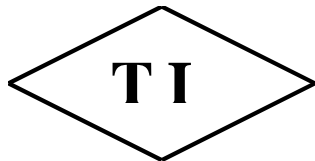


**MATERIAL SAFETY DATA SHEET**  
**ANHYDROUS AMMONIA**



**D I S T R I B U T O R S :**  
**T A N N E R I N D U S T R I E S , I N C .**

**DIVISIONS:**

NATIONAL AMMONIA	NORTHEASTERN AMMONIA
HAMLER INDUSTRIES	BOWER AMMONIA & CHEMICAL

735 Davisville Road, Third Floor, Southampton, PA 18966; 215-322-1238

**CORPORATE EMERGENCY TELEPHONE NUMBER: 800-643-6226 CHEMTREC (CMA) 800-424-9300.**

**DESCRIPTION**

**CHEMICAL NAME:** Ammonia, Anhydrous

**SYNONYMS:** Ammonia

**CHEMICAL FAMILY:** Inorganic

**COMPOSITION:** 99+% Ammonia

**CAS REGISTRY NO.:** 7664-41-7

**FORMULA:** NH<sub>3</sub>

**MOL. WT.:** 17.03(NH<sub>3</sub>)

**STATEMENT OF HEALTH HAZARD**

**HAZARD DESCRIPTION:** Ammonia is an irritant and corrosive to the skin, eyes, respiratory tract and mucous membranes. May cause severe burns to the eyes, lungs and skin. Skin and respiratory related diseases could be 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.

<b><u>EXPOSURE LIMITS:</u></b>	Federal OSHA PEL -	50 ppm	8 hour (TWA)
	NIOSH REL / ACGIH TLV -	25 ppm	10 hour (TWA)
		35 ppm	15 min. (STEL)
	IDLH -	300 ppm	

**EMERGENCY TREATMENT**

**EFFECTS OF OVEREXPOSURE:**

**Eye:** lacrimation, edema, or blindness may occur.

**Skin:** irritation, corrosive burns, blister formation may result. Contact with liquid will freeze the tissue and produce a caustic burn.

**Inhalation:** acute exposure may result in severe irritation of the respiratory tract, bronchospasm, edema or respiratory arrest.

**Ingestion:** Symptoms similar to Inhalation. Lung irritation and pulmonary edema may occur.

**Chronic effects:** None.

Extreme exposure may result in death from spasm, inflammation or edema.

**EMERGENCY AID:**

**Eye:** flush with copious amounts of water for 15 minutes. Eyelids should be held apart and away from eyeball for thorough rinsing.

**Skin:** flush with copious amounts of water for 15 minutes while removing contaminated clothing and shoes. Exercise caution when removing contaminated clothing as it may be frozen to the skin. Do not rub or apply ointment on affected area.

**Inhalation:** remove to fresh air. Administer oxygen or artificial respiration if necessary.

**Ingestion:** if conscious, give large amounts of water to drink or may drink orange juice or citrus to counteract ammonia.

Do **NOT** induce vomiting.

***SEEK IMMEDIATE MEDICAL HELP FOR ALL EXPOSURES!***

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

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## PHYSICAL DATA

BOILING PT: -33°C (-28°F)	FREEZING PT: -78 °C (-108°F)
VAPOR PRESSURE: 10 atm @ 25.7°C	SOLUBILITY IN WATER: 89.9 g/100cc @ 0 °C 7.4 g/100cc @ 100 °C
SPECIFIC GRAVITY (H <sub>2</sub> O=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
APPEARANCE & ODOR: Colorless gas/liquid and pungent odor	VAPOR DENSITY (AIR=1): 0.596 @ 0°C (32°F)

## FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	None
AUTOIGNITION TEMP:	651 °C (1204°F) catalyzed by iron; 850 °C (1562°F) uncatalyzed
FLAMMABLE LIMITS IN AIR:	LEL 15% UEL 28%
EXTINGUISHING MEDIA:	Non-combustible

**SPECIAL FIRE-FIGHTING PROCEDURES:** Must wear protective clothing and a positive pressure SCBA. Stop source if possible. Cool fire exposed containers with water spray. Stay upwind and use water spray to knock down vapor and dilute.

### **UNUSUAL FIRE AND EXPLOSION HAZARDS:**

Outdoors, ammonia is not generally a fire hazard.

Indoors, in confined areas, ammonia may be a fire hazard, especially if oil and other combustible materials are present.

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.

## CHEMICAL REACTIVITY

**STABILITY:** Stable at room temperature. Ammonia will react exothermically with acids and water.

### **CONDITIONS TO AVOID:**

Explosive or violent reactions can occur from mixing ammonia with halogens, strong oxidizers, strong mineral acids, Nitric Acid, Fluorine, Nitrogen Oxide, etc...

Sensitive explosive mixtures can form when mixed with air and hydrocarbons, Ethanol and Silver Nitrate, Chlorine, etc....

