

T&N, Incorporated

Professional Turf and Ice Melt Products

815 Highway T • P.O. Box 240 • Foristell, MO 63348-0240
Local (636) 673-2505 • Toll Free (866) 670-2505 • Fax (636) 673-2750
E-Mail: tandninc@aol.com www.tandninc.com

MATERIAL SAFETY DATA SHEET

PRODUCT Greenskeeper's Secret Urea 46-0-0

PRODUCT CODE GSUREA/50
DATE PREPARED October 2007

DISTRIBUTOR

T and N, Inc.
815 Hwy. T - P.O. Box 240
Foristell, MO 63348

MATERIAL IDENTIFICATION

PRODUCT Urea
CHEMICAL FORMULA $\text{CO}(\text{NH}_2)_2$
SYNONYM Urea Prills, Urea Granular
MATERIAL USE Fertilizer, Industrial, Agricultural, Feed

COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES	CAS NO.	EXPOSURE LIMITS		PERCENTAGE BY WEIGHT
		OSHA PEL	TLV - TWA	
Urea, Carbamide, Carbonyldiamide, Carbamidic Acid ⁽¹⁾	57-13-6	5 ⁽²⁾ mg/m ³	10 ⁽³⁾	97.5 - 99.7
Alkalinity as Ammonia				150 PPM (Max)
Urea				97.5 - 99.7
Biuret				0.00 - 1.50
Methylenediurea ⁽⁴⁾				0.00 - 2.42

(1) Nuisance dust 15 mg/m³ (Total)

(2) 5 mg/m³ - Respirable (particulate) Fraction Urea.

(3) 10 mg/m³ - Inhalable particulate

(4) Reagent and Chemical Grade Urea does not contain formaldehyde

HAZARD INFORMATION

POTENTIAL ACUTE HEALTH EFFECTS

SKIN

Repeated or prolonged contact may cause reddening, itching and inflammation.

INGESTION

A single dose of 100 grams has reportedly caused mild symptoms of Central Nervous System depression e.g. drowsiness and slow reflexes.

EYES AND SKIN

EYES

Severe irritant. Contact with heated material may cause thermal burns.

SKIN

Slightly irritating. Repeated or prolonged contact may cause reddening, itching and inflammation. Contact with heated material may cause thermal burns. Not expected to be toxic by dermal exposure.

INHALATION

May cause respiratory tract irritation although no incidents of dust inhalation health effects have been reported.

INGESTION

Not found to be toxic by oral exposure. May cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting and diarrhea.

POTENTIAL CHRONIC HEALTH EFFECTS

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None known. Urea is a naturally occurring chemical in the body. It is an end product of protein metabolism and is excreted in the urine.

CARCINOGENICITY LISTS

IARC Monograph	ATP	OSHA
No	No	No

FIRST AID MEASURES

EYES

Promptly flush with water, continuing for 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. If irritation persists, consult a physician immediately.

SKIN

Wash area of contact thoroughly with soap and water. For contact with molten product do not remove clothing. Flush skin immediately with cold water. Launder clothing before reuse.

INGESTION

Do not induce vomiting. Keep affected person warm and treat for shock. Get medical attention. A single dose of 100 grams has reportedly caused mild symptoms of Central Nervous System depression (drowsiness, etc.).

INHALATION

Remove affected person from source of exposure. If not breathing, ensure open airway and initiate CPR. If breathing is difficult, administer oxygen; if available get medical attention.

FIRE FIGHTING MEASURES

FLASH POINT

Not applicable

AUTO IGNITION TEMPERATURE

Not applicable

LOWER EXPLOSIVE LIMIT

Not applicable

UPPER EXPLOSIVE LIMIT

Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS

Heating above 270° F decomposes to Biuret, Ammonia, and Nitrogen Oxides. Short-term exposures to smoke and gases may lead to irreversible lung injury without early signs and symptoms.

EXTINGUISHING MEDIA

All standard agents are acceptable. Use extinguishing agent suitable for the surrounding fires. Material itself burns with difficulty. Urea becomes slippery when wet. Guard against slips and falls.

SPECIAL FIRE FIGHTING PROCEDURES AND EQUIPMENT

Irritating toxic substances may be emitted upon thermal decomposition. Exposed firefighters should wear NIOSH approved self contained breathing apparatus with full face piece and full protective clothing. May form explosive mixtures if mixed with strong acid (Nitric/Perchloric). Ventilation: Provide local or general ventilation to keep below nuisance dust limit of 15 mg/m³.

ACCIDENTAL RELEASE MEASURES

SMALL SPILL

If uncontaminated, recover and reuse as product.

LARGE SPILL

Prevent large quantities from contacting vegetation or waterways. Keep animals away from large spills.

