exhaust volume of 50 cu ft for each pound of wood refuse handled

The arrester used to collect woodworking scrap is traditionally the cyclone It is adequate for chips, shaper cuttings, boring scraps, sawdust, and other relatively large size particles Sanders release especially fine dust and unless it goes into an air stream which is already carrying chips and shavings from other types of machines, it is too fine to be trapped by the usual cyclone

The cyclone may be followed by a cloth collector which removes the fine dust and often allows the air to be recirculated

Cast iron machining

Dust from cast iron machining has been receiving an increasing amount of attention, not so much because of any health hazard, but because it is a distinct annoyance the operator's clothing and skin are coated with gray and rust-colored powder, and machinery, motors, and controls eventually require undue maintenance Higher machining speeds and multiple-operation machine tools have steadily raised the concentration of fine dust per unit of floor space

Usually, no effort is made to carry off the chips, although some will be caught The exhaust systems are aimed at removing the fine air-floated dust Fortunately, because of the small particle size of the dust, it can be brought into the hood by mass air movement, even though the actual air velocity is relatively low

Hood designs vary according to the machine tool, the part being finished, and the operation performed Usually, small hoods with face velocities of 400 to 2000 fpm can be designed, and placed most advantageously after watching the machining operation and observing the exact point of dust release

As always, the hood should be close to this point, and should surround it as much as possible On the other hand, it cannot interfere too much with the operator's line of vision, movement of the machine tool parts, or the placing or removal of work At times it will be possible to enclose much of the working area, in which case the total rate of air flow can be set to assure an indraft through the remaining openings of 100 to 150 fpm Transparent plastic windows and doors allow the machinist to watch the work

With local hoods, and branch sizes of 4 to 6 in , exhausting 400 to 800 cfm will often be sufficient Many modern machines, however, require 8- or 10-in branches capable of handling 1500 or 2400 cfm Except where only a few isolated machines are to be hooded, central systems – as contrasted with unit collectors – seem to be preferred because of their lower maintenance and more uniform air flow

Oil mist

Oil mist is a problem in shops where oil is used as a coolant as rooms can become filled with an oil haze, floors soaked with oil present a slipping hazard, and condensation on walls and ceilings becomes a fire hazard

Hood sides must act as splash guards, because air flow alone will not arrest the oil thrown from the operation The hood must incorporate such splash guards, but still permit the machine to be serviced and the operation observed when required A few manufacturers have provided their machine tools with plastic enclosures that meet these requirements Although all should do so, too often the "built-in" hood is omitted

Ingenuity will show the way for attaching hoods to most machines, but all are different Usually, an exhaust volume of 400 to 600 cfm will provide the recommended 100 to 150 fpm indraft Sometimes, when considerable heat is generated or where the hooding fails in being a complete enclosure, 1000 to 1500 cfm must be exhausted Duct velocities of 2500 fpm are ample Duct joints should be tight to prevent oil leakage and ducts should be pitched to allow condensed oil to flow back to the machine or to a special collector

Electrostatic precipitators and wet (oil-filled) centrifugal collectors are sold as arresters for oil mist exhaust systems To eliminate ductwork, units small enough to mount directly on the machine are available

An additional bonus collection and reuse of oil may offer considerable savings

Melting furnaces

The design of hoods for metallurgical melting furnaces depends on the type of furnace and the metal being melted The fumes may constitute a health hazard to the operator or a source of community air pollution

The tilting crucible furnace is often