SAFETY DATA SHEET

1. Identification

Product identifier	**Anhydrous Ammonia, Liquified**
Other means of identification	
SDS number	600 - GHS
Synonyms	Anhydrous Ammonia, Liquid Ammonia, Nitromite, Nitro-Sil, Ammonia (liquefied) See section 16 for complete information.
Recommended use	This product is intended for use as a refinery feedstock, fuel or for use in engineered processes. Use in other applications may result in higher exposures and require additional controls, such as local exhaust ventilation and personal protective equipment.
Recommended restrictions	None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer/Supplier	Valero Marketing & Supply Company and Affiliates One Valero Way San Antonio, TX 78269-6000
General Assistance	210-345-4593
E-Mail	CorpHSE@valero.com
Contact Person	Industrial Hygienist
Emergency Telephone	24 Hour Emergency 866-565-5220 1-800-424-9300 (CHEMTREC USA)

2. Hazard(s) identification

Physical hazards	Flammable gases	Category 2
	Gases under pressure	Liquefied gas
Health hazards	Acute toxicity, inhalation	Category 3
	Skin corrosion/irritation	Category 1B
	Serious eye damage/eye irritation	Category 1
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 1

OSHA defined hazards Not classified.

Label elements

Signal word	Danger
Hazard statement	Flammable gas. Contains gas under pressure; may explode if heated. 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. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area.
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. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If inhaled: Remove person to fresh air and keep comfortable for breathing. Wash contaminated clothing before reuse.
Storage	Protect from sunlight. Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Ammonia, anhydrous	7664-41-7	>99.5

4. First-aid measures

Inhalation Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Call a physician or poison control center immediately.

Skin contact Wash frost-bitten areas with plenty of water. Do not remove clothing. Get medical attention immediately.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

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.

Most important symptoms/effects, acute and delayed Symptoms include itching, burning, redness, and tearing of eyes. Contact with liquefied gas may cause frostbite. Be aware that symptoms of lung edema (shortness of breath) may develop up to 24 hours after exposure.

Indication of immediate medical attention and special treatment needed Treat symptomatically.

5. Fire-fighting measures

Suitable extinguishing media Dry chemical, CO2, water spray, fog, or foam.

Unsuitable extinguishing media None known.

Specific hazards arising from the chemical Heat may cause the containers to explode.

Special protective equipment and precautions for firefighters Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.

Fire-fighting equipment/instructions Self-contained breathing apparatus, operated in positive pressure mode and full protective clothing must be worn in case of fire.

Move container from fire area if it can be done without risk.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Evacuate the area promptly. No action shall be taken involving any personal risk or without suitable training. Keep unnecessary personnel away.

Ensure adequate ventilation. In case of inadequate ventilation, use respiratory protection. Wear appropriate personal protective equipment (See Section 8).

Methods and materials for containment and cleaning up Ventilate well, stop flow of gas or liquid if possible. Immediately contact emergency personnel.

Environmental precautions Should not be released into the environment. Prevent further leakage or spillage if safe to do so. Prevent from entering into soil, ditches, sanitary sewers, waterways and/or groundwater.

7. Handling and storage

Precautions for safe handling Wear appropriate personal protective equipment (See Section 8). Eating, drinking, and smoking should be prohibited in areas where this material is handled, stored, and processed. Do not breathe gas. Do not get in eyes, on skin, on clothing. Use only with adequate ventilation.

Conditions for safe storage, including any incompatibilities Store in accordance with local, regional, national, and international regulations. Secure cylinders in an upright position at all times, close all valves when not in use. Store in a cool, dry, well-ventilated place. Keep container tightly closed and sealed until ready for use. Protect cylinders from damage.

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, anhydrous (CAS 7664-41-7)	PEL	35 mg/m3
		50 ppm

US. ACGIH Threshold Limit Values

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

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Ammonia, anhydrous (CAS 7664-41-7)	STEL	27 mg/m3
		35 ppm
	TWA	18 mg/m3
		25 ppm

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. The engineering controls also need to keep gas, vapor, or dust concentrations below any lower explosive limits.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear approved safety glasses or goggles.

Skin protection

Hand protection Wear appropriate chemical resistant gloves.

Other Wear protective clothing appropriate for the risk of exposure.

Respiratory protection If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Do not eat, drink or smoke when using the product. Wash thoroughly after handling. Provide eyewash station and safety shower. Handle in accordance with good industrial hygiene and safety practices.

9. Physical and chemical properties

Appearance Colorless gas or cold, mobile liquid.

Physical state Gas.

Form Gas or liquid.

Color Colorless

Odor Penetrating odor.

Odor threshold Not available.

pH Not available.

Melting point/freezing point -107.99 °F (-77.77 °C)

Initial boiling point and boiling range -43.96 - 11.12 °F (-42.2 - -11.6 °C)

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) 15 %

Flammability limit - upper (%)	28 %
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	0.6
Relative density	0.68
Solubility(ies)	
Solubility (water)	Partially soluble.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	1204 °F (651.11 °C)
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Molecular formula	NH3
Molecular weight	17.04 g/mol

10. Stability and reactivity

Reactivity	Not available.
Chemical stability	Stable under normal temperature conditions and recommended use.
Possibility of hazardous reactions	Polymerization will not occur.
Conditions to avoid	In a fire or if heated, a pressure increase will occur and the container may burst or explode.
Incompatible materials	Oxidizing agents. Reducing agents. Acids.
Hazardous decomposition products	Nitrous gases.

