ISOPA PRODUCT STEWARDSHIP PROGRAMMES

“Walk the Talk”

MDI USERS

Revision 2017
ISOPA Member Companies
Walk the Talk - MDI Users

Content

- Essential data
- Good practice
- When things go wrong . . .

→ Dialogue
Regulatory requirements are subject to change and may differ between various locations. It is the buyer’s/user’s responsibility to ensure that his activities comply with all federal, state, provincial or local laws.

**MDI Classification according to EU Regulations**

- **Symbol:** Xn. **Signal Word:** Harmful

  - **Risk-phrases**
    - R20 Harmful by inhalation.
    - R36/37/38 Irritating to eyes, respiratory system and skin.
    - R40 Limited evidence of a carcinogenic effect.
    - R42/43 May cause sensitization by inhalation and skin contact.
    - R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

- **Signal word:** Danger

  - **Hazard statements**
    - H332 Harmful if inhaled.
    - H315 Causes skin irritation.
    - H319 Causes serious eye irritation.
    - H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
    - H317 May cause an allergic skin reaction.
    - H335 May cause respiratory irritation.
    - H351 Suspected of causing cancer.
    - H373 May cause damage to organs through prolonged or repeated exposure.
MDI Physical Properties

- Like most substances MDI evaporates and will be present in air
- The higher the temperature of the MDI the greater the potential concentration in the air
MDI Physical Properties

- Like most substances MDI evaporates and will be present in air.
- The higher the temperature, the greater the potential concentration.

You must always protect yourself against breathing in MDI.
MDI Chemical Properties

MDI will react with many compounds – especially water, polyol, amines, ammonium hydroxide, alkalides.

Higher temperatures mean faster reactions (beware temperatures > 40 °C).

During reaction heat & gases (CO₂) will be formed → Risk of burns/dangerous pressures.

Where do you find these conditions?
Where do you find these conditions?

- Drums – decontamination
- Spray applications
- High temperature operations
- Foam curing area
- Polyol / diisocyanate stored together
- Bulk off-loading of wrong chemical into a bulk tank
- Spillage into a drain
- MDI in eyes or other soft tissue
- MDI in wet disposal (waste) drums
Effect of MDI on your health

Short term / one-off exposure above safe level

- Irritates mouth, throat, lungs
- Tight chest, coughing
- Difficulty in breathing
- Eyes watering
- Itching, red skin (immediately or delayed)
- May be hot or burn

Symptoms can occur up to 24hrs after exposure
Effect of MDI on your health

Long term/repeated over-exposure from breathing or skin contact leads to risk of sensitisation
Symptoms such as occasional breathing difficulties similar to asthma, hay fever, sneezing
When sensitised, potentially severe asthma in the case of even low MDI exposure

Sensitization could prevent working with diisocyanates for life; early and prompt removal from exposure can typically result in cessation of allergic responses.

Sensitisation is non-reversible and is a reaction of the immune system. Not to be confused with irritation.
Typical examples of unsafe behaviour
Typical examples of safe behaviour
Safe handling of MDI

- Is the workplace clean and do you have good personal hygiene?
- Does anyone eat, drink or smoke in the workplace?
- Is there good workplace ventilation?
- Is there continuous use of the correct PPE – including during plant maintenance?
- Do you know where to find emergency equipment?
- Are MDI levels measured in the workplace?
- Do you know and practice emergency procedures?
- Are regular health checks performed?
Good personal hygiene

- You can use barrier and moisturising creams to prevent skin dryness – before starting work
- Wash with soap & water after finishing work and before eating, drinking or smoking
- Do not use solvents for washing
- Use disposable towels
- Do not re-use contaminated clothing or gloves
How to safely remove disposable gloves

Remove carefully to protect your skin from contamination
Clean and safe workplace

- Keep work area clean and tidy
- Respiratory equipment should be readily available (and well maintained)
- Know the locations of safety showers and eyebaths
- Do not eat, drink or smoke in the workplace
Good workplace ventilation

- Check that the extraction system is switched on
- Place hood as near as possible above the source
- Repeatedly check flow-direction
Good workplace ventilation
Continuous use of the correct PPE

Wear protective gloves
Wear overall & boots
In emergencies wear overall and/or heavy duty apron

Wear eye protection
Continuous use of the correct PPE

- MDI at elevated temperature
- Spray applications
- Dust with unreacted MDI

Respiratory equipment
Dealing with a spillage of MDI

VIDEO CLIPS:

Small Spillage – area less than about 2m²

Large Spillage – area more than about 2m²
Dealing with a spillage of MDI

Small Spillage – area less than about 2m²
- Clear immediate area

Large Spillage – area more than about 2m²
- Evacuate
- Put on PPE including respirator
- Cover with fire extinguishing foam or sand to prevent escape of MDI vapours

All Spillages
- Prevent MDI entering drains
- Control spill with wet sand absorbent
- Put contaminated sand in steel drums (max 2/3 full) and leave open to prevent pressure build up
- Treat as MDI waste
Know where to find the emergency equipment

- Decontaminant solution
- Shovels
- Brushes and waste container
- Absorbent material such as sand
First Aid equipment

Know where your first aid equipment is
Know what to do
Know who to tell

And don’t panic!

Shower
Soap
Clean running water is best
Eyebath or eye wash bottle
Telephone number of doctor
Emergency procedures

VIDEO CLIP:

Know First Aid for MDI
Emergency procedures

Know First Aid for MDI

• Force open the eyelids
• Flush with lots of water for at least 15 minutes
• If in doubt, keep flushing
• See eye specialist as soon as possible
• Advice not to wear contact lenses, they could complicate treatment in case of emergency.

• Immediately remove contaminated clothing and wash with soap & water
• An MDI skin decontamination study demonstrated that cleaning very soon after exposure is important, and that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water

• Go outside into fresh air
• Doctor must be called or patient taken to medical facility
• Inform supplier – who can provide supporting information
Emergency procedures - Exposure to MDI

- A single high exposure to MDI is one possible cause of sensitisation
- Early treatment is important
- Remember that symptoms may occur later
- Help is available for the doctor from ISOPA member companies
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- **Speed is essential**
- **Practice how to carry out First Aid procedure**
- **Seek medical advice**
Emergency procedures

Fire involving MDI

Follow your normal factory emergency procedure

- Sound Alarm
- EVACUATE
- Use trained specialists to fight fire
- Ensure protection from MDI emissions

Follow your normal factory emergency procedure
Handling of fresh MDI-based foam

Hazards:

- Exposure to MDI additives and release agent
- Heat generated during reaction
- Dust from sawing

- Wear PPE
- Good ventilation important
- Beware risk of fire from scorching until foam has cooled down
Typical questions

What would you do if?

- An diisocyanate pump which is being serviced is still mistakenly under pressure. A technician is sprayed in the face with diisocyanate

- Burst drum of hot MDI in factory

- Drum of MDI in an oven starts bulging
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