Aqua Ammonia – Ammonium Thiosulfate Liquid Fertilizer

Safety Data Sheet

Classified according to the UN-GHS as adopted in the US Hazard Communication Standard (HCS 2012), the Canada Hazardous Products Regulations (WHMIS 2015) and Mexico NOM-018-STPS-2015.

Revision Date: 4 June 2024 Date of issue: 4 June 2024 Supersedes Date: 23 June 2023 Version: 1.1

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Name: Aqua Ammonia – Ammonium Thiosulfate Liquid Fertilizer

CAS No: Not applicable (mixture)

1.2. Intended Use of the Product

Uses of the substance/mixture: Fertilizer

Uses advised against: Consumer use

1.3. Name, Address, and Telephone of the Responsible Party

Company

CF Industries
2375 Waterview Drive
Northbrook, Illinois, USA
847-405-2400
www.cfindustries.com

1.4. Emergency Telephone Number

Emergency Number : 800-424-9300
For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, call CHEMTREC – Day or Night

SECTION 2: HAZARDS IDENTIFICATION

Classification according to the OSHA Hazard Communication Standard (29 CFR 1910.1200)

2.1. Classification of the Substance or Mixture

Classification (GHS-US)

Acute Tox. 4 (Oral)	H302	Full text of H-phrases: see section 16
Skin Corr. 1	H314	
Eye Dam. 1	H318	
STOT SE 3	H335	
Aquatic Acute 1	H400	

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :

GHS05 GHS07 GHS09

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) :
H302 - Harmful if swallowed.
H314 - Causes severe skin burns and eye damage.
H318 - Causes serious eye damage.
H335 - May cause respiratory irritation.
H400 - Very toxic to aquatic life.

Precautionary Statements (GHS-US) :
P260 - Do not breathe mist, spray, vapors, or gas.
P264 - Wash hands, forearms, and exposed areas thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P273 - Avoid release to the environment.
P280 - Wear eye protection, protective clothing, protective gloves, face protection.
P301+P330+P331+P310 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a poison center or doctor.
P303+P361+P353+P310 - IF ON SKIN (OR HAIR): Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a poison center or doctor.

P304+P340+P310 - IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor.
P305+P351+P338+P310 - 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.
P363 - Wash contaminated clothing before reuse.
P391 - Collect spillage.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, provincial, territorial, national, and international regulations.

2.3. Other Hazards
Ammonium hydroxide is very volatile and may release ammonia as a gas. Ammonia vapor, in concentrations of 16-25% volume by weight in air, is flammable, toxic by inhalation and corrosive. Take all appropriate precautions.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS
3.1. Substances
Not applicable
3.2. Mixture

Name	Product Identifier	% (w/w)	Classification (GHS-US)
Ammonium hydroxide*	1336-21-6	80-100	Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314 Eye Dam. 1, H318 STOT SE 3, H335 Aquatic Acute 1, H400
Ammonium thiosulfate*	7783-18-8	0-20	Not Classified

*Exact composition withheld as a trade secret as per §1910.1200 paragraph (i)

SECTION 4: FIRST AID MEASURES
4.1. Description of First Aid Measures
General: Never give anything by mouth to an unconscious person. Seek medical attention immediately. Show label if possible.
Inhalation: When symptoms occur: go into open air and ventilate suspected area. Immediately call a POISON CENTER or doctor/physician.
Skin Contact: Immediately flush skin with plenty of water for at least 60 minutes. Remove/Take off immediately all contaminated clothing. Immediately call a POISON CENTER or doctor/physician. Wash contaminated clothing before reuse.
Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing for at least 60 minutes. Immediately call a POISON CENTER or doctor/physician.
Ingestion: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician.
4.2. Most Important Symptoms and Effects both Acute and Delayed
General: Harmful if swallowed. Corrosive to eyes and skin.
Inhalation: Symptoms may include: Sneezing, coughing, burning sensation of throat with constricting sensation of the larynx and difficulty in breathing. Damage to lungs.
Skin Contact: Corrosive. Causes burns. Symptoms may include: Redness. Pain. Serious skin burns. Blisters.
Eye Contact: Causes serious eye damage. Symptoms may include: Redness. Pain. Blurred vision. Severe burns. Causes permanent damage to the cornea, iris, or conjunctiva.
Ingestion: Harmful if swallowed. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.
Chronic Symptoms: None known.
4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed
If exposed or concerned, get medical advice and attention.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Water spray, fog.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Ammonia vapor concentrations in the range of 16-25% by volume in air can be ignited if heated to the auto-ignition temperature. Oil or other combustible materials increases the fire hazard. Emits toxic fumes under fire conditions.

