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Plan of Sandblasting Hazards Study to be Conducted by the National Safety Council

(Revised)

It is now well established that the inhalation of large amounts of dust containing free silica produces a disease of the lungs known as silicosis. This disease is most often encountered among workers in dusty trades. The duration of occupation necessary to produce the disease is dependent in some measure upon the physical condition of the worker. The most important factor however influencing the rate of production of the disease is the quanitative dust exposure and the percentage or amount of free silica in the dust.

In the studies made by the United States Public Health Service at Barre, Vermont, in a dust containing approximately 35 per cent of free silica, it was found that the exposure to less than twenty million particles of dust per cubic foot of air was relatively safe, whereas exposure to dust concentrations greater than this was found to be hazardous. If we contrast the foregoing with the exposure to a dust-containing 85 per cent of free silica, such as is found in South African gold mines, a concentration of more than eight million particles per cubic foot of air is found to be hazardous, and in a dust containing 90 per cent of free silica such as is the case in the Austrailian sandstone works, the exposure to over six million particles per cubic foot of air is hazardous. In sandblasting operations the percentage of free silica is in all likelihood approximately 85 to 95 per cent.

The object of the present study is to make a survey of sandblasting operations in the United States in order to determine how conditions in this industry compare with standards based on the South African or Australian experience since these are the best available standards for use in connection with dusts of this high free silica content. By this means it will be possible to evaluate the relative degree of hazardousness of sandblasting operations as conducted in this country. Should this study disclose the fact that in certain cases

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sandblasting is conducted in very low dust concentrations, we may urge the general adoption of this means of conduct for the pursuit of all sandblasting operations. In such a case as this where dust concentrations are very low and workers have been engaged for a period of years, it would be advisable to procure x-ray pictures in order to verify our standards. In general the following would be an outline of the study:

1. Type of blasting and plants.

   a. Sandblasting in open rooms, closed rooms, barrels, cabinets, outside work.

   b. Artificial abrasives.

   c. Carborundum.

   d. Building and monumental trades.

In general, the process is to be studied in excellent, good and bad types of installations, if possible.

2. Information to be obtained.

   a. Sanitary surveys of the job with sketches and dimensions and photographs (obtain plans and blue prints).

   b. Ventilation data. Sketch showing ventilation devices with measurements of ducts, fan sizes and velocity measurements of air. Static suction in hoods. Recirculation of air. Minimum requirements at level of workers' face.

   c. Complete data on sand blasting equipment and methods used.

   d. Dust counts. Samples obtained with the impinger apparatus at the breathing level of workmen. This will make it possible to compare these findings directly with those of the Australian, South African, and the U. S. Public Health Service investigations. Size distribution on representative samples.

   e. Chemical and petrographic analyses of pooled dust samples. Complete data on type of material used, sand, its source and write to Sand Company for analyses. (U.S. Geol. Survey - Pullman Laboratory)

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f. Occupational analysis of the workers with the history of exposure and complete history of occupations. Actual description of the nature of the work being conducted at this time.

g. Medical and statistical data showing the illnesses and deaths in the occupations at the plant under consideration. Also data on labor turnover in the sandblasting operation.

h. X-ray pictures of the chest to be obtained only in those cases where a reasonably long exposure to low concentrations of dust has obtained, in order to serve as a check on our standard. In a few cases where a severe dust exposure has been the rule, it might be well to have X-ray pictures as a contrast.

3. Studies on helmets and respirators.

a. In industry - by taking samples of dust while the worker is using the helmet.

b. In the laboratory - on those devices which appear satisfactory to the members of the investigating staff, tests will be conducted. The National Safety Council cannot afford the expense of testing all of the devices which will be offered by manufacturers.

4. Literature and Statistics.

By letters of inquiry addressed to all state departments of health, labor, vital statistics, or insurance organizations, all available information is to be collected.

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