Clearheart Construction Co., Inc.

Cadmium Awareness

HAZARDOUS JOB SITE CHEMICAL EXPOSURE

As part of process safety management of highly hazardous chemicals, prior to actual work in the petrochemical industry, our employees will be given training on negating the hazards relating to possible chemical exposures in the areas in which we are working.

These hazards may present themselves in refineries, drilling operations, tank gauging, or maintenance at a petrochemical plant.

This training of the facility operator's emergency/contingency plan would include identification of the various hazardous chemicals, their location, specific actions to take should there be an inadvertent spill, leak, or release of hazardous chemical gases. Also during this pre-work training, all facility safety rules would be explained.

Actions would include notification of personnel, evacuation of personnel in the area to a safe zone, training on the specific chemicals that may be released. The importance of wind direction, whether the gas is heavier or lighter than air, flammable or explosive, corrosive, means to detect the gas such as odor (and use of personal gas monitors), means to protect the employees through PPE, especially respiratory protection and the use of full face respirator (gas mask) with a organic vapor canister or self-contained breathing apparatus or airline respirator escape SCBA.

Per our Hazard Communication Plan, we will keep on site, and readily available, MSDS for each chemical to which we may be exposed. This information will be provided by the facility operator.

Benzene Awareness:

NIOSH Pocket Guide to Chemical Hazards - Benzene

Benzene is a toxic, flammable, colorless liquid or gas that has an aromatic odor. It is not soluble in water.

Short term health effect include eye and skin irritation. More acute effects include headache, vertigo, depression of the central nervous system. Chronic health effects include poisoning and damage to the central nervous system. Medical aid should be sought immediately.

PPE would include gloves, goggles, protective clothing, protective boots, aprons and face shields.

Respiratory protection would include:

1. Self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive pressure mode.
2. Supplied air respirator that has a full facepiece and is operated in a pressure-demand other positive-pressure mode in combination with an auxiliary self-contained positive–pressure breathing apparatus.
3. Air-purifying, full-facepiece respirator (gas mask) with a chin style, front or back-mounted organic vapor canister.
4. An appropriate escape-type, self-contained breathing apparatus.

Because Benzene liquid is highly flammable and vapors are explosive, no smoking is allowed in areas when Benzene is used of stored. Fire extinguishers must be readily available.

Cadmium

NIOSH Pocket Guide to Chemical Hazards – Cadmium

Cadmium, a noncombustible solid metal, is an odorless, yellow-brown, finely divided particulate dispersed in air.

Health Effects:

1. Acute: Metal fume fever may result from acute exposure with flu-like symptoms of weakness, fever, headache, chills, sweating and muscular pain. Acute pulmonary edema usually develops within 24 hours and reaches a maximum by three days. If death from asphyxia does not occur, symptoms may resolve within a week.
2. Chronic: The most serious consequence of chronic cadmium poisoning is cancer (lung and prostate). The first observed chronic effect is generally kidney damage, manifested by excretion of excessive (low molecular weight) protein in the urine. Cadmium also is believed to cause pulmonary emphysema and bone disease (osteomalcia and osteoporosis). Cadmium may also cause anemia, teeth discoloration (Cd forms CdS) and loss of smell (anosmia).

Workers should wash daily at the end of each work shift, and prior to eating, drinking, smoking, etc.

Workers whose clothing may have become contaminated should change into uncontaminated clothing before leaving the work premises.

Because the route of exposure is inhalation, respiratory protection is critical.

The below chart is extracted from NIOSH Pocket Guide to Chemical Hazards, Appendix E, OSHA Respirator Requirements for Selected Chemicals. This chart indicates the required respiratory protection as it relates to the airborne concentration or condition of use:

Cadmium (1910.1027 & 1926.1127)

Airborne Concentration or Condition of Use	**Required Respirator**
< or = 50 µg/m^3 (micrograms per cubic meter)	Half-mask, air-purifying respirator equipped with a high-efficiency filter*****.
< or = 125 µg/m^3	**(1)** Powered air-purifying respirator with a loose-fitting hood or helmet equipped with a high-efficiency filter*****; or **(2)** Supplied-air respirator with a loose-fitting hood or helmet facepiece operated in continuous-flow mode.
< or = 250 µg/m^3	**(1)** Full-facepiece air-purifying respirator equipped with a high-efficiency filter*****; **(2)** Powered air-purifying respirator with a tight-fitting half-mask equipped with a high-efficiency filter*****; or **(3)** Supplied-air respirator with a tight-fitting half-mask operated in continuous-flow mode.
< or = 1,250 µg/m^3	**(1)** Powered air-purifying respirator with a tight-fitting full facepiece equipped with a high-efficiency filter*****; or **(2)** Supplied-air respirator with a tight-fitting full facepiece operated in continuous-flow mode.
< or = 5,000 µg/m^3	Supplied-air respirator with half-mask or full facepiece operated in pressure-demand or other positive-pressure mode.
> 5,000 µg/m^3 or unknown concentration	**(1)** Self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive-pressure mode; or **(2)** Supplied-air respirator with a full facepiece operated in pressure-demand or other positive-pressure mode and equipped with an auxiliary escape-type self-contained breathing apparatus operated in pressure-demand mode.
Firefighting	Self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive-pressure mode.
Note: Quantitative fit testing is required for all tight-fitting air-purifying respirators where airborne concentration of cadmium exceeds 10 times the TWA PEL (10 X 5 µg/m^3 = 50 µg/m^3). A full-facepiece respirator is required when eye irritation is expected. ***** A high-efficiency filter means a filter that is at least 99.97% efficient against mono-dispersed particles of 0.3 µm (micrometers) in diameter or higher.	

Hydrogen Sulfide – H2S:

NIOSH Pocket Guide to Chemical Hazards – Hydrogen Sulfide H2S

Hydrogen Sulfide – H2S is toxic, and colorless with the odor of rotten eggs at low concentrations. It is soluble in water and is flammable.

Over time at low concentrations, the ability to smell Hydrogen Sulfide –H2S may diminish therefore, depending on the facility at which we are working a personal or area monitors may be required. These alarm will be pre-set to go off when the PEL exceeds 20 PPM, 1910 (Industry) or 10 PPM (Construction).

Exposure routes are inhalation, eye or skin. Health effects include irritation to the eyes, respiratory system distress, damage to the nerve centers of the brain which controls breathing, apnea, coma, convulsions, eye pain dizziness, headache. As a liquid, the health effect would be frostbite.

Respiratory protection would include:

1. Self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive pressure mode.
2. Supplied air respirator that has a full facepiece and is operated in a pressure-demand other positive-pressure mode in combination with an auxiliary self-contained positive–pressure breathing apparatus.
3. Air-purifying, full-facepiece respirator (gas mask) with a chin style, front or back-mounted organic vapor canister for hydrogen sulfide.
4. An appropriate escape-type, self-contained breathing apparatus.