Chubb Environmental Health Lab (EHL) Update 2022

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Adopted Threshold Limit Values

The 2022 updates to the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) have been released.[1]

Adopted values of note include:

- Antimony Hydride has been adopted with a 20-fold reduction in the TLV from 0.1 ppm down to 0.005 ppm. This will be challenging to sample. The lower limit of NIOSH 6008 is 0.0016 ppm and now requires the maximum method validated air volume of 50 liters to see about 1/3 of the TLV.
- Benzoic Acid and Alkali Benzoates did not have a previously established TLV. They are broken down into three specific substances: Benzoic Acid (0.5 $mg/m^{3\,(IFV)}$, Sodium Benzoate (2.5 $mg/m^{3\,(I)}$) and Potassium Benzoate (2.5 $mg/m^{3\,(I)}$). All three forms have a skin notation; dermal wipe sampling may be something to consider.
- Cyclopentane now has the addition of the "EX" or explosive notation and an increase in the TLV from 600 to 1000 ppm (how often does this happen) based on animal studies. The Lower Explosive Limit (LEL) for Cyclopentane is 11,000 ppm, so the 10% value would be 1,100 ppm, close to the 1000 ppm exposure standard, thus the addition of the "EX" notation.
- Dipropylene Glycol Methyl Ether (DPGME) now has a TWA (Time Weighted Average) of 50 ppm. The concern is centered on adverse effects to the liver. DPGME has been commonly used over the years, now we have a standard to use in its workplace evaluation.
- Ethyl Benzene and Xylenes both get the OTO (Ototoxicant) designation, with the TLV for Xylenes being further reduced from 100 to 20 ppm. Xylenes also had the STEL (Short Term Exposure Level) value of 150 ppm removed; note that the 3/5 rule implies a maximum STEL of 100 ppm, more stringent than the retired 150 ppm value.
- Iodoform, as elemental Iodine, was accepted with a major reduction from 0.1 ppm TWA to 0.001 ppm with the IFV (Inhalable Fraction and Vapor) notation added. A 100-fold decrease in the exposure limit will be challenging to control.
- A first-time standard for Isoflurane has been adopted at 50 ppm as a TWA. This is the first chemical in the family of "flurane" anesthetic gases to have a standard adopted. The basis is potential damage to embryo/fetus.
- Trimethyl Benzenes, isomers, now have a lower TWA of 10 ppm (was 25 ppm) with a new A4 notation, meaning it is explicitly not classified as a human carcinogen.
- Titanium Dioxide underwent a major revision that now separates exposures into two categories, Nanoscale ($0.2\ mg/m^{3\,(R)}$) and Finescale ($2.5\ mg/m^{3\,(R)}$). Both forms receive the A3 notation (confirmed animal carcinogen with unknown relevance to humans) along with the respirable collection directive. NIOSH has worked out a sampling plan and approach for assessing these two fractions of Titanium Dioxide. Anyone concerned with the potential ramifications to their health and safety program should start by reading the information in the bulletin. Here is the URL: NIOSH Current Intelligence Bulletin 63: Occupational Exposure to Titanium Dioxide. Even if you have historical

sampling data, we recommend that you review this information and reevaluate exposures to titanium dioxide to ensure compliance with the adopted changes.

Notice of Intended Changes to TLVs

Chemicals listed as 2022's Notice of Intended Changes (NIC) have also been published. The following are a few of the notable compounds that appear on the 2022 NIC:

- Benzene has a proposed reduction from 0.5 ppm TWA and 2.5 ppm STEL to 0.02 ppm and 0.1 ppm, respectively. This is a notable change and something to be prepared to address if adopted. The basis for the reduction is evidence of toxic bone marrow effects at lower doses.
- Benzoquinone would be a new addition to the chemical substances table with a TLV TWA of 0.1 ppm and a Surface Limit (SL) of 5 ug/100 cm^2. As implied by the SL limit, this chemical also carries the DSEN notation as a dermal sensitizer. The basis for these limits is eye irritation, respiratory irritation, and ocular effects.
- Di(2-Ethylhexyl) Phthalate has a current TLV-TWA of 5 mg/m^3 and is proposed to be reduced to 0.1 mg/m^3. A "Skin" notation will be added, indicating dermal exposure as a potential route of significance in exposure assessment. The reduction provides protection against potential effects to male reproduction. If past exposure data was based on a gravimetric approach, we recommend reevaluation using a more specific and sensitive method (OSHA 104).
- Divinylbenzene-ethylstyrene mixtures, as total divinylbenzene isomers – The proposed TWA is set at 0.5 ppm and is marked as a dermal sensitizer (DSEN). These mixtures are very reactive and require stabilizers to keep them from polymerizing. One of the common stabilizers used is Catechol, thus the recommendation that the media used for sampling be a catechol treated charcoal tube.
- Glyphosate makes its debut appearance on the list with a TWA of 5 mg/m^3 as an inhalable particulate and carries an A4 notation (not classifiable as a human carcinogen). At such a high level, use of common gravimetric methods would be acceptable means for assessing exposures.
- Nitric Acid appears with several significant changes. Proposed is the removal of the 2 ppm TWA (this was verified) and a reduction in the STEL from 4 ppm to 0.025 ppm (160 times lower) with the IFV modifier and an A4 notation. If adopted, these changes would have a considerable impact. It is likely many operations using Nitric Acid would have to be reevaluated.

While not all NICs will necessarily be adopted, they are listed as intended changes to solicit comments from interested parties. To receive further information on current ACGIH TLVs and NICs, or to make suggestions and comments about these changes, email ACGIH by May 31, 2022 (the end of the NIC comment period).

Technical Communications Developed by Chubb Global Risk Advisors

Chubb Global Risk Advisors (CGRA) continues to serve our professional community by producing technical comment relevant to today's hot topics in industrial hygiene and elsewhere in risk management. Below are a few of the titles we have developed over the past year that may be of interest to you:

- *Using Tethering Tools to Reduce Workplace Injuries*
- *Recognizing the Risk of Per- and Polyfluoroalkyl Substances (PFAS) in the Environment*
- *Building an Effective Strategy for Managing Construction Risks*

If you are interested in any of the articles above, please contact the lab and we will provide a copy.

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1. Annual Reports for the Year 2022: Committees on Threshold Limit Values (TLVs®) and Biological Exposure Indices (BEIs®); American Conference of Governmental Industrial Hygienists; December 9, 2021

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