

# MATERIAL SAFETY DATA SHEET

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## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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**MATHESON TRI-GAS, INC.**  
**150 Allen Road Suite 302**  
**Basking Ridge, New Jersey 07920**  
**Information: 1-800-416-2505**

**Emergency Contact:**  
**CHEMTREC 1-800-424-9300**  
**Calls Originating Outside the US:**  
**703-527-3887 (Collect Calls Accepted)**

**SUBSTANCE: AMMONIA, ANHYDROUS**

**TRADE NAMES/SYNONYMS:**

MTG MSDS 4; ANHYDROUS AMMONIA; AMMONIA GAS; AMMONIA; SPIRIT OF HARTSHORN;  
AMMONIA, ANHYDROUS, LIQUIFIED; UN 1005; H3N; MAT01050; RTECS BO0875000

**CHEMICAL FAMILY:** inorganic, gas

**PRODUCT USE:** industrial

**CREATION DATE:** Jan 24 1989

**REVISION DATE:** Dec 11 2008

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## 2. COMPOSITION, INFORMATION ON INGREDIENTS

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**COMPONENT:** AMMONIA, ANHYDROUS

**CAS NUMBER:** 7664-41-7

**PERCENTAGE:** 100.0

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## 3. HAZARDS IDENTIFICATION

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**NFPA RATINGS (SCALE 0-4):** HEALTH=3 FIRE=1 REACTIVITY=0



**EMERGENCY OVERVIEW:**

**COLOR:** colorless

**PHYSICAL FORM:** liquefied gas

**ODOR:** pungent odor

**MAJOR HEALTH HAZARDS:** respiratory tract burns, skin burns, eye burns, mucous membrane burns

**PHYSICAL HAZARDS:** Containers may rupture or explode if exposed to heat.

**POTENTIAL HEALTH EFFECTS:**

**INHALATION:**

**SHORT TERM EXPOSURE:** burns

**LONG TERM EXPOSURE:** burns

**SKIN CONTACT:**

**SHORT TERM EXPOSURE:** burns

**LONG TERM EXPOSURE:** burns

**EYE CONTACT:**

**SHORT TERM EXPOSURE:** burns

**LONG TERM EXPOSURE:** burns

**INGESTION:**

**SHORT TERM EXPOSURE:** burns

**LONG TERM EXPOSURE:** burns

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#### 4. FIRST AID MEASURES

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**INHALATION:** If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

**SKIN CONTACT:** Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing before reuse. Destroy contaminated shoes.

**EYE CONTACT:** Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

**INGESTION:** Rinse mouth out with water. DO NOT induce vomiting. Get medical attention immediately.

**NOTE TO PHYSICIAN:** For inhalation, consider oxygen.

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#### 5. FIRE FIGHTING MEASURES

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**FIRE AND EXPLOSION HAZARDS:** Moderate explosion hazard. Containers may rupture or explode if exposed to heat.

**EXTINGUISHING MEDIA:** carbon dioxide, regular dry chemical

Large fires: Use regular foam or flood with fine water spray.

**FIRE FIGHTING:** Do not attempt to extinguish fire unless flow of material can be stopped first. Do not get water inside container. Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Keep unnecessary people away, isolate hazard area and deny entry. Stop flow of gas.

**FIRE FIGHTING PROTECTIVE EQUIPMENT:** Wear full protective fire fighting gear including self

contained breathing apparatus (SCBA) for protection against possible exposure.

**FLASH POINT:** Not available

**LOWER FLAMMABLE LIMIT:** 15%

**UPPER FLAMMABLE LIMIT:** 28%

**AUTOIGNITION:** 1204 F (651 C)

**HAZARDOUS COMBUSTION PRODUCTS:**

Thermal decomposition or combustion products: ammonia, oxides of nitrogen

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## 6. ACCIDENTAL RELEASE MEASURES

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**AIR RELEASE:**

Reduce vapors with water spray. Collect runoff for disposal as potential hazardous waste.

**SOIL RELEASE:**

Trap spilled material at bottom in deep water pockets, excavated holding areas or within sand bag barriers. Dike for later disposal. Add dilute acid. Absorb with sand or other non-combustible material.

**WATER RELEASE:**

Collect spilled material using mechanical equipment.

