

# J.M. MILLER ENGINEERING

## TECHNICAL BULLETIN: Occupational Exposure to Benzene

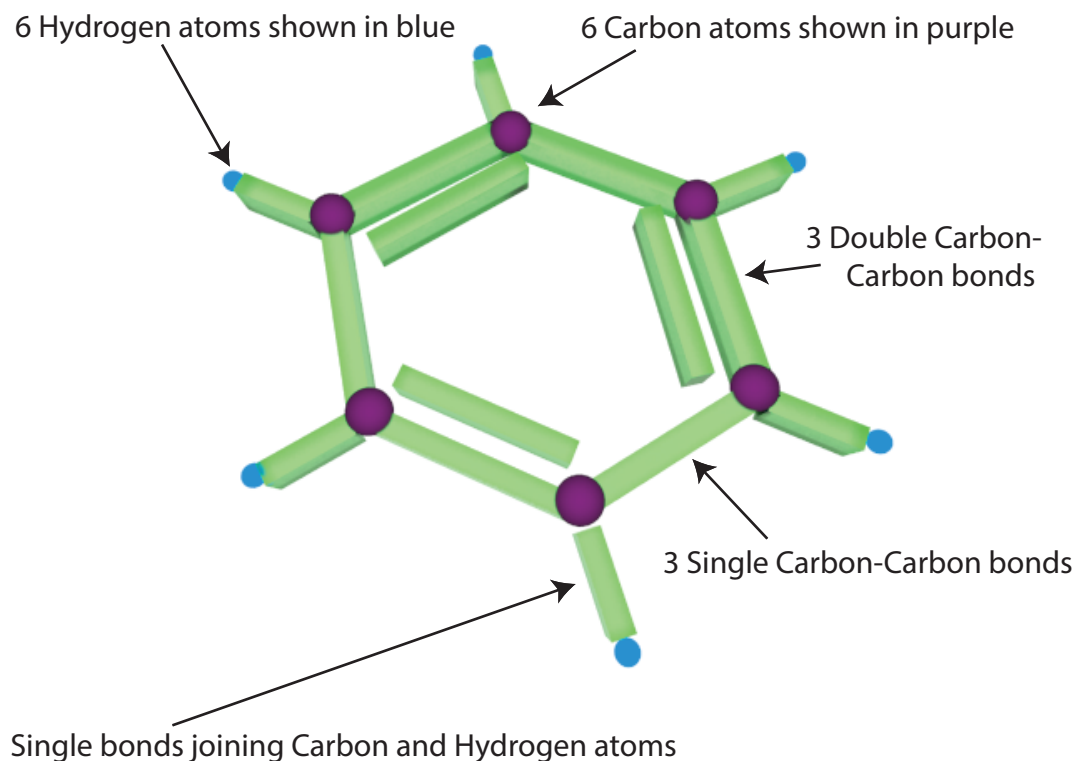
### What is Benzene?

Benzene is a liquid chemical at room temperature. Its structure is a six-sided carbon ring chain, with three double bonds as seen in Figure 1 below. Each carbon is also attached to a hydrogen atom.

### Where is Benzene found?

Benzene is a naturally occurring compound in crude oil. Therefore it is found in gasoline and vehicle emissions. Benzene is often used in chemical laboratories as a solvent. It is also used in the production of some plastics, detergents, & pesticides. Benzene is also found in cigarettes.

Figure 1: Benzene Molecule



## What are the Health Hazards of Benzene Exposure?

Acute exposures, or high short term exposures, to benzene can result in dizziness, drowsiness, or, at very high levels, death.

Chronic exposures, or lower long-term exposures, can lead to leukemia, which is a form of cancer, or problems with bone marrow and blood production.

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## Benzene Regulation History

Benzene is regulated for general industry under OSHA 29 CFR 1028, which came into effect in 1978. In fact this was OSHA's first chemical specific standard. OSHA set the benzene permissible exposure limit (PEL) at 1 ppm initially.

This limit was challenged and, as a result, the PEL was raised to 10 ppm for the next nine years. In 1987 OSHA provided enough health hazard evidence to once again reduce the PEL for occupational exposure to 1 ppm, where it remains today. The PEL is a time weighted average level of exposure over an 8-hour day.

OSHA has also established a short term exposure limit (STEL) which limits the maximum exposure for a 15-minute time period to 5 ppm.

Several applications of benzene are exempt from the OSHA regulations, including many of the gasoline distribution and transportation routes of exposure.

Further standards are available for specific industries such as shipbuilding and construction.

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## Miller Engineering & Benzene History

Miller Engineering has worked on several benzene workplace exposure cases, some of which dated back to the 1960s. As such, we have maintained a historical record of benzene from the 1950s to the present related to known health effects, occupational exposure regulation & the background for decision making, and contemporary scientific research for the entire time period.

Specifically we looked at the history of warnings, labeling, MSDS, and other marketing & technical information supplied within and across companies relative to their sale, distribution, manufacturing, and use of benzene.

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### **Additional chemical substances for which we have constructed histories include the following:**

\* Asbestos   \* Sodium Nitrate   \* Perchloroethylene   \* Tobacco   \* Vinyl Chloride

### **Some chemical manufacturers we have worked with in the past include:**

- \* Dow Chemical
- \* Vulcan Chemical
- \* Glitsa
- \* Occidental Chemical
- \* Conap
- \* Hexel
- \* Ashland Chemical
- \* Monsanto Chemical
- \* PPG