RELEASE NOTES

If spill could potentially enter any waterway, including intermittent dry creeks, contact the local authorities. If in the U.S., contact the US COAST GUARD NATIONAL RESPONSE CENTER at toll-free number 800-424-8802. In case of accident or road spill notify: CHEMTREC IN USA at 800-424-9300; CANUTEC in Canada at 613-996-6666. CHEMTREC in other countries at (International code)+1-703-527-3887.

COMMENTS

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See Section XIII for disposal information and Section XV for regulatory requirements. Large and small spills may have a broad definition depending on the user's handling system. Therefore, the spill category must be defined at the point of release by technically qualified personnel.

HANDLING AND STORAGE

VENTILATION

Provide local or general ventilation to keep below nuisance dust limit of 15 mg/m³.

HANDLING

Avoid contact with the eyes. Avoid repeated or prolonged contact with the skin or clothing. Avoid dust inhalation. Contact lenses should not be worn.

STORAGE

Store in closed containers in cool, dry, isolated, well ventilated area away from heat, sources of ignition, and incompatibles. Avoid contamination with other "look alike" materials that may produce a fire or explosion.

SPECIAL PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS

Avoid containers, piping or fittings made of brass, bronze or other copper bearing alloys or galvanized metals.

EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS

Provide local or general ventilation to keep below nuisance dust limit of 15 mg/m³.

PERSONAL PROTECTION

EYE PROTECTION

Wear safety glasses or chemical goggles to prevent eye contact. Do not wear contact lenses when working with this substance. Have eye wash facilities available where eye contact could occur.

PROTECTIVE CLOTHING

Wear impervious gloves and protective clothing to prevent skin contact.

RESPIRATORY PROTECTION

Normally none needed. Use NIOSH approved equipment when airborne dust exposure limits are exceeded. NIOSH approved breathing equipment must be available for non-routine and emergency use.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT

Normally not required.

PHYSICAL AND CHEMICAL PROPERTIES

MELTING POINT

271°F or 133°C

SOLUBILITY IN WATER

1193 g/L at 25°C

SPECIFIC GRAVITY

Not applicable

VAPOR DENSITY

Not applicable

BULK DENSITY

44 - 49 lbs/cu ft

pH

7.2 at 100 g/L

VISCOSITY

Not applicable

APPEARANCE/COLOR/ODOR

White solid, spherical or granular shape with slight ammonia odor.

STABILITY AND REACTIVITY

STABILITY

BOILING POINT

135°C (decomposes)

BOILING POINT/RANGE

Not applicable

VAPOR PRESSURE(mm Hg)

88 Pa at 20°C (calculated)

MOLECULAR WEIGHT

60.07

% VOLATILES

Not applicable

EVAPORATION RATE

Not applicable

DENSITY

750 kg/m³

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This product is stable under normal ambient conditions of temperature and pressure.

HAZARDOUS POLYMERIZATION

Will not occur

CONDITIONS TO AVOID

May slowly hydrolyze to Ammonium Carbamate after a long period of time which decomposes to Ammonia and Carbon Dioxide.

MATERIALS TO AVOID (Incompatibilities)

Avoid contact with strong oxidizers, acids or bases. Avoid contact with Nitrates. Reacts with Sodium or Calcium Hypochlorite to form explosive Nitrogen Trichloride.

HAZARDOUS DECOMPOSITION PRODUCTS

Decomposes to Ammonia, Biuret, Nitrogen Oxides, Carbon Oxides.

TOXICOLOGICAL INFORMATION

SIGNIFICANT ROUTES OF EXPOSURE

Eyes, Digestive Tract, Respiratory Tract, Skin

TOXICITY TO ANIMALS

Acute Oral Toxicity

LD₅₀ = 14,300 - 15,000 mg/kg(rat)

LD₅₀ = 11,500 - 13,000 mg/kg(mouse)

LD₅₀ = 510 mg/kg(cattle)

Repeated Dose

(rat) 24 weeks; dermal - NOAEL = 40% ointment

Skin Irritation/Corrosion

Mouse - Not Irritating (10% solution)

Eye Irritation/Corrosion

Rabbit - Not Irritating (50% solution)

Not found to be toxic by oral exposure as defined by OSHA. Based on toxicity data for another compound(i.e., ammonium nitrate), not expected to be toxic by dermal and inhalation exposure as defined by OSHA.

SPECIAL REMARKS ON TOXICITY TO ANIMALS

Bacterial Genetic Toxicity *in vitro*

(Salmonella typhimurium) - Bacterial reverse mutation assay - Negative

Chinese Hamster - Chromosomal aberration test - Positive(very high dose)

Mouse - Positive(very high dose)

Genetic Toxicity *in vivo*

Mouse - Bone marrow cytogenetic test - Positive(extremely high dose)

Toxicity to Reproduction

No toxic effects on mouse gonads up to 6,750 mg/kg day.