Explosion Hazard: Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions.

Reactivity: Corrosive to copper, brass, silver, zinc and galvanized steel.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Stop leak if safe to do so. Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Firefighters must use full bunker gear including NIOSH-approved positive-pressure self-contained breathing apparatus to protect against potential hazardous combustion and decomposition products.

Hazardous Combustion Products: Nitrogen oxides. Ammonia.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Keep away from open flames, hot surfaces and sources of ignition. No smoking. Avoid all contact with skin, eyes, or clothing. Do NOT breathe vapor, mist, or spray.

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE) as specified in section 8.

Emergency Procedures: Evacuate unnecessary personnel. Eliminate ignition sources.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection as specified in section 8.

Emergency Procedures: Stop leak if safe to do so. Ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Notify authorities if product enters sewers or public waters.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Stop the flow of material, if this is without risk. Ventilate area. Contain any spills with dikes or absorbents.

Methods for Cleaning Up: Clear up spills immediately and dispose of waste safely. Never neutralize spill with acid. Absorb and/or contain spill with inert material, then place in suitable container. Use only non-sparking tools. After cleaning, flush traces away with water.

6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. See Section 13, Disposal Considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Do NOT enter (storage areas, confined spaces) unless adequately ventilated. Emits ammonia vapors. Flammable gas. Ammonium hydroxide reacts with many heavy metals and their salts forming explosive compounds. It may attack metals forming flammable/explosive gas. The solution in water is a strong base, it reacts violently with acids.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained. Ensure adequate ventilation. Comply with applicable regulations.

Storage Conditions: Store in a dry, cool and well-ventilated place. Detached outside storage is preferable. Keep in fireproof place. Store away from oxidizers, combustible materials, and all ignition sources. Store in corrosive resistant container with a resistant inner liner. Storage containers should have safety relief valves. Store locked up.

Incompatible Materials: Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions. Corrosive to copper, brass, silver, zinc and galvanized steel.

Storage Area: Post readily visible warning signs in the storage area listing emergency measures. Water hoses should be readily available to disperse vapors in case of a spill.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL).

8.2. Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Gas detectors should be used when toxic gases may be released. Use explosion-proof equipment.

Personal Protective Equipment: Gloves. Protective goggles. Insufficient ventilation: wear respiratory protection. Protective clothing. Face shield.

Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical safety goggles and face shield.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.

Other Information: When using, do not eat, drink, or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	:	Liquid
Appearance	:	Colorless
Odor	:	Pungent
Odor Threshold	:	1 - 50 ppm
pH	:	10.6 - 11.6 (0.02-1.7% aqueous ammonia solution)
Evaporation Rate	:	Not available
Melting Point	:	- 77 °C (-106 °F) (< 44% NH_3)
Freezing Point	:	-38 °C (-36 °F)
Boiling Point	:	37.4 °C (99.3°F) (25% NH_3)
Flash Point	:	Not available
Auto-ignition Temperature	:	651 °C (1,204°F) (ammonia vapor)
Decomposition Temperature	:	Not available
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	16 % (ammonia vapor)
Upper Flammable Limit	:	25 % (ammonia vapor)
Vapor Pressure	:	49642.2 Pa at 68°F (20°C)
Relative Vapor Density at 20 °C	:	0.6 (for ammonia vapor over aqua ammonia at 0°C and 760 mm Hg)
Relative Density	:	Not available
Specific Gravity	:	0.90 at 60 °F (19% NH_3)
Solubility	:	Soluble in water.
Partition Coefficient: N-Octanol/Water	:	-1.14 at 25° C
Viscosity	:	Not available

Explosion Data – Sensitivity to Mechanical Impact : Not expected to present an explosion hazard due to mechanical impact.

