

most ducts are normally not moved and the ventilation system does not remove the fumes. According to reports, this type of system has been effectively used in shipyards for the control of welding fumes in confined areas. In view of this experience it should therefore be a satisfactory means of control for welding fumes in tanks. However, supervision and education are necessary to make such systems effective.

Where the room volume per welder is large, natural ventilation within the plant is usually sufficient to prevent accumulation of excessive concentration of fumes from plain steel

welding. Circulating fans directed from the side help to dilute the fume which may be concentrated in the breathing zone of the welder.

Another means of control is the use of personal respiratory equipment. Air line respirators and fume respirators have been developed which will provide adequate protection. Some manufacturers have on the market welders' helmets with facilities for providing fresh air to the wearer. Use of this type of equipment has been limited. Since the welder is already burdened with helmet, goggles, and protective clothing he probably will not be receptive to

a respirator. It is sufficient in most welding for the employee to wear an ordinary helmet and to arrange the position of the work so as to prevent the concentrated fume from flowing under the helmet.

Dry Grinding

Dust resulting from the grinding of nontoxic metals which are free of sand is generally considered a nuisance and is not harmful per se. Despite this fact some state laws require grinding operations to be ventilated. This requirement has probably been a holdover from the days when sandstone wheels were prevalent and also to prevent the creation of a nuisance condition. Grinding wheels in use in industry have artificial abrasives, such as aluminum oxide or silicon carbide. Emery, a natural product composed essentially of aluminum and magnetic oxide of iron, may also be used. A permissible limit of 50 million particles per cubic foot of air for aluminum oxide and silicon carbide was recently accepted by the members of the American Conference of Governmental Industrial Hygienists. Such a limit is liberal and concentrations of such magnitude are normally not encountered.

When lead, silica, or some similar toxic material comes in contact with the grinding wheel the exposure to the abrasive matter may be ignored and the exposure evaluated on the basis of the toxic material. If this latter material is controlled, the nuisance will also be eliminated.

Ventilation systems for grinding wheels have been fairly well standardized and generally are satisfactory to prevent a nuisance. Hoods should enclose the wheel as completely as is practicable. Air volumes should be sufficient to cause an inward flow into the hood when using the smallest wheel. This is especially true where toxic materials are involved.

Wet Grinding

Baffles, hoods, and guards are generally located near wet grinding wheels to prevent dispersion of the liquid used as a coolant. These devices are usually sufficient to control the dust if it is nontoxic in nature. If the dust liberated is toxic, mechanical exhaust ventilation may be required.

Buffing and Polishing

Buffing compounds applied to

wheels used for buffing and polishing vary in composition. Waxes and various types of abrasives are the major components. These materials, plus lint and fibers from the wheel, are the essential ingredients of the airborne dust. The toxicity is dependent upon the type of abrasive. Generally ventilation is provided to improve housekeeping and reduce the number of complaints and not because of the hazard to health.

Machining

Smoke from oily parts is the prevailing source of air contamination at machining operations. Illness has not been attributed to this type of exposure. As is the case with most fumes and dusts of the nuisance variety, little is known as to what effect such materials have on existing physical abnormalities.

Machining operations on steel produce large chips or turnings; consequently, dust is not a problem. Operations involving the machining of high lead alloys have been studied, and significant quantities of airborne lead have not been demonstrated.

Graphite which becomes airborne during the machining of cast iron is not considered physiologically significant, and therefore, is classified as a nuisance dust. Frequently management considers it advisable to provide ventilation for the machines which are productive of the most dust, as graphite on the clothing and person and surrounding machinery is conducive to many complaints.

Abrasive Cleaning

Since silica is recognized as the most harmful of mineral dusts, an adequate ventilation system is normally provided at the time of installation of commercially built sand blast equipment. Continuous usage and lack of maintenance result in a breakdown of adequate control. Visible escape of dust is the best evidence that this has occurred and it is advisable to correct such a condition without undue delay.

Employees who are stationed in blast rooms are dependent upon personal respiratory equipment. Devices of this type are of the supplied-air variety, and it is necessary that the air provided be free of harmful contaminants. Air compressors should be located in an area free of contamination, otherwise the contaminant will be transmitted to the helmet.

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