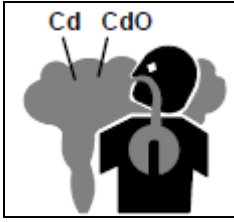

Cadmium Exposure from Welding and Allied Processes

INTRODUCTION

Fumes are poisonous and can kill. Overexposure may cause death. Some fume and dust from welding processes (including brazing, soldering, and thermal spraying) may contain cadmium or cadmium oxide compounds. The specific form and concentration of cadmium present in the fume and dust are dependent on the composition of the filler metal, base metals, metal coatings, atmosphere, flux, and the welding process.

ACUTE (SHORT TERM) EFFECTS OF OVEREXPOSURE TO CADMIUM

- Similar, but much more severe, to the effects produced by fume and dust from other metals.
- Inhalation exposure to high concentrations of fume may cause symptoms such as nausea, headaches, dizziness, nervousness, lung complications, and death.

CHRONIC (LONG TERM) EFFECTS OF OVEREXPOSURE TO CADMIUM

- Long term exposure to cadmium oxide fume and dust has caused severe chronic effects, kidney failure, and may, with longer exposure and/or higher concentrations lead to severe respiratory disease and death.
- Inhalation of cadmium by smokers may accelerate the development of respiratory diseases.
- There is evidence that long term exposure to cadmium may cause lung cancer. OSHA has defined cadmium as a carcinogen with no further categorization. Observations are difficult to interpret because of inadequate data and confounding factors.

OVERALL EVALUATION

- Overexposure to cadmium may cause death.
- Cadmium exposure is possibly carcinogenic to humans (IARC Group 2B).

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HOW TO PROTECT AGAINST OVEREXPOSURE

- Comply with OSHA regulations for cadmium.
- Identify composition of all base metals, coatings, and consumables; substitute non–cadmium containing materials wherever possible.
- Read and follow the Safety Data Sheets (SDSs) for cadmium containing products.
- Do not breathe fumes and gases. Avoid even brief exposure to high concentrations.
- Keep your head out of the fumes.
- Use enough ventilation, exhaust at the arc, or both, to keep fumes and gases from your breathing zone and the general area.
- Use industrial hygiene exposure assessments to determine exposure levels and the need for corrective measures—air supplied respirators may be required.
- Avoid ingestion. Do not eat or smoke in areas containing cadmium fume or dust.
- Keep exposure as low as possible.

INFORMATION SOURCES

Agency for Toxic Substances and Disease Registry (ATSDR), *Toxicological Profile for Cadmium—1998*, available from the Agency for Toxic Substances and Disease Registry, Dept. of Health and Human Services—Div. of Toxicology, 1600 Clifton Road, N.E.– M.S.E–29, Atlanta, GA 30333; Web site: www.astdr.cdc.gov.

National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161; Web site: www.ntis.gov.

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Organization for Economic Cooperation and Development (OECD), Risk Reduction Monograph No. 5: Cadmium—OECD 1994, available from the Organization for Economic Cooperation and Development, Environmental Health and Safety Division, Zrue André–Pascal, 75775 Paris Cedex 16, France; Web site: www.oecd.org.

National Institute for Occupational Safety and Health (NIOSH). Registry of Toxic Effects of Chemical Substances, and IDLHs. Cincinnati, Ohio: National Institute for Occupational Safety and Health, Taft Labs, 4676 Columbia Pkwy, Cincinnati, OH45226; Web site: www.cdc.gov/niosh.

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International Agency for Research on Cancer (IARC). IARC Monographs on the Evaluation of Carcinogenic Risk to Humans— Cadmium and Cadmium Compounds, Supplement 7 and Vols. 43–61 (1990). Oxford University Press, New York, NY 10016; Web site: www.iarc.fr.

American Conference of Governmental Industrial Hygienists, *Documentation of the Threshold Limit Values and Biological Exposure Indices, and Guide to Occupational Exposure Values*, available from American Conference of Governmental Industrial Hygienists (ACGIH), 1330 Kemper Meadow Drive, Cincinnati, OH 45240; Web site: www.acgih.org.

Occupational Safety and Health Administration (OSHA). Code of Federal Regulations, Title 29 Labor, Part 1910.1027 Cadmium, available from the U.S. Government Printing Office, 732 North Capitol Street NW, Washington, DC 20401; telephone: 800-321-6742; Web site: www.osha.gov.

Environmental Protection Agency (EPA). Integrated Risk Information System (IRIS) database; Web site: www.epa.gov/iris.

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

American National Standards Institute (ANSI). *Safety in Welding, Cutting, and Allied Processes*, Z49.1, published by the American Welding Society, 8669 NW 36 Street, #130, Miami, FL 33166; Web site: www.aws.org.

National Institute for Occupational Safety and Health (NIOSH). *Safety and Health in Arc Welding and Gas Welding and Cutting*, NIOSH Publication No. 78–138. Cincinnati, Ohio: National Institute for Occupational Safety and Health; Web site: www.cdc.gov/niosh.

Mine Safety and Health Administration (MSHA). Code Of Federal Regulations, Title 30 Mineral Resources, Parts 1-199, , available from the U.S. Government Printing Office, 732 North Capitol Street NW, Washington, DC 20401; telephone: 800-321-6742; Web site: www.msha.gov.

Occupational Safety and Health Administration (OSHA). Code of Federal Regulations, Title 29 Labor, Part 1910, available from the U.S. Government Printing Office, 732 North Capitol Street NW, Washington, DC 20401; telephone: 800-321-6742; Web site: www.osha.gov.

International Cadmium Association (ICdA). Using Cadmium Safely, available from International Cadmium Association, P.O. Box 924, Great Falls, VA 22066–0924; Web site: www.cadmium.org.