Safe Chlorine Use Meeting Kit

WHAT’S AT STAKE

Chlorine is used in water treatment and in the manufacturing process for paper, plastics, cleaning chemicals, and other products. Chlorine is used in liquid form and as a compressed gas. Because chlorine is a corrosive material, it can cause irritation when workers breathe it or expose their skin to it. At very high concentrations, chlorine exposure can cause death after just a few breaths. Because of the danger of respiratory damage, chemical burns, and death, workers need to use, store, and handle chlorine properly.

WHAT´S THE DANGER

HEALTH DANGERS OF WATER

Water can be contaminated from the sources of lakes, wells, pools, spas, etc. To prevent people from getting germs from there sources water companies have to disinfect the water from potential contamination. Commonly used chemical products contain chlorine, a known disinfectant. These products are called “chlorinating agents.”

THERE ARE TWO MAIN TYPES OF CHLORINATING AGENTS

- Inorganic, such as bleach (sodium hypochlorite) or chlorine granules (calcium hypochlorite)
- Organic (containing carbon), such as chlorine tablets (trichloroisocyanuric acid)

RISKS ASSOCIATED WITH THE USE AND STORAGE OF CHLORINATING AGENTS

Chlorinating agents are dangerous. Use them carefully and store them correctly to avoid the following risks:

Risk of fire or explosion. Chlorinating agents can cause fires or explosions if they come into contact with flammable materials such

as gasoline, paint or solvents. It is also very important to avoid mixing inorganic and organic chlorinating agents together as such mixtures can cause explosions.

Risk of chlorine gas fumes. Mixing chlorinating agents with certain other products may result in the release of chlorine gas, which is highly toxic.

For example, avoid mixing out of the water a chlorinating agent, such as bleach (sodium hypochlorite), with an acidic product used to adjust the acidity (pH) of water, such as muriatic acid (hydrochloric acid).

HEALTH HAZARDS ASSOCIATED WITH TOXIC OR CORROSIVE PRODUCTS

- Inhalation: VERY TOXIC, can cause death. Can cause severe irritation of the nose and throat. Can cause severe lung injury. Can cause life-threatening accumulation of fluid in the lungs (pulmonary edema). Symptoms may include coughing, shortness of breath, difficult breathing, and tightness in the chest. Symptoms may develop hours after exposure and are made worse by physical effort. Long-term damage may result from a severe short-term exposure. A single exposure to a high concentration can cause a long-lasting condition like asthma. If this occurs, many things like other chemicals or cold temperatures can easily irritate the airways. Symptoms may include shortness of breath, tightness in the chest and wheezing. {Reactive Airways Dysfunction Syndrome (RADS)}.
- Skin Contact: CORROSIVE. The gas irritates or burns the skin. Permanent scarring can result. Direct contact with the liquefied gas can chill or freeze the skin (frostbite). Symptoms of mild frostbite include numbness, prickling and itching. Symptoms of more severe frostbite include a burning sensation and stiffness. The skin may become waxy white or yellow. Blistering, tissue death and infection may develop in severe cases.
- Eye Contact: CORROSIVE. The gas irritates or burns the eyes. Permanent damage including blindness can result. Direct contact with the liquefied gas can freeze the eye. Permanent eye damage or blindness can result.

- Ingestion: Not a relevant route of exposure (gas).
- Effects of Long-Term (Chronic) Exposure: May harm the respiratory system. Can irritate and inflame the airways.
- Carcinogenicity: Not known to cause cancer.

HOW TO PROTECT YOURSELF

BEST SAFE WORK PRACTICES WITH CHLORINATING AGENTS – TAKE PRECAUTIONS:

Handling Products

- Before using chlorinating agents, follow the instructions on the label. Read the first-aid instructions beforehand in case of poisoning.
- Wear protective gear and clothing (such as gloves, glasses and shoes).
- Handle the products outdoors or in a well-ventilated area.
- Keep children away from the area where the products are being used.
- Use a clean and dry measuring cup to measure or pour products. Use a different cup for each product.
- To prevent the risk of a fire or an explosion, avoid mixing 2 or more different chemical products.
- Always pour the chlorinating agent into water, never the other way round (water into the chlorinating agent)
- Wash your hands thoroughly after handling products.

Storing Products

- Read the label to find out how to store the product properly.
- Store products in a cool, dry, well-ventilated place that is not exposed to sunlight. If the temperature rises, toxic fumes can accumulate in the product containers and escape into the air when opened.
- Never store chlorinating agents, such as bleach, near acidic products, such as those used to lower the pH of water. If they come into contact with each other, these products can release chlorine gas, which is highly toxic.

- Keep chemical products far away from:
    - Heat sources
    - Flames
    - Gasoline
    - Fertilizer
    - Pesticides
    - Oil or grease
    - Paint
    - Cleaning products
    - Turpentine
    - Other flammable products
- Store containers of liquid chlorinating agents under those of powder or solid products, never the other way around. This will prevent the products from coming into contact with each other if a liquid spills from its container.
- Get rid of leftover products at an authorized household-hazardous-waste collection centre. To find a centre near you, contact your municipality.

FINAL WORD

The effects of chlorine exposure on worker’s health are a function of the exposure concentration – that is how much chlorine is present in the air to which a worker is exposed – and the length and frequency of exposure.