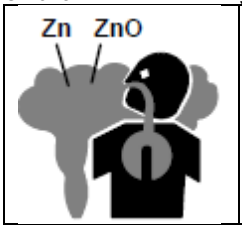

METAL FUME FEVER

OVERVIEW

Metal Fume Fever is the name for an illness that is caused primarily by exposure to zinc oxide fume (ZnO) in the workplace. Metal Fume Fever is an acute allergic condition experienced by many welders during their occupational lifetimes. Studies indicate that the most common cause of metal fume fever is overexposure to zinc fumes from welding, cutting, burning, or brazing galvanized steel. Since galvanized steel is more and more common in industry, the chances of welders having to work on it are occurring more frequently all the time. Other elements and their oxides, such as copper and magnesium, may cause similar effects.

EFFECTS OF OVEREXPOSURE

Overexposure to zinc oxide fumes cause a flu–like illness called Metal Fume Fever. Symptoms of Metal Fume Fever include headache, fever, chills, muscle aches, thirst, nausea, vomiting, chest soreness, fatigue, gastrointestinal pain, weakness, and tiredness. The symptoms usually start several hours after exposure; the attack can last 6 to 24 hours. Complete recovery generally occurs without intervention within 24 to 48 hours. Metal Fume Fever is more likely to occur after a period away from the job (after weekends or vacations). High levels of exposure can cause a metallic or sweet taste in the mouth, dry and irritated throat, thirst, and coughing at the time of the exposure. Several hours after exposure, a low–grade fever occurs (seldom higher than 102 °F or 39 °C). This is followed by sweating and chills before temperature returns to normal in 1 to 4 hours. If you encounter these symptoms, contact a physician and have a medical examination / evaluation.

OCCUPATIONAL EXPOSURE LIMITS

The current OSHA standard for zinc oxide fume is 5 milligrams of zinc oxide fume per cubic meter of air (mg/m^3) averaged over an eight–hour work shift. The ACGIH TLV (Threshold Limit Value) for zinc oxide fume is 2 mg/m^3 as a TWA (Time-Weighted Average) and 10 mg/m^3 as a STEL (Short-Term Exposure Limit).

HOW TO AVOID THE HAZARD

- Read and follow Safety Data Sheets (SDSs).
- Keep your head out of the fumes.
- Do not breathe fumes.
- Use enough ventilation, fume extraction at the arc, or both, to keep fumes and gases from your breathing zone and the general area.

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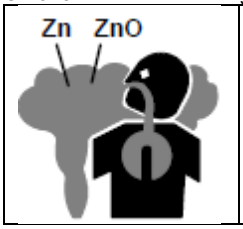

METAL FUME FEVER

- Use air sampling to determine if ventilation is adequate or requires application of corrective measures.

- Never take chances with welding fumes. If other precautions are not adequate or practical, wear a National Institute for Occupational Safety and Health (NIOSH) approved respirator, supplied air or otherwise, that adequately removes the fumes from your breathing zone.

MONITORING AND MEASUREMENT PROCEDURES

- **Eight Hour Exposure Evaluation**

Exposure measurements are best taken so that the eight hour exposure is based on a single eight hour sample or on two, four hour samples. Several short time interval samples (up to 30 minutes) may be used, but are not preferred. The air samples should be taken by a qualified person using approved collection methods and devices. Take the samples in the employee's breathing zone (air that would most nearly represent that inhaled by the employee). See AWS F1.1M, *Methods for Sampling Fumes and Gases Generated by Welding and Allied Processes*

INFORMATION SOURCES

AWS Study, *Fumes and Gases in the Welding Environment*, American Welding Society, <www.aws.org>.

ACGIH, *Threshold Limit Values (TLV®) for Chemical Substances and Physical Agents in the Workroom Environment*, American Conference of Governmental Industrial Hygienists, <www.acgih.org>.

OSHA, *Title 29 Labor, Part 1910,* Occupational Safety and Health Administration, *Code of Federal Regulations* (CFR), <www.osha.gov>.

ACGIH, *Documentation of the Threshold Limit Values and Biological Exposure Indices, and Guide to Occupational Exposure Values*, American Conference of Governmental Industrial Hygienists, <www.acgih.org>.

The following references include the specific precautionary methods used to protect against exposure to fumes and gases:

ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*, American Welding Society, <www.aws.org>.

NIOSH, Publication No. 78–138, *Safety and Health in Arc Welding and Gas Welding and Cutting,* National Institute for Occupational Safety and Health, <www.cdc.gov/niosh>.

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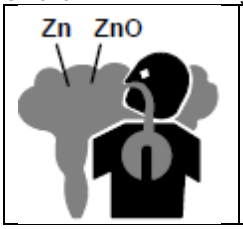

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