

1. IDENTIFICATION

Product identifier	Ammonia, Anhydrous
Synonyms	Ammonia, 82-00-0, NH ₃
Recommended use	Not available
Recommended restrictions	Use in accordance with supplier's recommendations
Company Name	CALAMCO 1776 W. March Lane Suite 420 Stockton, California 95207
	Corporate Office (209) 982-1000
	24 Hour / Emergency Contact (209) 466-9957
Emergency	Call CHEMTREC day or night 1-800-424-9300

2. HAZARD(S) IDENTIFICATION

Physical Hazards

Flammable gases	Category 2
Gases under pressure	Liquefied gas
Health hazards	
Acute toxicity, oral	Category 4
Acute toxicity, inhalation	Category 3
Skin corrosion/irritation	Category 1B
Serious eye damage/eye irritation	Category 1
OSHA defined hazards	Not classified

Label elements



Signal word	Danger
Hazard statement	Non-Flammable gas. Contains gas under pressure; container may explode if heated. Harmful if swallowed. Toxic if inhaled. Causes severe skin burns and eye damage.

Precautionary Statement

Prevention	Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not breathe gas/mist/vapors/spray. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling.
Response	Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. If swallowed: Rinse mouth. Do NOT induce vomiting. Call a poison center/doctor if you feel unwell. If on skin (or hair): Immediately take off all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person

Storage	to fresh air and keep comfortable. Immediately call a poison center/doctor. If in eyes: Rinse cautiously with water for thirty minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Hazards(s) not otherwise classified (HNOC)	Protect from sunlight. Store in a well-ventilated place. Keep container lightly closed.
Environmental hazards	Not classified.
	Hazardous to the aquatic environment. Category 1 hazard.

3. COMPOSITION / INFORMATION INGREDIENTS

Chemical name	Common name and synonyms	CAS number	%
Ammonia		7664-41-7	99-99.8
Water		7732-18-5	0.2-1

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. This Safety Data Sheet is not a guarantee of product specification or NPK value(s).

4. FIRST-AID MEASURES

Inhalation	Move injured person into fresh air and keep person calm under observation. For breathing difficulties, oxygen may be necessary. If breathing stops, provide artificial respiration. Get medical attention immediately.
Skin contact	Immediately flush with plenty of water for at least 30 minutes while removing contaminated clothing and shoes. If frostbite occurs, immerse affected area in warm water (not exceeding 105°F/41°C). Keep immersed for 20 to 40 minutes. Get medical attention immediately. Chemical burns must be treated by a physician.
Eye contact	Flush thoroughly with water for at least 30 minutes. Get immediate medical assistance. If medical assistance is not immediately available, continue to flush. If frostbite occurs, immediately flush eyes with plenty of warm water (not exceeding 105°F/41°C) for at least 30 minutes. If easy to do, remove contact lenses.
Ingestion	Call a physician or poison control center immediately. DO NOT induce vomiting. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head lower than the hips to help prevent aspiration. This material is a gas under normal atmospheric conditions and ingestion is unlikely.
Most important symptoms/effects, acute and delayed	Contact with this material will cause chemical burns to the skin, eyes and mucous membranes. Cough, shortness of breath, headache, nausea, vomiting.
Indication of immediate medical attention and special treatment needed	Signs and symptoms of Central Nervous System (CNS) depression, confusion and convulsions should be considered in the assessment and treatment of victims of exposure. Be aware that symptoms of lung edema (shortness of breath) may develop up to 24 hours after exposure.
General information	Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	Carbon dioxide (CO2). Water. Dry powder.
Unsuitable extinguishing media	Not applicable

Specific hazards arising from the chemical	Non-Flammable gas - Contents under pressure. Pressurized container may explode when exposed to heat or flame.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting; follow the general fire precautions indicated in the workplace. Chemical protective clothing is needed if contact with vapor or liquid is anticipated.
Fire-fighting equipment /instructions	Evacuate area. Cool containers exposed to flames with water until well after the fire is out. Do not get water inside container. Remove pressurized gas cylinders from the immediate vicinity. Close the valve if no risk is involved. Do not extinguish a leaking gas fire unless leak can be stopped. If leak cannot be stopped and no danger to surrounding area allow the fire to burn out. Fight fire from a protected location.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	If leakage cannot be stopped, evacuate area. Avoid contact with cold gas. Avoid inhalation and contact with skin and eyes. Wear appropriate personal protective equipment. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Remove sources of ignition. Beware of the explosion danger. Ventilate well, stop flow of gas or liquid if possible. Allow gas to dissipate. Vapor can be controlled using a water fog. Use water spray to reduce vapors or divert vapor cloud drift. Do not put water directly on leak, spill area or inside container. Collect runoff for disposal as potential hazardous waste. Stop leak if you can do so without risk. Prevent entry into waterways, sewer, basements or confined areas.

