

1. Identification

GHS product identifier	Ammonia, anhydrous
Other means of identification	
Product number	KF_NH3_ZA_EN
Synonyms	Ammonia, 82-00-0, NH3
Recommended use	Fertiliser.
Recommended restrictions	None known.
Manufacturer information	
Company name	Koch Fertilizer, 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 Mexico - 1.800.681.9531 Outside USA/Canada 1.703.527.3887 (collect calls accepted)
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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
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 1

Label elements



Signal word	Danger
Hazard statement	Flammable gas. Contains gas under pressure; may explode if heated. Harmful if swallowed. Causes severe skin burns and eye damage. Toxic if inhaled. Very toxic to aquatic life.
Precautionary statement	
Prevention	Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not breathe gas. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.
Response	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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 CENTRE or doctor/physician. Wash contaminated clothing before reuse. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. Collect spillage.
Storage	Store in a well-ventilated place. Keep container tightly closed. Store locked up. Protect from sunlight.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards which do not result in classification None known.

Supplemental information None.

3. Composition/information on ingredients

Substances

Hazardous components

Chemical name	Common name and synonyms	CAS number	Content in percent (%)
Ammonia		7664-41-7	99-99.8

Non-hazardous components

Chemical name	Common name and synonyms	CAS number	Content in 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

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a POISON CENTRE or doctor/physician.

Skin contact Take off immediately all contaminated clothing. If frostbite occurs, immerse involved area in warm water (between 38 °C/100 °F and 43 °C/110 °F, not exceeding 44 °C/112 °F). Keep immersed for 20 to 40 minutes. Seek medical assistance. Rinse skin with water/shower. Call a physician or poison control centre immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.

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. Call a physician or poison control centre immediately. If frostbite occurs, immediately flush eyes with plenty of warm water (not exceeding 105°F/41°C) for at least 15 minutes.

Ingestion Not likely, due to the form of the product. Call a physician or poison control centre immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms/effects, acute and delayed Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Cough, shortness of breath, headache, nausea, vomiting.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. 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. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide (CO₂).

Unsuitable extinguishing media None known.

Specific hazards arising from the chemical Vapours may form explosive mixtures with air. Vapours may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions In case of fire and/or explosion do not breathe fumes. DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED. In case of fire: Stop leak if safe to do so. Do not move cargo or vehicle if cargo has been exposed to heat. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. ALWAYS stay away from tanks engulfed in flame. Move containers from fire area if you can do so without risk. Do not direct water at source of leak or safety devices as icing may occur. Use water spray to cool unopened containers. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials. Cool containers exposed to flames with water until well after the fire is out.

General fire hazards Flammable gas. Contents under pressure. Pressurised container may explode when exposed to heat or flame.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep out of low areas. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Wear appropriate protective equipment and clothing during clean-up. Avoid breathing gas. Emergency personnel need self-contained breathing equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up Stop leak if you can do so without risk. If possible, turn leaking containers so that gas escapes rather than liquid. Use water spray to reduce vapours or divert vapour cloud drift. Isolate area until gas has dispersed. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). This product is miscible in water. Prevent entry into waterways, sewer, basements or confined areas.

Large Spills: Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. All equipment used when handling the product must be grounded. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Purge air from system before introducing gas. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Avoid containers, piping and fittings made of brass, bronze or other copper containing alloys or galvanized metals. Avoid using containers, pipes and fittings made of zinc-clad or copper bearing alloys. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Avoid breathing gas. Avoid prolonged exposure. When using, do not eat, drink or smoke. Use only outdoors or in a well-ventilated area. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities Store locked up. Keep away from heat, sparks and open flame. This material can accumulate static charge which may cause spark and become an ignition source. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Stored containers should be periodically checked for general condition and leakage. Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

South Africa. Recommended Exposure Limits (RELs) Regulations for Hazardous Chemical Substances, Table 2

Components	Type	Value
Ammonia (CAS 7664-41-7)	STEL	24 mg/m3
		35 ppm
	TWA	17 mg/m3
		25 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 minimise the risk of inhalation. If engineering measures are not sufficient to maintain concentrations 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.

Individual protection measures, such as personal protective equipment

Eye/face protection	Wear safety glasses with side shields (or goggles). 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.
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. Thermally protective gloves are recommended.
Other	Thermally protective gloves are recommended. Wear appropriate chemical resistant clothing to prevent any possibility of skin contact.
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. Respirator type: Chemical respirator with specific cartridge and full facepiece providing protection against the compound of concern. Seek advice from local supervisor.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Handle in accordance with good industrial hygiene and safety practices. When using, do not eat, drink or smoke. Wash hands after handling.

