

## **SKC Training Article on Lead Detection and Decontamination**

As early as 370 B.C., Hippocrates identified lead as an occupational hazard of miners and metallurgists. Throughout history, occupational health practitioners, including Dr. Alice Hamilton, have endeavored to protect exposed individuals from the toxic effects of lead. Still today, lead is one of the most common overexposures found in industry and is a leading cause of occupational illness. Lead poisoning is also the leading environmentally induced illness in children<sup>1</sup>.

Given these grim statistics, public health agencies are continuing their efforts to reduce the toxic effects of lead. Critical steps toward lead hazard abatement are contaminant identification and removal. To address these critical steps, researchers from CDC/NIOSH have developed two simple and reliable technologies. Used together, these technologies can help to reduce exposures to this age-old contaminant.

### **New NIOSH Technologies for Lead *Colorimetric Field Detection Kit***

After a workshift in a battery plant or a practice round at a firing range, exposed individuals may have significant lead residue on their skin. This can be a hazard not only to them, but can be a take-home toxic to family members.

To address this concern, NIOSH researchers have developed a field detection kit that provides a qualitative colorimetric indication of the presence of lead at levels  $\geq 18$  micrograms ( $\mu\text{g}$ ) of lead. Here is how it works:

1. At the end of the exposure period, a wet wipe in the kit is used to wipe exposed skin surfaces such as hands, face, and neck.
2. The wipe is sprayed with the kit's Reagent A and Reagent B.
3. If lead is present at or above 18  $\mu\text{g}$ , a red color appears on the wipe.
4. This is an indication that more decontamination is necessary to remove lead from exposed skin areas. As such, the kit serves both as a hazard identification tool and as a behavior modification tool.

See <http://www.skcinc.com/prod/550-001.asp> for further information on the Full Disclosure Field Detection Kit for lead.

### ***Decontamination Washcloth for Metal Removal***

Soap and water are not the best vehicles for removing metals from skin. Therefore, NIOSH researchers have developed a better way using a specially engineered pre-moistened washcloth.

The washcloth contains active ingredients that remove lead and other metals through several mechanisms. First, the washcloth removes metal contaminants through surfaction and mechanical action. In addition, the washcloth's unique formulation irreversibly binds metals through pH adjustment and chelation. The combination of these mechanisms

results in removal of 98% of lead from exposed skin. The washcloth has been shown to also be effective for the removal of other metals including cadmium, mercury, and arsenic. See <http://www.skcinc.com/prod/763-001.asp> for further information on the Hygenall Decontamination Washcloth.

After wiping, the washcloth is discarded and skin areas are rinsed with water. The skin is left free of metal contaminants and it feels fresh and conditioned. The washcloth's ingredients are also a green choice, as they will not pollute or persist in the environment.

### **Perfect Partners for Lead Control**

The colorimetric field detection kit and the decontamination washcloth can be partnered for a complete lead safety system of:

- *Identification* of the presence of lead
- *Decontamination* of lead from the skin
- *Confirmation* of complete lead removal

Through the Federal Technology Transfer Act, these NIOSH technologies are available commercially through SKC.

### **Conclusions**

Hopefully, these NIOSH technologies will go a long way toward reducing the incidence of lead-related illness. The scientific innovations from NIOSH have been packaged in ways that make lead detection and removal easy and convenient for field use. Lead workers can themselves perform the steps necessary to recognize and abate lead hazards to which they are exposed.

### **References:**

1. R. Larson and J. Church, "Hot Topics in Toxicology" *The Synergist*, Sept. 2008: 49-50, <http://www.aiha.org> (requires membership login)
2. E. Esswein, M. Boeniger, K. Ashley, "Real Occupational Hygiene: What Does it Take to Remove Toxic Metals from Skin?" AIHCE 2009, Toronto, Canada, [http://www.skcinc.com/Features/archives/DeconTowel\\_NIOSH.pps](http://www.skcinc.com/Features/archives/DeconTowel_NIOSH.pps)