

MATERIAL SAFETY DATA SHEET

AMMONIUM HYDROXIDE



DISTRIBUTORS:

TANNER INDUSTRIES, INC.

DIVISIONS:

NATIONAL AMMONIA	NORTHEASTERN AMMONIA
HAMLER INDUSTRIES	BOWER AMMONIA & CHEMICAL

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DESCRIPTION

CHEMICAL NAME: Ammonium Hydroxide Solutions (10% to 30%)

CAS REGISTRY NO: 1336-21-6

SYNONYMS: Aqua Ammonia

CHEMICAL FAMILY: Inorganic nitrogen compounds **FORMULA:** NH_4OH ($\text{NH}_3 + \text{H}_2\text{O}$) **MOL. WT:** 35.05 (NH_4OH)

COMPOSITION: Solutions: Anhydrous Ammonia (10% to 30%); Water (90% to 70%); Density: 16° Baume to 26° Baume

Ammonia, Anhydrous: CAS # 7664-41-7; Water: CAS# 7732-18-5

STATEMENT OF HEALTH HAZARD

HAZARD DESCRIPTION:

Ammonia is an irritant and corrosive to the skin, eyes, respiratory tract and mucous membranes. May cause severe chemical 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.

Not listed as a carcinogen by the International Agency for Research on Cancer.

EXPOSURE LIMITS FOR AMMONIA: Vapor

OSHA	50 ppm,	35 mg / m ³ PEL	8 hour TWA
NIOSH	35 ppm,	27 mg / m ³ STEL 15 minutes	
	25 ppm,	18 mg / m ³ REL	10 hour TWA
	300 ppm,	IDLH	
ACGIH	35 ppm,	27 mg / m ³ STEL 15 minutes	
	25 ppm,	18 mg / m ³ TLV	8 hour TWA

TOXICITY: LD 50 (ammonia) (Oral / Rat) 350 mg / kg

GENERAL PHYSICAL DATA

APPEARANCE AND ODOR: Colorless liquid with a pungent odor.

SOLUBILITY IN WATER: Miscible

SPECIFIC GRAVITY OF VAPOR (air = 1): 0.596 at 32 ° F

WEIGHT (per gallon): 7.46 pounds to 7.71 pounds

EVAPORATION RATE (water = 1): Similar

PH: 13+

See Solution-Specific Physical Data on Page 4

EMERGENCY TREATMENT

EFFECTS OF OVEREXPOSURE:

Eye: Tearing, edema or blindness may occur. Vapors cause irritation. Effects of direct contact may range from irritation and lacrimation to severe injury and blindness.

Skin: Irritation, corrosive burns, blister formation may result. Contact with liquid may produce caustic burns.

Inhalation: Acute exposure to vapor may result in severe irritation of the respiratory tract, bronchospasm, edema or respiratory arrest.

Ingestion: May cause corrosion to the esophagus and stomach with perforation and peritonitis. **Extreme exposure may result in death from spasm, inflammation or edema.**

EMERGENCY TREATMENT (CONT'D)

EMERGENCY AID: Remove patient to uncontaminated area.

MATERIAL SAFETY DATA SHEET

Eye: Immediately flush with copious amounts of tepid water for a minimum of 20 minutes. Eyelids should be held apart and away from eyeball for thorough rinsing.

Skin: Immediately flush with copious amounts of tepid water for a minimum of 20 minutes while removing contaminated clothing, jewelry and shoes. Do not rub or apply topical, occlusive compounds, such as ointments, certain creams, etc., on affected area.

Inhalation: Immediately remove to fresh air. If not breathing, administer artificial respiration. If trained to do so, administer supplemental oxygen, if required.

Ingestion: If conscious, give large amounts of water to drink. May drink orange juice, citrus juice or diluted vinegar (1:4) to counteract ammonia. If unconscious, do not give anything by mouth. **Do not induce vomiting!**

SEEK IMMEDIATE MEDICAL HELP FOR ALL EXPOSURES!

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

FIRE AND EXPLOSION HAZARD DATA

FLASHPOINT: None.

