

Occupational exposure limits

An occupational exposure limit (OEL) is defined as the level to which workers are exposed during their working career that should not cause any adverse health effects to them or their offspring.² OELs are based on continuous exposure to a chemical (or other) substance via inhalation.^{1,2}

Research into OELs for airborne chemical workplace exposure dates back to the 1880s in Germany;¹ South Africa set a limit for exposure to crystalline silica in the mines in the 1910s.¹

OELs are referred to by many different names.¹ The American Conference of Governmental Industrial Hygienists (ACGIH) calls them 'threshold limit values' (TLVs), while the term 'recommended exposure limits' (RELs) is used by the National Institute for Occupational Safety and Health (NIOSH).¹ The European Union uses 'Binding Occupational Exposure Limit Values' (BOELVs) and 'Indicative occupational exposure limit values' (IOELVs).¹ However, the International Labour Organisation (ILO) adopted the term 'occupational exposure limit' (OEL) in the 1970s, to encompass all chemical exposures in the workplace.¹ South Africa has adopted the ILO, together with 'control limit', and 'recommended limit' for hazardous chemical substances used in the work environment.³

The three most commonly (and interchangeably) types of OELs used internationally are defined as follows:

- Time-weighted average (TWA) – the average, maximum concentration for an airborne chemical hazardous substance for a 8-hour working day and 40-hour week⁴
- Short-term exposure limit (STEL) – the short term, usually 15 minutes, maximum average concentration of an airborne chemical hazardous substance to which a worker can be exposed⁴
- 'Ceiling value' – the concentration of an airborne chemical hazardous substance that should not be exceeded at any time⁴

The purpose of OELs is to protect workers from the adverse health effects associated with repeated exposure to chemicals in their working lives.³ OELs represent conditions in the workplace under which almost all workers who might be repeatedly exposed will not have any adverse effects to their health.⁵ Therefore, it is important that exposure be kept as low as reasonably practicable.⁵

As OELs are the main benchmarks used when conducting an assessment for occupational exposure, they form an essential basis for using chemicals in the workplace safely.² The comparison and interpretation of OELs and workplace exposure concentrations are important steps in choosing an effective control strategy for exposure.⁶

The United States has registered approximately 84 000 chemical substances, while the European Union's,

REACH, has more than 107 000 different substances on its database.¹ Most chemicals currently used in industry do not have OELs.¹ In addition, many of the existing OELs are out-dated and might therefore no longer be applicable.¹

The OELs stipulated in Annexure 1, Tables 1 and 2 of the Regulations for Hazardous Chemical Substances, 1995 were last updated on 27 June 2008.³ The Department of Labour (DoL) is currently reviewing the Regulations, including the OELs. A specific work group, the OEL Work Group under the Technical Committee⁷, has been tasked with the review and updating the South African limits. Suggestions from industry on additional substances and exposure limits have been received and will be considered by the group. The updated OELs will be provided to industry and other stakeholders once the process has been finalised.

Although there are some promising developments regarding the revision of the OELs, there are also a number of barriers,⁷ such as the applicability of the OEL to an individual's exposure, international coordination on OELs, and the non-systematic approach in their development.⁷ The DoL is looking for sustainable solutions to workplace occupational health that will see employees contributing to the economy of the country for many more years. This will only be possible through our continued efforts on this front to ensure limited exposure of employees to harmful chemicals.

OELs will always play an integral and important role in anticipating, recognising and controlling workplace chemical hazards.⁷

REFERENCES

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