

Cobalt Control and Other Filing Room Ventilation Issues

Chessor E

School of Occupational and Environmental Hygiene, University of British Columbia,
Vancouver, BC, Canada

Disclaimer: Opinions expressed in this paper are those of the writer. Much of this paper is professional opinion, not scientific fact.

Introduction

The need for control of cobalt from saw filing has been demonstrated by health studies in Finland, Washington state and British Columbia. I am most familiar with the study done in BC, because that is where I live and work.

That study was done by a team led by Drs. Susan Kennedy and Kay Teschke, of the University of BC. They observed work activity and measured filers lung function in 8 sawmills, from June to December 1991. They found a high incidence of significantly below normal lung function. Their report was widely and effectively communicated to the sawmill industry.

By 1996 ventilated enclosures had been installed on over 200 wet grinding machines in BC sawmills. There are other sources of metal dust, organic dust, mist, fume and smoke in filing rooms. Local exhaust has been used on most of them, in some filing rooms, for decades. With the introduction of highly functional enclosures on wet grinding machines, there have been a few enclosures installed on other sources.

Saw Filing Ventilation

The writer has been visiting saw filing rooms to assess ventilation systems since 1973. Many mills had dust exhaust systems on the dry grinding machines long before that. Local exhaust to control cadmium from silver soldering was also fairly common. Special hoods to control lead and irritants from babbitt pots and moulds were installed in some mills, and wall fans for general ventilation were commonplace. Prior to the study, very little attention was paid to the wet grinding machines.

After the Study

The study was released in June of 1993, and circulated widely through the sawmill industry and Workers' Compensation Board. Other studies from Finland were also considered by the industry. One of these found that ventilated enclosures on filing machines were an effective way of reducing worker exposure to cobalt and chrome. A

demand for these enclosures developed. From 1993 to the end of 1996, 200 or more enclosures were installed on wet filing machines in British Columbia. They have been supplied by filing machine manufacturers and a Kelowna BC firm. Other firms installed ventilation ducts and fans for the enclosures.

Some mills installed improved hood and duct systems on machines used to weld and grind Stellite, and more frequent changes of coolant became common.

Saw filers have other air contaminant concerns, which have led to enclosures or well designed hoods being installed on every process in a few mills. Other control measures, such as substitution of less toxic tool steel for stellite, and frequent coolant changes, have also been implemented. For those who want to minimize exposure to all pollutants, the following controls are suggested.

Wet Grinding

Put vented enclosures on all wet grinding machines. Be sure the doors are closed tight whenever the machine is operating, and the venting system provides adequate air flow. I define adequate as providing a velocity of 200 feet per minute through the cracks in the enclosure, and one air change per minute in the enclosure. Wait a couple of minutes after grinding has stopped, before opening the enclosure.

Dry Grinding, Stellite Tooth Forming

Put the grinding apparatus in a ventilated enclosure. Provide good enclosures on machines that melt or cut Stellite. Provide enough ventilation to keep fume and dust in. On one plasma tooth moulding machine in BC, that is 150 cfm.

Do your filing room cleanup with a HEPA vacuum cleaner. If any of the settled dust does contain cobalt or other toxic material, this will keep your exposure to a minimum.

Chromium Control for Knife Grinding

Planer and chipper knives may contain up to 12% by weight chromium. This is found as a suspended solid and dissolved in the coolant. Other irritants or toxins may also be found in the coolant.

Put a vented enclosure on the knife grinder. Ensure that there is an inward air velocity of at least 200 feet per minute at all openings. The total opening area should be less than 2 square feet.

Babbitt Bench

If the temperature of a babbitt pot is properly controlled, there is little risk of excessive exposure to lead. Filers tell me that there will still be an irritating cloud of smoke off the babbitt pot when they add or remove metal, and off the mould when they pour. A babbitt bench should have slot exhaust for the pot and mould.

Summary

If you are wet grinding carbide or Stellite, put vented enclosures on all those machines.

If you are welding, plasma forming or abrasive cutting Stellite, enclose and ventilate those operations.

If you are dry grinding carbide or Stellite, the best control will be provided by vented enclosures. If you can't do that, increase local exhaust air flow to 500 cfm, per machine, and draw part of that through a 3 inch duct from the wheel guard.

I'm convinced it is fairly easy for most filing rooms to operate with cobalt levels below our Exposure Limit of 0.02 mg/cubic meter. One mill achieved that in a room where they plasma formed and ground Stellite. The grinding was done on two old bandsaw machines, without enclosures.