

# LOSS CONTROL TOOL CHEST

## Welding and Manganese

In October, 2003 after nearly a decade of litigation, a former welder won a large lawsuit against welding wire and rod manufacturers in a county in the Midwest having national jurisdiction. His case focused on his symptoms which were similar to Parkinson's disease stating that they were a result of exposure to manganese from his years of welding.

Manganese is a reactive gray-white metal which increases the hardness, stiffness and strength of welds. Manganese fumes would be present during most welding processes and would be seen in a greater measure during a shielded metal arc welding (SMAW), one of the most common forms of commercial welding. It is a fairly universal component of both the stick and flux in this process with rod and wire manufacturers expected to not alter the composition of their products.

The Cal/OSHA Permissible Exposure Limit for manganese is  $0.2 \text{ mg/m}^3$  which is the same as the American Conference of Governmental Industrial Hygienists (ACGIH.) while the Federal PEL is still at  $5 \text{ mg/m}^3$ .

Chronic overexposure may lead to a disease known as manganism which involves the central nervous system and presents symptoms similar to Parkinson's disease. Other possible symptoms could include respiratory problems, tremors and/or a spastic gait, mood swings and, in some cases, decreased male fertility. The neurological symptoms are irreversible and may continue to worsen even after the individual is removed from the exposure.

Welders should be protected from manganese and other welding fume exposures through proper local or general ventilation. Local exhaust should draw the fumes away from the welder's breathing zone and should be discharged to the outdoors if possible. If ventilation is not able to reduce the exposure below the PEL then respirators must be worn to protect the worker. Establishment of exhaust system and use of respiratory protection should follow Cal/OSHA standards. Please refer to:

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Subchapter 7. General Industry Safety Orders  
Group 16. Control of Hazardous Substances  
Article 107. Dusts, Fumes, Mists, Vapors and Gases  
5150. Ventilation and Personal Protective Equipment Requirements for  
Welding, Brazing and Cutting.

As with any industrial hygiene exposure, the worker must be protected from a worst case scenario until the exposure(s) are quantified and if needed, proper protection can be determined.

Additional information may be found at:  
The California Office of Health Hazard Assessment  
[http://oehha.ca.gov/air/chronic\\_rels/pdf/mangnREL.pdf](http://oehha.ca.gov/air/chronic_rels/pdf/mangnREL.pdf)

## **Cal/OSHA Publications**

### **Respiratory Protection in the Workplace**

[http://www.dir.ca.gov/dosh/dosh\\_publications/respiratory.pdf](http://www.dir.ca.gov/dosh/dosh_publications/respiratory.pdf)

### **Respirator Regulation**

[http://www.dir.ca.gov/dosh/dosh\\_publications/newRespira.pdf](http://www.dir.ca.gov/dosh/dosh_publications/newRespira.pdf)

### **Guide to California Hazard Communication Regulation**

[http://www.dir.ca.gov/dosh/dosh\\_publications/hazcom.pdf](http://www.dir.ca.gov/dosh/dosh_publications/hazcom.pdf)