Explosion Data – Sensitivity to Static Discharge : Not expected to present an explosion hazard due to static discharge.

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity
Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions. Corrosive to copper, brass, silver, zinc and galvanized steel.

10.2. Chemical Stability
Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of Hazardous Reactions
Hazardous polymerization will not occur.

10.4. Conditions to Avoid
Direct sunlight. Extremely high or low temperatures. Heat. Sources of ignition.

10.5. Incompatible Materials
Strong acids. Strong bases. Strong oxidizers. Hypochlorites.

10.6. Hazardous Decomposition Products
Thermal decomposition generates: Carbon oxides (CO, CO2). Nitrogen oxides. Emits ammonia vapors.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects – Product
Symptoms/Injuries After Inhalation: Symptoms may include: Sneezing, coughing, burning sensation of throat with constricting sensation of the larynx and difficulty in breathing.
Symptoms/Injuries After Skin Contact: Corrosive. Causes burns. Symptoms may include: Redness. Pain. Serious skin burns. Blisters.
Symptoms/Injuries After Eye Contact: Causes serious eye damage. Symptoms may include: Redness. Pain. Blurred vision. Severe burns. Causes permanent damage to the cornea, iris, or conjunctivae.
Symptoms/Injuries After Ingestion: Harmful if swallowed. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.
Acute Toxicity: Oral: Harmful if swallowed.
LD50 and LC50 Data:

Ammonium hydroxide 1336-21-6	
Acute Oral	350.00 mg/kg (Rat)
Ammonium thiosulfate CAS # 7783-18-8	
Acute Oral	1950-2890 mg/kg (Rat)
Acute Oral	2100-3000 mg/kg (Mouse)
Acute Inhalation	>2260 mg/L (Rat, 4h)
Acute Inhalation	>1800 mg/L (Mouse, 4h)

Skin Corrosion/Irritation: Causes severe skin burns and eye damage.
pH: 10.6 - 11.6
Serious Eye Damage/Irritation: Causes serious eye damage.
pH: 10.6 - 11.6
Respiratory or Skin Sensitization: Not Classified
Germ Cell Mutagenicity: Not Classified
Teratogenicity: Not available
Carcinogenicity: Not Classified
Specific Target Organ Toxicity (Single Exposure): May cause respiratory irritation.
Specific Target Organ Toxicity (Repeated Exposure): Not Classified
Reproductive Toxicity: Not Classified
Aspiration Hazard: Not Classified
Chronic Symptoms: None known.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General: Toxic to aquatic life.

Ammonium hydroxide CAS # 1336-21-6	
LC50	8.2 mg/l (Exposure time: 96 h - Species: *Pimephales promelas*)
EC50	0.66 mg/l (Exposure time: 48 h - Species: *Daphnia magna*)
EC50	0.66 mg/l (Exposure time: 48 h - Species: *Daphnia pulex*)
Ammonium thiosulfate CAS # 7783-18-8	
LC50	510 mg/l (Exposure time: 96 h – Species: *Lepomis macrochirus*)
EC50	230 mg/l (Exposure time: 48 h - Species: *Daphnia magna*)

12.2. Persistence and Degradability

Ammonium hydroxide (1336-21-6)	
Persistence and Degradability	No data were identified for this product or its constituents.

12.3. Bioaccumulative Potential

Ammonium hydroxide (1336-21-6)	
Log Pow	-1.14
Bioaccumulative Potential	Not established.