**OCCUPATIONAL RELEASE:**

Stop leak if possible without personal risk. Reduce vapors with water spray. Do not get water directly on material. Do not get water inside container. Keep unnecessary people away, isolate hazard area and deny entry. Small spills: Flood with water. Large spills: Dike for later disposal. Stay upwind and keep out of low areas. Ventilate closed spaces before entering. Evacuation radius: 150 feet. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

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## 7. HANDLING AND STORAGE

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**STORAGE:** Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.111. Protect from physical damage. Store outside or in a detached building. Inside storage: Store in a cool, dry place. Store in a well-ventilated area. Avoid heat, flames, sparks and other sources of ignition. Keep separated from incompatible substances. Store in a cool, dry place. Store in a well-ventilated area. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355 Part B). Protect from sunlight.

**HANDLING:** Keep away from heat, sparks and flame. When using, do not eat, drink or smoke. Do not

breathe gas, fumes, vapor, or spray. Do not get in eyes, on skin, or on clothing. Use only with adequate ventilation.

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## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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### **EXPOSURE LIMITS:**

#### **AMMONIA, ANHYDROUS:**

50 ppm (35 mg/m<sup>3</sup>) OSHA TWA

35 ppm (27 mg/m<sup>3</sup>) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)

25 ppm ACGIH TWA

35 ppm ACGIH STEL

25 ppm (18 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

35 ppm (27 mg/m<sup>3</sup>) NIOSH recommended STEL

**VENTILATION:** Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

**EYE PROTECTION:** Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

**CLOTHING:** Wear appropriate chemical resistant clothing.

**GLOVES:** Wear appropriate chemical resistant gloves.

**RESPIRATOR:** The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

#### **250 ppm**

Any air-purifying half-mask respirator equipped with cartridge(s) providing protection against the compound of concern.

Any supplied-air respirator.

#### **300 ppm**

Any supplied-air respirator operated in a continuous-flow mode.

Any powered, air-purifying respirator with cartridge(s) providing protection against this substance.

Any air-purifying full-facepiece respirator equipped with cartridge(s) providing protection against the compound of concern.

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

Emergency or planned entry into unknown concentrations or IDLH conditions -

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

**Escape -**

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.  
Any appropriate escape-type, self-contained breathing apparatus.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**PHYSICAL STATE:** gas

**COLOR:** colorless

**PHYSICAL FORM:** liquefied gas

**ODOR:** pungent odor

**MOLECULAR WEIGHT:** 17.03

**MOLECULAR FORMULA:** N-H<sub>3</sub>

**BOILING POINT:** -27 F (-33 C)

**FREEZING POINT:** -108 F (-78 C)

**DECOMPOSITION POINT:** Not available

**VAPOR PRESSURE:** 6658 mmHg @ 21 C

**VAPOR DENSITY (air=1):** 0.5967

**SPECIFIC GRAVITY:** Not applicable

**DENSITY:** 0.7067 g/L @ 25 C

**WATER SOLUBILITY:** 38% @ 20 C

**PH:** 11.6 @ 25 C (1.0 N solution)

**VOLATILITY:** Not applicable

**ODOR THRESHOLD:** 1-5 ppm

**EVAPORATION RATE:** Not applicable

**VISCOSITY:** 0.475 cP @ -69 C

**COEFFICIENT OF WATER/OIL DISTRIBUTION:** Not applicable

**SOLVENT SOLUBILITY:**

**Soluble:** methanol, ethanol, chloroform, ether, organic solvents

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## 10. STABILITY AND REACTIVITY

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**REACTIVITY:** Stable at normal temperatures and pressure.

**CONDITIONS TO AVOID:** Minimize contact with material. Avoid inhalation of material or combustion by-products. Containers may rupture or explode if exposed to heat. Avoid heat, flames, sparks and other sources of ignition.

**INCOMPATIBILITIES:** acids, combustible materials, metals, oxidizing materials, metal salts, halo carbons, halogens, amines, reducing agents, cyanides, bases

**HAZARDOUS DECOMPOSITION:**

Thermal decomposition or combustion products: ammonia, oxides of nitrogen

**POLYMERIZATION:** Will not polymerize.

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## 11. TOXICOLOGICAL INFORMATION

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**AMMONIA, ANHYDROUS:**

**TOXICITY DATA:** 2000 ppm/4 hour(s) inhalation-rat LC50

**LOCAL EFFECTS:**

Corrosive: inhalation, skin, eye, ingestion

**ACUTE TOXICITY LEVEL:**

Toxic: inhalation

**TARGET ORGANS:** respiratory system

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** eye disorders, respiratory disorders, skin disorders and allergies

