

Using the Numbers to Determine Worker Safety

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When it comes to critical cleaning there are many aspects to factor in. Does the precision cleaning fluid clean well? Does it do the job quickly? Is it economically viable? Does it meet regulatory requirements and environmental issues? Importantly, is it safe for workers?

Sometimes the cleaning methods may work well to remove the contaminant. But, they are not always the safest for staff. There are, however, cleaning chemistries out there that do put safety first. Plus, they provide all the other important qualities required for a great cleaner.

It's All in the Numbers

When it comes to worker safety it is important to look at the key features within a cleaning chemistry. This includes everything from flammability and corrosivity to toxicity. The risk of fire and corrosiveness may be well-understood, but toxicity can appear to be more difficult to figure out. Determining a cleaners' ability to do the job well against its toxicity risk is an important aspect to consider. One way to understand toxicity is to look at the product's Safety Data Sheet (SDS). In particular, Section 2, Hazard Identification and Section 8 Exposure Controls.

Look to the SDS

Section 2 details if OSHA regulates a product as hazardous, and indicates the type of physical and health hazards associated with the product. The exposure limits detailed in Section 8 are there to safeguard workers from exposure to high levels of harmful chemicals that can be dangerous, whether that is through short-term use or during their working life. Firstly, look for the relevant numbers by identifying the toxicity ratings detailed in the SDS. Several names are associated with this rating. The most common is TWA (Time Weighted Average). But, some manufacturers list them as PEL (Personal Exposure Limit). Or government bodies assign them as an AEL (Allowable Exposure Limit).

Determining Exposure Limits

Expressed in parts-per-million (ppm), it helps to evaluate if a cleaning chemistry can safely be used in the workplace. These values may also be specified in milligrams per cubic meter (mg/m³) or milligrams per liter (mg/l). A greater number is better as it specifies that a larger concentration of exposure can take place without causing adverse effects. Higher numbers, those approaching 1,000 ppm, which is the highest rating possible, indicate a safe chemistry. The lower the score the greater the risk of exposure.

The scores are estimated by the calculation of a worker's risk from exposure to the cleaning chemistry for a typical working week – eight hours per day, five days a week, over a theoretical thirty-year working career. A lower score indicates that even short-lived contact with the chemical can be hazardous. If a cleaning solution has a TWA under 25 ppm, extra engineering controls such as personal protection equipment, ventilation and air filtration along with air quality monitoring are needed. This ensures worker exposures are maintained below the exposure limits.

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Higher Numbers are Better

Fluids, cleaners or coatings with a TWA of 50-100 ppm can be used safely but only with the implementation of the correct equipment and training. Fluids with a TWA of 100-200 ppm or more are better still. Although the potential for concern is manageable, they may still require engineering controls to ensure exposures are kept below the exposure limits

Exposure limits are 'time-weighted' and designed to manage worker exposures on a daily basis that may last days, weeks or even years. It is prudent to understand the underlying basis for exposure limits recommended or mandated by an organization or vendor. Some exposure limits are set simply to prevent acute effects that could make working uncomfortable or difficult to perform. Other exposure limits are set to prevent more serious and immediate effects further quantifying the risk of using a specific chemical.

Don't be Risk Adverse

It is not only TWA values that help to measure the safety of the chemistry, also look at the vapor pressure which can be found in Section 9 of the product's SDS. If a vapor pressure is known, and applicable, it is included in the SDS. A high vapor pressure fluid will volatilize easily, and readily generate vapor. This is especially apparent within small enclosed spaces. Also, if this vapor is flammable the threat of fire can be high. As a best bet, always choose a cleaner with low vapor pressure, not only will it reduce the flammability risk, but it will also lower the hazard of inhalation exposure.

Before deciding on a cleaning solution, obtain as much information as possible concerning the identity of the chemical or chemicals of the product being used. To reduce risk to workers, understand and consider all the figures on the SDS. This significant piece of information will offer specific details on the product's potential hazards and allow users to understand the potential threats helping to make an informed decision.

Look at the Whole Picture

All cleaning chemistries have an SDS which is organized into several categories. For example, identification of the substance and manufacturer; toxicological information; and exposure controls / personal protection.

It is important to remember that concentrating on just the TWA figure is insufficient for a comprehensive assessment. Look at the whole picture to determine safety. Fundamental aspects to consider include flammability, storage, handling, and disposal. You should include all of these details in any safety analysis.

Innovative, modern cleaning chemistries not only work effectively to remove the contaminant, but also address worker safety, regulatory requirements and environmental concerns. Before selecting a cleaning solution, the best advice is to contact the cleaning chemistry manufacturer. They will have the knowledge and experience to answer any concerns and can help to recommend cleaning solutions that do the job well, without any safety implications.



Look for a cleaning fluid with a PEL of 200 or higher.



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About the Author:

Mike Jones, retired Vice President of International Sales for MicroCare, has over 30 years of experience in the critical cleaning industry. He is a prolific writer and educator focusing on critical cleaning in general and vapor degreasing and benchtop cleaning in particular.

For more information, visit www.microcare.com.



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