



ISOPA PRODUCT STEWARDSHIP PROGRAMMES

“Walk the Talk”

MDI USERS



Elastogran



■ • **BASF** Group

HUNTSMAN



Shell Chemicals

**REPSOL
YPF**



Bayer MaterialScience



Walk the Talk - MDI Users



Content

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

→ *Dialogue*

MDI Classification



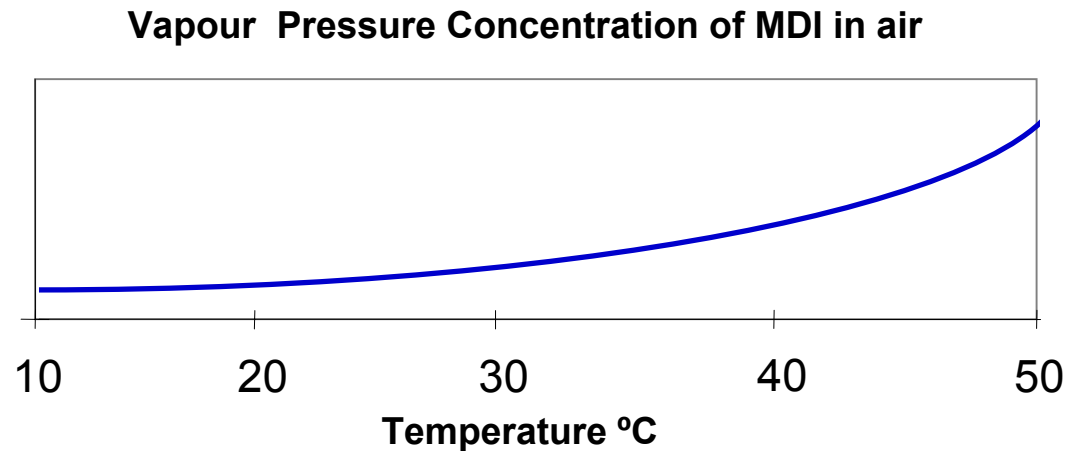
- Harmful by inhalation
- Irritating to eyes, respiratory system and skin
- May cause sensitisation by inhalation and skin contact



