HEALTH

HSEQ library

TOOLBOX INFORMATION

BENZENE

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HSEQ Direct is a digital communication, registration and training platform with a focus on Health, Safety, the Environment and Quality.
Designed specifically for the workplace!

Associated IOGP Life-Saving Rules

HSEQ DIRECT safer healthier workplace

WHAT IS IT? (1/2)

Benzene is a chemical that is a colorless or light yellow liquid at room temperature. It has a sweet odor and is highly flammable. Benzene evaporates into the air very quickly. Its vapor is heavier than air and may sink into low-lying areas.

WHAT IS IT? (2/2)

Other properties of Benzene:

- reacts fiercely with acids
- explosive
- has a strong degreasing effect on the skin

The odour threshold of Benzene is higher than the threshold exposure limit value, which relates to maximum permissible exposure. **If you can smell Benzene, you are probably over-exposed to this substance.** Ask your company about their threshold exposure limit value.

HAZARDS (1/2)

- irritates the eyes, skin and airways
- carcinogenic
- unconsciousness (in very high concentrations)
- harmful to the environment
- flammable and explosive

HAZARDS (2/2)

Effects of contact:

- **inhalation:** irritation, headache, nausea, dizziness, unconsciousness, pneumonia
- **skin (contact):** redness, rough skin, itching, headache, dizziness
- **eye (contact):** redness, pain
- **swallowing:** irritation of the lips, mouth and throat (burning sensation)
- **prolonged contact:** eczema, cracked skin, anaemia, leukaemia, damage to DNA

PREVENTION (1/5)

Ask your HSE Manager if, when and where Benzene might be released.

PERSONAL HYGIENE

Wash your hands:

- before eating, drinking or smoking
- before using the toilet
- before leaving the workplace
- after removing contaminated clothing in a designated area

PREVENTION (2/5)

PREPARING FOR WORK

- familiarise yourself with the risks associated with the work in question
- discuss these risks in detail
- take all necessary precautionary measures
- ensure that the workplace is well ventilated, or install extra air extraction equipment
- use the appropriate items of Personal Protection Equipment (PPE)

PREVENTION (3/5)

BEFORE YOU START WORK

Before the job begins, an authorized gas tester with expertise in the field of Benzene should **investigate and measure existing levels**. Position any vacuum unit as far as possible from the workplace, taking into account the wind direction.

PREVENTION (4/5)

AT WORK

- ensure optimal ventilation
- position any vacuum unit as far as possible from the workplace and also conduct Benzene measurements around the vacuum unit
- conduct continuous measurements
- record the results on the Permit to Work*
- ensure you name is registered on the Permit to Work
- work with the wind at your back
- use drip trays if Benzene could escape from a system
- use the Personal Protection Equipment correctly

PREVENTION (5/5)

***Please note:** results of any unprotected exposure to concentrations that exceed the threshold limit value must be reported. It is a legal requirement to register this information. Ask your company for the relevant threshold limit value, procedure and the personnel that are required to be informed.

NB. Inadequate workplace ventilation or air extraction increases the risk of exposure!

PROTECTION (1/2)

WHAT PERSONAL PROTECTION EQUIPMENT (PPE)?

What type of PPE to use depends on different circumstances. Follow and adhere to the advice of your HSE Manager. Addressing the source and prevention of exposure is most important and also required by law. Ask your company about the threshold limit value for exposure to Benzene. Based on the threshold limit values the following Personal Protection Equipment is recommended:

- **respiratory protection**
- **powered Air Purifying Respirator**
- **independent respiratory protection**

PROTECTION (2/2)

Other protection equipment:

Basic Personal Protection Equipment plus:

- **impermeable clothing/(disposable) overall/coverall**
- **impermeable gloves**
- **impermeable boots**

NB. Proper cleaning and ventilation is, and remains, of the utmost importance. Conduct frequent measurements and prevent exposure!

