Urea Ammonium Nitrate Solution - 32% N (UAN)

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), Mexico NOM-018-STPS-2015.

Revision Date: 4 June 2024 Date of issue: 4 June 2024 Supersedes Date: 23 June 2023 Version: 2.1

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Name: Urea Ammonium Nitrate Solution - 32% N (UAN)
CAS No: 15978-77-5
EC No: 605-190-4
Synonyms: UAN (28, 30, and 32%N)
STCC: 2871313

1.2. Intended Use of the Product

Agricultural Industry: Fertilizer

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 : +1 800-424-9300
For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, call CHEMTREC – Day or Night

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification (CLP)
Eye Irrit. 2A H319
Full text of H-phrases: see section 16

2.2. Label Elements

GHS Labeling
Hazard Pictograms (CLP) :

GHS07

Signal Word (CLP) : Warning
Hazard Statements (CLP) : H319 - Causes serious eye irritation.
Precautionary Statements (CLP) : P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.
P280 - Wear protective gloves, protective clothing, and eye protection.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 - If eye irritation persists: Get medical advice/attention.

2.3. Other Hazards

No additional information available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Not applicable

3.2. Mixture

Contains	Product Identifier	REACH Registration No.	% (w/w)	Classification (GHS-US)
Ammonium nitrate	(CAS No) 6484-52-2 (EC No) 229-347-8	01-2119490981-27-0111	41 - 48	Ox. Sol. 3, H272 Eye Irrit. 2A, H319

Urea	(CAS No) 57-13-6 (EC No) 200-315-5	01-2119463277-33-0135	32.6 - 38	Not classified
Water	(CAS No) 7732-18-5 (EC No) 231-791-2	Not applicable	19.4 - 31.1	Not classified

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: When symptoms occur: go into open air and ventilate suspected area. Call a POISON CENTER/doctor/physician if you feel unwell.

Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists. Wash contaminated clothing before reuse.

Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

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: Causes eye irritation.

Inhalation: May cause irritation to the respiratory tract.

Skin Contact: May cause skin irritation.

Eye Contact: Causes eye irritation. Symptoms may include: Redness, pain, swelling, itching, burning, tearing, and blurred vision.

Ingestion: Ammonium Nitrate: Ingestion may cause methemoglobinemia. Intial manifestation of methemoglobinemia is cyanosis, characterized by navy lips, tongue and mucous membranes, with skin color being slate grey. Further manifestation is characterized by headache, weakness, dyspnea, dizziness, stupor, respiratory distress and death due to anoxia. If ingested, nitrates may be reduced to nitrites by bacteria in the digestive tract. Signs and symptoms of nitrite poisoning include methemoglobinemia, nausea, dizziness, increased heart rate, hypotension, fainting and possibly shock.

Chronic Symptoms: Overexposure to this material may result in methemoglobinemia.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. Hot Ammonium Nitrate burns skin, allowing rapid absorption of Ammonium Nitrate through the skin and toxic effects can occur quite rapidly. Causes methemoglobinemia – emergency response should treat appropriately, such as by intravenous administration of methylene blue.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

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: Contains substances that are oxidizers when in solid form. May cause fire or explosion if allowed to dry.

Explosion Hazard: May be explosive in contact with flammable or organic substances and confinement during fire.

Reactivity: Accelerates the rate of burning materials. Oxidizer if allowed to dry.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire. Under fire conditions closed containers may rupture or explode.

Firefighting Instructions: Do not allow product to evaporate to dryness. For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Water spray may be useful in minimizing or dispersing vapors. Cool equipment exposed to fire with water, if it can be done with minimal risk.

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

Hazardous Combustion Products: Nitrogen oxides. Ammonia. Toxic vapors. Carbon oxides (CO, CO_2).

Reference to Other Sections
Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Use special care to avoid static electric charges. Keep away from open flames, hot surfaces and sources of ignition. No smoking. Avoid all contact with skin, eyes, or clothing. Avoid breathing vapor, mist, or spray.

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).
Emergency Procedures: Evacuate unnecessary personnel. Eliminate ignition sources.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.
Emergency Procedures: Stop leak if safe to do so. Ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Contact competent authorities after a spill.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container. Do not take up in combustible material such as: saw dust or cellulosic material. Contact competent authorities after a spill.

