



MATERIAL SAFETY DATA SHEET

Emergency Contact: CHEMTREC 1-800-424-9300

A. GENERAL INFORMATION

Trade Name (common name or synonym) UREA SOLID		C.A.S. NO. 57-13-6	
Chemical Name UREA, CARBAMIDE, CARBONYLDIAMIDE			
Formula NH₂, CONH₂		Molecular Wt. 60.06	
Address PRO Chemical & Dye, Inc. P.O. Box 14 Somerset, MA 02726 (508) 676-3838 Fax (508) 676-3980			
Contact PRO Chemical & Dye, Inc.	Phone Number (508) 676-3838	Issue Date JULY 1989	Revised Date 12/24/92

B. FIRST AID

EYES:	PROMPTLY FLUSH WITH WATER, CONTINUING FOR 15 MINUTES. IF IRRITATION PERSISTS, PROMPTLY CONSULT A PHYSICIAN.
SKIN:	WASH WITH MILD SOAP AND WATER. GET PROMPT MEDICAL ATTENTION IF IRRITATION PERSISTS.
INHALATION:	NO INCIDENTS OF DUST INHALATION HEALTH EFFECTS REPORTED.
INGESTION:	A SINGLE DOSE OF 100 GRAMS HAS REPORTEDLY CAUSED MILD SYMPTOMS OF CENTRAL NERVOUS SYSTEM DEPRESSION, E.G. DROWSINESS, SLOW REFLEXES, SLURRED SPEECH.

** NOTICE **

Seller warrants that this Product conforms to the specifications stated herein. Buyer assumes all risks associated with the possession, use, mixing, blending, treatment, storage, disposal, transportation and handling of the Product, whether alone or in combination with other substances. SELLER MAKES NO OTHER WARRANTY OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, AND ALL OTHER WARRANTIES, INCLUDING WARRANTIES OF QUALITY, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE DISCLAIMED. Seller's liability is limited to the product price.

In the event of any medical emergency involving this Product, seek professional assistance or contact a Poison Control Center immediately.



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C. HAZARDS INFORMATION - HEALTH

Inhalation

NO INCIDENTS OF DUST INHALATIONS HEALTH EFFECTS HAVE BEEN REPORTED.

Ingestion

A SINGLE DOSE OF 100 GRAMS HAS REPORTEDLY CAUSED MILD SYMPTOMS OF CENTRAL NERVOUS SYSTEM DEPRESSION, E.G. DROWSINESS, SLOW REFLEXES, SLURRED SPEECH.

Skin

VERY MILD IRRITANT. WASH WITH MILD SOAP AND WATER. GET PROMPT MEDICAL ATTENTION IF IRRITATION PERSISTS.

Eyes

PROMPTLY FLUSH WITH WATER, CONTINUING FOR 15 MINUTES. IF IRRITATION PERSISTS, PROMPTLY CONSULT PHYSICIAN.

Permissible Concentration

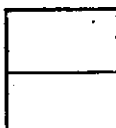
Air: NONE ESTABLISHED BY OSHA. 15 MG/M3 TOTAL DUST (TOTAL UREA) PEL/5 MG/M3 - RESPONSIBLE/10 MG/M3-TLV.
Biological: NONE ESTABLISHED.

Unusual chronic toxicity

NONE KNOWN.

C. HAZARDS INFORMATION - Fire and Protection

Flash Point: Not applicable



Open Cup

Closed Cup

Auto Ignit. Temperature:

NOT APPLICABLE

Flammable limits in air (% by vol)

Upper: NOT APPLICABLE

Lower: NOT APPLICABLE

Unusual fire and explosion hazards

HEATING ABOVE 270 DEG. F DECOMPOSES TO BIURET, AMMONIA, CYANURIC ACID, AND NITROGEN OXIDES. STEEL TO SMOKE FUMES AND GASES CAN LEAD TO IRREVERSIBLE LUNG INJURY WITHOUT EARLY SIGNS AND SYMPTOMS.



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D. PRECAUTIONS/PROCEDURES

Fire extinguishing agents RECOMMENDED

ALL STANDARD AGENTS ARE ACCEPTABLE.
(WATER, CO₂, DRY CHEMICALS)

Fire extinguishing agents to AVOID

ALL STANDARD AGENTS ARE ACCEPTABLE.
(WATER, CO₂, DRY CHEMICALS)

Special fire fighting precautions

WET UREA IS SLIPPERY.

Ventilation

PROVIDE LOCAL OR GENERAL VENTILATION TO KEEP DUST BELOW OSHA NUISANCE
DUST LIMIT OF 15 MG / M³.

Normal Handling

AVOID CONTACT WITH EYES. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN
OR CLOTHING. AVOID DUST INHALATION. CONTACT LENSES SHOULD NOT BE WORN.

Storage

KEEP MATERIAL DRY. AVOID HEATING OF PRODUCT.