7. HANDLING AND STORAGE

Precautions for safe handling	Avoid inhalation and contact with skin and eyes. Do not get in eyes, on skin, on clothing. Do not breathe gas. Use only with adequate ventilation. Open valve slowly. Ensure that cylinders are not exposed to heat. When using, do not eat, drink or smoke. Do not pressurize, cut, weld, braze, solder, drill, grind or expose empty containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Compressed gas storage. Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50°C/122 °F. Store in a cool and well-ventilated place. Secure cylinders in an upright position at all times, close all valves when not in use. Secure cylinders from falling or being knocked over.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Ammonia (CAS 7664-41-7)	PEL	35 mg/m ³ 50ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
Ammonia (CAS 7664-41-7)	STEL	35 ppm
	TWA	25 ppm

US NIOSH Pocket Guide to Chemical Hazards: Recommended exposure limit (REL)

Components	Type	Value
Ammonia (CAS 7664-41-7)	TWA	18 mg/m ³ 25 ppm

US NIOSH Pocket Guide to Chemical Hazards: Short Term Exposure Limit (STEL)

Components	Type	Value
Ammonia (CAS 7664-41-7)	STEL	27 mg/m ³ 35 ppm

Biological limit values	No biological exposure limits noted for the ingredient(s).
Exposure guidelines	Follow standard monitoring procedures.
Appropriate engineering controls	Provide adequate general and local exhaust ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation. If engineering measures are not sufficient to maintain concentrations below the Permissible Exposure Limit (PEL), suitable respiratory protection must be worn. An eye wash and safety shower must be available in the immediate work area.

Individual Protection Measures, Such As Personal Protective Equipment

Eye/face protection	Wear approved, tight fitting indirect vented or non-vented safety goggles where splashing is probable. Use of full face respirator with a canister or cartridge approved for NH ₃ is best practice.
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Skin Protection

Hand protection	Wear appropriate chemical resistant gloves. Thermally protective gloves are recommended. Suitable gloves can be recommended by the glove supplier.
Other	Wear appropriate clothing to prevent any possibility of skin contact.

Respiratory protection	If engineering controls do not maintain concentrations below recommended exposure limits an approved respirator must be worn. Selection and use of respiratory protective equipment should be in accordance with OSHA General Industry Standard 29 CFR 1910.134, Respirator type: Chemical respirator with specific cartridge and full facepiece providing protection against the compound of concern.
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Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
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General hygiene considerations	Handle in accordance with good industrial hygiene and safety practice. When using, do not eat, drink or smoke. Wash hands after handling.
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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Gas compressed, liquefied.
Form	Compressed liquefied gas.
Color	Colorless.
Odor	Pungent, Irritating.
Odor threshold	5-50 ppm
pH	11.7
Freezing point	-107°F (-77.2°C) (20% solution)
Initial boiling point	--28.12°F (-33.4°C)

Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid,gas)	Not available.
<u>Upper/lower Flammability Or Explosive Limits</u>	
Flammability limit – lower (%)	16%
Flammability limit – upper (%)	25%
Explosive limit – lower (%)	Not available.
Explosive limit – upper (%)	Not available.
Vapor pressure	124 psi @ 20 °C (68 °F)
Vapor density	0.589 @ 0 °C (Air = 1)
Relative density	0.633 @ 4 °C (Water=1)
Solubility(ies)	34 % @ 20 °C
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	1203.8 °F (651 °C)
Decomposition temperature	Not available.
Viscosity	0.27 cP @ -34 °C
<u>Other Information</u>	
Bulk density	620 kg/m ³ @ 16 °C
Molecular formula	N-H3
Molecular weight	17.03 g/mol
Percent volatile	100%

10. STABILITY AND REACTIVITY

Reactivity	Contact with acids will cause evolution of heat.
Chemical stability	Stable under normal temperature conditions and recommended use.
Possibility of hazardous reactions	May react with evolution of heat on contact with water. Hazardous polymerization does not occur.
Conditions to avoid	Heat, sparks, flames, elevated temperatures. Heat may cause the containers to explode. May form explosive mixtures with air. Contact with acids will cause evolution of heat.
Incompatible materials	Acids. Halogens. Oxidizing agents. Mercury, silver oxide or hypochlorite can form explosive compounds.
Hazardous decomposition products	Upon decomposition, this product may yield poisonous gases including oxides of nitrogen, hydrogen gas and ammonia. Decomposition temperature may be lowered to 575 °F (302 °C) by contact with certain metals, such as nickel.