12.4. Mobility in Soil

Not available

12.5. Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains; dispose of this material and its container in a safe way.
Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.
Additional Information: Prevent runoff from entering drains, sewers or waterways.
Ecology – Waste Materials: This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

SECTION 14: TRANSPORT INFORMATION

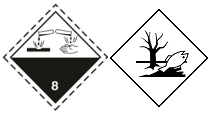
14.1. In Accordance with DOT

Proper Shipping Name : AMMONIA SOLUTION
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8

Packing Group : III
ERG Number : 154
Additional Information : Marine Pollutant

14.2. In Accordance with IMDG

Proper Shipping Name : AMMONIA SOLUTION
Hazard Class : 8
Identification Number : UN2672
Packing Group : III
Label Codes : 8 + MP(P)
EmS-No. (Fire) : F-A
EmS-No. (Spillage) : S-B



Additional Information : Marine Pollutant, Classified as HME per MARPOL Annex V

14.3. In Accordance with IATA

Proper Shipping Name : AMMONIA SOLUTION
Hazard Class : 8
Identification Number : UN2672

Label Codes : 8
Packing Group : III
ERG Code (IATA) : 8L

14.4. In Accordance with TDG

Proper Shipping Name : AMMONIA SOLUTION
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Packing Group : III
Additional Information : Marine Pollutant

14.5. Classified in Accordance with MX-SCT

Proper Shipping Name : AMMONIA SOLUTION
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Additional Information : Marine Pollutant

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

Ammonium hydroxide (1336-21-6)	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard
SARA Section 302 Threshold Planning Quantity (TPQ)	**Ammonia hydroxide**: 1000 lb final RQ; 454 kg final RQ **Ammonium sulfite**: 5000 lb final RQ; 2270 kg final RQ
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Sudden release of pressure hazard
SARA Section 313 - Emission Reporting	1.0 % de minimus concentration (includes anhydrous Ammonia and aqueous Ammonia from water dissociable Ammonium salts and other sources, 10% of total aqueous Ammonia is reportable under this listing)
U.S. Clean water act	Ammonium hydroxide- Present (1000 lb RQ) Ammonium sulfite- Present (5000 lb RQ)

Ammonium hydroxide (1336-21-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Ammonium thiosulfate (7783-18-8)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. US State Regulations

	State Hazardous Substance List (Right to Know)				
	CAS Number	**CA Prop 65**	**MA**	**NJ**	**PA**
U.S. State Regulations	**1336-21-6**	Not Listed	Present	Present	Present
	7783-18-8	Not Listed	Present	Present	Not Listed
	7783-20-2	Not Listed	Present	Present	Not Listed
	10196-04-0	Not Listed	Present	Present	Present

15.3. Canadian Regulations

Ammonium hydroxide (1336-21-6)	
WHMIS Classification	Class E - Corrosive Material Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic

	effects
	

Ammonium hydroxide (1336-21-6)	
Listed on the Canadian DSL (Domestic Substances List) Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1%	
WHMIS Classification	Class E - Corrosive Material Class D Division 1 Subdivision B - Toxic material causing immediate and serious toxic effects

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 4 June 2024

Revision Comments : This version contains updates/revisions to the following sections:

- Updated company address

GHS Full Text Phrases:

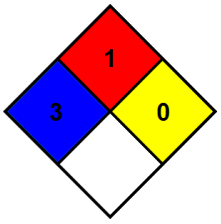
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Skin Corr. 1A	Skin corrosion/irritation Category 1A
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H221	Flammable gas
H280	Contains gas under pressure; may explode if heated
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H331	Toxic if inhaled
H335	May cause respiratory irritation
H400	Very toxic to aquatic life

NFPA Rating

Health Hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

Fire Hazard : 1 - Must be moderately heated or exposed to relatively high temperature before ignition can occur.

Reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

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

Flammability : 1 Slight Hazard

Physical : 0 Minimal Hazard

Party Responsible for the Preparation of This Document
CF Industries, Corporate EHS Department, 847-405-2400

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.

CF believes the information contained herein is accurate; however, CF makes no guarantees or warranties with respect to such accuracy and assumes no liability in connection with the use of the information contained herein by any party. The provision of the information contained herein by CF is not intended to be and should not be construed as legal advice or as ensuring compliance by other parties. Judgments as to the suitability of the information contained herein for the party's own use or purposes are solely the responsibility of that party. Any party handling, transferring, transporting, storing, applying or otherwise using this product should review thoroughly all applicable laws, rules, regulations, standards and good engineering practices. Such thorough review should occur before the party handles, transfers, transports, stores, applies or otherwise uses this product.

North America GHS US 2012