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: Smothering, contact with organic material, or combustible material may cause an explosive situation. Thoroughly wash out pipes, tanks, or valves before welding or burning. Residual solidified Ammonium Nitrate may explode under high temperatures and confinement. Heating above 140°F will promote hydrolysis. Extreme cold (< 32 °F) may cause crystallization of the product. Do not allow liquid to evaporate, as solid ammonium nitrate residue can explode.
Precautions for Safe Handling: Use only outdoors or in a well-ventilated area. Avoid all eye and skin contact, and do not breathe vapor and mist.
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. Wash contaminated clothing before reuse.

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. Ventilate confined spaces before entering. Proper grounding procedures to avoid static electricity should be followed. Comply with applicable regulations.
Storage Conditions: Store in a dry, cool, and well-ventilated place. Keep in fireproof place. Store locked up. Store away from oxidizers, combustible materials, and all ignition sources. Protect container(s) against corrosion, physical damage, and extreme temperatures. Detached outside storage is preferable. May be corrosive to some metals.
Incompatible Materials: Strong acids. Strong bases. Strong oxidizers. Chlorine. Hypochlorites. Metallic powders. Combustible materials. Chromates. Zinc. Copper and its alloys. Chlorates.

7.3. Specific End Use(s)

Agricultural Industry: Fertilizer

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.

8.2. Exposure Controls

Appropriate Engineering Controls: Gas detectors should be used when toxic gases may be released. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use explosion-proof equipment. Ensure all national/local regulations are observed. Provide sufficient ventilation to keep ammonia vapors below the permissible exposure limit.

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

Materials for Protective Clothing: Chemically resistant materials and fabrics.
Hand Protection: Wear chemically resistant protective gloves.
Eye Protection: Chemical goggles or safety glasses.
Skin and Body Protection: Chemical resistant suit. Rubber apron, boots.
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 liquid
Odor	:	Little or no detectable ammonia odor
Odor Threshold	:	Not available
pH	:	6.5 - 7.8
Evaporation Rate	:	Not available
Melting Point	:	0°F (-18°C) for 28%N; 16°F (-9°C) for 30%N; 32°F (0°C) for 32%N (salt out temperature)
Freezing Point	:	Not available
Boiling Point	:	> 100 °C (> 212 °F)
Flash Point	:	Not available
Auto-ignition Temperature	:	Not available
Decomposition Temperature	:	Not available
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	Not available
Upper Flammable Limit	:	Not available
Vapor Pressure	:	0.11 - 0.06 psia (28%, 32% respectively) @60°F (15.6°C) due to water component
Relative Vapor Density at 20 °C	:	Not available
Relative Density	:	10.67 lbs/gal (28%N); 10.86 lbs/gal (30%N); 11.08 lbs/gal (32% N)
Specific Gravity	:	1.281 (28%N); 1.304 (30%N); 1.330 (32%N) @60°F (16°C)
Solubility	:	Miscible
Partition Coefficient: N-Octanol/Water	:	Not available
Viscosity	:	3.6 cP (28%N); 6.1 cP (32%N) @40°F (4.4°C)
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: Accelerates the rate of burning materials. Oxidizer if allowed to dry.

10.2. Chemical Stability: Stable.

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

10.4. Conditions to Avoid: Extremely high or low temperatures. Open flame. Heat. Sparks. High pressures-explodes if heated under confinement. Do not allow product to dry out.

10.5. Incompatible Materials: Strong acids. Strong bases. Strong oxidizers. Chlorine. Hypochlorites. Metallic powders. Combustible materials. Chromates. Zinc. Copper and its alloys. Chlorates.

10.6. Hazardous Decomposition Products: Nitrogen oxides. Ammonia. Carbon oxides (CO, CO_2).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects - Product

Acute Toxicity: Not classified

LD50 and LC50 Data: Not available

Skin Corrosion/Irritation: Not classified

pH: 6.5 - 7.8

Serious Eye Damage/Irritation: Causes serious eye irritation.

pH: 6.5 - 7.8

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Teratogenicity: Not classified

Carcinogenicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: May cause irritation to the respiratory tract.

Symptoms/Injuries After Skin Contact: May cause skin irritation.

Symptoms/Injuries After Eye Contact: Causes eye irritation. Symptoms may include: Redness, pain, swelling, itching, burning, tearing, and blurred vision.