**TUMORIGENIC DATA:** Available.

**MUTAGENIC DATA:** Available.

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## 12. ECOLOGICAL INFORMATION

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**ECOTOXICITY DATA:**

**FISH TOXICITY:** 1600 ug/L 96 hour(s) LC50 (Mortality) Common jollytail (*Galaxias maculatus*)

0.45 mg/L 96 hours (Static) (Mortality) Coho Salmon, silver salmon (*Oncorhynchus kisutch*);

**INVERTEBRATE TOXICITY:** 7700 ug/L 96 hour(s) LC50 (Immobilization) Ark shell (*Anadara granosa*)

**ALGAL TOXICITY:** 2100-2300 ug/L NR hour(s) (Abundance) Algae, phytoplankton, algal mat (Algae)

**PHYTOTOXICITY:** 16500 ug/L 30 hour(s) (Abundance) Common water-nymph (*Najas guadalupensis*)

**OTHER TOXICITY:** 27200 ug/L 30 hour(s) LETH (Mortality) Frog (*Rana* sp)

**FATE AND TRANSPORT:**

**BIODEGRADATION:** The conversion of ammonia to nitrites/nitrates by bacteria in aquatic systems can reduce the concentration of dissolved oxygen (referred to as nitrogenous oxygen demand).

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## 13. DISPOSAL CONSIDERATIONS

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Dispose in accordance with all applicable regulations.

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## 14. TRANSPORT INFORMATION

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**U.S. DOT 49 CFR 172.101:**

**PROPER SHIPPING NAME:** Ammonia, anhydrous



**ID NUMBER:** UN1005  
**HAZARD CLASS OR DIVISION:** 2.2  
**LABELING REQUIREMENTS:** 2.2  
**QUANTITY LIMITATIONS:**  
**PASSENGER AIRCRAFT OR RAILCAR:** Forbidden  
**CARGO AIRCRAFT ONLY:** Forbidden  
**ADDITIONAL SHIPPING DESCRIPTION:** Toxic-Inhalation Hazard Zone D

**INTERNATIONAL U.S. DOT 49 CFR 172.101:**  
**PROPER SHIPPING NAME:** Ammonia, anhydrous  
**ID NUMBER:** UN1005  
**HAZARD CLASS OR DIVISION:** 2.3  
**LABELING REQUIREMENTS:** 2.3; 8  
**QUANTITY LIMITATIONS:**  
**PASSENGER AIRCRAFT OR RAILCAR:** Forbidden  
**CARGO AIRCRAFT ONLY:** Forbidden  
**ADDITIONAL SHIPPING DESCRIPTION:** Toxic-Inhalation Hazard Zone D



**CANADIAN TRANSPORTATION OF DANGEROUS GOODS:**  
**SHIPPING NAME:** Ammonia, anhydrous  
**UN NUMBER:** UN1005  
**CLASS:** 2.3; 8

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## 15. REGULATORY INFORMATION

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**U.S. REGULATIONS:**  
**CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):**  
**AMMONIA, ANHYDROUS:** 100 LBS RQ

**SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B):**  
**AMMONIA, ANHYDROUS:** 500 LBS TPQ

**SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C):**  
**AMMONIA, ANHYDROUS:** 100 LBS RQ

**SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):**  
**ACUTE:** Yes  
**CHRONIC:** No  
**FIRE:** No  
**REACTIVE:** No  
**SUDDEN RELEASE:** Yes

**SARA TITLE III SECTION 313 (40 CFR 372.65):**

**AMMONIA, ANHYDROUS**

**OSHA PROCESS SAFETY (29 CFR 1910.119):**  
**AMMONIA, ANHYDROUS:** 10000 LBS TQ

**STATE REGULATIONS:**

**California Proposition 65:** Not regulated.

**CANADIAN REGULATIONS:**

**WHMIS CLASSIFICATION:** A, B1, D1A, E

**NATIONAL INVENTORY STATUS:**

**U.S. INVENTORY (TSCA):** Listed on inventory.

**TSCA 12(b) EXPORT NOTIFICATION:** Not listed.

**CANADA INVENTORY (DSL/NDSL):** Not determined.

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**16. OTHER INFORMATION**

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