tected by installing a ventilation system which probably would not have been satisfactory if the operation had not been isolated and thus able to be enclosed

Enclosing the process or equipment is a desirable method of control since the enclosure will prevent or minimize the escape of solvent vapor into the workroom atmosphere Where some of the more highly toxic solvents are used, enclosure should be one of the first measures attempted, after considering substitution In most instances, the enclosure should also be exhausted to avoid buildup of solvent vapors Additional precautions must be taken when cleaning enclosed equipment or during start up or shut down in order to avoid high concentrations of solvent vapors

Enclosure of an operation effectively prevents the dispersal of contaminants Enclosed equipment is usually run tightly closed and is only opened during cleaning or filling operations Further examples of where this type of control is effective are radium dial painting, glove booths, airless blast or shot blast machines for cleaning castings, and abrasive blasting cabinets

In the chemical industry, the isolation of hazardous processes in closed systems is a widespread practice, which is one reason why the manufacture of toxic substances is often less hazardous than their use In the mechanical industries, complete enclosure is frequently the best solution of severe dust or fume hazards, such as those from sand blasting or metal spraying operations

Wet methods

Dust hazards can frequently be minimized or greatly reduced by application of water or other suitable liquid at the source of dust, a method often used for silica and loose dusts Wetting of floors before sweeping to keep down the dispersion of harmful dust is advisable when better methods, such as vacuum cleaning, cannot be applied

"Wetting down" is one of the simplest methods for dust control Its effectiveness, however, depends upon proper wetting of the dust This may require the addition of a wetting agent to the water and proper disposal of the wetted dust before it dries out and is redispersed Tremendous reductions in dust concentrations have been achieved by the use of water forced through the drill bits used in rock drilling operations Many foundries successfully use water under high pressure for cleaning castings in place of sandblasting Airborne dust concentrations can be kept down if molding sand is kept moist, if castings are wet down before shakeout, and if the floors are wetted intermittently

Local exhaust ventilation

A local exhaust system traps the air contaminant near its source so that a worker standing at the process is not exposed to harmful concentrations This method is usually preferred to general ventilation, but should be used only when the contaminant cannot be controlled by substitution, changing the process, or isolation or enclosure Even though a process has been isolated, it may still require a local exhaust system

After the system is installed and set in operation, its performance should be checked to see it meets engineering specifications—correct rates of air flow, duct velocities, negative pressures, *etc* Its performance should be rechecked periodically as a maintenance measure

Full details of this method of control are given in Chapter 29, "Local Exhaust Systems" For further reference, see N S C Industrial Data Sheet 428, *Checking Performance of Local Exhaust Systems*

General or dilution ventilation

General or dilution ventilation—adding air to keep the concentration of a contaminant below hazardous levels—uses natural convection through open doors or windows, roof ventilators, and chimneys, or artificial air currents produced by fans or blowers Exhaust fans through roofs, walls, or windows constitutes positive all season dilution ventilation Consideration must be given to providing make-up air, especially during winter months Dilution ventilation is practicable only if the degree of air contamination is not excessive and particularly if the contaminant is released at a substantial distance from the worker's breathing zone Under other conditions, the contaminated air will not be diluted sufficiently before inhalation

General ventilation should not be used