

We have a great many sources in our plants where poisonous fumes emanate. One of our raw material is borings, which are often purchased on the open market. On these borings are deposited micron sized particles of lead which are dispersed through the air when the borings are disturbed. These tiny particles are the ones which must be removed before heavy concentrations are inhaled by employees. Problems such these are extremely difficult to solve.

When our materials are melted down prior to the pouring into actual castings, excessive volumes of poisonous fumes are produced. The removal of these fumes presents our most serious problem. Because of the design of the furnaces in which our metals are melted, the problem of local removal of these fumes is often extremely difficult. In the past we attempted to remove these large quantities of fumes by isolating the furnaces within large rooms and using the rooms as individual enclosures and providing ventilation in these units. However, this has generally proven unsatisfactory and we have attempted to find methods whereby we can provide local ventilation. At the Meadville plant we have a room in which are located 12 bronze melting furnaces. Into this room we introduce 60,000 cubic feet of unheated air per minute. From this same room we exhaust 100,000 cubic feet of air per minute. In designing this room we felt that an excessive exhaust would produce a vacuum in this area and that air would rush into the room through all openings, thereby preventing poisonous fumes from being dispersed through the balance of the plant.

From the furnace bay molten metal is transferred to the molding departments and poured into castings. As you can readily see, the problem of confining fumes emanating from ladles which are being transported, is an extremely difficult one. To date we have been unable to find a satisfactory solution.

After the castings have been made, we are faced with the problem of removing gates and risers and cleaning and grinding the castings so that they may be ready for shipment to our customers. At our Meadville plant we use shot-blast machines such as wheelabrators for cleaning the surface of our castings. The wheelabrators are used on small and medium sized castings. Since micron sized lead particles are freed by the use of steel shot against the castings during cleaning operations, we are faced with the problem of carefully ventilating our wheelabrators. In spite of good ventilation, we have found that some of the lead fumes are still dispersed into the surrounding atmosphere. At the Meadville plant we located the wheelabrators within an individual room and provided general ventilation in this room. This has proved to be a fairly successful operation.

For the cleaning of large castings we provided a Hydro-Blast unit. In recommending a Hydro-Blast, we felt that besides a means for cleaning the inside and outside of the castings, we would also provide a means of wetting down lead particles which would be loosened from castings, and thus prevent them from being dispersed into the atmosphere.

Poisonous fumes are also produced when our castings are chipped and ground. Our snag grinders are equipped with wheel guards and hoods and there is still a question as to whether or not sufficient protection is provided for the operator. For the chipping and grinding of the small castings we have provided ventilated chipping benches which remove the lead particles from the air at the point of origin. So far we have not solved the problem of providing ventilation for chipping and grinding large castings, because the varied size and number of the castings which we make makes this problem extremely complex.