11. TOXICOLOGICAL INFORMATION

Information On Likely Routes Of Exposure

Ingestion	This material is a gas under normal atmospheric conditions and ingestion is unlikely.
Inhalation	Toxic by inhalation.

Skin contact	Causes skin chemical burns.
Eye contact	Causes serious eye damage.
Symptoms related to the physical, chemical and toxicological characteristics	Contact with this material will cause chemical burns to the skin, eyes and mucous membranes. Cough, shortness of breath, headache, nausea, vomiting.
<u>Information On Toxicological Effects</u>	
Acute toxicity	Toxic if inhaled. Harmful if swallowed. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.
Skin corrosion/irritation	Causes severe skin chemical burns. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.
Serious eye damage/eye irritation	Causes severe eye damage. Direct contact with liquefied gas may cause eye damage from frostbite.
Respiratory sensitization	No data available.
Skin sensitization	No data available.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
Reproductive toxicity	No data available.
Specific target organ toxicity- single exposure	No data available.
Specific target organ toxicity – repeated exposure	No data available.
Aspiration hazard	Not available.
Further information	Be aware that symptoms of lung edema (shortness of breath) may develop up to 24 hours after exposure.

12. ECOLOGICAL INFORMATION

Ecotoxicity In aqueous solution: very toxic to aquatic organisms.

Components	Species	Test Results
Ammonia (CAS 7664-41-7)		
Aquatic		
Fish	LC50 Chinook salmon (Oncorhynchus tshawytscha)	0.43 – 0.47 mg/l, 96 hours

Persistence and degradability	Not relevant.
Bioaccumulative potential	Not relevant.
Mobility in soil	Not available.
Mobility in general	The gas will disperse in the air.
Other adverse effects	Not relevant.

13. DISPOSAL CONSIDERATIONS

Disposal instructions	The packaging should be collected for reuse. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.
Hazardous waste code	D002: Waste Corrosive material [pH <=2 or >=12.5, or corrosive to steel]
Waste from residues / unused products	Dispose in accordance with all applicable regulations.

Contaminated packaging

Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. TRANSPORT INFORMATION

DOT

UN number UN1005
UN proper shipping name Ammonia, Anhydrous
Transport hazard class(es) 2.2
Subsidiary class(es) -
Packing group -

Environmental Hazards

Marine pollutant Yes
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Special provisions 13, T50
Packaging exceptions None
Packaging non bulk 304
Packaging bulk 314, 315

IATA

UN number UN1005
UN Proper shipping name AMMONIA ANHYDROUS
Transport hazard class(es) Forbidden
Subsidiary class(es) -
Packaging group -
Environmental hazards -
Labels required -
ERG Code -
Special precautions for user Passenger and Cargo Aircraft Quantity limitation: Forbidden.

IMDG

UN number UN1005
UN proper shipping name AMMONIA ANHYDROUS
Transport hazard class(es) 2.3
Subsidiary class(es) 8
Packaging group -
Environmental Hazards
Marine pollutant Yes
Labels required 2.3, 8
EmS F-C, S-U
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. REGULATORY INFORMATION

US Federal Regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D) Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050) Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4) Ammonia (CAS 7664-41-7) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard Categories

Immediate Hazard Yes

Delayed Hazard Yes

Fire Hazard Yes

Pressure Hazard Yes

Reactivity Hazard No

SARA 302 Extremely hazardous substance Yes

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Ammonia	7664-41-7	99-99.8

Other Federal Regulations

Clean Air Act (CAA) Section 112 Not regulated

Hazardous Air Pollutants (HAPs) List
Clean Air Act (CAA) Section 112(r) Ammonia (CAS 7664-41-7)

Accidental Release Prevention (40 CFR 68.130)

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130) Hazardous substance

Safe Drinking Water Act (SDWA) Not regulated

Food and Drug Administration (FDA) Not regulated.

US State Regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US, California Proposition 65

**US – California Proposition 65 –
Carcinogens & Reproductive Toxicity
(CRT): Listed substance**

Not listed.

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Issue date 01 January 2014
Revision date 15 February 2018
Version # 01
NFPA Ratings



References

ACGIH
 EPA: Acquire database
 NLM: Hazardous Substances Data Base
 US. IARC Monographs on Occupational Exposures to Chemical Agents

Disclaimer

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