MIOSHA Fact Sheet

Methylenedianiline

What is Methylenedianiline (MDA)?

MDA is a man-made chemical that is mainly used to produce other chemicals. Michigan does not have a producer of MDA, but it is commonly used as a curing agent and hardener in epoxy resins, urethanes and rubber. In general, cured materials do not present an occupational hazard.

MDA is also known by other names, but the CAS number of 101-77-9 is a unique identifier for MDA. When applicable, this number is required on safety data sheets (SDS).

How can exposure to MDA affect me?

Exposure can cause liver damage, ~~and~~ as well as skin and eye irritation. Liver damage has symptoms that include jaundice, liver tenderness, weakness, nausea, headache, fever, and muscle pain. MDA is considered a suspected human carcinogen.

How does exposure to MDA occur?

Exposure to MDA can occur when the substance is inhaled, ingested, or absorbed through the skin. At room temperature, MDA evaporates very slowly and does not present a vapor hazard. Common routes of occupational exposures are inhaling dusts or mists and skin contact. Unlike many chemicals, MDA is readily absorbed through the skin. Ingestion can also be a significant route of exposure if proper hygiene practices are not followed.

Is employee exposure to MDA or its salts regulated?

Yes, Part 303. Methylenedianiline (MDA) is the MIOSHA standard that protects employees and specifies the requirements when exposure to MDA or its salts are possible. This standard includes the following requirements:

- Perform **initial air monitoring** to determine employee exposure. The "action level" is 5 parts per billion parts of air (ppb) of MDA and the "permissible exposure limit" (PEL) is 10 ppb. These exposure limits are based on an employee's average exposure for an eight-hour work day. The 15 minute "Short Term Exposure limit" (STEL) is 100 ppb. Relative to other exposure limits these limits are very low.
- Perform **periodic air monitoring**, at least every 6 months, when initial monitoring shows employee exposure at or above the action level, but below the PE; and at least every 3 months, when initial monitoring shows employee exposure above the PEL.
- **Monitoring for dermal effects** must be routinely performed, employee reports of potential dermal exposures shall be referred to medical personnel for observation. Skin contact with materials containing MDA at concentrations >0.1% by weight or volume are considered to be dermal exposure.
- Establish a **regulated area** when the PEL is exceeded or dermal exposure is expected. Limit access only to authorized personnel (people who have to work or be present in the area). No food, cosmetics, gum, smoking or drinking is allowed in a regulated area.
- Use **appropriate engineering or work practice controls** to reduce employee exposure below the PEL. This can include local exhaust ventilation, limiting an operation to a particular area (enclosed room or booth), or having prescribed methods of performing the job. Employee job rotation cannot be used to comply with the PEL.
- Provide **respiratory protection** in accordance with Part 451, Respiratory Protection Standard and according to the Methylenedianiline Standard, whenever the PEL is exceeded and

feasible controls cannot reduce exposures below the PEL.

- Provide **personal protective clothing or equipment** whenever:
  - The PEL is exceeded;
  - There is dermal exposure;
  - Or when liquids that contain MDA can be splashed or sprayed into an employees eyes.
- Ensure **contaminated clothing and equipment** is removed at the workplace, properly stored, cleaned and replaced. Employees cannot take such contaminated items from the workplace. Inform any person who launders or cleans such clothing or equipment that MDA is present.
- Implement good **personal hygiene practices** and provide for change rooms and washing facilities. Eating and drinking areas must be provided according to the standard.
- Part 303 requires that **lunch areas** located within areas in which there is potential for airborne exposure to MDA at or above the PEL shall have a positive-pressure, temperature-controlled, filtered air supply.
- In addition to all requirements of Part 430. Hazard Communication, employees must be provided with the following **information and training:**
  - The contents of the MDA standard and appendices;
  - Explain the medical surveillance and removal program;
  - All training program materials and the standard must be readily available to all affected employees.
- **Medical surveillance** by a licensed physician and without cost to employee is required when:
  - The action level is exceeded for 30 or more days per year;
  - Employees have dermal exposure for 15 or more days per year;
  - Exposure occurs in an emergency situation;
  - Dermal exposure monitoring indicates dermal exposure; or
  - Employees show signs or symptoms of exposure.
- **Records** must be kept of all air monitoring; any objective data relied upon to meet the standard's requirements such as materials, operations, processes, etc.; employee medical surveillance or removal; employee medical complaints related to MDA exposure, etc.

Additional Information

Please visit the MIOSHA website at www.michigan.gov/mioshapublications where additional information may be available; or contact the Consultation, Education & Training Division at (517) 284-7720.