MYSORE AMMONIA

MATERIAL SAFETY DATA SHEET (MSDS)	AMMONIA ANHYDROUS CAS No.: 7664 – 41 - 7

CHEMICAL NAME: **AMMONIA ANHYDROUS** **COMPOSITION:** **99+ % Ammonia** **FORMULA:** **NH_3**

MOLAR MASS: **17.031 g/mol** **CHEMICAL FAMILY:** **Ammonia**

SYNONYMS: NH_3, Liquid Ammonia, Liquefied Ammonia, Liquified Ammonia, Ammonia Gas & AMMONIA

1. STATEMENT OF HEALTH HAZARD

Is an irritant, and corrosive to skin, eye, respiratory tract and mucous membranes. May cause severe burns, eye and lung-injuries. Skin and respiratory related diseases aggravated by exposure. Not recognized by OSHA as a carcinogen. Not listed in the National Toxicology Program annual report. Not listed as a carcinogen by the International Agency for Research on Cancer.

EXPOSURE LIMITS: Vapor

OSHA	Permissible Exposure Limit (PEL) 35 ppm (27 mg/m^3)	as a 15-minute STEL
NIOSH	Recommended Exposure Level (REL) 25 ppm (17 mg/m^3)	as 8-hour TWA (Time-Weighted Avg.)
NIOSH	Recommended Exposure Level (REL) 35 ppm	as a 15-minute STEL
ACGIH	Threshold Limit Value (TLV) 25 ppm (17 mg/m^3)	as 8-hour TWA ((Time-Weighted Avg.)
ACGIH	Short Term Exposure Limit (STEL) 35 ppm (24 mg/m^3)	as a 15-minute STEL

2. EMERGENCY TREATMENT

HAZARD DESCRIPTION: Is an Irritant and corrosive to skin, eye, respiratory tract and mucous membranes. May cause severe burns, eye and lung injuries. Skin and respiratory related diseases aggravated by exposure.

Not recognized by OSHA as a carcinogen. Not listed in the National Toxicology Program annual report. Not listed as a carcinogen by the International Agency for Research on Cancer.

EFFECTS OF OVEREXPOSURE: Eye: lachrymation, edema, blindness. Skin: irritation, corrosive burns, blister formation. Contact with liquid will freeze the tissue, then produces a caustic burn. Inhalation: heavy, acute exposure may result in severe irritation of the respiratory tract, glottal edema, bronchialspasm, pulmonary edema and respiratory arrest. Chronic effects: bronchitis. Extreme exposure (5000 ppm) can cause immediate death from spasm, inflammation or edema of larynx.

EMERGENCY AID: Skin: flush with copious amounts of water while removing contaminated clothing and shoes. Do not rub, or apply ointment on affected area. SEEK IMMEDIATE MEDICAL HELP. Ingestion: if conscious, give

large amount of water to drink. Refer immediately to physician. Eye: flush with copious amounts of water for 15 min. Eyelids should be held apart and away from eyeball for thorough rinsing. SPEED AND THOROUGHNESS IN RINSING THE EYE IS MOST IMPORTANT IN PREVENTING LATENT PERMANENT INJURIES. Inhalation: remove to fresh air. Administer oxygen or artificial respiration if necessary.

NOTE TO PHYSICIAN: Lung injury may appear as delayed phenomenon, pulmonary edema may follow chemical bronchitis. Supportive treatment with necessary ventilation actions, including oxygen, may warrant consideration.

3. PHYSICAL DATA

BOILING POINT: -33˚C (-28˚F)

FREEZING POINT: -78˚C (-108˚F)

VAPOR DENSITY (AIR=1): 0.596 @ 0˚C (32˚F)

VAPOR PRESSURE: 10 atm @ 25.7˚C

APPEARANCE & ODOR: Colorless gas/liquid and pungent odor

SOLUBILTY IN WATER: 89.9 g/100cc @ 0˚C, 7.4 g/100cc @100˚C

SPECIFIC GRAVITY (H2O=1): 0.682 @ 4˚C (39˚F)

EVAPORATION RATE (Water=1): Faster than water

PERCENT VOLATILE: 100%

SURFACE TENSION: 23.4 dynes/cm @ 11.1˚C

4. FIRE AND EXPLOSION HAZARD DATA

FLAMMABLE LIMITS IN AIR: LEL 15% UEL 28%

EXTINGUISHING MEDIA: Non-combustible

FLASH POINT: None

AUTO-IGNITION TEMPERATURE: 651˚C (1204˚F) catalyzed by iron; 850˚C (1562˚F) uncatalyzed

5. SPECIAL FIRE-FIGHTING PROCEDURES

Must wear protective clothing and respiratory protection. See PROTECTIVE EQUIPMENT. Stop source if possible. Cool fire exposed containers with water spray. Stay upwind and use water spray to knock down vapor and dilute.

