



Material Safety Data Sheet

Anhydrous Ammonia MSDS

Section 1. Chemical product and company identification

Trade name : Anhydrous Ammonia MSDS
Manufacturer : Yara North America, Inc
100 North Tampa Street
Suite 3200
P.O. Box 24926
Tampa, FL 33623
USA
Tel: +1 813 222 5700
Fax: +1 813 875 5735

Validation date : 2005-06-06.
Print date : 2005-06-06.
Responsible name : Bill Easterwood
In case of emergency : Additional Product Information: 813-222-5700
or Chemtrec 24-hours Emergency Resonse: 1-800-424-9300

Section 2. Composition, Information on Ingredients

<u>Name</u>	<u>CAS number</u>	<u>% by weight</u>
Ammonia, anhydrous	7664-41-7	100

Section 3. Hazards identification

Physical state : Gas. (Liquefied Gas)
Emergency overview : Warning!
CONTENTS UNDER PRESSURE.
HARMFUL IF SWALLOWED.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, RESPIRATORY TRACT,
SKIN, EYES, EYE, LENS OR CORNEA.
Do not ingest. Extremely hazardous liquid and vapor under pressure. Do not puncture or
incinerate container. Wash thoroughly after handling.

Potential acute health effects

Eyes : No known significant effects or critical hazards.
Skin : No known significant effects or critical hazards.
Inhalation : No known significant effects or critical hazards.
Ingestion : Toxic if swallowed.
Carcinogenic effects : No known significant effects or critical hazards.
Mutagenic effects : No known significant effects or critical hazards.
Reproduction toxicity : No known significant effects or critical hazards.
Medical conditions aggravated by overexposure : Repeated exposure to a highly toxic material may produce general deterioration of health
by an accumulation in one or many human organs.

See toxicological information (section 11)

Section 4. First aid measures

- Eye contact** : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.
- Skin contact** : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
- Inhalation** : If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
- Ingestion** : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Section 5. Fire fighting measures

- Flammability of the product** : Flammable.
- Auto-ignition temperature** : 651.11°C (1204°F)
- Products of combustion** : These products are nitrogen oxides (NO, NO₂...).
- Fire fighting media and instructions** : Do not extinguish a leaking gas flame unless leak can be stopped. This material is very toxic to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. Container explosion may occur under fire conditions or when heated.
- Special protective equipment for fire-fighters** : Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode.

Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8).

Section 7. Handling and storage

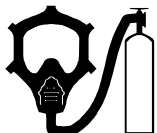
- Handling** : Do not get in eyes, on skin or on clothing. Keep container closed. Use only with adequate ventilation. Do not breathe gas. Avoid contact of spilled material and runoff with soil and surface waterways. Wash thoroughly after handling.
- Storage** : Store in a segregated and approved area. Store in original container and secure against falling.

Section 8. Exposure Controls, Personal Protection

- Engineering controls** : Ventilation is normally required when handling or using this product.
- Personal protection**
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
Recommended: full-face mask
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved.
Body: Recommended: Protective Clothing
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Recommended: ammonia filter (Type K) , self-contained breathing apparatus (SCBA)
- Hands** : Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
<1 hour(s) (breakthrough time): Insulated gloves suitable for low temperatures

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Personal protective equipment (Pictograms) :



Personal protection in case of a large spill : Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Product name

Ammonia, anhydrous

Exposure limits

ACGIH TLV (United States, 1/2004).

STEL: 24 mg/m³ 15 minute(s). Form: All forms

STEL: 35 ppm 15 minute(s). Form: All forms

TWA: 17 mg/m³ 8 hour(s). Form: All forms

TWA: 25 ppm 8 hour(s). Form: All forms

NIOSH REL (United States, 12/2001).

STEL: 27 mg/m³ 15 minute(s). Form: All forms

STEL: 35 ppm 15 minute(s). Form: All forms

TWA: 18 mg/m³ 10 hour(s). Form: All forms

TWA: 25 ppm 10 hour(s). Form: All forms

OSHA PEL (United States, 8/1997).

TWA: 35 mg/m³ 8 hour(s). Form: All forms

TWA: 50 ppm 8 hour(s). Form: All forms

OSHA PEL 1989 (United States, 3/1989).

STEL: 27 mg/m³ 15 minute(s). Form: All forms

STEL: 35 ppm 15 minute(s). Form: All forms

Section 9. Physical and chemical properties

Physical state : Gas. (Liquefied Gas)

Color : Colorless.

