Ammonia Safety Meeting Kit

Ammonia is a commonly used chemical in commercial and household cleaners. In industry, ammonia is used in petroleum refining, to manufacture pharmaceuticals, to disinfect water, and as a refrigerant. In agriculture, ammonia can be used for crop processing, fertilizers, or as an anti-fungal treatment for citrus. Ammonia can also be produced naturally when stored materials such as manure, compost, or other materials break down.

THE HAZARDS OF WORKING WITH AMMONIA

Ammonia is widely used as a refrigerant gas. A colourless gas with a sharp, penetrating, intensely irritating odour and a colourless liquid under pressure, it is not considered a flammable gas. However, a large and intense energy source may cause ignition and/or explosion.

Ammonia gas can decompose at high temperatures forming very flammable hydrogen and toxic nitrogen dioxide. It is a COMPRESSED GAS and a confined space explosion and toxicity hazard. Ammonia gas is a CORROSIVE GAS and may be fatal if inhaled. Ammonia gas may cause lung injury, and the liquefied gas can cause frostbite and corrosive injury to eyes and skin.

Ammonia gas is a severe respiratory tract irritant. Most people can detect it by smell at 0.6 to 53 ppm. Nose and throat irritation may be noticed at concentrations as low as 24 ppm after 2-6 hours exposure. A 10-minute exposure to 30 ppm may be faintly irritating to some, while 50 ppm may be found to be moderately irritating by most. A 5-minute exposure to 72 or 134 ppm will cause irritation of the nose and throat for most people.

At 500 ppm, immediate and severe irritation of nose, and throat occurs. Brief exposure to concentrations above 1500 ppm can cause pulmonary edema, a potentially fatal accumulation of fluid in the lungs. The symptoms of pulmonary edema (tightness in the chest and difficulty breathing) may not develop for 1-24 hours after an exposure.

Numerous cases of fatal ammonia exposure have been reported, but actual exposure levels have not been well documented. If the victim survives, complete recovery may occur depending on the extent of injury to the respiratory tract and lungs. However, long-term respiratory system and lung disorders have been observed following severe short-term exposures to ammonia.

AMMONIA SAFETY PRECAUTIONS FOR WORKERS

- **If ammonia is released**, immediately put on a suitable respirator and leave the area until the severity of the release is determined. In case of leaks or spills, escape-type respiratory protective equipment should be available in the work area.
- **Never work alone with this chemical.**
- **Unprotected persons** should avoid all contact with this chemical, including contaminated equipment.
- **Use a closed handling system** for processes involving this material. If a closed handling system is not possible, use the smallest possible amounts in a well-ventilated area separate from the storage area.
- **Do not use with incompatible materials** such as oxidizing agents (e.g., nitrogen oxide), halogens (e.g., chlorine, fluorine) and heavy metals (e.g., mercury, silver).
- **Regularly inspect cylinders** for corrosion or other damage or leaks before handling. Use corrosion-resistant transfer equipment.
- **For large-scale handling operations** use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas of use. Do not use near welding operations. It is very important to keep areas where this material is used clear of other materials which can burn (e.g., cardboard, sawdust).
- **Never perform any welding, cutting, soldering, drilling** or other hot work on an empty vessel, container or piping until all the ammonia has been cleared.
- **Use the appropriate pressure regulator**. Before connecting the cylinder for use, make sure that back feed from the system into the cylinder is prevented.
- **Do not open a damaged cylinder**. Open cylinder valve slowly to prevent rapid decompression and damage to valve seat. Keep cylinder valves clean and free from contaminants (particularly oil and water). Make sure valves on gas cylinders are fully opened when gas is used. Open and shut valves at least once a day, while cylinder is in use, to avoid valve ‘freezing’.
- **Shut flow off at cylinder valve** and not just at the regulator after use. Replace outlet caps or plugs and cylinder caps as soon as cylinder is disconnected from equipment.
- **Make sure cylinders are labeled clearly**. Avoid damaging cylinders. Move cylinders by hand truck or cart designed for that purpose.
- **Keep empty cylinders under slightly positive pressure**. Do not use cylinders as rollers or for any other purpose than to contain the gas as supplied.

FINAL WORD

There are a wide range of occupations in many industries that place workers at risk of being exposed to ammonia. Diligence, vigilance and training are absolute requisites for workers in the understanding and handling of a potentially hazardous chemical like ammonia.