No toxic effects on rat gonads up to 2,250 mg/kg day.

Developmental Toxicity/Tertogenicity

Not teratogenic

OTHER EFFECTS ON HUMANS

Despite extensive medical use, no significant side effects on humans have been noted.

SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS

No chronic effects known.

SPECIAL REMARKS ON OTHER EFFECTS ON OTHER EFFECTS ON HUMANS

May be irritating at > 10% concentration; not a skin sensitizer. Despite extensive medical uses no significant side effects on humans has been noted.

ECOLOGICAL INFORMATION

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ECOTOXICITY

Acute Toxicity to Fish - 96-h

(Barillius barna) LC₅₀ = > 9,100 mg/L

Acute Toxicity Aquatic Invertebrates - 24-h

(Daphnia magna) EC₅₀ > 10,000 mg/L

Toxicity to Aquatic Plants - 192-hr

(Scenadesmus quadricauda) cell multiplication test - TT > 10,000 mg/L

Toxicity to Other Non-Mammalian Terrestrial Species

(Pigeon)-subcutaneous-LD_{LO} = 16,000 mg/kg. Since Urea is a fertilizer, it may promote eutrophication in waterways.

Non-toxic to aquatic organisms as defined by USEPA.

ENVIRONMENTAL FATE

Stability in Water

T_{1/2} > 1 year.

Transport

0.16% in air; 99.84% in water

TOXICITY

No known toxicity

DEGRADATION PRODUCTS

Biodegradation

Ultimately Biodegradable

DISPOSAL CONSIDERATIONS

PRODUCT DISPOSAL

Disposal of Urea may be subject to federal, state or local regulations.

GENERAL COMMENTS

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.

TRANSPORTATION INFORMATION

	US DOT	TDG - CANADA
PROPER SHIPPING NAME	Not regulated	Not regulated
HAZARD CLASS	Not regulated	Not regulated
IDENTIFICATION NUMBER	Not regulated	Not regulated
PACKAGING GROUP (Technical Name)	Not regulated	Not regulated
LABELING/PLACARDING	Not regulated	Not regulated
AUTHORIZED PACKAGING	Not regulated	Not regulated

NOTES

EUROPEAN TRANSPORTATION

If shipping internationally, notate Urea as Cabamidic Acid.

REGULATORY INFORMATION

UNITED STATES

SARA Hazard Category

This product has been reviewed according to the EPA Hazard categories formulated under Section 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories.

Fire: NO Pressure Generating: NO Reactivity: NO Acute: Yes Chronic: NO

40 CFR Part 355 - Extremely Hazardous Substances: None

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40 CFR Part 370 - Hazardous Chemical Reporting: Applicable

All intentional ingredients listed on the TSCA inventory.

SARA Title III Information

This product contains the following substances subject to the reporting requirements of Title III (EPCRA) of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

Chemical

Urea

CAS No

57-13-6

Percent by Weight

97.5 - 99.7

SARA (1986) Reporting

311: YES 312: YES 313: NA

CERCLA RQ (lbs)

Not applicable

CERCLA/Superfund, 40 CFR Parts 117, 302:

If this product contains components subject to substances designated as CERCLA Reportable Quantity (RQ) Substances, it will be designated in the above table with the RQ value in pounds. If there is a release of RQ Substance to the environment, notification to the National Response Center, Washington D.C. (1-800-424-8802) is required.

CANADA

WHMIS Hazard Symbol and Classification

This product is not WHMIS controlled.

Ingredient Disclosure List

This product does contain ingredient(s) on this list.

Environmental Protection Act

All intentional ingredients are listed on the DSL (Domestic Substance List).

OTHER INFORMATION

NFPA HAZARD RATINGS

Health: 1 Fire: 0 Reactivity: 0 Special Hazards: 0

0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

COMMENTS

This product is TSE/BSE (Transmissible Spongiform Encephalopathy/Bovine Spongiform Encephalopathy) free.

There are no animal constituents used in the manufacture of Urea, Dry for PCS Sales (USA) Inc. Our product is created through a chemical process.

SUMMARY

The information and statements in these Material Safety Data Sheets are believed to accurately reflect the scientific evidence used in making the hazard determination, but is not to be construed as a warranty or representation for which we assume legal responsibility. Additional information may be necessary or desirable, depending on particular, exceptional, or variable conditions or circumstances of use, or storage, or because of locally applicable laws or government regulations. Therefore, you should use this information only as a supplement to other information available to you, and must make independent determination of the suitability of the information from all sources, to assure both the proper use of the material described herein and the safety and health of employees.