Safety Bulletin #

Carbon Dioxide – CO2 Neutralizing Agent

The Carbon Dioxide (CO2) cylinders Millard Refrigerated Services' uses are filled with liquid Carbon Dioxide and stored at pressure of 600 PSI. The approximate temperature of the liquid is minus 100˚ F. When the CO2 is exposed to the atmosphere the liquid is transformed into a CO2 gas, which is heavier then atmospheric air, so the CO2 gas will settle at the floor level.

Using Carbon Dioxide (CO2) to neutralize ammonia (NH3): This is a common practice in our industry, because CO2 is very effective in neutralizing ammonia. However, precautions must be taken when using CO2.

Proper ventilation: Circulating the air in the affected area blends the CO2 with the NH3 enhancing the CO2 ability to neutralized NH3. The air circulation is also vital for maintaining proper Oxygen levels in the affected area.

Proper ventilation is vital for two main reasons:

1st: CO2 is heavier than atmospheric air, so it tend to accumulate at the floor level and ammonia (NH3) is lighter then atmospheric air, so it will tend to accumulate at the ceiling level.
2nd: CO2 removes Oxygen from the atmosphere and ventilation ensures proper oxygen levels.

When using CO2 as a neutralizing agent for smaller ammonia release:

1st: Restrict room to authorized personnel only until other wised notified
2nd: Equip yourself with the required personal protective equipment.
3rd: Properly position the ventilation fans to provide continuous circulation.
4th: Properly transport the cylinders to the affected area and properly secure the cylinders.
5th: Slowly open the valve to release the CO2 in a low volume.

When using CO2 as a neutralizing agent for larger ammonia releases:

1st: Restrict room to authorized personnel only until other wised notified
2nd: Equip yourself with the required personal protective equipment.
3rd: Properly position the ventilation fans to ensure a large volume of continuously supplied fresh air and provides continuous circulation.
4th: Properly transport the cylinders to the affected area and properly secure the cylinders.
5th: Slowly open the valve to release the CO2 in a low volume.

NH3 + CO2 = Ammonium Carbamate in a powder form. Ammonium Carbamate is classified as a non-hazardous powder, which would be formed in minor amounts. Ammonium Carbamate will decompose into Urea and water. Urea would release NH3 back into the atmosphere at a very slow rate over a period of time. Information obtained from IIAR.

General Information: Do not store the CO2 cylinders inside the engine room or other hot areas. The cylinder must be inspected monthly and leaking cylinders removed from service and the supplier notified for further instructions. DOT cylinder test required every 5 years. A single 50-pound CO2 cylinder weights approximately 150-pounds.

MSDS: Engineers must obtain a copy and understand all the hazards and precautions listed.