



Chemical Hazards and Toxic Substances



Overview

What are chemical hazards and toxic substances?

Chemical hazards and toxic substances pose a wide range of health hazards (such as irritation, sensitization, and carcinogenicity) and physical hazards (such as flammability, corrosion, and explosibility).

This page provides basic information about chemical hazards and toxic substances in the workplace. While not all hazards associated with every chemical and toxic substance are addressed here, we do provide relevant links to other pages with additional information about hazards and methods to control exposure in the workplace.

How does OSHA regulate worker exposure to chemicals?

29 CFR 1910.1200, 1915.1200, 1917.28, 1918.90, and 1926.59

OSHA's Hazard Communication Standard (HCS) is designed to ensure that information about chemical and toxic substance hazards in the workplace and associated protective measures is disseminated to workers.

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- Chemical manufacturers and importers are required to evaluate the hazards of the chemicals they produce or import, and prepare labels and safety data sheets to convey the hazard information to their downstream customers;
- All employers with hazardous chemicals in their workplaces must have labels and safety data sheets for their exposed workers, and train them to handle the chemicals appropriately. The training for employees must also include information on the hazards of the chemicals in their work area and the measures to be used to protect themselves.

For more information see OSHA's Hazard Communication and What is Hazard Communication? pages.

Allowable airborne concentrations

Employers are required to identify and evaluate the respiratory hazard(s) in their workplaces. Various types of Occupational Exposure Limits (OELs) have been established by a number of organizations, and are listed on many of OSHA's Safety and Health webpages on chemical hazards and toxic substances. Here is an explanation of some of the different levels.

- OSHA Permissible Exposure Limits (PELs).

29 CFR 1910 Subpart Z, 1915 Subpart Z, 1926 Subparts D and Z

OSHA sets enforceable permissible exposure limits (PELs) to protect workers against the health effects of exposure to hazardous substances, including limits on the airborne concentrations of hazardous chemicals in the air. Most OSHA PELs are 8-hour time-weighted averages (TWA), although there are also Ceiling and Peak limits, and many chemicals include a skin designation to warn against skin contact. Approximately 500 PELs have been established.

Most of OSHA's PELs for General Industry are contained in 1910.1000 – Air Contaminants, and are listed by chemical name in Tables Z-1, Z-2, and Z-3. The standards for Marine Terminals and Longshoring both incorporate the General Industry standards (1910 Subpart Z).

Most of OSHA's PELs for Shipyard Employment are contained in 1915.1000 – Toxic and Hazardous Substances, and are listed by chemical name.

Most of OSHA's PELs for Construction are contained in 1926.55 – Gases, Vapors, Fumes, Dusts, and Mists, and are listed by chemical name.

However, many of these limits are outdated. Also, there are many substances for which OSHA does not have workplace exposure limits.

To provide employers, workers, and other interested parties with a list of alternate occupational exposure limits that may serve to better protect workers, OSHA has annotated the existing Z-Tables with additional selected occupational exposure limits. OSHA has chosen to present a side-by-side table with the California/OSHA PELs, the NIOSH Recommended Exposure Limits (RELs) and the ACGIH TLVs. The tables list air concentration limits, but do not include notations for skin injury, absorption or sensitization.

- California Division of Occupational Safety and Health (Cal/OSHA) Permissible Exposure Limits (PELs).

Cal/OSHA has established an extensive list of PELs (Cal/OSHA AC-1 Table) that are enforced in workplaces under its jurisdiction. Cal/OSHA PELs are promulgated under statutory requirements for risk and feasibility that are no less protective than the OSH Act. Though not enforceable in establishments outside of Cal/OSHA's jurisdiction, these PELs can provide information on acceptable levels of chemicals in the workplace. Of all the states that have OSHA-approved State Plans, California has the most extensive list of PELs.

- National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs).

- File a complaint asking OSHA to inspect their workplace if they believe there is a serious hazard or that their employer is not following OSHA's rules. OSHA will keep all identities confidential.
- Exercise their rights under the law without retaliation, including reporting an injury or raising health and safety concerns with their employer or OSHA. If a worker has been retaliated against for using their rights, they must file a complaint with OSHA as soon as possible, but no later than 30 days.

For additional information, see OSHA's Workers page.

How to Contact OSHA

Under the Occupational Safety and Health Act of 1970, employers are responsible for providing safe and healthful workplaces for their employees. OSHA's role is to help ensure these conditions for America's working men and women by setting and enforcing standards, and providing training, education and assistance. For more information, visit www.osha.gov or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.



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