Symptoms/Injuries After Ingestion: Ammonium Nitrate: Ingestion may cause methemoglobinemia. Intial manifestation of methemoglobinemia is cyanosis, characterized by navy lips, tongue and mucous membranes, with skin color being slate grey. Further manifestation is characterized by headache, weakness, dyspnea, dizziness, stupor, respiratory distress and death due to anoxia. If ingested, nitrates may be reduced to nitrites by bacteria in the digestive tract. Signs and symptoms of nitrite poisoning include methemoglobinemia, nausea, dizziness, increased heart rate, hypotension, fainting and possibly shock.

Chronic Symptoms: Overexposure to this material may result in methemoglobinemia.

11.2. Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Urea (57-13-6)	
LD50 Oral Rat	8471 mg/kg
Ammonium nitrate (6484-52-2)	
LD50 Oral Rat	2217 mg/kg
LC50 Inhalation Rat	> 88.8 mg/l/4h

Urea (57-13-6)

Skin Corrosion/Irritation: Not classified
Serious Eye Damage/Irritation: Not classified
Respiratory or Skin Sensitization: Not classified
Germ Cell Mutagenicity: Not classified
Teratogenicity: Not classified
Carcinogenicity: Not classified
Specific Target Organ Toxicity (Repeated Exposure): Not classified
Reproductive Toxicity: Not classified
Specific Target Organ Toxicity (Single Exposure): Not classified

Ammonium nitrate (6484-52-2)

Skin Corrosion/Irritation: Not classified
Serious Eye Damage/Irritation: Causes serious eye irritation. pH: 6.5 - 7.8
Respiratory or Skin Sensitization: Not classified
Germ Cell Mutagenicity: Not classified
Teratogenicity: Not classified
Carcinogenicity: Not classified
Specific Target Organ Toxicity (Repeated Exposure): Not classified
Reproductive Toxicity: Not classified
Specific Target Organ Toxicity (Single Exposure): Not classified

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Urea Ammonium Nitrate Solution- 32% N (UAN) (15978-77-5)	
	No data available
Urea (57-13-6)	
LC50 Fish 1	16200 - 18300 mg/l (Exposure time: 96 h - Species: Poecilia reticulata)
EC50 Invertebrate 1	3910 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
Ammonium nitrate (6484-52-2)	
LC50 Fish 1	447 mg/L (48h - Species: Carp)
EC50 Invertebrate 1	490 mg/L ((300 mg NO3/L) TLm (=EC50), Exposure time: 48h – Species: Daphnia magna)

12.2. Persistence and Degradability

Urea Ammonium Nitrate Solution- 32% N (UAN) (15978-77-5)	
Persistence and Degradability	Not established.
Urea (57-13-6)	
Persistence and Degradability	Readily Biodegradable
Ammonium nitrate (6484-52-2)	
Persistence and Degradability	Readily degradable

12.3. Bioaccumulative Potential

Urea Ammonium Nitrate Solution- 32% N (UAN) (15978-77-5)	
Bioaccumulative Potential	Not established.
Log Pow	-1.14
Urea (57-13-6)	
BCF Fish 1	< 10

Log Pow	-1.59 (at 25 °C)
Ammonium nitrate (6484-52-2)	
BCF Fish 1	(no bioaccumulation expected)
Log Pow	No data

12.4. Mobility in Soil Very soluble in water. The NO3- ion is mobile. The NH4+ ion is adsorbed by the soil.

12.5. Other Adverse Effects None known

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.

SECTION 14: TRANSPORT INFORMATION

14.1. UN Number Not regulated for transport
14.2. UN Proper Shipping Name Not regulated for transport
14.3. Transport Hazard Class(es) Not regulated for transport
14.4. Packing Group Not regulated for transport
14.5. Environmental Hazards Not regulated for transport
14.6. Special Precautions for User Not regulated for transport
14.7. Transport in Bulk According to Annex II of MARPOL and the IBC Code Not regulated for transport

SECTION 15: REGULATORY INFORMATION

15.1. Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

Ammonium nitrate (6484-52-2)
EU - REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances
EU - REACH (1907/2006) - Registered Substances Considered not to be PBT/vPvB

Urea (57-13-6)
EU - REACH (1907/2006) - Article 15(1) - Substances Regarded as Being Registered - Plant Health Products
EU - REACH (1907/2006) - Registered Substances Considered not to be PBT/vPvB

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:

Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A
Ox. Sol. 3	Oxidizing solids Category 3
H272	May intensify fire; oxidizer
H319	Causes serious eye irritation

Party Responsible for the Preparation of This Document

CF Industries, Corporate EHS Department, +1-847-405-2400

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.

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