



Respirator Medicals – Again – and Aluminum

By Janet L. Keyes, CIH, CHESS, Inc.

First, a correction from last time. Our article on respirator use incorrectly stated that anyone who uses a paper type of dust mask (a filtering facepiece) needs to have had medical approval. For voluntary use of N95 filtering facepieces (dust masks), you need to give employees Appendix D to OSHA's respirator standard, but there are no other requirements. If you require use of dust masks or cartridge respirators, medical approval is needed. If employees voluntarily use any type of respirator other than dust masks, medical approval is needed. Confused? Call us.

And we strongly recommend getting the medicals done as soon as you hire someone (or better, as part of a pre-employment physical). What if you discover, after an employee has been painting for years, that he can't wear a respirator? Is it because of work done for you? Or is it a longstanding problem, beginning well before he began in your employment? It can be very difficult to tell. If you screen for respirator health when you hire, at least you know you aren't buying a problem.

Aluminum

It doesn't take a crystal ball to predict that your future includes servicing cars with aluminum bodies. Aluminum isn't any more of a health hazard than steel. Breathing the dust has been shown to cause coughing and shortness of breath and, in rats, scarring of the lungs, but that's at pretty high concentrations. There's speculation that it can damage the nervous system – but the evidence for that isn't as clear as it is, for example, for the toluene in lacquer thinner.

You'll notice more problems when you weld on aluminum, because welding on aluminum produces ozone in much higher amounts than does welding on steel. Ozone is a very strong respiratory irritant, causing coughing, wheezing, and a feeling of tightness in the chest. Local exhaust ventilation is the best way to trap the ozone and the welding fumes. If that isn't adequate, welders may need to use respirators able to remove ozone (P100 filters with charcoal).

Ozone isn't the only concern with aluminum work though. Unlike steel, aluminum dust or shavings catch fire.

The Department of Transportation classifies aluminum dust as a flammable solid. If it gets wet, it gives off highly flammable hydrogen gas. Mixing aluminum with rusted steel creates thermite; heating that mixture results in a rapid chemical reaction, so hot that it is used to weld railroad tracks together. If aluminum does catch on fire, your usual ABC fire extinguishers won't be of any use. Instead, you need a Class D extinguisher or a big pile of sand to smother the fire. And putting out the fire requires a different technique than putting out an oily rag fire.

Because of the fire hazard, aluminum requires some special precautions.

Don't mix dusts from aluminum and steel. Don't use the same grinders on both metals. If you grind some rust off of a part and follow it up by grinding aluminum, you create thermite. Add a spark from grinding, and you'll have an explosion. It might be a small blast, if you just have some residual dust on the grinder. But you don't want to risk that. Dedicate grinders, buffers, and sanders to work with aluminum. Mark them, so they aren't used on steel.

For the same reason, use a dedicated dust collector for aluminum. Your ordinary central vacuum system isn't designed for the flammability of aluminum. Dust can settle in the ductwork and hoses of that, providing good conditions for a combustible dust explosion. Wet dust collectors which trap the dust in water are considered much safer. But you can't just use any commercial dust collector or vacuum. It has to be specifically approved for use with combustible metals.

Don't leave your full wet collector in a poorly ventilated area. Remember that aluminum plus water produces hydrogen, which ignites very easily. Portable vacuums designed for aluminum may have built-in hydrogen vents. But those don't do any good if the gas accumulates outside the vacuum.

Clean out the vacuum each day. And then put the waste outside, in a closed metal container. The NFPA standard for combustible metals advises mixing it with sand or another nonreactive material (such as clay cat litter) in a ratio of one part metal dust to five parts sand, to make it safe to handle. If it's relatively uncontaminated, you may be able to recycle it.

Practice good housekeeping. Keep the areas where aluminum dust can be created cleaned up. And do not use compressed air to blow the dust around. You can use nonconductive tools, brooms with soft natural bristles, or scoops.

Train your employees on the hazards of aluminum. They need to know what housekeeping measures to follow. Make sure they know what to do in case of an aluminum dust fire, because it isn't fought the same way as other fires.

Aluminum is the most common metal on earth, and the most commonly used nonferrous metal. Thousands of companies work with it routinely. We can benefit from their experience to work with it safely.

If you have questions about working with aluminum, welding, chemical exposures, OSHA inspections, OSHA grants, or other safety or environmental issues, contact CHESS at 651-481-9787; toll free at 877-482-4377, or carkey@chess-safety.com. CHESS specializes in helping small to medium sized business with occupational health and safety issues. We have been providing services to the automotive industry for more than 20 years.

<p>This article is intended to provide general information (not advice) about current safety topics. To discuss your specific concerns and how CHESS may help, please contact CHESS at 651-481-9787 or chess@chess-safety.com</p>

This article originally appeared in *AASP News* (December 2014).