AMMONIA (15N, 98%)

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 17/12/2010 Revision date: 23/08/2022 Supersedes: 29/09/2016 Version: 5.0

NLM-107

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form	:	Substance
Substance name	:	AMMONIA (15N, 98%)
EC Index-No.	:	007-001-00-5 (Unlabeled)
EC-No.	:	231-635-3 (Unlabeled)
CAS-No.	:	13767-16-3
Product code	:	NLM-107
Formula	:	*NH3

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Main use category	:	Professional use
Industrial/Professional use spec	:	For professional use only

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Cambridge Isotope Laboratories, Inc.
50 Frontage Road
Andover, MA 01810
USA

USA: 1-800-322-1174 Int: 1-978-749-8000
cilsales@isotope.com www.isotope.com

Emergency telephone number

Emergency numbers:

Chemtrec: 1-800-424-9300 (24 hours)
International: 1-703-741-5970 (24 hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flam. Gas 2	H221
Press. Gas (Comp.)	H280
Acute Tox. 3 (Inhalation)	H331
Skin Corr. 1A	H314
Eye Dam. 1	H318
Aquatic Acute 1	H400 (M=10)
Aquatic Chronic 1	H410

Full text of hazard classes and H-statements : see section 16

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

R5
R10
T; R23
C; R35
Xi; R41
N; R50/53

Full text of R-phrases: see section 16

GHS-US classification

Flam. Gas 2	H221
Press. Gas (Comp.)	H280
Acute Tox. 3 (Inhalation)	H331
Skin Corr. 1A	H314
Eye Dam. 1	H318
Aquatic Acute 1	H400

Aquatic Chronic 1 H410

Full text of H statements : see section 16

Adverse physicochemical, human health and environmental effects

Lungs, Central nervous system, Liver, Kidney.

2.2. Label elements

Labeling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS06 GHS05 GHS09 GHS04

Signal word (CLP) : Danger

Hazard statements (CLP) : H221 - Flammable gas
H280 - Contains gas under pressure; may explode if heated
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
H331 - Toxic if inhaled
H410 - Very toxic to aquatic life with long lasting effects

Precautionary statements (CLP) : P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260 - Do not breathe dust, fume, gas, mist, spray, vapors.
P264 - Wash hands thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear eye protection, face protection, protective clothing, protective gloves.
P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

GHS-US labeling

Hazard pictograms (GHS-US) :

GHS06 GHS05 GHS09 GHS04

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H221 - Flammable gas
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H410 - Very toxic to aquatic life with long lasting effects

Precautionary statements (GHS-US) : P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking.
P260 - Do not breathe dust, fume, gas, mist, spray, vapors.
P261 - Avoid breathing dust, fume, gas, mist, spray, vapors.
P264 - Wash Both hands thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear eye protection, face protection, protective clothing, protective gloves.
P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a poison center or doctor
P311 - Call a poison center or doctor
P321 - Specific treatment (see Hazard pictograms (CLP) on this label)
P363 - Wash contaminated clothing before reuse.
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so.
P391 - Collect spillage.

P403 - Store in a well-ventilated place.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P405 - Store locked up.
P410+P403 - Protect from sunlight. Store in a well-ventilated place.
P501 - Dispose of contents/container to Comply with applicable regulations

2.3. Other hazards

No additional information available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Directive 67/548/EEC
AMMONIA (15N, 98%)	(CAS-No.) 13767-16-3 (EC-No.) 231-635-3 (Unlabeled) (EC Index-No.) 007-001-00-5 (Unlabeled)	100	R5 R10 T; R23 C; R35 Xi; R41 N; R50/53

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
AMMONIA (15N, 98%)	(CAS-No.) 13767-16-3 (EC-No.) 231-635-3 (Unlabeled) (EC Index-No.) 007-001-00-5 (Unlabeled)	100	Flam. Gas 2, H221 Press. Gas (Comp.), H280 Acute Tox. 3 (Inhalation), H331 Skin Corr. 1A, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400 (M=10) Aquatic Chronic 1, H410

