

THE ENGINEERING CONTROL OF AN OCCUPATIONAL HEALTH HAZARD

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THE CONTROL engineer, representing the last member of the staff of specialists delving into this case history, is now in possession of some pertinent facts which form the basis of his approach to, and final development of, an adequate engineering control of the occupational health hazard.

A 26 year old machinist has become ill as a result of the inhalation of some toxic substance, and beryllium is thought to be the possible offender. The man is ill, and others have become ill on being exposed to the same material.

With this as a starting point, the control engineer is confronted with three major problems:

1. Can the operation be completely isolated so as to prevent contamination of the working environment of the operator (a direct exposure) and contamination of the working environment of adjacent workers (a contributory exposure not directly related to their own occupations)?
2. Can the isolating medium be provided with adequate mechanical ventilation to remove the contaminant quickly, effectively and economically to the outdoors?
3. How can the control be developed so that it will not interfere with operator maneuverability, production or accessibility and maintenance of the machine?

In the illustration *A* shows an abrasive cut-off wheel unit used by the machinist. The unit consists of a direct-connected motor unit operating an 8 in. diameter, high speed, rubber-bonded, artificial abrasive wheel enclosed in a suitable housing. The beryllium rod is clamped to a movable mount and is fed to the wheel by means of the external lever arm. The entire equipment is completely enclosed in a tightly sealed plexiglas® housing or enclosure which prevents the toxic beryllium dust from being dispensed to the breathing zone of the operator. A hinged door allows the operator to gain access to the interior of the enclosure when inserting or withdrawing work from the cutting-off unit. A front opening allows air from the working environment to be drawn into the enclosure, thereby placing the enclosure under slight suction or negative pressure. The air drawn into the enclosure entrains the dust dispersed or thrown off from the cutting-off wheel and is exhausted through a rear opening. This opening is connected to an exhaust fan of sufficient capacity to discharge the toxic dust to a dust collector, with the air being finally discharged to a point outside the plant.

B illustrates a side view of the enclosure and cutting-off unit.

Atmospheric tests of the air over the hood indicate that the concentration of toxic dust is well below the tolerance limits.

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