

SECTION 6

BENZENE SAFETY AWARENESS

1. PURPOSE AND SCOPE

- 1.1. This safety guideline is intended to provide suitable information to all MAPP employees regarding the potential toxic effects of benzene and where it may be found so that adequate measures can be taken to limit exposures through controls in the workplace.

2. GENERAL

- 2.1. Of all the hydrocarbons, Benzene poses the most serious long-term threat. Exposure over time, to even low levels of Benzene can cause leukemia, blood changes and aplastic anemia.

3. CHARACTERISTICS

- 3.1. Benzene is a colorless to light-yellow liquid with a pleasant sweet odor.
 - 3.1.1. Formula (C₆H₆)
 - 3.1.2. CAS No.: 71-43-2
- 3.2 Benzene is a flammable liquid that can accumulate static electricity. Benzene vapors are heavier than air and may travel to a source of ignition and flash back. The vapors are readily dispersed by wind movement and/or air currents. Liquid benzene tends to float on water and may travel to a source of ignition and spread fire. Benzene is highly reactive with no oxidizing materials.

4. USES / LOCATIONS

- 4.1. Benzene is a component of gasoline, both in the manufacturing process and found naturally in crude oil; Benzene is also used as a feed stock for chemical manufacturing. Can be found at petroleum refining sites, tank gauging (tanks at producing, pipeline & refining operations), and field maintenance (Excavations on military bases, adjacent to gas stations and refineries.)

5. HEALTH EFFECTS

- 5.1. **WARNING-** Benzene is a cancer-causing agent in humans. All contact should be reduced to the lowest possible level. The above exposure limits are for air levels only. Skin contact may also cause overexposure.
- 5.2. Benzene is one of the most hazardous of all petroleum products because of its adverse health hazards and high flammability.
- 5.3. The following adverse health effects are important to remember where there may be a potential exposure to Benzene.
 - 5.3.1. Acute: at high concentrations (1000 PPM) Benzene has an acute effect on the central nervous systems causing headaches, dizziness, drowsiness,

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unconsciousness, and possible death. Acute exposure can also cause breathlessness, irritability, and giddiness.

- 5.3.2. Chronic: Benzene has the chronic exposure effect on bone marrow (aplastic anemia leukemia). Chronic exposure can also cause convulsions, liver damage, heart damage, blood diseases (aplastic anemia), and cancer (leukemia). These symptoms can take months or years to surface and can develop without physical or visible indications.
- 5.3.3. Repeated skin contact lead to irritant contact dermatitis (rash); as with any petroleum solvent (which Benzene is also classified as), it will leach the natural oils out of the skin, direct contact with the skin can cause erythema and/or blistering.
- 5.3.4. Benzene is irritating to eyes and mucous membranes
- 5.3.5. Flammable/dangerous fire risk: benzene has a very low flash point making it dangerous to have any open flame, spark or source of ignition when vapors are present.
- 5.3.6. Explosive limits in air 1.5 to 8% by volume: benzene is highly flammable at low levels of vapor quantity in air.

6. PERSONAL PROTECTION MEASURES

- 6.1. MAPP employees are not permitted to work in areas where there may be a potential for Benzene exposure. It is the responsibility of the Contracting Company's Project Manager and the on-site supervisor/foreman to see that any jobsite that may expose employees to Benzene is not manned with personnel until it is proven that it is safe to work within the acceptable OSHA limits without personal protective equipment.
 - 6.1.1. Chemical Boots, gloves, sleeves, aprons, eye and face protection are required.

7. SPECIAL REQUIREMENTS

- 7.1. If it is necessary to perform any work where the exposure to Benzene is about the OSHA acceptable limits, then MAPP must implement a comprehensive OSHA mandated special safety policy and procedure that includes special elements of exposure monitoring, formal medical program, special personal protective equipment, and much more.
- 7.2. Benzene liquid is highly flammable and vapors may form explosive mixtures in air. Fire extinguishers must be readily available in areas where benzene is used or stored.
- 7.3. Smoking is prohibited in areas where benzene is used or stored.

8. TRAINING

- 8.1. All affected employees will be provided awareness training in this program in order to be familiar with potential hazards and proper safe work procedures to follow if exposed to this health hazards.

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- 8.2. Employees should be aware of owners' emergency response and alarm systems (Site Specific Orientation will provide such knowledge). Employees must be informed where benzene is used in the host facility and aware of additional plant safety rules.