Managing Chemical Hazards & Permissible Exposure Limits

Coatings Industry Considerations

By Alison B. Kaelin, CQA
ABKaelin, LLC

n October 2014, the Occupational Safety and Health Administration (OSHA) announced it is seeking public comment on strategies for managing chemical hazards in the workplace and approaches to updating chemical permissible exposure limits (PELs). In this request, OSHA admits that “Many OSHA PELs are out-of-date and they’re not adequate for ensuring protection of worker health.” The initiative is requesting public comment by April 8, 2015 on how to streamline and improve OSHA’s process for updating PELs and possible approaches to reducing and controlling chemical exposures in the workplace.

This article discusses material provided in the request for information and the OSHA website section; “Transitioning to Safer Chemicals” and evaluates them based on their potential relevance or impact on the coatings industry.

Permissible Exposure Limits
PELs establish the acceptable amount or concentration of a substance in the air in the workplace. They are intended to protect workers from adverse health effects related to hazardous chemical exposure.

Most of OSHA’s PELs were issued shortly after adoption of the Occupational Safety and Health (OSH) Act in 1970. OSHA has occupational exposure limits for only about 470 substances. Section 6(a) of the OSH Act allowed OSHA to adopt existing federal standards or national consensus standards as enforceable OSHA standards. Most of these are listed as simple limits in the three Z-Tables of 29 CFR 1910.1000; Subpart Z, Toxic and Hazardous Substances: Table Z-1, Limits for Air Contaminants, Table Z-2, and Table Z-3, Mineral Dusts.

Approximately 30 chemicals and carcinogens are regulated through Comprehensive Health Standards (including lead, cadmium, hexavalent chromium and arsenic). Most PELs were adopted from the Walsh-Healy Public Contracts Act as existing federal standards for general industry. These were adopted from the 1968 Threshold Limit Values (TLVs) of the American Conference of Governmental Industrial Hygienists (ACGIH).

This means that approximately 95 percent of OSHA’s current PELs have not been updated since they were adopted nearly 45 years ago. Further, the American Chemistry Council estimates that approximately 8,300 chemicals are being used in significant amounts in the workplace, and that OSHA is regulating approximately only 5 percent of these chemicals.

Industrial experience, safety, health and industrial hygiene professionals and organizations, new developments in technology, and current scientific data (such as what we now have about lead, silica and isocyanates to name just a few) clearly demonstrate that, in many instances, the outdated PELs are not sufficiently protecting worker health. Even the more recent PELs, such as the OSHA PEL for “Lead in Construction” of 50 µg/m³ as an eight-hour time-weight-
OSHA relies heavily on the Hazard Communication Standard (HCS). It suggests that priorities for new and revised PELs may be based on the updated hazard classifications established in the HCS. It states that data used for “banding” (grouping based on similarities) could be based on information in the safety data sheets. One method suggests that the hazard classification and dustiness of the material might have to be considered.

OSHA is interested in using task-based control approaches in the construction industry such as the method used in the recently proposed rule for crystalline silica. This approach allows employers to choose to measure their workers’ exposure to silica and independently decide which controls work best in their workplaces. Alternately, the employers can simply use a pre-established control method that outlines work practice, engineering controls and respiratory protection based on the task (such as use of hand grinders).

OSHA indicated that workers suffer more than 190,000 illnesses and 50,000 deaths annually due to chemical exposures. Workplace chemical exposures are linked to various cancers, lung, kidney, skin, heart, stomach, brain, nerve, and reproductive diseases.

As a precursor to the RFI, in October 2013 OSHA introduced the “Transitioning to Safer Chemicals: A Toolkit for Employers and Workers” website and annotated an occupational exposure limits table to assist employers to voluntarily reduce chemical
exposures and adopt newer, more protective workplace exposure limits.

Transitioning to Safer Chemicals Process

The “Transitioning to Safer Chemicals” (www.osha.gov/dsg/safer_chemicals/index.html) and “Toolkit” online resources support OSHA’s hierarchy of controls where hazard elimination or substitution make the most effective solution for reducing chemical hazards.

The OSHA step-by-step toolkit provides employers and workers with information, methods, tools and guidance on using informed substitution in the workplace. It can be utilized by all types of businesses that use products containing chemicals in their everyday operations.

The Toolkit Steps

Step 1: Engage
• Form a team to develop a plan.
• Develop goals for chemical management.
• Develop a work plan.

Step 2: Inventory and Prioritize
• Identify current or expected chemical inventory.
• Obtain product information.
• Identify and assess risks, health effects, exposure pathways, etc. through review of SDS and other data.
• Prioritize transition based on risk, use, health effects, etc.
• Provides resources for locating product and health data.

