

# 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).

### What are the health hazards of occupational exposure to MDA?

Exposure can cause liver damage 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 MDA enter a worker's body?

MDA can be 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 inhalation of dust or mist 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.

### Do any MIOSHA regulations cover employee exposure to MDA?

Yes, General Industry Safety and Health Standard, [Part 303. Methylenedianiline \(MDA\) in General](#)

[Industry](#) (Part 303) is the MIOSHA standard that protects employees and specifies the requirements when exposure to MDA or its salts are possible. The 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. The permissible exposure limits (PELs) are 10 ppb as an eight-hour time-weighted average or a short-term exposure limit (STEL) of 100 ppb. The STEL is determined by any 15-minute sample period. 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 PELs; and at least every 3 months, when initial monitoring shows employee exposure above the PELs.
- **Monitor for dermal effects** routinely. 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 is considered to be dermal exposure.
- Establish a **regulated area** when the PELs are exceeded, or dermal exposure is expected. Limit access to only 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.
- Institute **engineering or work practice controls** to reduce employee exposure to at or below the PELs. This can include local exhaust ventilation, confining an operation to an enclosed area (room or booth), or requiring prescribed methods to perform the job. Employee rotation shall not be permitted as a means of reducing exposure.
- A **written program** shall be established and implemented to reduce employee exposure to or

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below the PELs by means of engineering and work practice controls and by use of respiratory protection where permitted. The program shall include a schedule for periodic maintenance and shall include the written plan for emergency situations.

- Provide **respiratory protection** in accordance with General Industry and Construction Safety and Health Standard [Part 451. Respiratory Protection](#) and according to Part 303 whenever the PELs are 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 employee's eyes.
- Ensure **contaminated clothing and equipment** are removed at the workplace, properly stored, cleaned, and replaced. Employees cannot take the contaminated items from the workplace. Inform any person who launders or cleans the clothing or equipment that MDA is present through the use of labels.
- Provide clean **change rooms** with separate storage for protective clothing and equipment and street clothes for employees who must wear protective clothing.
- Ensure that employees who work in areas above the action level shower at the end of the shift. Provide **shower facilities** that comply General Industry Safety and Health Standard, [Part 474. Sanitation](#).
- 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 Occupational Health Standards, [Part 430. Hazard Communication](#), employees must be provided with the following **information and training**:
  - The contents of Part 303 and its appendices;
  - A description of the medical surveillance; and;
  - A description of the medical removal program.

All training program materials and the standard must be readily available to all affected employees.

- A **housekeeping** program shall also be implemented to ensure surfaces are maintained as free as practicable of visible accumulations of MDA and that cleaning methods used are appropriate to contain and clean MDA according to the standard.
- **Medical surveillance** by a licensed physician and without cost to the 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 of the following:
  - Monitoring data for exempted employers;
  - Objective data for exempted employers;
  - Exposure measurements;
  - Medical surveillance; and
  - Medical removals.

### Additional Information

Please visit the MIOSHA website at [www.michigan.gov/mioshapublications](http://www.michigan.gov/mioshapublications) where additional information may be available or contact the Consultation Education and Training Division at (517) 284-7720.