6. UNUSUAL FIRE AND EXPLOSION HAZARDS:

Not generally a fire hazard. If relief valves are inoperative, heat-exposed storage containers may become explosion hazards. Ammonia contact with chemicals such as mercury, chlorine, iodine, bromine, silver oxide, or hypochlorites can form explosive compounds. Special hazards with chlorine to form chloramine gas, also a primary skin irritant and sensitizer. Combustion may form toxic nitrogen oxides.

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CHEMICAL REACTIVITY

7. STABILITY:

Ammonia is stable at room temperature. It reacts exothermically with acids and water.

CONDITIONS TO AVOID: Avoid mixing with sulfuric acid or other strong mineral acids. Avoid mixing with hypochlorites (chlorine bleach) or other halogens and sodium hydroxide. Avoid contact with galvanized surfaces, copper, brass, bronze, aluminum alloys, mercury, gold, silver, andstrong oxidizers. Avoid heating.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen and Nitrogen gases above 450˚C (842˚ F)

8. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN: Wear respiratory protection and protective clothing, see PROTECTIVE EQUIPMENT. Stop source if possible. If Exposure concerns are present, stay upwind and use water spray downwind of leak source to absorb ammonia gas and dilute. CAUTION: ADDING WATER DIRECTLY TO LIQUID SPILLS WILL INCREASE VOLATILIZATION OF AMMONIA, THUS INCREASING POSSIBILITY OF EXPOSURE.

WASTE DISPOSAL: Listed as hazardous substance under CWA (40 CFR 1164.40 CFR 117.3 Reportable Quantity 100 lbs. OR 45.4kg) Classed as a hazardous waste under RCRA (40 CFR 261.32 Corrosive # D002). Comply with all regulations. Suitably diluted product may be disposed of on agricultural land as fertilizer. Keep spill from entering streams or lakes.

SPECIAL PROTECTION AND PROCEDURES

9. RESPIRATORY PROTECTION

MSHA/NIOSH approved respiratory protection with full face piece for gas and vapor contaminants effective for anhydrous ammonia and able to be used for entry and escape in emergencies. Refer to 29 CFR 1910.134 and ANSI: Z88.2 for requirements and selection.

10. VENTILATION

Local exhaust sufficient to keep ammonia gas below Permissible Exposure Limits. Refer to 29 CFR 1910.134 and ANSI: Z9.2 for requirements and selection.

11. PROTECTIVE EQUIPMENT

Splash-proof, chemical safety goggles, rubber gloves and boots to prevent contact. Respiratory protection. Cotton work clothes recommended. Refer to 29 CFR 1910.132 to 1910.136 for requirements.

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SPECIAL PRECAUTIONS

12. STORAGE AND HANDLING

Store in cool, well-ventilated area with containers tightly closed. OSHA 29 CFR 1910.111 prescribes handling and storage requirements for anhydrous ammonia as a hazardous material.

13. WORK-PLACE PROTECTIVE EQUIPMENT

As discussed above, should be near, but outside of ammonia area. Eye-wash and safety-shower should be available in immediate vicinity. See 29 CFR 1910.141 for workplace requirements.

14. DISPOSAL

Ammonia is listed as a hazardous substance under FWPCA. See WASTE DISPOSAL. Classified as RCRA Hazardous waste due to corrosivity.

PERSONAL: Avoid unnecessary exposure. Use protective equipment as needed. Do not wear contact lenses.

LABELING AND SHIPPING

HAZARD CLASS: 2.2 (Nonflammable Gas) U.S. Domestic AND 2.3 (Poison Gas) International

PROPER SHIPPING DESCRIPTION: Ammonia, Anhydrous, 2.2, UN1005, RQ, Inhalation Hazard (U.S. Domestic) AND Ammonia, Anhydrous, 2.3, UN1005, RQ, Poison-Inhalation Hazard Zone "D" (International)

PLACARD/LABEL: Nonflammable Gas (U.S. Domestic) AND Poison Gas, Corrosive (Subsidiary) (International)

IDENTIFICATION NO: UN 1005

Hazardous Materials Identification System Labels:

ANHYDROUS AMMONIA	
HEALTH	**3**
REACTIVITY	**0**
FLAMMABILITY	**1**
PERSONAL PROTECTION	**H**

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