Step 3: Identify Alternatives
• Provide resources for locating and evaluating safer chemicals.

Step 4: Assess and Compare Alternatives
• Identify performance characteristics.
• Determine whether alternatives introduce new risks.
• Note other regulatory considerations such as air emissions and TRIR reporting.
• Assess costs.
• Assess potential changes in worker experience, training and transition.

Step 5: Select

Step 6: Pilot Test the Alternative
• Implement a pilot or small scale test.
• Identify resources needed if alternative is implemented.
• Evaluate.

Step 7: Implement and Evaluate the Alternative
• Evaluate worker benefit (reduction in exposures).
• Determine if alternative meets needs.

Annotated Z-Tables

OSHA’s mandatory PELs in the Z-Tables remain in effect. However, OSHA recommends that employers consider using the alternative occupational exposure limits because the agency believes that exposures above some of these alternative occupational exposure limits may be hazardous to workers, even when the exposure levels are in compliance with the relevant PELs.

The annotated tables provide alternative occupational exposure levels from the following sources:

California Division of Occupational Safety and Health (Cal/OSHA) PELs
Cal/OSHA has created a broad list of PELs (Cal/OSHA AC-1 Table) that are enforced in workplaces under its jurisdiction. Of all the states that have OSHA-approved state plans, California has the most extensive list of PELs.

NIOSH Recommended Exposure Limits (RELS)
NIOSH assesses all accessible medical, biological, engineering, chemical, and trade information pertaining to the hazard. NIOSH communicates its recommendations to OSHA in order to produce legally enforceable standards. NIOSH also publishes a pocket guide to chemical hazards, alerts, special hazard reviews and technical guidelines.

ACGIH Threshold Limit Values (TLVs)
ACGIH is a private, scientific organization that produces recommendations and guidelines to help manage occupational health hazards. TLVs are airborne concentrations of chemical substances which are believed to cause no adverse effects after repeated exposure over a working lifetime.

Because the TLVs are based solely on health issues, there is no attention given to economic or technical practicality. They are recognized as credible and their inclusion is required on safety data sheets by the HCS.

The complete set of annotated tables can be accessed at www.osha.gov/dsg/annotated-pels/index.html.

Paint and PELs

How could this effect the painting industry? Current hazardous constituents present in most coating formulations could potentially be affected through reduction of existing PELs or introduction of new PELs for the 95 percent of chemicals not covered.

A quick review of the safety data sheets for commonly used zinc, epoxy and urethane three-coat systems indicated that PELs exist for most chemicals listed; however, most PELs were significantly higher than TLVs or Cal/OSHA Levels. Cal/OSHA is currently considering reduction of the PEL for lead to 15 to 20 µg/m³ and other groups are lobbying for reductions in hexavalent chromium and other standards. As new safety data sheets continue to come online through the HCS, it is expected that OSHA will apply more and more pressure to drastically reduce PELs accordingly.
Conclusions

The scope of the RFI and the information on which OSHA wants feedback are so vast that it is impossible to predict what regulatory changes, if any, will ultimately result from this process. The RFI poses more than 50 general questions seeking information that will establish the agency’s approach for evaluating and regulating chemical exposure in the workplace. There is no question, however, that employers who regularly handle chemicals in the workplace should pay careful attention to this RFI and consider submitting information by April 8, 2015 to be part of the record as the agency considers its next steps.

So What Can We Do?

Employers who regularly handle chemicals in the workplace should respond to the OSHA request for information by the April 8, 2015 deadline.

• Start looking at your voluntary chemical usage (chemicals not specified or mandated by contract). Are there opportunities to substitute a less hazardous product? If so, use the seven-step process to investigate replacements.

• Consider your worker exposures to lead and other materials which have PELs that we know are insufficient. Consider revising your work practices, engineering controls and training to proactively reduce worker exposures to as low as is feasible.

• Keep tuned, there is certain to be more conversation and controversy as this process unfolds.

About the Author

Alison B. Kaelin, CQA, has more than 25 years of public health, environmental, transportation and construction management experience in the coatings industry. She is the owner of ABKaelin, LLC, a provider of OSHA training; quality assurance, auditing, consulting, and related services to the protective coatings, construction, fabrication, and nuclear industries. Kaelin is a certified quality auditor and a NACE-certified Coating Inspector. She was a corecipient of the inaugural SSPC 2014 Women in Coatings Award, a 2012 JPCL Top Thinker, a 2012 JPCL Editor’s Award Winner and an SSPC Technical Achievement Award winner in 2005. Kaelin is also a JPCL contributing editor. JPCL