MDI Physical Properties

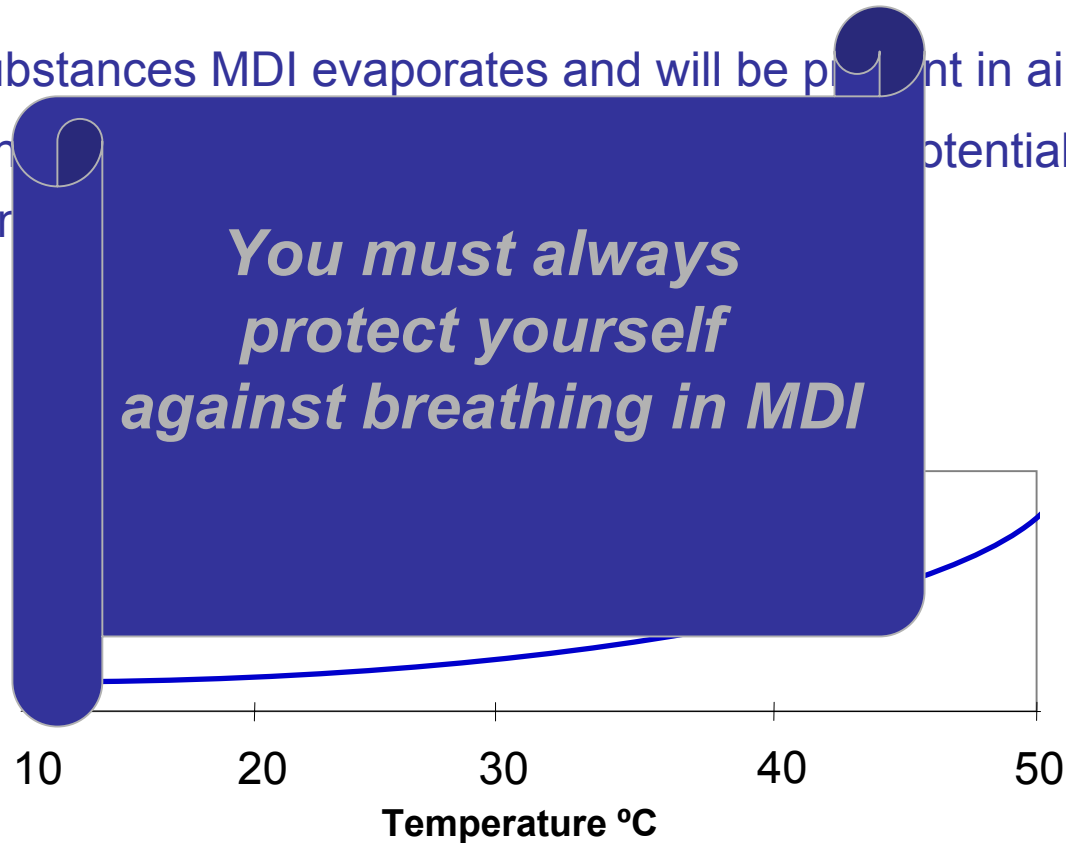


- Like most substances MDI evaporates and will be present in air
- The higher the temperature of the MDI the greater the potential concentration in the air



MDI Physical Properties

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



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 / isocyanate 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

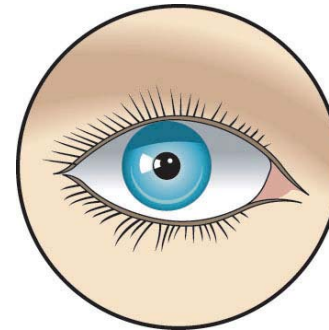


Effect of MDI on your health

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

Sensitisation will prevent working with isocyanates for life

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



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

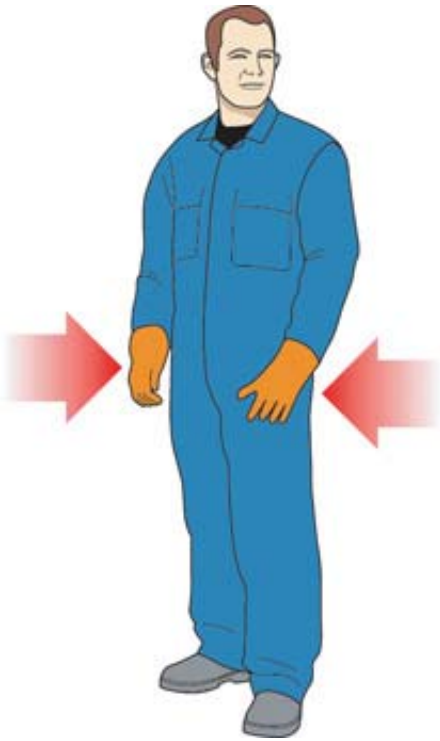
Bad



Best



Continuous use of the correct PPE



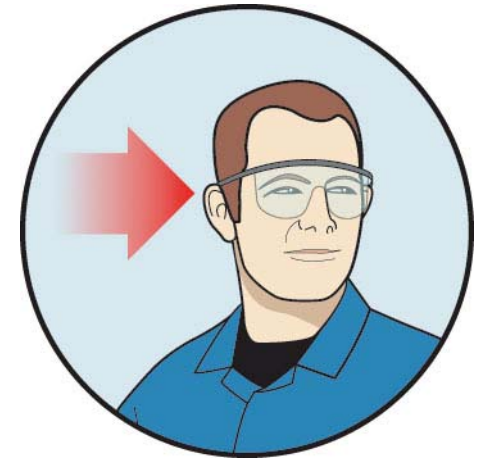
Wear protective gloves



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



Respiratory equipment

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



Shower

Soap

Clean running water is best

Eyebath or eye wash bottle

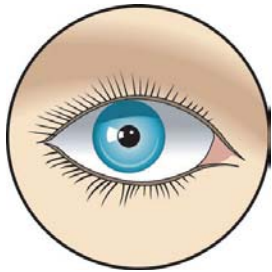
Telephone number of doctor



And don't panic !

Emergency procedures

Know First Aid for MDI



- Force open the eyelids
- Flush with lots of water for at least 10 minutes
- If in doubt, keep flushing
- See eye specialist as soon as possible



- Immediately remove contaminated clothing
- Immediately wash, wash, wash with soap & 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 can cause sensitisation
- Early treatment is important
- Remember that symptoms may occur later
- Help is available for the doctor from ISOPA member companies

Emergency procedures - Exposure to MDI

- A single high
 - Early treatment
 - Remember to
 - Help is available
member contact
- ***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 isocyanate pump which is being serviced is still mistakenly under pressure. A technician is sprayed in the face with isocyanate
- Burst drum of hot MDI in factory
- Drum of MDI in a drum oven starts bulging





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