TIPS & TRICKS WHEN WORKING WITH AMMONIA

WHAT IS AMMONIA ?

Ammonia is an energy-efficient and cost-effective refrigerant but must be properly handled and maintained when servicing your system. Here are some tips and recommendations when working with your ammonia industrial/recreational refrigeration system.

TIP 1: CLEANLINESS IS KEY

It is important to maintain cleanliness of your systems including all machinery, electrical equipment, piping and vessels, machinery rooms and more. Schedule regular clean-ups and maintenance as necessary.

- **Monitor** oil accumulations around equipment, seal reservoirs that are filling up, and make sure absorbent materials are readily available for spills/leaks. Repair those leaks as soon as possible!
- Used oils are disposed of following **environmental regulations**
- **Properly store and maintain** all personal protective equipment
- Ensure that the appropriate **markers and safety labels** on your system are still legible (such as ammonia mechanical room signs). Ensure piping colours/paint follow area guidelines.

TIP 2: PERFORM A THOROUGH MAINTENANCE CHECK ON YOUR EQUIPMENT REGULARLY:

- Test and tag all critical components at least once annually, as per TSSA, including: interlocks and safety controls, compressor operation, ammonia detection system, ventilation systems, etc.
- **Inspect regularly:**
  - Compressor temperatures and pressures, perform annual vibration analysis (if applicable) and oil analysis
  - Inspection of valve groups, vessels, and pumps for leaks and premature lcorrosion
  - Inspect / Replace or recertify safety relief valves as needed (Replacement every five (5) years as per regulations)
- **Don’t forget to check the other components:**
  - All electrical connections and components are properly inspected (thermal imaging is recommended)
  - Make sure that your evaporators, condensers and automatic bleed-off systems are functioning properly (evaporators are defrosting properly, condenser water treatment equipment are functioning properly, fans are cycling normally, belts/sheaves are in good condition)
  - Calibrate regularly all pressure gauges/transducers
  - Ventilation systems of your machinery room should be functioning normally
  - Drain oil from your system regularly in a safe manner, follow standard operating procedures
- **Follow proper protocols:**
  - Read your equipment’s safety manual and follow the appropriate preventative maintenance instructions for your refrigeration system
  - Follow your equipment manufacturer’s recommendations on frequency schedules, lubricant, etc.

“TIP3: KEEP A PROPER LOG OF EVERYTHING”

- Official and permanent **Logbook**, legibly signed by all certified staff.
- **Log Sheets** including daily pressure and temperature logs, etc.
- When working in environments that may contain ammonia, **a hazard assessment** shall be completed:
  - Identify physical state of the substance for ammonia (gas/vapor, liquid or aerosol)
  - Identify appropriate PPE
  - Determine length of time respirator is to be used
  - Identify escape routes and maintenance activities and procedures that could create a hazard, work area layout, etc.
- Consider creating an ammonia **safety checklist**
- Services performed such as **preventative and emergency maintenance**, etc.
- Refrigerant and oil changes such as ammonia added to a system, oil drainages, oil additions, any secondary refrigerant levels or changes, etc. (Analysis of ALL secondary refrigerants is highly recommended.)
- **Record of all inventory** including personal protective equipment

BERG IS HERE FOR YOUR INDUSTRIAL REFRIGERATION NEEDS

Berg offers 24/7 emergency service and support wherever your cooling system may be. Our certified refrigeration experts can also provide ammonia awareness and safety training to your staff to ensure that your ammonia system is always at its best. Contact us today to learn more on how we can help with your refrigeration needs.

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RESPONDING TO AMMONIA EMERGENCIES

In any case of an ammonia exposure or emergency, it is best to know what to do and how to respond beforehand. Regular training and awareness are key! Here are some things you can do to prepare in the event of an ammonia emergency.

AMMONIA VAPOR OVEREXPOSURE

- Remove victim from exposure and seek fresh air. Seek immediate medical attention (Call 911)
- If breathing fails, perform mouth/mask resuscitation. (Oxygen may be administered by trained staff)
- If there is no pulse, begin CPR. (Caution: Symptoms of pulmonary edema may be delayed. Respond and treat accordingly.)
- If patient goes into shock, treat accordingly.

SKIN EXPOSURE TO AMMONIA LIQUID

- **Gas**: Immediately flush your skin with lukewarm, gently flowing water for at least 5 minutes. Seek immediate medical attention afterwards.
- **Liquefied Gas**: Decontaminate the victim with water as well as the victim's clothing before bringing the victim to the ambulance. Do not attempt to rewarm the affected area on site and do not rub the area or apply direct heat. Gently remove clothing/jewelry that may restrict circulation and carefully cut around clothing that sticks to the skin and remove the rest of the garment. Loosely cover the affected area with sterile dressing.
- **Inform medical personnel** of any burns or bruises from ammonia exposure as well as any ointments or treatments applied before turnover

EYE EXPOSURE TO AMMONIA LIQUID

- **Gas**: Immediately flush your contaminated eyes with lukewarm, gently flowing water for at least 15 minutes, while holding the eyelids open. Seek immediate medical attention afterwards.
- **Liquefied Gas**: Move victim to fresh air. Immediately and briefly flush with lukewarm, gently-flowing water. Seek immediate medical attention afterwards.

AMMONIA INHALATION

As soon as an unconscious patient resumes breathing, always place them in the Recovery Draining Position (on their side). The general idea is so that any fluids that could compromise the airway drain away.

AMMONIA INDIGESTION

- While ingestion of anhydrous ammonia is rare, if it occurs: do not induce vomiting as it may re-expose the esophagus and mouth to caustic substance.
- Do not administer activated charcoal
- Do not perform gastric lavage or attempt neutralization after ingestion. If not given during decontamination, give 4 to 8 ounces of water by mouth to dilute stomach contents.
- Consider endoscopy to evaluate the extent of gastrointestinal tract injury.

PREPARE BEFOREHAND FOR ANY POTENTIAL AMMONIA EMERGENCY

- Train everybody on basic ammonia first-aid procedures such as mouth-to-mask resuscitation, cardiopulmonary resuscitation (CPR), treatment for shock, etc.
- Train everybody in ammonia first-aid, treatment and support services including hotline numbers for your local fire department, ambulance service, and emergency health clinic, etc.
- Train everybody in the various processes of handling with ammonia such as ammonia recovery, handling & storing ammonia cylinders, ammonia spill reporting procedures, etc.
- Review your policies and practices on dealing with accidents and emergencies. Familiarize yourself with the various health regulations and policies (such as MSDS, HAZCOM WHMIS, SDS) and follow the best practices on health and safety.
- Consider investing in more personal protective & breathing equipment: provide more equipment to prevent any possible accidents such as a safety shower & eye wash fountain, full face-shield and gas-tight goggles, full face piece air-purifying respirator (NIOSH/MSHA-approved)
- Prepare an ERP (Evacuation Response Plan), regular ammonia evacuation drills, know "muster points", pay attention to wind directions with properly functioning wind socks or flags.

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