Spill or leak

IF UNCONTAMINATED, RECOVER AND REUSE AS PRODUCT. PREVENT LARGE
QUANTITIES FROM CONTACTING VEGETATION OR WATERWAYS. KEEP ANIMALS
AWAY FROM LARGE SPILLS.

Special Precautions / Procedures / Label Instructions

AVOID CONTAINERS, PIPING OR FITTINGS MADE OF BRASS, BRONZE, OR OTHER
COPPER-BEARING ALLOYS, OR GALVANIZED METAL.



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E. PERSONAL PROTECTIVE EQUIPMENT

Respiratory protection NIOSH APPROVED DUST RESPIRATOR.
Eyes and face DO NOT WEAR CONTACT LENSES. WEAR SAFETY GLASSES.
Hands, arms, and body NOT GENERALLY REQUIRED, UNLESS IRRITATION OF SKIN DEVELOPS. WEAR IMPERVIOUS GLOVES AND LONG SLEEVES.
Other clothing and equipment NOT GENERALLY REQUIRED.

F. PHYSICAL DATA

Material is (at normal conditions) <input type="checkbox"/> LIQUID <input checked="" type="checkbox"/> SOLID <input type="checkbox"/> GAS	Appearance and Odor WHITE, SOLID, SPHERICAL SHAPED WITH SLIGHT AMMONIA ODOR.	
Boiling Point: N/A Melting Point: 271 DEG. F Specific Gravity (H2O = 1) : 1.335 @ 68 DEG. F Vapor Density (Air = 1) : N/A		
Solubility in Water (% by wt.) 108 GM / 100 CC @ 68 DEG. F.	pH 7.2 (10% AQUEOUS SOLUTIONS)	Vapor Pressure <input type="checkbox"/> (mm Hg at 20C) <input type="checkbox"/> (PSIG) NOT APPLICABLE
Evaporation Rate <input type="checkbox"/> (Butyl Acetate = 1) <input type="checkbox"/> (Ether = 1) Time : NOT APPLICABLE	% Volatiles by volume (at 20 C) NOT APPLICABLE	



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G. REACTIVITY DATA

Stability <input type="checkbox"/> Unstable <input checked="" type="checkbox"/> Stable		Conditions to Avoid NOT APPLICABLE
Incompatibility (materials to avoid) INCOMPATIBLE WITH SODIUM NITRITE, PHOSPHORUS PENTACHLORIDE, NITROSYLPER- CHLORATE. MAY REACT WITH NITRATES, ALKALIES, OXIDIZING AGENTS, HYPOCHLO- RIDE, ALDEHYDES, INORGANIC ACIDS, OLEFINS, POLYMERIZABLE ESTERS, COPPER		
Hazardous decomposition products 266 DEG. F DECOMPOSITION STARTS WITH FORMATION OF AMMONIA, CYANURIC ACID, CYANIC ACID, CARBON DIOXIDE, BIURET, AND NITROGEN OXIDES.		
Hazard polymerization <input type="checkbox"/> May Occur <input checked="" type="checkbox"/> Will Not Occur		Conditions to Avoid NOT APPLICABLE.

H. HAZARDOUS INGREDIENTS (MIXTURES ONLY)

Material or Composition / C.A.S. #	Wt. %	Hazard Data (see Section K)
UREA - NON-HAZARDOUS	97 - 98	
BIURET - NON-HAZARDOUS	0 - 1	
METHYLENE DIUREA - NON-HAZARDOUS	0 - 1.76	



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I. ENVIRONMENTAL

Degradability / aquatic toxicity

AQUATIC TOXICITY CONSIDERATION INDICATES A LOW ORDER OF TOXICITY. SINCE UREA IS A FERTILIZER, IT MAY PROMOTE EUTROPHICATION IN WATERWAYS.

EPA hazardous substance?

YES

NO

If so, reportable quantity :
NONE.

40 CFR
116-117

Waste disposal methods (disposer must comply with disposal & discharge laws)

DISPOSAL OF UREA LIQUOR MAY BE SUBJECT TO FEDERAL, STATE, AND LOCAL REGULATIONS. USERS OF THIS PRODUCT SHOULD REVIEW THEIR OPERATIONS IN TERMS OF APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS, THEN CONSULT WITH APPROPRIATE REGULATORY AGENCIES BEFORE DISCHARGING OR DISPOSING OF WASTE MATERIAL.

J. REFERENCES

Is this a listed material?

YES

NO

YES

NO

NTP (List)

OSHA (Carcinogen)

IARC (Monographs)

ACGIH (TLV List)

Permissible concentration references

(OSHA - DUST - 15 MG / M3
5 MG / M3

- NUISANCE DUST (TOTAL) UREA
- RESPIRABLE FRACTION UREA

Regulatory Standards

NONE.

D.O.T. Classification NOT REGULATED

49 CFR

General

- (A) ARCADIAN CORPORATION MATERIAL SAFETY DATA SHEET FOR SOLID UREA, 198
- (B) MERCK INDEX, 9TH ED., 1976, "UREA", MONOGRAPH - 9525.
- (C) COAST GUARD "CHRIC" SYSTEM FORM "URE" ON UREA, OCTOBER 1978.

