

The *BSO Plus Safety Topic* is a review designed from the BSO Plus agenda. This safety topic is your way to stay current on the safety information over the 3 years between BSO Plus and BSR.

## BENZENE

### What is benzene?

Benzene is a colourless or light-yellow liquid at room temperature. It has a sweet odour and is highly flammable. The vapour, which evaporates very quickly off the liquid form of this hazard, is 2.5 times heavier than air and may collect in low-lying areas.

Some industries use benzene to make other chemicals that are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of lubricants, rubbers, dyes, detergents, drugs, and pesticides.

Benzene is listed as a Designated Substance under O. Reg. 490/09.



**DID YOU KNOW?**

Natural sources of benzene include volcanoes and forest fires. Benzene is also a natural part of crude oil, gasoline, and cigarette smoke.

### What are the health effects of exposure to benzene?



Benzene has been classified by the International Agency for Research on Cancer (IARC) as carcinogenic to humans. Long-term exposure to high levels of benzene in the air can cause leukemia, cancer of the blood-forming organs.

The major effect of benzene from long-term exposure is on the blood. Benzene affects the bone marrow's ability to produce red blood cells, leading to anemia and a depressed immune system. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection.

A short-term exposure can irritate the nose and throat. Symptoms may include headache, nausea, dizziness, drowsiness and confusion. A severe exposure can also cause unconsciousness.

**DID YOU KNOW?**

An estimated 375,000 Canadian workers are currently exposed to benzene, according to CAREX Canada, a carcinogen surveillance program. Most of these exposures fall into the "low exposure category". Many workers are exposed to benzene via inhalation of motor vehicle exhaust.

### How are workers exposed to benzene?

Benzene can be found on many local plant sites as it occurs naturally in crude oil and gasoline. It is also often held in pipelines or full tanks and is frequently present as it is being shipped, in large quantities, by trucks, rail, and boats.

People working in industries that make or use benzene may be exposed to the highest levels of it.

The most common route of exposure to Benzene is through inhalation of the vapour, followed by absorption of the liquid through the skin.

- Outdoor air contains low levels of benzene from tobacco smoke, gas stations, motor vehicle exhaust, and industrial emissions.
- Indoor air generally contains levels of benzene higher than those in outdoor air. The benzene in indoor air comes from products that contain benzene such as glues, paints, furniture wax, and detergents.
- The air around hazardous waste sites or gas stations can contain higher levels of benzene than in other areas.



## How to reduce the risk of benzene?

|                                 |   |
|---------------------------------|---|
| <b>Administrative Controls:</b> | <p>Use stringent control measures such as process enclosure to prevent product release into the workplace.</p> <p>Use backup controls (e.g. double mechanical pump seals) to prevent the release of this material due to equipment failure.</p> <p>Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored.</p> |
| <b>Eye/Face Protection:</b>     | Wear chemical safety goggles and a face shield when contact is possible.  |
| <b>Skin Protection:</b>         | Wear chemical protective clothing e.g. gloves, aprons, boots.   |
| <b>Respiratory Protection:</b>  | At concentrations above the NIOSH* REL**, or where there is no REL, at any detectable concentration, use (NIOSH) approved respirators.  |

\*NIOSH = National Institute for Occupational Safety and Health

\*\*REL = Recommended Exposure Limit

SOURCES: CCOHS, CAREX Canada, CDC