Full text of R- and H- phrases: see section 16

Name	Product identifier	%	GHS-US classification
AMMONIA (15N, 98%) (Main constituent)	(CAS-No.) 13767-16-3	100	Flam. Gas 2, H221 Press. Gas (Comp.), H280 Acute Tox. 3 (Inhalation), H331 Skin Corr. 1A, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400 Aquatic Chronic 1, H410

Full text of H-phrases: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

First-aid measures after inhalation : If breathed in, move person to fresh air. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

First-aid measures after eye contact : Continue rinsing eyes during transport to hospital. Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

First-aid measures after ingestion : Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation : May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

Symptoms/effects after skin contact : May be harmful if absorbed through the skin. Causes skin burns.

Symptoms/effects after eye contact : Causes eye burns. Causes serious eye damage.

Symptoms/effects after ingestion : May be harmful if swallowed.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Reactivity : Not available.

5.3. Advice for firefighters

Firefighting instructions : Wear self contained breathing apparatus for fire fighting if necessary.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

Other information : Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapours can accumulate in low areas.

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3. Methods and material for containment and cleaning up

For containment : Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent build up of electrostatic charge.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Keep container tightly closed in a dry and well-ventilated place.

Storage conditions : Store at room temperature away from light and moisture.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

AMMONIA (15N, 98%) (13767-16-3)		
Italy - Portugal - USA ACGIH	ACGIH TWA (ppm)	25.00000000 ppm USA. ACGIH Threshold Limit Values (TLV)
Italy - Portugal - USA ACGIH	ACGIH STEL (ppm)	35 ppm USA. ACGIH Threshold Limit Values (TLV)
Italy - Portugal - USA ACGIH	Remark (ACGIH)	Upper Respiratory Tract irritation Eye damage.
USA NIOSH	NIOSH REL (TWA) (mg/m³)	18 mg/m³ USA. NIOSH Recommended Exposure Limits - Often used in an aquenous solution.
USA NIOSH	NIOSH REL (TWA) (ppm)	25 ppm USA. NIOSH Recommended Exposure Limits - Often used in an aquenous solution.
USA NIOSH	NIOSH REL (STEL) (mg/m³)	27 mg/m³ California permissible exposure limits for chemical contaminants (Title 8, Article 107)
USA NIOSH	NIOSH REL (STEL) (ppm)	35 ppm California permissible exposure limits for chemical contaminants (Title 8, Article 107)
USA NIOSH	Remark (NIOSH)	ST 35.000000 ppm / 27.000000 mg/m3 USA. NIOSH Recommended Exposure Limits - Often used in an aquenous solution.

AMMONIA (15N, 98%) (13767-16-3)		
USA OSHA	OSHA PEL (TWA) (mg/m³)	35 mg/m³ USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants - The value in mg/m3 is approximate.
USA OSHA	OSHA PEL (TWA) (ppm)	50 ppm USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants - The value in mg/m3 is approximate.
USA OSHA	OSHA PEL (STEL) (mg/m³)	27 mg/m³ USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
USA OSHA	OSHA PEL (STEL) (ppm)	35 ppm USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
USA OSHA	OSHA PEL (Ceiling) (mg/m³)	18 mg/m³ California permissible exposure limits for chemical contaminants (Title 8, Article 107)
USA OSHA	OSHA PEL (Ceiling) (ppm)	25 ppm California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2. Exposure controls

Appropriate engineering controls : Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment : Gloves. Protective clothing. Protective goggles. Self-contained breathing apparatus.

Materials for protective clothing : Wear suitable protective clothing and gloves.

Hand protection : Wear suitable protective clothing and gloves.

Eye protection : Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH or EN 166.

Skin and body protection : Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection : When appropriate, use NIOSH/CEN approved respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Compressed Gas.

Molecular mass : 18.02 g/mol (Labeled)

Color : Colorless.