FLAMMABLE LIMITS OF VAPOR IN AIR: LEL/UEL 16% to 25% (listed in the *NIOSH Pocket Guide to Chemical Hazards* 15% to 28%).

EXTINGUISHING MEDIA: Dry Chemical, CO₂, water spray or alcohol-resistant foam if gas flow cannot be stopped.

AUTO IGNITION TEMPERATURE: 1,204°F (If catalyzed). 1,570°F (If un-catalyzed).

SPECIAL FIRE-FIGHTING PROCEDURES:

Must wear protective clothing and a positive pressure SCBA. Stop source if possible. If a portable container (such as a drum, Intermediate Bulk Container [IBC] or trailer) can be moved from the fire area without risk to the individual, do so to prevent the pressure relief valve from discharging or the container from failing. Fight fires using dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Cool fire exposed containers with water spray. Stay upwind when containers are threatened. Use water spray to knock down vapor and dilute.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

When heated, product will give off ammonia vapor, which is a strong irritant to the eye, skin and respiratory tract.

Outdoors, ammonia is not generally a fire hazard. Indoors, in confined areas, ammonia vapors may be a fire hazard, especially if oil and other combustible materials are present. Combustion may form toxic nitrogen oxides.

If relief valves are inoperative, heat-exposed storage containers may become explosion hazards due to over pressurization.

CHEMICAL REACTIVITY

STABILITY:

Stable at room temperature. Ammonium Hydroxide will react exothermically with acids. Will not polymerize. Ammonia vapors are released when heated.

CONDITIONS TO AVOID:

Avoid Ammonium Hydroxide contact with chemicals such as mercury, chlorine, iodine, bromine, silver oxide or hypochlorites; they can form explosive compounds.

Avoid Ammonium Hydroxide contact with chlorine, which forms a chloramine gas, which is a primary skin irritant and sensitizer.

Ammonium Hydroxide has a corrosive reaction with galvanized surfaces, copper, brass, bronze, aluminum alloys, mercury, gold and silver.

HAZARDOUS DECOMPOSITION PRODUCTS:

Ammonia will be liberated if heated. Hydrogen will be released on heating ammonia above 450 °C (842 °F).

MATERIAL SAFETY DATA SHEET

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN:

Stop source of leak if possible, provided it can be done in a safe manner. Leave the area of a spill by moving laterally and upwind. Isolate the affected area. Non-responders should evacuate the area, or shelter in place. Only properly trained and equipped persons should respond to an ammonium hydroxide release. Wear eye, hand and respiratory protection and protective clothing; see PROTECTIVE EQUIPMENT. Stay upwind and use water spray downwind of container to absorb the evolved gas. Contain spill and runoff from entering drains, sewers, and water systems by utilizing methods such as diking, containment, and absorption.

WASTE DISPOSAL:

Listed as hazardous substance under CWA (40 CFR 116.4 and 40 CFR 117.3). Reportable Quantity 1,000 pounds (as NH₄OH). Classified as hazardous waste under RCRA (40 CFR 261.22 Corrosive #D002). Comply with all regulations. Suitably diluted product may be utilized as fertilizer on agricultural land. Keep spill from entering streams, lakes, or any water systems.

SPECIAL PROTECTION AND PROCEDURES

RESPIRATORY PROTECTION:

Respiratory protection approved by NIOSH/MSHA for ammonia must be used when applicable safety and health exposure limits are exceeded. For escape in emergencies, MSHA / NIOSH approved respiratory protection that consists of a full-face gas mask and canisters approved for ammonia is required. Refer to 29 CFR 1910.134 and ANSI: Z88.2 for requirements and selection. A positive pressure SCBA is required for entry into ammonia atmospheres at or above 300 ppm (IDLH).

EYE PROTECTION: Chemical splash goggles should be worn when handling ammonium hydroxide (aqua ammonia). A face shield can be worn over chemical splash goggles as additional protection. Do not wear contact lenses when handling ammonium hydroxide.

VENTILATION:

Local exhaust should be sufficient to keep ammonia vapor to 25 ppm or less.

