

Lecture 2: International and Egyptian Occupational Exposure Limits and Control Measures

Recommended or mandatory occupational exposure limits (OELs) have been developed in many countries for airborne exposure to gases, vapors and particulates. The most widely used limits, called **threshold limit values (TLVs)**, and are those issued in the USA by the **American Conference of Governmental Industrial Hygienists (ACGIH)**. The Egyptian occupational exposure limits or threshold limit values (OEL or TLV) are similar to that of NIOSH & OSHA. In Egypt, the regulations that cover the occupational exposures are in the law No. 12-2003, and its executive law of the Ministry of Man-Power & Immigration No 211-2003& in the executive law of the Prime Minister Decisions No 1095-2011 and 710-2012.

OSHA sets enforceable **Permissible Exposure Limits (PELs)** to protect workers against the health effects of exposure to hazardous substances. PELs are regulatory limits on the amount or concentration of a substance in the air. They may also contain a skin designation. **OSHA PELs are based on an 8-hour time weighted average (TWA) exposure.**

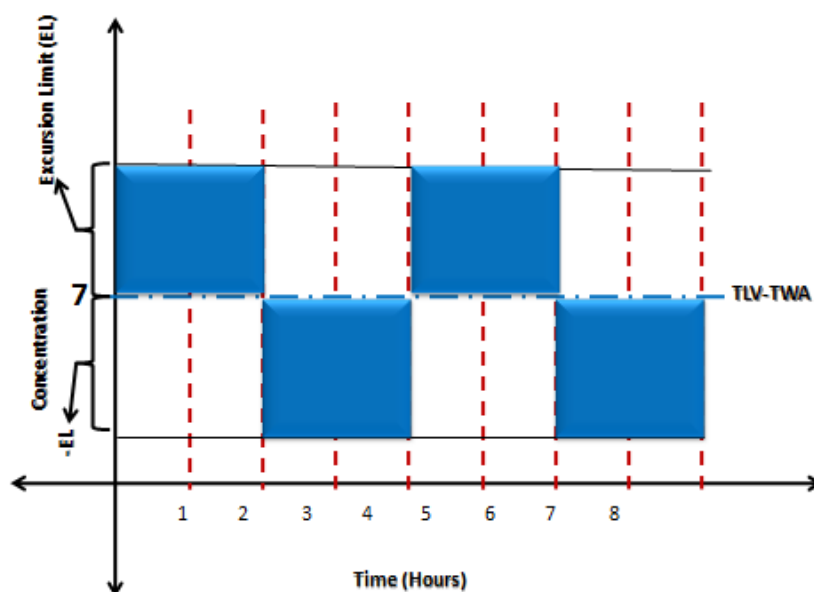


Figure (4) definition of Permissible Excursion Limit

Occupational Exposure Limits (OELs) are the concentration (level) of hazardous contaminants (agent) in the work environment to which it is believed that average workers are repeatedly exposed day after day for all their working life without causing any health effects or discomfort to the workers or their off-springs.

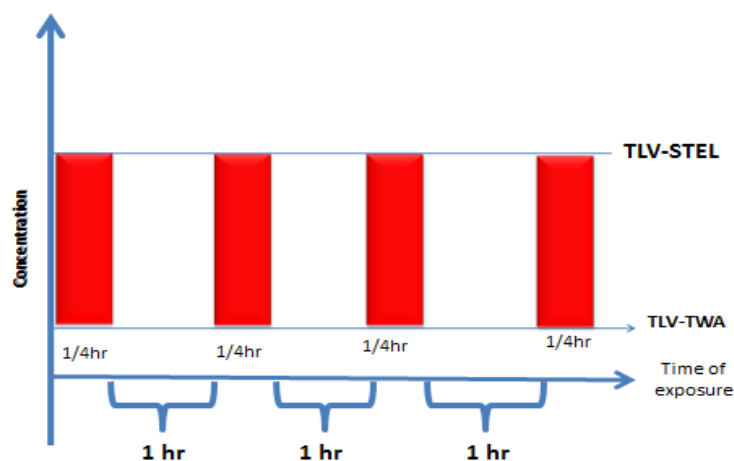
For airborne exposures, there are three types of limits in common use:

- i) **Time weighted average (TLV-TWA)** is the employee's average airborne exposure in any 8-hour work shift of a 40-hour work week which shall not

be exceeded. Workers may be repeatedly exposed day after day for all their working life without causing adverse health effects to the workers or their off-springs.

ii) **Short term exposure limit (TLV-STEL)** is the employee's 15-minute time weighted average exposure which shall not be exceeded at any time during a work day unless another time limit is specified in a parenthetical notation below the limit. If another time period is specified, the time weighted average exposure over that time period shall not be exceeded at any time during the working day.

iii) **Ceiling (TLV-C)** is the employee's exposure which shall not be exceeded during any part of the work day. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute time weighted average exposure which shall not be exceeded at any time over a working day.



2. Threshold Concept:

For most chemicals there is a threshold of effect or a no-effect level. As the dose is increased, there is a point at which the first measurable effect is noted or at which the incidence of a health effect in the exposed population exceeds its incidence in unexposed populations.

Exposure thresholds are most easily determined (and more available) for effects occurring soon after exposure. Other effects such as reproductive defects and cancer occur months or years after exposure began.