# Revised TLV For Manganese

Revision Date: June 20, 2025

The American Conference of Governmental Industrial Hygienists (ACGIH) advised in February 2013 that it had adopted the proposed change to the Threshold Limit Value (TLV) for manganese. The change was published in the 2013 Edition of its TLVs and Biological Exposure Indices (BEIs) publication. The new TLV of 0.02 mg/m3 for respirable particulate matter represents a ten-fold reduction from the previous 0.2 mg/m3 TLV. The new TLV for manganese includes a 0.1 mg/m3 limit for inhalable manganese particulate.

The ACGIH's change in the manganese particulate TLVs appears to be based on reports of pre-clinical neurobehavioral and neuropsychological changes in workers exposed to chronic low levels of manganese.

The ACGIH acknowledges that its TLVs are not consensus standards and do not take into account economic or technical feasibility issues. The ACGIH recognizes that some governmental entities may utilize its TLVs in adopting standards.

Where exposures are assessed to be over the TLV, many approaches can be considered in the workplace for reducing manganese exposure levels to below the new TLV.

**Frequently Asked Questions**

**Why did the American Conference of Governmental Industrial Hygienists (ACGIH) decide to make this change which lowers the TLV for respirable and inhalable manganese?**
The ACGIH's change in the manganese particulate TLVs appears to be based on reports of pre-clinical neurobehavioral and neuropsychological changes in workers exposed to chronic low levels of manganese. Some reviewers have pointed out methodological flaws in these studies and that they have demonstrated notably inconsistent findings after several decades of research. Nevertheless, the ACGIH has decided to move forward with the reduction in its TLV for respirable and inhalable manganese.

**Does the new Threshold Limit Value (TLV) distinguish manganese in welding fume from other types of manganese?**
No, the new TLV does not distinguish between the form of manganese found in welding fume and other forms of manganese.

**What is the ACGIH and is it part of the government?**
The ACGIH is a non-profit, non-governmental corporation dedicated to promoting worker health and reducing exposures to environmental health stressors in the workplace.

**What exactly is the TLV?**
According to the ACGIH, its TLVs represent levels of exposure to which nearly every worker can be exposed throughout their working career without adverse health effects. They also caution that TLVs are not intended to represent fine lines between safe and unsafe exposure levels.

**Is the TLV a legal or regulatory exposure limit?**
No, the TLV is not a regulatory limit such as OSHA's Permissible Exposure Limit (PEL). The ACGIH acknowledges that its TLVs are not consensus standards and do not take into account economic or technical feasibility issues. The ACGIH acknowledges that some governmental entities utilize its TLVs in adopting standards. The Permissible Exposure Limit (PEL) of 5.0 mg/m3, ceiling, remains the US exposure limit for manganese enforced by OSHA.

**Should we follow the new TLV – and if so – why?**
The ACGIH is a long-standing body that is comprised of professional industrial hygienists and environmental health scientists whose fundamental task is to review applicable health studies, monitor reports related to the health effects and risks of exposure to compounds encountered in the workplace, and to advise regarding safe exposure levels. Lincoln Electric continues to recommend that exposures in the workplace be controlled to the TLV or the applicable regulatory exposure limit standard, whichever is the more conservative.

**Do countries outside the U.S. adopt the ACGIH TLV as their legal regulatory exposure limit?**
In short, yes. Many countries, and the State of California, tend to adopt exposure limits that are equal to the ACGIH TLV. Countries with exposure limit standards equivalent to the 2012 TLV include Canada, many European countries, Japan, Malaysia, Mexico and much of South America.

**How do I know if a welder's exposure is below the TLV?**
As an initial observation, the welder's breathing zone and general area should be clear of any visible fume or particulate. The most effective means for confirming that exposures are below the TLV, is to have a qualified individual such as a professional industrial hygienist conduct a proper exposure assessment in your workplace.

**If any exposures are over the TLV, how can they be reduced to acceptable levels?**
Many approaches should be considered for the workplace in order to meet the new TLV limits for manganese. These might include: a change in the welding process or procedure to reduce the rate of fume production where consistent with application requirements, the use of engineering controls such as local exhaust ventilation, work practice improvements and work process design changes. Should these or other options prove infeasible or inadequate, respiratory protection may also be necessary, such as the use of positive pressure options like supplied-air and Powered Air Purifying (PAPR) systems.

**What if we still have questions?**

If you need any assistance you can contact your Lincoln Electric local sales representative or the Lincoln Electric EHS Department. Direct inquiries can be addressed to MnTLV@lincolnelectric.com. Lincoln will continue to work with customers to develop the solutions they need to weld effectively and meet this new challenging TLVs.

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