

SAFETY DATA SHEET

1. Identification

GHS product identifier Ammonia, anhydrous
MSDS number KNC_NH3_GHS_EN
Version # 01
Issue date 01-09-2013
Revision date -
Supersedes date -
Chemical description Inorganic, alkaline gas or liquid
CAS # 7664-41-7
Recommended use Not available.
Recommended Restrictions Use in accordance with supplier's recommendations.
Synonym(s) Ammonia, 82-00-0, NH3
Manufacturer
Company Name Koch Nitrogen Company, LLC
 4111 E 37th Street North
 PO Box 2219
 Wichita, KS, 67201-2219
 kochmsds@kochind.com
 1-316-828-7672
Emergency For Chemical Emergency
 Call CHEMTREC day or night
 1.800.424.9300
 Outside USA/Canada
 1.703.527.3887
 (collect calls accepted)

2. Hazards identification

GHS classification

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
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 1

GHS label elements

Signal word Danger



Hazard statement Flammable gas. Contains gas under pressure; may explode if heated. Harmful if swallowed. Toxic if inhaled. Causes severe skin burns and eye damage. Very toxic to aquatic life.

Precautionary statement

Prevention Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not breathe dust/fume/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. Avoid release to the environment.

Response	Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth. IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician. Collect spillage.
Storage	Protect from sunlight. Store in a well-ventilated place. Store locked up. Keep container tightly closed.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Specific hazards	Inhalation may cause lung congestion, sore throat, cough, difficulty breathing, chest pain, nausea, vomiting, headache and nerve damage.

3. Composition/information on ingredients

Hazardous components	CAS #	Percent
Ammonia, anhydrous	7664-41-7	99-99.8
Non-hazardous components	CAS #	Percent
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). NPK content is on specified sales orders, customer invoices, or product specification sheets obtained from supplier.

4. First aid measures

First aid procedures

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	Immediately flush with plenty of water for at least 15 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	Flush thoroughly with water for at least 15 minutes. Get immediate medical assistance. If medical assistance is not immediately available, flush an additional 15 minutes. If frostbite occurs, immediately flush eyes with plenty of warm water (not exceeding 105°F/41°C) for at least 15 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 and effects, both acute and delayed Contact with this material will cause burns to the skin, eyes and mucous membranes. Cough, shortness of breath, headache, nausea, vomiting.

Notes to physician Signs and symptoms of 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 advice 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 Flammable gas - may cause flash fire. Contents under pressure. Pressurized container may explode when exposed to heat or flame.

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.

Protection of fire-fighters

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. 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

If leakage cannot be stopped, evacuate area. Avoid contact with cold gas. Avoid inhalation and contact with skin and eyes. In aqueous solution: Avoid contact with spilled material. Wear appropriate personal protective equipment. See Section 8 of the MSDS for Personal Protective Equipment.

Environmental precautions

In aqueous solution: Avoid release to the environment. Do not contaminate water.

Methods for containment

Stop leak if you can do so without risk. Use water spray to reduce vapors or divert vapor cloud drift. Do not put water directly on leak, spill area or inside container. In aqueous solution: Collect runoff for disposal as potential hazardous waste. Prevent entry into waterways, sewer, basements or confined areas.

Methods for cleaning up

Ventilate well, stop flow of gas or liquid if possible. Allow gas to evaporate. Remove sources of ignition. Beware of the explosion danger. Vapor can be controlled using a water fog. In aqueous solution: Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.

7. Handling and storage

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.

Storage

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

Control parameters

US. ACGIH Threshold Limit Values

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

Recommended monitoring procedures

Follow standard monitoring procedures.

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 of dust particulates below the Occupational Exposure Limit (OEL), suitable respiratory protection must be worn. An eye wash and safety shower must be available in the immediate work area.

Personal protective equipment

Eye/face protection

Wear approved, tight fitting safety goggles where splashing is probable. Gas-proof goggles are recommended. Use of full face respirator with a canister or cartridge approved for NH₃ is best practice.

Skin protection

Wear appropriate chemical resistant clothing to prevent any possibility of skin contact.

Respiratory protection

Chemical respirator with specific cartridge and full facepiece providing protection against the compound of concern. Seek advice from supervisor on the company's respiratory protection standards.

Hand protection

Thermally protective gloves are recommended. Suitable gloves can be recommended by the glove supplier.

9. Physical and chemical properties

Appearance

Physical state

Gas compressed, liquefied.

Color

Colorless.

