



WAGNER-MEINERT LLC
Engineers – Contractors

BENZENE AWARENESS PROGRAM (SECTION 30)

PURPOSE:

The Benzene Awareness Program is essential to the safety of our employees. The purpose of Benzene Awareness Program is to inform personnel of the dangers of Benzene.

SYNONYMS: Benzol, benzole, coal naphtha, cyclohexatriene, phene, phenyl hydride, pyrobenzol. (Benzin, petroleum benzin and Benzine do not contain Benzene).

SCOPE:

Wagner-Meinert has chosen to establish a Benzene Awareness Program for emergencies that could arise from exposure to Benzene.

REFERENCES:

- A) 29 CFR 1926.55, Gases, Vapors, Fumes, Dust, and Mists
- B) 29 CFR 1910.106 Flammable and combustible liquids

- 1.0 PHYSICAL AND CHEMICAL CHARACTERISTICS**
- 2.0 EXPOSURE AND HEALTH EFFECTS**
- 3.0 REGULATORY LIMITS**
- 4.0 WORKING SAFELY WITH BENZENE**
- 5.0 EMERGENCY PROCEDURES**
- 6.0 TRAINING**
- 7.0 CHANGE CONTROL**

1.0 PHYSICAL AND CHEMICAL CHARACTERISTICS

- 1.1 Benzene is a clear, colorless liquid with a distinctive sweet odor. Its boiling point is 176 degrees F and its flash point is 12 degrees F. The flammable limits in air are 1.3% for the low end and 7.5% for the high end. Benzene is a flammable liquid. Its vapors can form explosive mixtures. All ignition sources must be controlled when Benzene is used, handled, or stored. Where liquid or vapor may be released, such areas shall be considered as hazardous locations.
- 1.2 Benzene vapors are heavier than air; thus the vapors may travel along the ground and be ignited by open flames or sparks at locations remote from the site at which Benzene is handled. No smoking designated area and fire extinguishers must be readily available.
- 1.3 Benzene is classified as a 1 B flammable liquid for the purpose of conforming to the requirements of 29 CFR 1910.106. A concentration exceeding 3,250 ppm is considered a potential fire explosion hazard. Locations where Benzene may be present in quantities sufficient to produce explosive or ignitable mixtures are considered Class I Group D for the purposes of conforming to the requirements of 29 CFR 1910.309. Health Effects: Benzene is primarily an inhalation hazard. Systemic absorption may

2.0 EXPOSURE AND HEALTH EFFECTS

- 2.1 Benzene is primarily an inhalation hazard. Systemic absorption may cause depression of the hematopoietic system, pancytopenia, aplastic anemia, and leukemia. Inhalation of high concentrations can affect central nervous system function. Aspiration of small amounts of liquid Benzene immediately causes pulmonary edema and hemorrhage of pulmonary tissue. There is some absorption through the skin. Absorption may be more rapid in the case of abraded skin, and Benzene may be more readily absorbed if it is present in a mixture or as a contaminant in solvents that are readily absorbed. The defatting action of Benzene may produce primary irritation due to repeated or prolonged contact with the skin. A high concentration is irritating to the eyes and the mucous membranes of the nose, and respiratory tract.
- 2.2 Direct skin contact with Benzene may cause erythema. Repeated or prolonged contact may result in drying, scaling dermatitis, or development of secondary skin infections. In addition, there is Benzene absorption through the skin. Local effects of Benzene vapor or liquid on the eye are slight. Only at very high concentrations is there any smarting sensation in

the eye. Inhalation of high concentrations of Benzene may have an initial stimulatory effect on the central nervous system characterized by exhilaration, nervous excitation, and/or giddiness, followed by a period of depression, drowsiness, or fatigue. A sensation of tightness in the chest accompanied by breathlessness may occur and ultimately the victim may lose consciousness. Tremors, convulsions and death may follow from respiratory paralysis or circulatory collapse in a few minutes to several hours following severe exposures.

- 2.3 The detrimental effect on the blood-forming system of prolonged exposure hematopoietic system is the chief target for Benzene's toxic effects that are manifested by alterations in the levels of formed elements in the peripheral blood. These effects have occurred at concentrations of Benzene that may not cause irritation of mucous membranes, or any unpleasant sensory effects. Early signs and symptoms of Benzene morbidity are varied, often not readily noticed and non-specific. Subjective complaints of headache, dizziness, and loss of appetite may precede or follow clinical signs. Rapid pulse and low blood pressure, in addition to a physical appearance of anemia, may accompany a subjective complaint of shortness of breath and excessive tiredness. Bleeding from the nose, gums, or mucous membranes, and the development of purpuric spots (small bruises) may occur as the condition progresses. Clinical evidence of leukopenia, anemia, and thrombocytopenia, singly or in combination, has been frequently reported among the first signs.
- 2.4 Bone marrow may appear normal, aplastic, or hyperplastic, and may not, in all situations, correlate with peripheral blood forming tissues. Because of variations in the susceptibility to Benzene morbidity, there is no "typical" blood picture. The onset of effects of prolonged Benzene exposure may be delayed for many months or years after the actual exposure has ceased and identification or correlation with Benzene exposure must be sought out in the occupational history.
- 2.5 Locations where benzene exposure can occur:
 - 2.5.1. Petroleum refining sites
 - 2.5.2. Tank Gauging (tanks at producing, pipeline & refining operations)
 - 2.5.3. Field maintenance

3.0 REGULATORY LIMITS:

- 3.1 The permissible exposure limits for Benzene are as follows
 - 3.1.1 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.

3.1.2 Dermal: Eye and skin contact shall be prevented.

4.0 WORKING SAFELY WITH BENZENE

4.1 Order only the amount needed for your work. Excessive chemicals produce increased risk to the work place.

4.2 Store Benzene in a vented flammable storage cabinet.

4.3 Before you are about to use Benzene, don proper personal protective equipment.

4.3.1 Respiratory, eye and face, boots, gloves and apron protection.

5.0 EMERGENCY PROCEDURES

5.1 In a medical emergency call 911 or on site responders if available. All personnel will be aware of the site specific emergency plan.

5.2 **Inhalation:** If inhaled, move to fresh air. If not breathing give artificial respiration. If breathing difficultly, give oxygen.

5.3 **Skin Contact:** In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes.

5.4 **Eye Contact:** If in contact with eyes, flush with large amounts of water for at least 15 minutes. Assure adequate flushing by separating eyelids with fingers.

5.5 **Ingestion:** If swallowed, wash out mouth with water.

6.0 TRAINING:

6.1 All Benzene Awareness training shall be coordinated by the Safety Director and the Safety Committee. Training will be conducted annually.

DOCUMENT MANAGEMENT:

The Safety Director is responsible for developing and maintaining the program.

If after reading this program, you find that improvements can be made, please contact the Safety Director. We encourage all suggestions because we are committed to the success of our written Benzene Awareness Program. We strive for clear understanding, safe behavior, and involvement from every level of the company.

CHANGE CONTROL:

All management system changes are reviewed, approved or disapproved by the Safety Committee.

This program was initially developed on December 21, 2007, replacing the former Benzene Awareness Program entirely.

Revision No. 1 (December 21, 2007)

Revision No. 2 (February 27, 2008)

Revision No. 3 (March 3, 2010)

Revision No. 3 (October 7, 2011)

PERSONNEL:

The Owners of Wagner-Meinert have the ultimate responsibility for the Benzene Awareness Program. They have designated the Safety Director to manage the Benzene Awareness Program.

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