



## MONTHLY SAFETY BRIEF: BENZENE

As you may recall, we are finishing out the year with contaminant specific safety topics. The last few months we covered silica, carbon monoxide and mercury. The last of the year will be benzene!

Now, for those of you that have been commissioned to work on a longer-term project at a refinery, you know we have a specific benzene awareness policy in place in our safety manual:

### 7.26 PETROLEUM SITE BENZENE BUTADIENE AND HYDROGEN SULFIDE AWARENESS POLICY (PAGE 113)

This policy contains more detailed HazCom information than this brief, but it is there for reference if you would like additional information!

Hygieneering technical staff performs duties at petroleum facilities and other locations that may contain benzene including personal air sampling, area air sampling, direct read air monitoring and worker observations. Hygieneering workers are typically either outside of locations or spend very little time in locations where there may be exposure to benzene. Anticipated potential exposures to benzene are well less than related OSHA limits based on our job functions.

Benzene is recognized by OSHA as a Hazardous and Dangerous Substance and has a standard of 1910.1028. The following general information (excerpts) on benzene is taken from Appendices A, B and C of the OSHA Benzene standard, Title 29 Code of Federal Regulations 1926.1128:

### Exposure Limits and Qualities of Benzene

- A. Substance: Benzene.
- B. Permissible Exposure: Except as to the use of gasoline, motor fuels and other fuels subsequent to discharge from bulk terminals and other exemptions specified in 1910.1028(a)(2):
  - 1. Airborne: The maximum time-weighted average (TWA) exposure limit is 1 part of benzene vapor per million parts of air (1 ppm) for an 8-hour workday and the maximum short-term exposure limit (STEL) is 5 ppm for any 15-minute period. An organic vapor cartridge in your respirator will work for benzene.
  - 2. Dermal: Eye contact shall be prevented and skin contact with liquid benzene shall be limited.
- C. Appearance and odor: Benzene is a clear, colorless liquid with a pleasant, sweet odor. The odor of benzene does not provide adequate warning of its hazard.

Benzene is naturally occurring organic compound that is classified as a hydrocarbon. Benzene is one of the 20 most frequently used chemicals in the United States; featured in many plastics, rubbers, dyes, detergents, and gasoline. Benzene may also be found outside the work zone in volcanic eruption, car exhaust, wildfires, and even cigarette smoke. Benzene enters the body through respiration and dermal contact.

### Health Hazard Data

- A. Benzene can affect your health if you inhale it, or if it comes in contact with your skin or eyes. Benzene is also harmful if you swallow it.
- B. Effects of overexposure.
  - 1. Short-term (acute) overexposure: If you are overexposed to high concentrations of benzene, well above the levels where its odor is first recognizable, you may feel breathless, irritable, euphoric, or giddy; you may experience irritation in eyes, nose, and respiratory tract. You may develop a



headache, feel dizzy, nauseated, or intoxicated. Severe exposures may lead to convulsions and loss of consciousness.

2. Long-term (chronic) exposure. Repeated or prolonged exposure to benzene, even at relatively low concentrations, may result in various blood disorders, ranging from anemia to leukemia, an irreversible, fatal disease. Many blood disorders associated with benzene exposure may occur without symptoms.

## POTENTIAL HEALTH EFFECTS

- [Recognized carcinogen](#)
- Leukemia and cancer of the blood
- Skin irritant
- Anemia
- Nervous system irritant: headaches, tremors, nausea, dizziness

## CONTROLS

- Elimination/substitution of benzene products
- Respiratory protection compliant with [OSHA 1910.134](#)
- Quitting cigarettes
- Conducting a workplace environmental survey assessment
- Conduct blood lead level testing for workers who are potentially exposed to benzene
- Training



## BENZENE QUIZ

- 1) Which of the following is not a source of benzene?
  - a. Volcanic eruptions
  - b. Tobacco smoke
  - c. Gasoline
  - d. Nuclear waste
  
- 2) Which of the following is a health affect associated with benzene over exposure?
  - a. Skin Irritation
  - b. Leukemia
  - c. Kidney disease
  - d. None of the Above
  
- 3) An organic vapor cartridge in your respirator is the appropriate selection to protect you from benzene?  
 True  
 False
  
- 4) OSHA has a specific standard just for benzene?  
 True  
 False
  
- 5) You can be exposed to benzene outside of the work place?  
 True  
 False
  
- 6) Cigarette smoke has no effect on your exposure to benzene?  
 True  
 False

**SCORE: PASS / FAIL**

\_\_\_\_\_  
Employee Signature

\_\_\_\_\_  
Supervisor Signature

\_\_\_\_\_  
Date