9. Physical and chemical properties

Appearance

Physical state	Gas compressed, liquefied.
Form	Compressed liquefied gas.
Colour	Colourless.
Odour	Pungent. Irritating.
Odour threshold	5 ppm
pH	11.7 approximate (1% aqueous solution)
Melting point/freezing point	-34.9 °C (-30.82 °F) (20% solution)
Initial boiling point and boiling range	-33.4 °C (-28.1 °F)
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Flammable gas.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	16 %
Flammability limit - upper (%)	28 %
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapour pressure	124 psi @ 20 °C (68 °F)
Vapour density	0.6 @ 0 °C (Air = 1)
Relative density	0.633 @ 4 °C (Water=1)
Solubility(ies)	
Solubility (water)	34 % @ 20 °C
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	651 °C (1203.8 °F)
Decomposition temperature	Not available.
Viscosity	0.27 cP @ -34 °C
Other information	
Bulk density	620 kg/m ³ @ 16 °C
Explosive properties	May form explosive mixtures with air.
Molecular formula	N-H ₃
Molecular weight	17.03 g/mol
Oxidising properties	Not oxidising.
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 polymerisation 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. Zinc.
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

Inhalation	Toxic if inhaled.
Skin contact	Causes severe skin burns.
Eye contact	Causes serious eye damage.
Ingestion	Causes digestive tract burns. Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.

Information on toxicological effects

Acute toxicity Toxic if inhaled. Harmful if swallowed. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.

Components	Species	Test Results
Ammonia (CAS 7664-41-7)		
Acute		
Inhalation		
LC50	Rat	5.1 mg/l, 1 Hours
Oral		
LD50	Rat	350 mg/kg as Ammonium hydroxide
Skin corrosion/irritation	Causes severe skin burns. Contact with liquefied gas might cause frostbite, in some cases with tissue damage.	
Serious eye damage/eye irritation	Causes serious eye damage. Direct contact with liquefied gas may cause eye damage from frostbite.	
Respiratory or skin sensitisation		
Respiratory sensitisation	Not a respiratory sensitiser.	
Skin sensitisation	This product is not expected to cause skin sensitisation.	
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.	
Carcinogenicity	This product is not classified as a carcinogen.	
Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.	
Specific target organ toxicity - single exposure	Not classified.	
Specific target organ toxicity - repeated exposure	Not classified.	
Aspiration hazard	Not likely, due to the form of the product.	
Chronic effects	Prolonged inhalation may be harmful.	
Further information	Be aware that symptoms of lung edema (shortness of breath) may develop up to 24 hours after exposure.	

12. Ecological information

Ecotoxicity Very toxic to aquatic life.

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	No data is available on the degradability of this product.
Bioaccumulative potential	No data available.
Mobility in soil	This product is miscible in water.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Waste from residues / unused products	Dispose of in accordance with all applicable regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

ADR

UN number	UN1005
UN proper shipping name	AMMONIA, ANHYDROUS
Transport hazard class(es)	
Class	2.3
Subsidiary risk	8
Label(s)	2.3 +8
Hazard No. (ADR)	268
Tunnel restriction code	C/D
Packing group	Not available.
Environmental hazards	Yes.
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

RID

UN number	UN1005
UN proper shipping name	AMMONIA, ANHYDROUS
Transport hazard class(es)	
Class	2.3
Subsidiary risk	8
Label(s)	2.3+8 (+13)
Packing group	Not available.
Environmental hazards	Yes.
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IATA

UN number	UN1005
UN proper shipping name	Ammonia, anhydrous
Transport hazard class(es)	
Class	Forbidden
Subsidiary risk	Forbidden
Packing group	Not available.
Environmental hazards	Yes.
ERG Code	2CP
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)	
Class	2.3
Subsidiary risk	8
Packing group	Not available.

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.
General information	IMDG Regulated Marine Pollutant. Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: Ensure that containers are firmly secured. Ensure cylinder valve is closed and not leaking. Ensure valve outlet cap nut or plug (where provided) is correctly fitted. Ensure valve protection device (where provided) is correctly fitted. Ensure adequate ventilation. Ensure compliance with applicable regulations.

15. Regulatory information

Safety, health and environmental regulations specific for the product in question	This product is classified in accordance with SANS 10234: 2008 – Globally Harmonized System of Classification and Labeling of Chemicals (GHS)
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Hazardous Substances Act, 1973 (Act No. 15 of 1973)

Not listed.

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Montreal Protocol

Not applicable.

Kyoto Protocol

Not applicable.

Basel Convention

Not applicable.

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
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	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

Issue date	26-July-2018
Revision date	22-April-2020
Version No.	02

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.