

An end grinder is similar to a swing grinder, but instead of grinding on the bottom of the wheel, it uses the front face of the wheel to grind against a more or less vertical surface. This problem was solved at Denver by installing a floor grill with an underground duct and showed good results.

All of the grinders mentioned so far can be exhausted one way or another. We don't yet know, however, quite what to do about the stiff shaft grinders. They are used for the biggest part of our heavy grinding work because, like a hand grinder, they can be used in various positions and can reach parts of the castings that would be impossible to grind with a swing grinder. We have 23 of them in operation at Chicago Heights against 7 swing and end grinders. In some cases, they are used on small castings that can be placed on a table, in which case a down draft table seems like the logical solution, although we have not as yet tried it. Most of their work, however, is on larger castings such as dippers where the casting is placed on the floor and the grinder hung on a jib crane is moved around in various positions. We have reached the point where something will have to be done about these machines and if any of you have any suggestions, I would like very much to have them.

Machine Shop: As I mentioned above, most of our machine tools are equipped with grinding wheels due to the difficulty of machining manganese steel with tools. In the last couple of years, however, we have installed some tooling equipment, which has been working out most satisfactorily on some castings. This has reduced the dust in the machine shop to some extent, but unfortunately we are, so far, tooling only about 20 per cent of the work and still grinding the rest. Very little has been done to alleviate the dust in this department except for general ventilation.

General Considerations - Building Design: So much for the specific installations we have made. Before I stop I would like to bring up several points of interest that might be well to consider.

Since all of our dust control work to date has been in existing buildings, we have discovered that some building designs can make the job difficult and others can make it easy. For example, the leanto on the cleaning room building at Denver allowed us to exhaust their swing grinders at a minimum cost. On the other hand, the Chicago Heights cleaning room consists of three bays, side by side, with cranes in each and with no more than one foot between the crane clearance lines. Even if expensive sheet metal design did allow us to squeeze a long, thin, rectangular duct up between the cranes, the duct would emerge through the roof in a valley where drainage would be obstructed.

I would highly recommend that any new buildings, intended for operations where numerous exhaust systems will be required, be designed with several feet between the ends of adjacent cranes. The extra cost of such a building will probably be justified in the years to come.

Heating Costs: We have been somewhat concerned about the additional cost of heating our cleaning room buildings when and if we reach the point where all the grinders are properly exhausted. At Chicago Heights we have about 30 machines altogether which will require in the neighborhood of 5,000 cubic feet per minute each. Based on average winter conditions and heating the building to only 50° or 55°, the extra oil required because of the exhaust systems would amount to around \$4,000 per season. One way this cost can be reduced is to install an individual exhaust unit on each grinder instead of using a central system.