

Normally, ventilation within the room is provided so as to improve visibility and to help prevent the escape of dust to the surrounding areas, not to reduce the concentration of silica dust to a safe level.

Tumble or rotating table type of sand blast units should be provided with sufficient ventilation to prevent the escape of silica dust. Leakage due to excessive wear should be remedied.

Small sandblast cabinets, where the operator controls the blast nozzles from outside the cabinet, frequently have faulty seals around the doors or the rubber gauntlets are loose or torn. The dust which escapes from the cabinet through these openings is in close proximity to the breathing zone of the employee and in many instances exceeds the permissible limit for silica. This leakage should be corrected and the men should not be required to use respirators.

If the articles being blasted are free of silica or other toxic material, the dust resulting from grit or shot blasting is classified in the nuisance category. It follows that the maintenance of ventilating systems for grit blasting, although desirable, is not always so necessary as for sand blasting.

The use of steel grit or shot in blasting rooms produces excessively high concentrations of dust within the enclosure. It is therefore, necessary to protect the worker within the room. The remarks concerning sand blasting rooms are therefore, pertinent when considering rooms in which steel grit or shot are used as the abrasive.

Vapor blasting, a variation of sand blasting, is a comparatively recent development. This procedure involves the use of fine silica and water under pressure. The silica used in vapor blast units varies in size and may even be as small as 1250 mesh (approximately 10 microns). It is generally believed that airborne silica particles below .5 microns are most significant in causing silicosis. It then follows that operations involving the use of silica abrasive whose initial particle size approaches that order of magnitude are more hazardous, and, require continual vigilance in maintaining good control. It is, therefore, essential that the vapor blast cabinets be maintained so that leakage of mist does not occur.

Good housekeeping is also essential as spillage of the sand and water sludge upon the floor will create a source for dust dissemination when the water evaporates. Likewise, containers of the dried sludge should not be allowed to stand in the factory where they can be influenced by air currents of high velocity.

Practically all industrial plants have operations which involve the use of lead base bearing metal or

tin. Babbit bearing metal containing approximately 75 per cent lead have been encountered. The composition of solder metal is variable and dependent upon the purpose for which it is used, with ordinary soft solder containing a comparatively high percentage of lead.

Assuming that the babbitt or solder contains a significant amount of lead, the question then arises as to whether or not employees working with this material will become ill. The answer could be given by a qualified industrial hygienist after he had seen the operation and considered such factors as the temperature to which the metal is heated, the method of removing excess solder, the length of exposure, and the effectiveness of the control measures provided.

It is a well known fact that lead causes illness if absorbed in excessive amounts, and therefore operations where lead is used have received considerable study. Out of this experience certain practices are known to produce excessive exposure whereas other practices have been proved not to be harmful. It is generally conceded that excessive concentrations do not result from operations where solder is applied by means of an electric soldering iron. This is probably due to the small amounts of solder used and the comparatively low heat of the metal.

When the iron is heated in a small gas-fired furnace, the exposure may be of greater consequence. Solder which remains on the iron coming into contact with the flame or heat is vulnerable for volatilization. Small amounts of solder drop from the iron onto the hot floor of the furnace where it is readily volatilized or oxidized. The oxidized material may become airborne due to disturbances created by the flame or by removing or placing the soldering iron in the furnace.

Frequently industrial hygienists recommend that ventilation be provided for heating units of this type, thereby removing lead fumes and dust from the environment. This is particularly true in small rooms or where many units are in use.

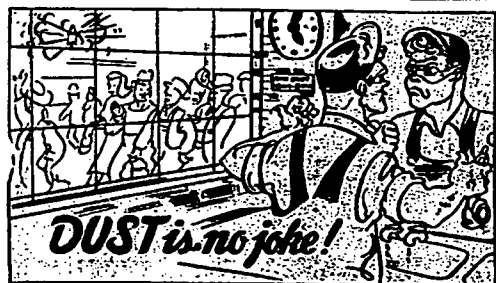
Atmospheric contamination occasioned by the use of either gas or electrically heated pots containing solder is dependent on a number of factors. With higher temperatures more volatilization will occur and the greater will be the exposure. With the

higher temperature the metal is more readily oxidized to produce a dross consisting of a high percentage of lead oxide. The dross may provide a protective coating to reduce the volatilization of the lead; however, disturbance of this coating will create an exposure.

As a safeguard against excessive contamination, pots containing solder or babbitt are usually ventilated. Wherever possible, it is advisable to enclose the pot as completely as possible and provide sufficient air volume to overcome the thermal effects

of the molten metal. Attempts have been made to use natural draft ventilation systems to control these fumes and in those instances where the ducts were not of sufficient diameter the system was inadequate. A preferable method is the use of mechanical systems.

The removal of excess solder with power-driven tools, such as grinding wheels, discs, or wire wheels, creates airborne dust which may contaminate large areas if the operation is extensive. Diligent use of abrasive cloth will also result in excessive concentra-



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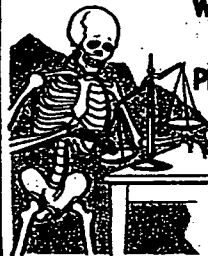
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