



HSE guidelines 

January 2022

METHANOL



WORKPLACE EDITION





WHAT IS METHANOL?

Methanol is one of the most widely used raw materials in the chemical industry. It can also be used as an energy source.





WHAT IS METHANOL? (2/3)

In Natural Gas extraction, Methanol can be injected into the process to prevent the formation of hydrate (ice-like blockage in the process) in transport pipes. Methanol is a substance that easily evaporates. Both the liquid and the vapor are highly flammable.

The legal limit value for exposure of persons to Methanol is important: **an average value of 100 ppm = 133 mg/m³ during 8 hours.**



WHAT IS METHANOL? (3/3)

PROPERTIES OF METHANOL

- Colorless
- Highly flammable
- Toxic
- Volatile substance



HAZARDS (1/6)

Methanol is a highly volatile substance that can quickly form hazardous concentrations for humans when evaporated.

The vapors are heavier than air, spread out on the floor and form in combination with air an explosive mixture.

Methanol is easily biodegradable, so it does not pose any hazards to the environment.





HAZARDS (2/6)

HAZARDOUS SITUATIONS

Even though Methanol is processed in a closed system in which employees are not exposed to the substance, there are situations in which exposure to Methanol (vapors) can take place:

Maintenance

Methanol vapors may be released when opening installations - for maintenance - that have contained Methanol.



HAZARDS (3/6)

HAZARDOUS SITUATIONS

Bunkering

When connecting and disconnecting the hose for the supply of Methanol, some vapour will escape and there is a risk of splashing.

Unforeseen

Methanol can be released unintentionally, e.g. in case of hose rupture or failure or release of the hose coupling. In such a case, an explosive mixture may form which may rapidly contain a concentration of Methanol that is hazardous to health.



HAZARDS (4/6)

HEALTH EFFECTS

Methanol can be absorbed into the human body through the lungs, by swallowing and by absorption through the skin or eyes.

Immediate effects

- **Inhalation** causes respiratory irritation, coughing and shortness of breath. The vapors can cause dizziness, nausea and unconsciousness and can eventually be fatal.



HAZARDS (5/6)

HEALTH EFFECTS

- **Ingestion** causes nausea, abdominal pain and can cause dizziness, unconsciousness and death just like inhalation.
- **Exposure to the skin** causes degreasing of the skin. Repeated exposure causes irritated skin that is dry, rough, red and painful.
- **Exposure to the eyes** causes irritation, redness and abnormalities of the cornea.



HAZARDS (6/6)

HEALTH EFFECTS

Chronic effects

The chronic effects of Methanol are felt in the central nervous system. There may be persistent or recurring headaches.

The facial nerve can also be damaged to such an extent that it leads to blindness. Finally, movement disorders can occur.



PREVENTION (1/3)

PREVENT PERSONAL CONTACT

Exposure to Methanol can be prevented by properly ventilating and applying the correct PPE at all times and replacing it immediately in case of signs of wear and tear. Always wash your hands at the end of the work activities and remove soiled clothing immediately. Do not eat or drink while working.



PREVENTION (2/3)

PREVENT PERSONAL CONTACT

To prevent exposure to vapors and liquid Methanol, it is important to rinse the process section with water and purge with nitrogen before opening the process. Afterwards a gas measurement must be carried out. Measurements on Methanol vapors are performed with a gas detector by measuring for VOS (Volatile Organic Substances). If the concentration exceeds the limit value, the correct PPE must always be used to prevent damage to health (see the relevant work permit).



PREVENTION (3/3)

PREVENTING EXPLOSION AND FIRE

Since Methanol is highly flammable, it is important to take measures to prevent discharges of static electricity and to work with explosion proof equipment and lighting.

Working with non-sparking tools is also essential.



PROTECTION (1/2)

When working in a space where Methanol may be present, the following applies:

- Use antistatic and chemical resistant clothing (in the form of a fully protective suit) and footwear.
- Wearing protective gloves made of butyl rubber is recommended for work involving prolonged contact. Nitrile and neoprene gloves are also suitable for short-term work of less than one hour.
- Use safety goggles with side shields or a face mask.



PROTECTION (2/2)

- In case of insufficient ventilation or in case of possible vapour formation, use a half or full face mask with a gas can (filter can) type A class 2, this applies to work activities that take less than 30 minutes. For work that lasts longer, a fresh air hood or full face mask with breathing air is recommended.
- All personal PPE must be replaced immediately in case of signs of wear and tear.