PROTECTIVE EQUIPMENT:

At a minimum, splash proof, chemical safety goggles, ammonium hydroxide resistant gloves (such as rubber), and ammonium hydroxide-impervious clothing should be worn to prevent contact during normal loading, unloading and transfer operations and handling small spills. Face shield and boots can be worn as additional protection.

Respiratory protection approved by NIOSH/MSHA for ammonia must be used when applicable safety and health exposure limits are exceeded. For a hazardous material release response, Level A and/or Level B ensemble including positive-pressure SCBA should be used. A positive pressure SCBA is required for entry into ammonia atmospheres at or above 300 ppm (IDLH). Refer to 29 CFR 1910.132 through 1910.138 for personal protective equipment requirements.

SPECIAL PRECAUTIONS

STORAGE AND HANDLING:

Only trained persons should handle ammonium hydroxide. Store in cool, dry and well-ventilated areas, with containers tightly closed. Keep out of direct sunlight and away from heat sources. Do not use any non-ferrous metals such as copper, brass, bronze, aluminum, tin, zinc or galvanized metals. Protect containers from physical damage. Closed storage tanks should be provided with safety relief valves and vacuum breakers as necessary.

WORK-PLACE PROTECTIVE EQUIPMENT:

Protective equipment should be stored near, but outside of ammonium hydroxide area. Water for first aid, such as an eyewash station and safety shower should be kept available in the immediate vicinity.

DISPOSAL:

See WASTE DISPOSAL. Classified as RCRA Hazardous Waste due to corrosivity with designation D002, if disposed of in original form.

MATERIAL SAFETY DATA SHEET

LABELING AND SHIPPING

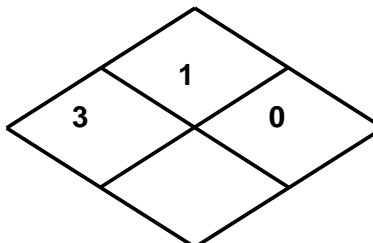
HAZARD CLASS: 8 (Corrosive Material)

PROPER SHIPPING DESCRIPTION: Ammonia Solutions, 8, UN2672, PG III, RQ

PLACARD: Corrosive

IDENTIFICATION NUMBER: UN 2672

National Fire Protection Assoc. Hazardous Rating:



Hazardous Materials Identification System Labels:

AMMONIUM HYDROXIDE	
HEALTH	3
FLAMMABILITY	1
REACTIVITY	0
PERSONAL PROTECTION	H

SOLUTION-SPECIFIC PHYSICAL DATA

	20.5° Baume	25° Baume	26° Baume
AMMONIA PERCENTAGE:	18.5% to 19.5%	26.5% to 27.5%	29.4% to 30.0%
WATER PERCENTAGE:	81.5% to 80.5%	73.5% to 72.5%	70.6 % to 70.0%
SPECIFIC GRAVITY (water = 1):	0.9309 to 0.9278 at 60°F	0.9060 to 0.9030 at 60°F	0.8974 to 0.8957 at 60°F
BOILING POINT:	124°F at 14.7 psia	88°F at 14.7 psia	84.9°F at 14.7 psia
VAPOR PRESSURE:	3.9 psia at 60°F	6.9 psia at 60°F	9.1 psia at 60°F
APPROXIMATE FREEZING POINT:	-32°F	-89°F	-110°F

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 1,000 pounds (as NH₄OH) must be reported promptly to the National Response Center, Washington, D.C. (1-800-424-8802).

The material is subject to the reporting requirements of Section 304, Section 312 and Section 313, Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR 372. Under Section 313, as of June 30, 1995, this material is reportable with the following qualifications: 10% of total aqueous ammonia is reportable as Ammonia (CAS #: 7664-41-7) under this listing.

Toxic Substances Control Act (TSCA): This material and its components are listed in the TSCA Inventory.

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

Clean Air Act – Section 112(r): Material is listed under EPA's Risk Management Program (RMP), 40 CFR Part 68 at concentrations greater than 20% and storage/process amounts greater than the Threshold Quantity (TQ) of 20,000 pounds of contained Ammonia (CAS #: 7664-41-7).

DISCLAIMER

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.