Odor : No data available.

Odor threshold : No data available

pH : No data available

Relative evaporation rate (butyl acetate=1) : No data available

Melting point : -78 °C (-108 °F)

Freezing point : No data available

Boiling point : -33 °C (-27 °F) - lit.

Flash point : 132 °C (270 °F) - closed cup

Auto-ignition temperature : 651 °C (1,204 °F)

Decomposition temperature : No data available

Flammability (solid, gas) : No data available

Vapor pressure : 6402 hPa (4,802 mmHg) at 15.50 °C (59.90 °F) ; 8,866 hPa (6,650 mmHg at 21 °C (70 °F)

Relative vapor density at 20 °C : 0.59 - (Air = 1.0)

Relative density : No data available

Relative gas density : 0.59 g/cm3

Solubility : Water: Soluble

Log Pow : No data available

Log Kow	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available
Explosion limits	:	15 - 25 % (V)

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Not available.

10.2. Chemical stability

Stable if stored under recommended conditions.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Heat, flames and sparks.

10.5. Incompatible materials

Oxidizing agents, Iron, Zinc, Copper, Silver/silver oxides. Cadmium/cadmium oxides, alcohols, acids, halogens, aldehydes.

10.6. Hazardous decomposition products

Products formed under fire conditions. - Nitrogen oxides (NOx).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Inhalation: Toxic if inhaled.

AMMONIA (15N, 98%) (13767-16-3)	
LC50 inhalation rat (ppm)	2000 ppm 4 h
ATE CLP (gases)	700.000 ppmV/4h
ATE CLP (vapors)	3.000 mg/l/4h
ATE CLP (dust, mist)	0.500 mg/l/4h

Skin corrosion/irritation	:	Causes severe skin burns and eye damage. No data available
Serious eye damage/irritation	:	Causes serious eye damage. No data available
Respiratory or skin sensitization	:	Not available No data available
Germ cell mutagenicity	:	Not available
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not available
Specific target organ toxicity – single exposure	:	Not classified No data available.
Specific target organ toxicity – repeated exposure	:	Not classified No data available.
Aspiration hazard	:	Not classified
Potential Adverse human health effects and symptoms	:	To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Liver - Irregularities - Based on Human Evidence.
Symptoms/effects after inhalation	:	May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Symptoms/effects after skin contact	:	May be harmful if absorbed through the skin. Causes skin burns.
Symptoms/effects after eye contact	:	Causes eye burns. Causes serious eye damage.
Symptoms/effects after ingestion	:	May be harmful if swallowed.

SECTION 12: Ecological information

12.1. Toxicity

AMMONIA (15N, 98%) (13767-16-3)	
EC50 Daphnia 1	25.4 mg/l Daphnia magna (Water flea) - 48 h

12.2. Persistence and degradability

AMMONIA (15N, 98%) (13767-16-3)	
Persistence and degradability	Not available.

12.3. Bioaccumulative potential

AMMONIA (15N, 98%) (13767-16-3)	
Bioaccumulative potential	Not available.

12.4. Mobility in soil

AMMONIA (15N, 98%) (13767-16-3)	
Ecology - soil	Not available.

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

Other adverse effects : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic organisms.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste) : Waste materials should be disposed of under conditions which meet Federal, State, and local environmental control regulations.

Product/Packaging disposal recommendations : Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Ecology - waste materials : Dispose of as unused product.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No.(DOT) : 1005

DOT NA no. UN1005

14.2. UN proper shipping name

Proper Shipping Name (DOT) : Ammonia, anhydrous

Class (DOT) : 2.3 - Class 2.3 - Poisonous gas 49 CFR 173.115

Hazard labels (DOT) : 2.3 - Poison gas
8 - Corrosive

DOT Symbols : I - Proper shipping name appropriate for international and domestic transportation

DOT Special Provisions (49 CFR 172.102) : 4 - This material is poisonous by inhalation (see 171.8 of this subchapter) in Hazard Zone D (see 173.116(a) of this subchapter), and must be described as an inhalation hazard under the provisions of this subchapter.
N87 - The use of copper valves on UN pressure receptacles is prohibited.
T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter.