IN CASE OF... (1/4)

- **inhalation:** bring the affected person out into the fresh air; allow them to rest
- **skin contact:** remove contaminated clothing; make clothing wet (to prevent fire); wash skin with plenty of soap and water
- **eye contact:** rinse with plenty of water; remove contact lenses (if possible), if worn
- **swallowing:** rinse mouth; do not induce vomiting
- **serious exposure:** immediately notify a medic or a doctor

IN CASE OF... (2/4)

WHAT TO DO IN THE EVENT OF A SPILL?

- please note: Benzene is highly flammable and explosive
- stop work immediately
- evacuate the danger zone
- notify the HSE Manager

IN CASE OF... (3/4)

WHAT TO DO IN CASE OF CONTACT OR EXPOSURE?

Contact or exposure can be caused by:

- protective clothing that is torn
- Personal Protection Equipment that is used too late or incorrectly
- Personal Protection Equipment that hasn’t provided sufficient protection
- other unforeseen circumstances

IN CASE OF... (4/4)

What to do:

- notify the HSE Manager
- contact the health and safety service/company doctor
- have a urine sample taken**
- in case of health problems: contact the company doctor and your general practitioner
- retain Permits to Work and measurement results

**NB. In practice it has become clear that smoking has a major effect on the SPMA value in urine.

IMPORTANT INFORMATION

1 Have the Operator demonstrate that **the workplace is well ventilated** (to measure = to know) and **work is being performed upwind**.

2 Position a vacuum unit **as far away as possible** and ensure measurements are conducted at the actual work location.

3 Perform **the control measures** as specified in the work permit and check status regularly (undertake a Last Minute Risk Analysis).

4 **Use the correct PPE** and have it cleaned properly if it becomes contaminated.

5 Maintain **good personal hygiene** to prevent contamination.

QUESTIONS? MORE INFORMATION? UNSAFE WORKING CONDITIONS?

Your HSE Manager is there to help answer any questions and ensure a safe working environment for all.

QUESTION 1

Why is Benzene hazardous?

A. Benzene is carcinogenic, harmful to the environment, flammable and explosive. Furthermore, Benzene irritates the eyes, skin and airways. In very high concentrations you can become unconscious.

B. Benzene is carcinogenic, harmful to the environment, flammable and explosive. Furthermore, Benzene irritates the eyes, skin and airways. The vapour is lighter than air, therefore it is more likely that you may inhale the vapour.

C. Benzene is carcinogenic, harmful to the environment, flammable and explosive. Benzene is odourless and therefore you don’t recognize the substance. Furthermore, Benzene irritates the eyes and airways.

ANSWER 1

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QUESTION 2

What does Benzene smell like?

A. Rotten eggs.

B. A sour odor.

C. A sweet odor.

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QUESTION 3

What should you do in the event of serious exposure to Benzene?

A. Notify a doctor immediately.

B. Immediately remove the affected person's contaminated clothing and then notify a doctor.

C. Bring the affected person out into the fresh air and wet their clothing to prevent fire. Then you notify a doctor.

ANSWER 3

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QUESTION 4

How do you prevent exposure to Benzene before you start working?

A. Before you start working the company must have measurements carried out by an authorized gas tester that is an expert in the field of Benzene.

B. You use a vacuum unit to remove Benzene from barrels, tanks and system components.

C. You inform colleagues what was discussed in the toolbox meeting. Then you cordon off the workplace with hazard tape.

ANSWER 4

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QUESTION 5

How do you prevent exposure to Benzene during work?

A. Use the appropriate Personal Protection Equipment and ensure it is utilised the correct way. Place a vacuum unit as close as possible to the workplace.

B. Use the appropriate Personal Protection Equipment and ensure it is utilised the correct way. Work with the wind at your back.

C. Take measurements frequently and make sure that there is adequate ventilation. Have a urine sample taken after each measurement.

ANSWER 5

How do you prevent exposure to Benzene during work?

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B. Use the appropriate Personal Protection Equipment and ensure it is utilised the correct way. Work with the wind at your back.

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