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K. ADDITIONAL INFORMATION

UREA
FREE AMMONIA 0 - 250 PPM
BIURET 0 - 1%
TOTAL NITROGEN 45 - 46.5

SECTION I - TITLE III - SARA

UREA LIQUOR / COMPONENTS / IMPURITIES LIST IN: (REQ. REPORTING)

40 CFR PART 355 - EXTREMELY HAZARDOUS SUBSTANCES - NONE
40 CFR PART 370 - HAZARDOUS CHEMICAL REPORTING - NOT APPLICABLE

SARA - SECTION 311 - EPA HAZARD CATEGORIES

IMMEDIATE HEALTH	DELAYED HEALTH	FIRE	SUDDEN PRESSURE RELEASE	REACTIVE
X				
40 CFR PART 372 - TOXIC CHEMICALS -				NONE

NFPA

HEALTH - 1
FIRE - 0
INSTABILITY - 0
SPECIAL PRECAUTIONS - NONE

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K. ADDITIONAL INFORMATION (continued)

GLOSSARY:

ACGIH	AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS
AEL	ACCEPTABLE EXPOSURE LIMIT
CAS	CHEMICAL ABSTRACTS SERVICE (IDENTIFIES SPECIFIC CHEMICALS)
CERCLA	COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (SUPERFUND)
CFR	CODE OF FEDERAL REGULATIONS
CHEMTREC	CHEMICAL TRANSPORTATION EMERGENCY CENTER
DOT	U.S. DEPARTMENT OF TRANSPORTATION
EPA	ENVIRONMENTAL PROTECTION AGENCY
IARC	INTERNATIONAL AGENCY FOR RESEARCH ON CANCER
IMO	INTERNATIONAL MARINE ORGANIZATION
LD50/LC50	DOSE OR CONCENTRATION CAUSING 50% DEATH IN ANIMALS
LEL-UEL	LOWER AND UPPER EXPLOSIVE LIMIT CONCENTRATIONS
MG/M3	MILLIGRAMS PER CUBIC METERS OF AIR
NIOSH	NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NTP	NATIONAL TOXICOLOGY PROGRAM
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PEL	PERMISSIBLE EXPOSURE LIMIT VALUES SET BY OSHA
PPM	PARTS PER MILLION
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
STEL	SHORT TERM EXPOSURE LIMIT (15 MINUTES)
TLV	THRESHOLD LIMIT VALUE (AIRBORNE CONCENTRATION OF A SUBSTANCE, SET BY ACGIH, THAT AN AVERAGE WORKER CAN REPEATEDLY BE EXPOSED TO WITHOUT ANY ADVERSE EFFECT)
TSCA	TOXIC SUBSTANCES CONTROL ACT
TWA	TIME WEIGHTED AVERAGE (FOR EXPOSURE TO A SUBSTANCE)
UN/NA NO.	DOMESTIC AND INTERNATIONAL IDENTIFICATION NUMBERS ASSIGNED TO HAZARDOUS MATERIALS

NFPA DEFINITIONS:

HEALTH HAZARD -

- 4 - DANGER: MAY BE FATAL ON SHORT EXPOSURE. SPECIALIZED PROTECTIVE EQUIPMENT REQUIRED.
- 3 - WARNING: CORROSIVE OR TOXIC. AVOID SKIN CONTACT OR INHALATION.
- 2 - WARNING: MAY BE HARMFUL IF INHALED OR ABSORBED.
- 1 - CAUTION: MAY CAUSE IRRITATION.
- 0 - NO UNUSUAL HAZARD.

FIRE HAZARD -

- 4 - DANGER: FLAMMABLE GAS OR EXTREMELY FLAMMABLE LIQUID.
- 3 - WARNING: FLAMMABLE LIQUID FLASH POINT BELOW 100 DEG. F.
- 2 - CAUTION: COMBUSTIBLE LIQUID. FLASH POINT OF 100 DEG. F - 200 DEG. F.
- 1 - COMBUSTIBLE IF HEATED.
- 0 - NOT COMBUSTIBLE.

INSTABILITY HAZARD -

- 4 - DANGER: EXPLOSIVE MATERIAL AT ROOM TEMPERATURE.
- 3 - DANGER: MAY BE EXPLOSIVE IF SHOCKED, HEATED UNDER CONFINEMENT OR MIXED WITH WATER.
- 2 - WARNING: UNSTABLE, OR MAY REACT IF MIXED WITH WATER.
- 1 - CAUTION: MAY REACT IF HEATED OR MIXED WITH WATER.
- 0 - STABLE: NOT REACTIVE WHEN MIXED WITH WATER.

SYMBOLS

W	- AVOID USE OF WATER	ALK	- ALKALI	ACID	- ACID
	- RADIATION	COR	- CORROSIVE	OXY	- OXIDIZING CHEMICALS