controlled?
- b. Is the material toxic, or is it only a manufacturing nuisance?
- c. Can control be applied to the section or area where the material is generated so that dispersion to the general workroom area can be prevented?
- d. Can a proper amount of air be exhausted at the generation points so that, if some of the material does get to the breathing zone of the operator, this material will present an occupational health hazard in the concentrations so found? This pre-supposes that it is not necessary to remove all the material to reduce the concentration to safe limits and that in many cases it is practically impossible or uneconomical to do so.
- e. Will the control interfere with the operator's movements so as to reduce his productive capacity?
- f. Will the hoods, piping, etc. be of such a complicated nature that the maintenance and repair crews are unable to dismantle quickly and easily such portions as are necessary for access to the machine, tank, process, or operation?

semi-enclosing type. When finishing the edges and sides of the stone, the operator moves the hood as close to the tool as he possibly can. Workmen in the industry are careful about this point because they realize that the exhaust equipment is for their health protection.

Carving operations are effectively controlled in regular blasting rooms, the operator being located outside the room.

When shoveling or handling the sand abrasive, the operator should be provided with and use an approved dust respirator.

(9) DUST IN THE ASBESTOS INDUSTRY

No attempt will be made to present any extensive outline of operations in this industry particularly in the mining or milling divisions, but only a few operations in the manufacturing division will be mentioned. These are handling of any bulk asbestos previous to fabrication, carding, spinning, and weaving. Depending on the condition of the fibers in the manufacturing processes, it may not be desirable to provide excessive exhaust. This applies particularly to carding operations where too much air applied at one point will remove a large percentage of the asbestos fibers from the machine to the dust collecting system.

No dry sweeping should be allowed; industrial vacuum cleaning should be utilized. The use of approved dust respirators is to be insisted upon wherever and whenever this type of protection is found desirable.

(10) LEAD DUST

All forms of lead are poisonous, the most common mode of exposure being the inhalation of the dust.

Probably the most extensive and intensive exposures are in the various operations connected with storage battery manufacturing. The chief operations are mixing of the dry lead oxides, pasting of the moist mixed oxides into grid plates, plate forming, casting of lead plates, lead burning, lead salvaging, and general common labor and cleaning operations. Isolation, adequate local ventilation, and effective periodic wetting down of floor and work areas are the most important controls in this industry, together with the use of approved dust respirators.

In the printing industry, type boxes should not be blown or brushed out, for these methods of cleaning readily disperse the finely divided lead oxides. A portable industrial vacuum cleaner should be used periodically, the operator being provided with proper respiratory protection.

Plungers from the lead melting pots of monotype or linotype machines should be cleaned in a special cleaning box equipped with a wire cleaning brush which can readily be operated by means of a handle extending through the box. If hand brushing has to be resorted to, the operator should wear an approved respirator.

(11) FUMES, MISTS, VAPORS, GASES

Noxious and poisonous fumes, mists, vapors, and gases resulting from industrial operations such as metal cleaning and pickling, metal plating, oil or water quench may be heavy or light, sluggish in their movements, or easily dissipated. It is important to remove them to the outdoors as soon as they are generated. The