

APPENDIX J

UREA SOLUTION SAFETY DATA SHEET

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INDUSTRIAL SOLUTION SERVICES, INC.

Post Office Box 1921; Upland, California 91786

Phone (909) 931-1860 Fax (909) 931-1960

Reagent Grade Urea Solution – Safety Data Sheet



SECTION 1 - IDENTIFICATION

<u>Product/Chemical Name</u>	Urea Solution
<u>Formula</u>	CH ₄ N ₂ O + H ₂ O
<u>Chemical Family</u>	Amide
<u>Synonyms</u>	Urea Liquor; Nitrogen
<u>General Use</u>	Solution for SCR NO _x Control Systems

Manufacturer Information

Industrial Solution Services, Inc.	(909) 931-1860
P.O. Box 1921	
Upland, CA 91786	

Emergency Phone:

Chemtrec (USA)	(800) 424-9300
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SECTION 2 - HAZARDS IDENTIFICATION

Hazard Classification

H315	Skin Corrosion/Irritation (Category 2)
H320	Eye Irritation (Category 2B)

<u>Signal Word</u>	Warning
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<u>Pictograms</u>	None
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Precautionary Statements

P262	Do not get in eyes, skin or on clothing
P264	Wash hands thoroughly after handling
P302+P350	IF ON SKIN: Wash with plenty of soap and water
P305+P351+P388	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing
P332+P313	IF SKIN irritation occurs: get medical advice/attention
P337+P313	IF eye irritation persists: get medical advice/attention
P501	Dispose of container in accordance with local regional, national and international regulations

Other Hazards

None

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SECTION 3 - COMPOSITION / INFORMATION ON INGREDIENTS

<u>Component Name</u>	<u>Percentage by Weight</u>	<u>Product Identifier</u>
Urea	30 - 70%	(CAS No.) 57-13-6
Water	28 - 69.7%	(CAS No.) 7732-18-5
Free Ammonia	0.1 - 1.0%	(CAS No.) 7664-41-7
Biuret	0.1 - 0.5%	(CAS No.) 108-19-0
Ammonium Carbamate	01. - 0.5%	(CAS No.) 1111-78-0

SECTION 4 - FIRST AID MEASURES

First Aid Measures:

Inhalation

Move patient to fresh air and monitor. If cough or difficulty in breathing develops, evaluate for respiratory tract irritation. If trained to do so, administer supplemental oxygen if needed. If irritation, coughing or difficulty in breathing persists, the patient should be seen in a health care facility

Skin Contact

Flush exposed area with copious amounts of tepid water for at least 15 minutes followed by washing area thoroughly with soap and water. The patient should be seen in a health care facility if irritation or pain persists.

Eye Contact

Flush eyes with copious amounts of tepid water for at least 15 minutes. If irritation, pain, swelling, excessive tearing, or light sensitivity persists, the patient should be seen in a health care facility.

Ingestion

If conscious, give the patient large quantities of water to drink and DO NOT induce vomiting. Seek medical attention.

Important Symptoms (Acute or Delayed)

Inhalation

May irritate the nose and mucus membranes.

Skin Contact

May cause mild irritation to skin.

Eye Contact

May cause irritation. May result in redness and tearing.

Ingestion

May cause abdominal pain, nausea, or vomiting.

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SECTION 5 - FIRE FIGHTING MEASURES

Flammability

Solution is not flammable

Suitable Extinguishing Media

Use water to extinguish if compatible with burning material

Specific Hazards Arising from the Chemical

Runoff from fire control or dilution water may cause pollution. At elevated temperature, urea solution may decompose to form cyanuric acid, ammonia, biuret, and/or nitrogen oxides.

Special Fire Fighting Procedures

Wear full fire fighting protective equipment that is appropriate for conditions. Positive pressure self-contained breathing apparatus (SCBA) should be used when there is a potential for inhalation of vapors and/or fumes.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions and Protective Equipment

Wear appropriate protective equipment as described in Section 8.

Emergency Procedures, Containment and Cleanup

Remove unnecessary personnel from the area. Generally, a small spill is one that involves a single, small package (i.e. up to a 55 gallon drum), small cylinder, or a small (non-continuing) leak from a large container. Shut off the source of the leak where safe to do so. Collect the material for reuse as fertilizer, or disposal in accordance with local, state, province, and federal regulations. Avoid direct discharge to sewers or other water sources, as runoff may cause pollution.

SECTION 7 - HANDLING AND STORAGE

Incompatible Materials

Oxidizers, Hypochlorites

Storage Precautions

Store away from direct sunlight in a well ventilated area. Contact with mild steel may result corrosion damage. Ensure tanks and other containers are adequately labeled for the contents

Handling Precautions

Use proper protective equipment (Section 8) when handling urea solution. Provide adequate ventilation when working with urea solution. Do not eat or drink, and wash hands with soap and water after handling.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limit (Ammonia)

TWA 25 ppm

STEL 33 ppm

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PEL 50 ppm
IDLH 300 ppm

No limits established for other mixture components (urea, water, biuret, ammonium carbamate)

Respiratory Protection

Under normal conditions, respiratory protection is not required. If work requires exposure within a confined area, monitor for ammonia and oxygen content. If ammonia vapors are present, protect using an air-purifying respirator with ammonia cartridge according to the following:

< 25 ppm	No protection required
25-35 ppm	Air-purifying respirator required if the daily TWA is exceeded
35-50 ppm	Air-purifying respirator required if exposed for >15 minutes
50-300 ppm	Air-purifying respirator required
>300 ppm	Fresh air supply system required (i.e., SCBA)

Eye Protection

It is recommended that safety glasses or goggles be used and if there is a potential for splashing liquid, a face shield should be used in conjunction with the safety glasses or goggles.