IN CASE OF... (1/3)

When there's exposure to Methanol (or suspicion of) adequate and proper action must be taken.

EXPOSURE TO METHANOL

For any kind of exposure to Methanol, **ALWAYS CONSULT A DOCTOR!**
In addition, the following is important:

- **Inhalation** Bring the victim into the fresh air as soon as possible.



IN CASE OF... (2/3)

- **Swallowing** Rinse mouth with water. If the victim has swallowed Methanol and is conscious, let him/her drink small amounts of water. Do not induce vomiting unless directed to do so by medical personnel. If the victim vomits, keep the head low to prevent vomit from entering the lungs.
- **Skin contact** Rinse with large amounts of water and remove contaminated clothing (use gloves).
- **Eye contact** Rinse eyes with large amounts of water for ten minutes.



IN CASE OF... (3/3)

FIRE FIGHTING

When a fire starts, it can be extinguished with extinguishing powder, Carbon dioxide, water mist (no water jet) or alcohol-resistant foam.

LARGE SPILLS

When large quantities of Methanol have been released you approach the emission with the wind in your back. Use respiratory protection and other PPE (see protection). Stop the leak if you can do so without risk. Remove packaging from the spillage area. Use non-sparking tools and explosion-proof equipment. Absorb spilled Methanol with non-combustible absorbent materials and dispose of in a chemical waste container.

PERSONAL HYGIENE

Make sure to always avoid contact with the skin and your own clothing. Change and remove gloves and protective clothing professionally with gloves. Make sure that you always wash your hands after work and do not eat or drink while working.



The Supervisor always informs the team and discusses the work with the team members before the work starts.

Always approach the Supervisor or site manager if you have any doubts or questions before, during or after work.

Work safely or do not work at all!

5 to remember

1

Ensure **proper ventilation** in the work place.

2

Make sure that a qualified person measures the air concentration of Methanol **before starting and during the execution** of the work.

3

Always use the **prescribed PPE** (see PtW).

4

Replace the PPE immediately at the first signs of wear and tear.

5

Consult a doctor immediately in case of (or suspicion of) contact with Methanol.



Methanol is extremely hazardous and can cause serious health problems. Therefore, make sure you remember these five important rules.

QUESTION 1

What is the average legal limit value for exposure of persons to Methanol during 8 hours?

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A. 100 ppm = 133 mg/m³

.....

B. 1000 ppm = 133 mg/m³

.....

C. 10 ppm = 133 mg/m³

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ANSWER 1

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QUESTION 2

What are properties of Methanol?

.....

A. Highly corrosive, volatile, highly flammable, colorless

.....

B. Toxic, colorless, volatile, highly flammable, oxygen displacing

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C. Toxic, colorless, volatile, highly flammable

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C. Toxic, colorless, volatile, highly flammable

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QUESTION 3

When may you come into contact with Methanol?

-
- A. If you use ventilation in the workplace. Methanol is heavier than air and through ventilation the toxic substance will rise.
-
- B. During maintenance of installations, when connecting and disconnecting the hose for the supply of Methanol, in case of hose rupture or failure or release of the hose coupling.
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- C. During inspections and making and keeping pipes inert.
-

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QUESTION 4

What to do if someone has been seriously exposed to Methanol?

-
- A. You approach the victim with the wind in your back and you bring the victim into the fresh air as soon as possible.
-
- B. You immediately notify the doctor.
-
- C. You bring the victim into the fresh air as soon as possible, let him/her drink small amounts of water and then you notify the doctor.
-

QUESTION 4

What to do if someone has been seriously exposed to Methanol?

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QUESTION 5

How to prevent exposure to Methanol?

-
- A. You must be familiar with the hazards of Methanol. You have notified a doctor beforehand on the nature of the work.
-
- B. By properly ventilating, using the right PPE, washing hands when the work is done and by removing soiled clothing immediately.
-
- C. By always working with the wind in your back and performing measurements on Methanol vapors after work using a gas detector.
-

ANSWER 5

How to prevent exposure to Methanol?

A. You must be familiar with the hazards of Methanol. You have notified a doctor beforehand on the nature of the work.

B. By properly ventilating, using the right PPE, washing hands when the work is done and by removing soiled clothing immediately.

C. By always working with the wind in your back and performing measurements on Methanol vapors after work using a gas detector.

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WORKFORCE EDITION

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