Odor : Pungent.

Molecular formula : NH₃

Boiling/condensation point : -33.33°C (-28°F)

Melting/freezing point : -77.77°C (-108°F)

Critical temperature : 133°C (271.4°F)

Specific gravity : 0.682 (Water = 1)

Vapor density : 0.6 (Air = 1)

Odor threshold : 5 ppm

Viscosity : Dynamic: 0.22 cP

Section 10. Stability and reactivity

Stability and reactivity : Stable under recommended storage and handling conditions (see section 7).

Incompatibility with various substances : Reactive with oxidizing agents, metals, acids.

Section 11. Toxicological information

Ingredient name	Test	Result	Route	Species
Ammonia, anhydrous	LD50	350 mg/kg	Oral	Rat
	LC50	7000 mg/m ³ (1 hour(s))	Inhalation	Rabbit
	LC50	2000 ppm (4 hour(s))	Inhalation	Rat
	LC50	4230 ppm (1 hour(s))	Inhalation	Mouse

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LCLo	7000 ppm (1 hour(s))	Inhalation	Rabbit
LCLo	7000 ppm (1 hour(s))	Inhalation	Cat.

Other toxic effects on humans : Hazardous in case of skin contact (corrosive), of eye contact (corrosive), of inhalation (lung corrosive).

Section 12. Ecological information

<u>Ingredient name</u>	<u>Species</u>	<u>Period</u>	<u>Result</u>
Ammonia, anhydrous	Cyprinus carpio (LC50)	96 hour(s)	0.44 mg/l
	Cyprinus carpio (LC50)	96 hour(s)	0.66 mg/l
	Lepomis macrochirus (LC50)	96 hour(s)	1.17 mg/l
	Poecilia reticulata (LC50)	96 hour(s)	71.1 mg/l
	Poecilia reticulata (LC50)	96 hour(s)	128.2 mg/l

Toxicity of the products of biodegradation : The products of degradation are less toxic than the product itself.



Special remarks on the products of biodegradation : The product does not show any bioaccumulation phenomena.



Section 13. Disposal considerations

Waste disposal : Do not puncture or incinerate container. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Consult your local or regional authorities.

Section 14. Transport information

<u>Regulatory information</u>	<u>UN number</u>	<u>Proper shipping name</u>	<u>Class</u>	<u>Packing group</u>	<u>Label</u>	<u>Additional information</u>
DOT Classification	UN1005	AMMONIA, ANHYDROUS	2.3	-	 	Reportable quantity 100 lbs. (45.36 kg) Limited quantity Yes. Packaging instruction Passenger Aircraft Quantity limitation: Forbidden. Cargo Aircraft Quantity limitation: 25 kg Special provisions 4, T50

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TDG Classification	UN1005	AMMONIA, ANHYDROUS; OR ANHYDROUS AMMONIA	2.2	-	 	-

Section 15. Regulatory information

HCS Classification : Compressed Gas
Toxic material
Target organ effects

U.S. Federal regulations : TSCA 8(b) inventory: Ammonia, anhydrous
SARA 302/304/311/312 extremely hazardous substances: Ammonia, anhydrous
SARA 302/304 emergency planning and notification: Ammonia, anhydrous
SARA 302/304/311/312 hazardous chemicals: Ammonia, anhydrous
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Ammonia, anhydrous : Sudden Release of Pressure, Immediate (Acute) Health Hazard
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: Ammonia, anhydrous
Clean air act (CAA) 112 accidental release prevention: Ammonia, anhydrous
Clean air act (CAA) 112 regulated flammable substances: No products were found.
Clean air act (CAA) 112 regulated toxic substances: Ammonia, anhydrous

SARA 313

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
Form R - Reporting requirements	: Ammonia, anhydrous	7664-41-7	100
Supplier notification	: Ammonia, anhydrous	7664-41-7	100

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations : Pennsylvania RTK: Ammonia, anhydrous : (environmental hazard, generic environmental hazard)
Massachusetts RTK: Ammonia, anhydrous
New Jersey: Ammonia, anhydrous

Section 16. Other information

Hazardous Material Information System (U.S.A.)	Health	*	2
	Fire hazard		0
	Reactivity		0

National Fire Protection Association (U.S.A.) :

		Flammability
Health		Instability
		Special

Date of issue : 2005-06-06.
Date of previous issue : No Previous Validation.
Version : 1

 Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.