

PLAINTIFF'S
EXHIBIT

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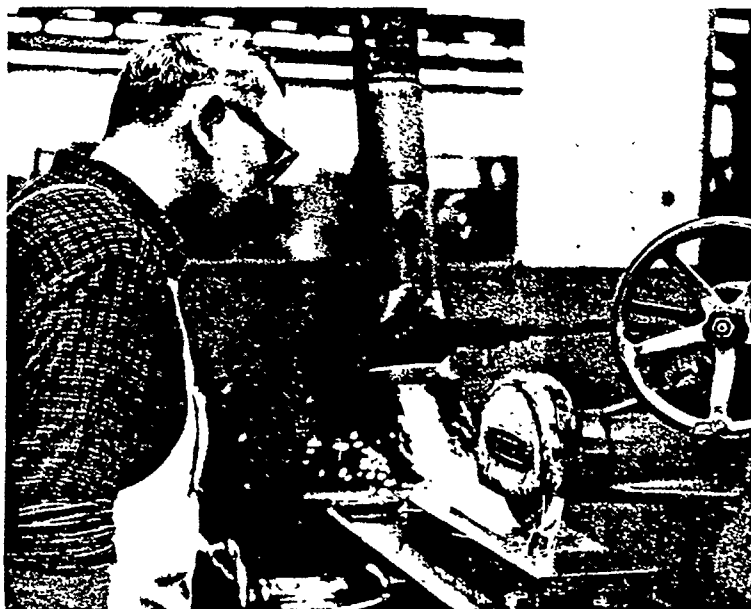
SUPERVISORS SAFETY MANUAL



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6—Industrial Hygiene



Local exhaust pickup is placed so that particles from grinding operation are thrown directly into it.

Nonmetallic dusts

A number of occupational diseases result from exposures to non-metallic dusts, such as silica and asbestos dusts. Although specialized knowledge and instruments are needed to tell how severe a hazard may be, the supervisor can, however, recognize a danger spot and ask for expert help. If a supervisor is not alert, a lot of harm can be done.

Here are some of the things to watch for.

A process that produces dust fine enough to remain suspended in the air long enough to be breathed should be regarded as questionable until it can be proved safe. Silicosis, for example, is produced in hard rock mines and by quarrying and dressing granite, which contains free silica.

The danger of lung disease from the grinding wheel itself disappeared when the natural sandstone wheel was replaced with the Carborundum wheel and the Alundum wheel. Neither produces silicosis;

however, when they are used to grind castings that contain mold sand, the grinding operation can still present a silicosis hazard.

Methods of drilling rock with power machinery produce more dust than old-fashioned hand methods. This dust, however, is controlled by applying water to the drill steel so that the dust forms a slurry instead of forming an air suspension.

Processes in which inorganic materials are crushed, ground, or transported are potential sources of dust. They should either be controlled by use of wet methods or should be enclosed and ventilated by local exhaust. Points where conveyors are loaded or discharged, transfer points along the conveying system, and heads or boots of elevators should be enclosed and, usually, exhaust ventilated. Powdered material that is simply riding along on a belt or other conveyor should cause no dust problem.

The supervisor must check that someone does not cancel the effectiveness of built-in dust controls by tampering with them or by using them improperly. He must also check closely that required respiratory equipment is worn by those workers who need supplementary protection.

Fumes

Welding, metalizing, and other hot operations produce fumes, which may be harmful under certain conditions.

Arc welding volatilizes metal which condenses—as the metal or its oxide—in the air around the arc. In addition, the rod coating is in part volatilized. These fumes, because they are extremely fine, are readily inhaled.

Iron pigment in the lungs appears to have no effect in producing illness or disability. Its presence shows up in X rays of the lungs and may lead to a mistaken diagnosis of silicosis.

More-toxic materials—such as those formed when welding structures that have been painted with red lead, or when welding galvanized metal—may produce severe symptoms of toxicity rather rapidly, unless fumes are controlled with good local exhaust ventilation, or the welder is protected by respiratory protective equipment.

When pouring brass, zinc volatilizes from the molten mass and oxidizes in the surrounding air to produce a zinc fume, which (in high concentrations) may produce the rather nonspecific disease known as

which the filter and other parts can be replaced, the dust-tightness of the apparatus, freedom from leakage, and resistance to flow of air when the wearer is inhaling and exhaling are all tested.

Types of equipment

Respiratory equipment includes mechanical filter respirators, chemical cartridge respirators, gas masks with canisters, hose mask and air line respirators, and self-contained breathing apparatus.

Mechanical filter respirators must protect against exposure to nuisance dusts and pneumoconiosis-producing dusts, mists, and fumes. Examples of nuisance dusts are aluminum, cellulose, cement, coal, flour, gypsum, iron ore, limestone, and sawdust.

Pneumoconiosis comes from three Greek words that mean "lung," "dust," and "abnormal condition." The generally accepted meaning of the word is merely "dusty lung." The kind of dust inhaled determines the type of condition or injury. A number of organic dusts are capable of producing lung diseases, but not all these diseases are classified as pneumoconioses because they are not all a "dusty condition" of the lung.

In very rare cases, enough dust has been inhaled to cause mechanical blockage of the air spaces. Flour dust has been known to cause this condition. Some dusts may be essentially inert and remain in the lungs indefinitely with no recognizable irritation, and a few (like limestone dust) may gradually dissolve and be eliminated without harm.

Another type of filter respirator is approved for toxic dusts, such as lead, asbestos, arsenic, cadmium, manganese, selenium, and their compounds.

Protection against mists, such as chromic acid, and exposure to fumes, such as zinc and lead, is also afforded by types of mechanical filter respirators specifically approved for such exposures. The filter, usually made of paper or felt, should be replaced or cleaned frequently, for if it becomes clogged, it restricts breathing or becomes inoperative. This may happen as frequently as several times a shift.

A mechanical filter respirator is of no value as protection against solvent vapors, injurious gases, or oxygen deficiency. To use it under these conditions is a common, but most serious mistake.

Chemical cartridge respirators usually have a half-mask facepiece