Explosive products are formed by the reaction of ammonia with Silver Chloride, Silver Oxide, Bromine, Iodine, Gold, Mercury, Tellurium Halides, etc....

Ammonia is incompatible or has hazardous reactions with Silver, Acetaldehyde, Acrolein, Boron, Halogens, Perchlorate, Chloric Acid, Chloric Monoxide, Chlorites, Nitrogen Tetroxide, Tin, Sulfur, etc....

Ammonia has a corrosive reaction with galvanized surfaces, copper, brass, bronze, aluminum alloys, mercury, gold, and silver. This is a partial list of incompatibilities.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Hydrogen and nitrogen gases above 450°C (842°F).

Decomposition temperatures may be lowered by contact with certain metals.

## SPILL OR LEAK PROCEDURES

**STEPS TO BE TAKEN:** Wear protective clothing and respiratory protection, 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. Contain diluted run-off from drains, sewers, water systems, etc... CAUTION: ADDING WATER DIRECTLY TO LIQUID SPILLS WILL INCREASE VOLATILIZATION OF AMMONIA, THUS INCREASING POSSIBILITY OF EXPOSURE.

# MATERIAL SAFETY DATA SHEET

**WASTE DISPOSAL:** Listed as a hazardous substance under CWA (40 CFR 1164.40 CFR 117.3 Reportable Quantity 100 lbs. OR 45.4kg) Classified as a hazardous waste under RCRA (40 CFR 261.32 Corrosive # D002). Comply with all Federal, State and local regulations. Suitably diluted product may be applied to agricultural land as fertilizer. Keep spill from entering streams, lakes or any water systems.

## SPECIAL PROTECTION AND PROCEDURES

**RESPIRATORY PROTECTION:** MSHA/NIOSH approved respiratory protection that consists of a full face gas mask and canisters effective for anhydrous ammonia that enable use for entry and escape in emergencies. Refer to 29 CFR 1910.134 for requirements and selection. A positive pressure SCBA is required for entry into ammonia atmospheres at or above 300 ppm.

**VENTILATION:** Local exhaust sufficient to keep ammonia gas below Permissible Exposure Limits.

**PROTECTIVE EQUIPMENT:** Splash-proof, chemical safety goggles, rubber gloves and boots should be worn to prevent contact. Face shield can be worn over the goggles as added protection. Respiratory protection and cotton work clothes are recommended. Refer to 29 CFR 1910.132 to 1910.136 for requirements. A positive pressure SCBA is required for entry into ammonia atmospheres at or above 300 ppm.

## SPECIAL PRECAUTIONS

**STORAGE AND HANDLING:** Store in a 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.

**WORK-PLACE PROTECTIVE EQUIPMENT:** Protective equipment should be stored near, but outside of ammonia area. Water for first aid, such as an eyewash station and safety shower, is to be kept available in the immediate vicinity. See 29 CFR 1910.141 for workplace requirements.

**DISPOSAL:** Ammonia is listed as a hazardous substance under FWPCA. It is classified as RCRA hazardous waste due to corrosivity, See WASTE DISPOSAL.

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

## LABELING AND SHIPPING

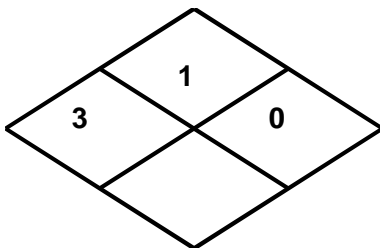
**HAZARD CLASS:** 2.2 (Nonflammable Gas) U.S. Domestic AND 2.3 (Poison Gas) International

**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

**National Fire Protection Assoc. Hazardous Rating:**



**Hazardous Materials Identification System Labels:**

ANHYDROUS AMMONIA	
HEALTH	3
FLAMMABILITY	1
REACTIVITY	0
PERSONAL PROTECTION	H

# MATERIAL SAFETY DATA SHEET

## OTHER REGULATORY REQUIREMENTS

Under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), Section 103, any environmental release of this chemical equal to or over the reportable quantity of 100 lbs. must be reported promptly to the National Response Center, Washington, D.C. (1-800-424-8802).

Any consumer product containing 5% or more ammonia requires a POISON label under FHSA (16 CFR 1500. 129(1)).

The material is subject to the reporting requirements of Section 304, Section 312, Section 313, Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372.

EPCRA extremely hazardous substance, 40 CFR 355, Title III, Section 302 – Ammonia, TPQ 500 lbs.

Regulated under the Clean Air Act 40 CFR 112(r) , TQ 10,000 lbs.

EPA Hazard Categories - Immediate: Yes; Delayed: No; Fire: No; Sudden Release: Yes; Reactive: No.

Toxic Substance Control Act – Ammonia is listed in the TSCA Inventory.

The information, data, and recommendations in this material safety data sheet relate only to the specific material designated herein and do not relate to use in combination with any other material or in any process. The information, data, and recommendations set forth herein are believed by us to be accurate. We make no warranties, either expressed or implied, with respect thereto and assume no liability in connection with any use of such information, data, and recommendations.