11. Toxicological information

Information on likely routes of exposure

Ingestion	Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract.
Inhalation	Toxic if inhaled. Causes respiratory tract burns.
Skin contact	Causes severe skin burns.
Eye contact	Causes serious eye damage.
Symptoms related to the physical, chemical and toxicological characteristics	Symptoms include itching, burning, redness, and tearing of eyes. Contact with liquefied gas may cause frostbite. Be aware that symptoms of lung edema (shortness of breath) may develop up to 24 hours after exposure.

Information on toxicological effects

Acute toxicity	Toxic if inhaled. Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").

Components	**Species**	**Test Results**
Ammonia, anhydrous (CAS 7664-41-7)		
Acute		
Inhalation		
LC50	Rat	2000 ppm, 4 Hours

Skin corrosion/irritation	Causes severe skin burns.
Serious eye damage/eye irritation	Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization	Based on available data, the classification criteria are not met.
Skin sensitization	Based on available data, the classification criteria are not met.

Germ cell mutagenicity	Based on available data, the classification criteria are not met.
Carcinogenicity	Based on available data, the classification criteria are not met.
Reproductive toxicity	Based on available data, the classification criteria are not met.
Specific target organ toxicity - single exposure	Based on available data, the classification criteria are not met.
Specific target organ toxicity - repeated exposure	Based on available data, the classification criteria are not met.
Aspiration hazard	Based on available data, the classification criteria are not met.

12. Ecological information

Ecotoxicity Very toxic to aquatic organisms.

Components		Species	Test Results
Ammonia, anhydrous (CAS 7664-41-7)			
Aquatic			
Fish	LC50	Silver carp (Hypophthalmichthys molitrix)	0.38 mg/l, 96 hours
Acute			
Algae	EC50	Chlorella vulgaris	< 2700 mg/l, 432 hours
Crustacea	EC50	Daphnia	25.4 mg/l, 48 hours
	NOEC	Daphnia	< 0.79 mg/l
Fish	LC50	Rainbow Trout	0.16 - 1.1 mg/l, 96 Hours
	NOEC	Rainbow Trout	< 1.2 mg/l
Chronic			
Crustacea		Daphnia	0.79 mg/l, 4 days
Fish		Ictalurus punctatus	0.048 mg/l, 31 days

Persistence and degradability	Not available.
Bioaccumulative potential	Not available.
Mobility in soil	Not available.
Other adverse effects	Not available.

13. Disposal considerations

Disposal instructions	Dispose in accordance with all applicable regulations. Empty containers may contain product residues. Do not puncture or incinerate even when empty. This material and/or its container must be disposed of as hazardous waste. Return the empty cylinder to the supplier.
Hazardous waste code	Waste codes should be assigned by the user based on the application for which the product was used.
Waste from residues / unused products	Dispose of in accordance with local regulations.
Contaminated packaging	Offer rinsed packaging material to local recycling facilities.

14. Transport information

DOT

UN number	UN1005
UN proper shipping name	Ammonia, anhydrous
Transport hazard class(es)	
Class	2.3
Subsidiary risk	8
Packing group	Not applicable.
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

DOT BULK

BULK

UN number	UN1005

UN proper shipping name Ammonia, anhydrous

Transport hazard class(es)

Class 2.2

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)

Class 2.3

Subsidiary risk 8

Label(s) 2.3, 8

Packing group Not applicable.

Environmental hazards Yes

ERG Code 2CP

Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number UN1005

UN proper shipping name AMMONIA, ANHYDROUS

Transport hazard class(es)

Class 2.3

Subsidiary risk 8

Label(s) 2.3, 8

Packing group Not applicable.

Environmental hazards

Marine pollutant Yes

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. This product is a compressed or liquefied gas and when transported in bulk is covered under IGC code.

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, anhydrous (CAS 7664-41-7) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - No
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Chemical name	CAS number	Reportable quantity	Threshold planning quantity	Threshold planning quantity, lower value	Threshold planning quantity, upper value
Ammonia, anhydrous	7664-41-7	100	500 lbs		

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Ammonia, anhydrous	7664-41-7	>99.5

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Ammonia, anhydrous (CAS 7664-41-7)

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

Safe Drinking Water Act (SDWA) 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. Massachusetts RTK - Substance List

Ammonia, anhydrous (CAS 7664-41-7)

US. New Jersey Worker and Community Right-to-Know Act

Ammonia, anhydrous (CAS 7664-41-7)

US. Pennsylvania Worker and Community Right-to-Know Law

Ammonia, anhydrous (CAS 7664-41-7)

US. Rhode Island RTK

Ammonia, anhydrous (CAS 7664-41-7)

US. California Proposition 65

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

Not listed.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

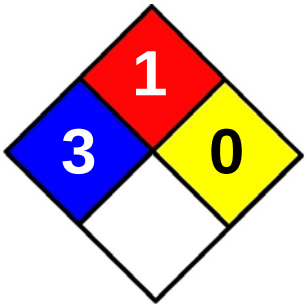
Issue date 28-May-2014

Revision date -

Version # 01

Further information HMIS® is a registered trade and service mark of the NPCA.

NFPA Ratings



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