Skin Protection

Impervious gloves should be worn.

Other Protections

Safety shower and eyewash fountain or at least 5 gallons of accessible clean water should be provided in a urea liquid handling area.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

<u>Physical Form</u>	Liquid
<u>Color</u>	Colorless
<u>Odor</u>	Slight ammonia odor
<u>Odor Threshold</u>	N/A
<u>Boiling Point</u>	223°F (106°C) at 50% solution
<u>Melting Point</u>	40% urea solution salts out at 33°F (0.6°C) 50% urea solution salts out at 64°F (18°C) 70% urea solution salts out at 135°F (57°C)
<u>pH</u>	9.25 at 40% solution
<u>Solubility</u>	100% (water)
<u>Specific Gravity</u>	1.11 at 40% solution 1.14 at 50% solution 1.175 at 70% solution
<u>Vapor Density</u>	N/A
<u>Vapor Pressure</u>	N/A

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<u>Flash Point</u>	N/A
<u>Flammability</u>	N/A
<u>Auto-Ignition Temperature</u>	N/A
<u>Evaporation Rate</u>	N/A
<u>% Volatile by Volume</u>	N/A
<u>Molecular Weight</u>	N/A
<u>Density</u>	9.28 lb/gal at 60°F for 40% solution 9.51 lb/gal at 60°F for 50% solution 9.80 lb/gal at 60°F for 70% solution
<u>Critical Temperature</u>	N/A
<u>Decomposition Temperature</u>	N/A
<u>Partition Coefficient: n-octanol/water</u>	N/A
<u>Viscosity</u>	N/A

SECTION 10 - STABILITY AND REACTIVITY

Reactivity

Reacts with sodium hypochlorite or calcium hypochlorite to form nitrogen trichloride that may explode spontaneously in air. Incompatible with sodium nitrite, phosphorus pentachloride, and nitrosyl or gallium perchlorate.

Chemical Stability

This is a stable material

Hazardous Polymerization

Hazardous Polymerization will not occur

Decomposition

Urea solution forms ammonia, cyanuric acid, biuret, and/or nitrogen oxides (NOx) upon decomposition.

SECTION 11 - TOXICOLOGICAL INFORMATION

Acute Oral Toxicity

LD50 (Rat)	14,300 – 15,000 mg/kg
LD50 (Mouse)	11,500 – 13,000 mg/kg
LD50 (Cattle)	510 mg/kg

Exposure Routes

Inhalation	(Acute) Minor respiratory irritation (Chronic) No chronic effects
Skin Exposure	(Acute) Minor dermal irritation (Chronic) No chronic effects
Eye Contact	(Acute) Minor eye irritation and tearing

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Ingestion	(Chronic) No chronic effects (Acute) Irritation of the mouth and throat, possible abdominal pain, nausea, vomiting (Chronic) N/A
Other	N/A

SECTION 12 - ECOLOGICAL INFORMATION

Acute Toxicity to Fish

LC50 (Barillius Barna) 9,100 mg/L (96 hr)

Acute Toxicity to Aquatic Invertebrates

EC50 >10,000 mg/L (DIN 38412 Part 11; 24 hr)

Ecological Effects

Persistence and Degradability N/A

Bioaccumulation potential N/A

Mobility in Soil N/A

Other Adverse Effects Notify local health and wildlife officials and operators of any nearby water intakes of contamination or discharge into or leading to waterways.

SECTION 13 - DISPOSAL CONSIDERATIONS

RCRA Hazardous Waste Not listed

Neutralization No neutralization required

Disposal Practices

Consult state and local environmental agencies for acceptable disposal methods. Recover product for use as a fertilizer, if possible.

SECTION 14 - TRANSPORT INFORMATION

Urea solution is not listed by any U.S. or Canadian transportation authority as a hazardous material and as such, no specific information is available.

SECTION 15 - REGULATORY INFORMATION

SARA Hazard Categories

Immediate Health Hazard Yes

Delayed Hazard No

Fire Hazard No

Pressure Hazard No

Reactivity Hazard No

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CERCLA Hazardous Substance

Not Listed

TSCA Inventory

Not Listed

California Prop 65 Chemicals

This product does not contain any chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.

SECTION 16 - OTHER INFORMATION

The information and recommendations herein are taken from data contained in independent, industry-recognized references including but not limited to NIOSH, OSHA, CHRIS, the TFI Product Testing Program, and SAX's Dangerous Properties of Industrial Materials — ninth edition. INDUSTRIAL SOLUTION SERVICES, INC. makes no guarantee, warranty or other representation concerning this substance, since conditions of its use are beyond the control of the company. INDUSTRIAL SOLUTION SERVICES, INC. disclaims any liability for loss or damage incurred in connection with the use of this substance.

Revised April 3, 2018

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