Occupational Exposure Limits

from the AIHA® Guideline Foundation

OEL Use and Limitations

OELs

Occupational Exposure Limits (OELs) are developed for the protection of healthy workers; they are not intended for the general public, which includes sensitive populations such as infants, the elderly, or the infirm. OELs are based on repeated daily exposures over a working lifetime. They are normally averaged over an 8-hour workday and serve to protect against acute and chronic health effects.

INTRODUCTION

The OSHA PELs are set and enforceable by law. However, there are other recommended guidelines established by various agencies, standards organizations, and industry. The American Conference of Governmental Industrial Hygienists (ACGIH®), the National Institute for Occupational Safety and Health (NIOSH), and other organizations develop recommended guidelines based on sound industrial hygiene practice and available toxicological and epidemiologic research.

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Only a modest number of occupational health standards are available for the immense number of chemicals in use today. In addition, numerous new chemicals are produced each year. Chemical occupational exposure limits provide guidance for professionals involved in protecting the health and safety of workers exposed to chemicals through the performance of their jobs.

The AIHA Guideline Foundation Occupational Exposure Limits (OELs) provide guidance for protecting most workers from adverse health effects related to occupational chemical exposures. Conformance with these guideline values does not ensure protection of all workers. Workers may have underlying health conditions which make them unusually susceptible to the adverse health effects of some chemicals.

OELs are expressed as either time-weighted average (TWA) concentrations or ceiling values. Different time periods are specified depending on the properties of the agent. An 8-hour TWA indicates a time-weighted average concentration for a normal 8-hour workday and a 40-hour work week. A ceiling limit should not be exceeded at any time during the workday.

When it is believed that excursion levels should be more limited, a shorter duration TWA may be recommended, either in conjunction with, or in place of, an 8-hour TWA. The time specified is relevant to exposure, not necessarily to sampling. A short-term TWA is a time-weighted average concentration of shorter duration, such as 15 minutes, established to limit excursion levels.

Worker excursion exposure levels may exceed three times the 8-hour time-weighted average for no more than a total of 30 minutes during a workday, provided that

the 8-hour TWA is not exceeded. Under no circumstances should worker excursion exposure levels exceed 5 times the 8-hour TWA.

The notation “skin” indicates that the chemical might be absorbed in toxicologically significant amounts through the skin. Therefore, skin contact can contribute to the overall exposure and must be carefully considered in any overall exposure evaluation.

In some cases, the data would indicate that worker exposure by all routes should be minimized to the fullest extent possible. In these cases, no value is assigned.

The notations “DSEN” and “RSEN” are used to denote agents that can cause dermal and respiratory sensitization, respectively, in an occupational setting. The notation “DSENP” is used to indicate the potential for dermal sensitization resulting from photosensitization (i.e., the interaction of an absorbed chemical and ultraviolet light). Use of the notations indicates that adequate data may not be available to allow the determination of sensitization thresholds upon which to base an OEL.

Since the probability of experiencing allergic symptoms decreases with decreasing exposure, such notations are intended to alert the EHS professional that additional process control measures or personal protective equipment may be needed. Since potency will vary among agents assigned notations, the OEL documentation should be consulted for information regarding relative potency information.

NOTE: It may not be appropriate to use OELs for situations involving unusual work schedules that differ markedly from a normal 8-hour workday, 40-hour work week. Field hygienists should refer to the Brie and Scala Model.