Form	Compressed liquefied gas.
Odor	Pungent. Irritating.
Odor threshold	5 ppm
pH	11.7 approximate (1% aqueous solution)
Melting point/Freezing point	-30.8 °F (-34.9 °C) (20% solution)
Boiling point	-28.1 °F (-33.4 °C)
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Flammability limits in air, lower, % by volume	16 %
Flammability limits in air, upper, % by volume	25 %
Vapor pressure	124 psi @ 20 °C (68 °F)
Vapor density	0.6 @ 0 °C (Air = 1)
Relative density	0.633 @ 4 °C (Water=1)
Solubility (H2O)	34 % @ 20 °C
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	1203.8 °F (651 °C)
Decomposition temperature	Not available.
Viscosity	0.266 cP @ -34 °C
Bulk density	620 kg/m ³ @ 16 °C
Percent volatile	100 %
Molecular weight	17.03 g/mol
Molecular formula	N-H3

10. Stability and reactivity

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

Toxicological data

Product	Species	Test Results
Ammonia, anhydrous (CAS 7664-41-7)		
Acute		
<i>Inhalation</i>		
LC50	Rat	3796 - 6586 ppm, 1 Hours 2961 - 5137 mg/m ³ , 1 Hours
<i>Oral</i>		
LC50	Rat	350 mg/kg
Routes of exposure	Inhalation. Skin contact. Eye contact.	
Toxicological information	Occupational exposure to the substance or mixture may cause adverse effects.	
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 burns. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.	
Serious eye damage/irritation	Causes severe eye damage. Direct contact with liquefied gas may cause eye damage from frostbite. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.	

Respiratory sensitizer	No data available.
Skin sensitization	No data available.
Mutagenicity	No data available.
Carcinogenicity	Not classified.
Reproductive toxicity	No data available.
Specific target organ toxicity - single exposure	No data available.
Specific target organ toxicity - repeated exposure	No data available.
Local effects	Causes severe skin burns and eye damage.
Chronic effects	Long term exposures may affect liver, kidneys, and central nervous system.
Neurological effects	May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue) and/or damage.
Symptoms	Contact with this material will cause burns to the skin, eyes and mucous membranes. Cough, shortness of breath, headache, nausea, vomiting.
Other information	Be aware that symptoms of lung edema (shortness of breath) may develop up to 24 hours after exposure.

12. Ecological information

Ecotoxicological data

Components	Species	Test Results
Ammonia, anhydrous (CAS 7664-41-7)		
Aquatic		
Fish	LC50 Carp (Hypophthalmichthys nobilis)	0.3 mg/l, 96 hours
Ecotoxicity	In aqueous solution: Very toxic to aquatic organisms.	
Persistence / degradability	Not relevant.	
Bioaccumulation	Not relevant.	
Aquatic toxicity	Very toxic to aquatic organisms.	
Mobility	The Gas will disperse in the air.	
Other adverse effects	The product contains a substance which has a photochemical ozone creation potential.	

13. Disposal considerations

Disposal methods	The packaging should be collected for reuse. Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

ADR

UN number	UN1005
Proper shipping name	AMMONIA, ANHYDROUS
Hazard class	2.3
Environmental hazards	
Marine pollutant	Yes
Labels required	2.3 +8
Special precautions	Read safety instructions, SDS and emergency procedures before handling.

IATA

UN number	UN1005
Proper shipping name	Ammonia, anhydrous
Hazard class	2.3
Subsidiary hazard class	8
Special precautions	Read safety instructions, MSDS and emergency procedures before handling.

IMDG

UN number	UN1005
Proper shipping name	AMMONIA, ANHYDROUS
Hazard class	2.3
Subsidiary hazard class	8

Environmental hazards	
Marine pollutant	Yes
EmS	F-C, S-U
Special precautions	Read safety instructions, MSDS and emergency procedures before handling.
RID	
UN number	UN1005
Proper shipping name	AMMONIA, ANHYDROUS
Hazard class	2.3
Environmental hazards	
Marine pollutant	Yes
Labels required	2.3+8 (+13)
Special precautions	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

Inventory status

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)

16. Other information

Disclaimer

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Safety Data Sheet (SDS) and was prepared pursuant to Government regulation(s) that identify specific types of information to be provided. This SDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. Additional information may be needed to evaluate other uses of the product, including use of the product in combination with any materials or in any processes other than those specifically referenced. Information provided herein with respect to any hazards that may be associated with the product is not meant to suggest that use of the product in a given application will necessarily result in any exposure or risk to workers or the general public. No responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product. Purchasers and users assume all risk of use, storage and handling of the product in compliance with applicable federal, state and local laws and regulations. Purchasers and users of the product specifically should advise all of their employees, agents, contractors and customers who will use the product of this (M)SDS.

List of abbreviations

Not available.