DOT Packaging Exceptions (49 CFR 173.xxx) : None

DOT Packaging Non Bulk (49 CFR 173.xxx) : 304

DOT Packaging Bulk (49 CFR 173.xxx) : 314;315

DOT RQ : 100 lbs

Marine pollutant : No

14.3. Additional information

Other information : No supplementary information available.

Special transport precautions : IATA Passenger/Cargo: Not permitted for transport.

Overland transport

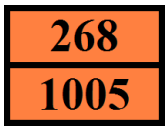
Class (ADR) : 2 - Gases

Hazard identification number (Kemler No.) : 268

Classification code (ADR) : 2TC

Hazard labels (ADR) : 2.3 - Toxic gases
8 - Corrosive substances

Orange plates :



Tunnel restriction code (ADR) : C/D

Limited quantities (ADR) 0

EAC : 2RE

APP : A(c)

Excepted quantities (ADR) : E0

Transport by sea

DOT Vessel Stowage Location : D - The material must be stowed ‘‘on deck only’’ on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded.

DOT Vessel Stowage Other : 40 - Stow ‘‘clear of living quarters’’,52 - Stow ‘‘separated from’’ acids,57 - Stow ‘‘separated from’’ chlorine

MFAG-No : 125

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : Forbidden

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : Forbidden

Civil Aeronautics Law : Gases under pressure/Gases toxic under pressure

14.4. Environmental hazards

Dangerous for the environment :

Other information : No supplementary information available.

14.5. Special precautions for user

Special transport precautions : IATA Passenger/Cargo: Not permitted for transport.

14.6. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

AMMONIA (15N, 98%) (13767-16-3)	
Listed on the United States SARA Section 302 Subject to reporting requirements of United States SARA Section 313	
SARA Section 311/312 Hazard Classes	Sudden release of pressure hazard Immediate (acute) health hazard Delayed (chronic) health hazard

15.2. International regulations

CANADA

AMMONIA (15N, 98%) (13767-16-3)
Listed on the Canadian DSL (Domestic Substances List)

15.2.1. National regulations

No additional information available

15.3. US State regulations

AMMONIA (15N, 98%)(13767-16-3)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	RTK - U.S. - Massachusetts - Right To Know List RTK - U.S. - Pennsylvania - RTK (Right to Know) List RTK - U.S. - New Jersey - Right to Know Hazardous Substance List This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SECTION 16: Other information

Other information : This product is not radioactive. The data given for this product are those of the corresponding unlabeled compound, unless specifically indicated otherwise. Health and safety data for labeled compounds are generally not available, but are assumed to be similar or identical to the corresponding unlabeled compound.

Full text of R-, H- and EUH-phrases:

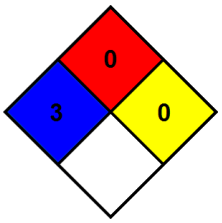
Acute Tox. 3 (Inhalation)	Acute toxicity (inhalation) Category 3
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment - Chronic Hazard Category 1
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Flam. Gas 2	Flammable gases Category 2
Press. Gas (Comp.)	Gases under pressure Compressed gas
Skin Corr. 1A	Skin corrosion/irritation Category 1A
H221	Flammable gas
H280	Contains gas under pressure; may explode if heated
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H331	Toxic if inhaled
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects
R10	Flammable
R23	Toxic by inhalation
R35	Causes severe burns
R41	Risk of serious damage to eyes
R5	Heating may cause an explosion
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

C	Corrosive
N	Dangerous for the environment
T	Toxic
Xi	Irritant

NFPA health hazard : 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

NFPA fire hazard : 0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire conditions.



Hazard Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 1 Slight Hazard

Physical : 1 Slight Hazard

CIL Substance SDS

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product