





# Safety Data Sheet

<b>NFPA Classification</b>	<b>DOT / TDG Pictograms</b>	<b>WHMIS Classification</b>	<b>PROTECTIVE CLOTHING</b>
Health  Flammability Reactivity Specific Hazard			

## Section I. Chemical Product and Company Identification

<b>PRODUCT NAME/ TRADE NAME</b>		Urea, Lawn Grade 46-0-0	
<b>SYNONYM</b>	46-0-0 Granular Urea Turf Grade Fertilizer	<b>MSDS NUMBER:</b>	14081
<b>CHEMICAL NAME</b>	Carbamide	<b>REVISION NUMBER</b>	4.7
<b>CHEMICAL FAMILY</b>	Aliphatic amide (Aliphatic.)	<b>MSDS prepared by the Environment, Health and Safety Department on:</b>	
<b>CHEMICAL FORMULA</b>	CO(NH <sub>2</sub> ) <sub>2</sub>	<b>24 HR EMERGENCY TELEPHONE NUMBER:</b>  800-634-0603	
<b>MATERIAL USES</b>	Agricultural use.: Fertilizer. Industrial applications: Manufacture of specialty fertilizers.		
<b>MANUFACTURER</b>	<b>SUPPLIER</b>		
	The Espoma Company  6 Espoma Road  Millville, NJ 08332		

## Section II. Hazardous Ingredients

NAME	CAS #	Exposure Limits (ACGIH)						% by Weight
		TLV-TWA mg/m <sup>3</sup>	TLV-TWA ppm	STEL mg/m <sup>3</sup>	STEL ppm	CEIL mg/m <sup>3</sup>	CEIL ppm	
Urea	57-13-6	---						97
Methylene diurea	9011-05-6	---						1.5
Imidodicarbonic diamide (biuret)	108-19-0	---						1.3

**TOXICOLOGICAL DATA ON INGREDIENTS** TFI Product Testing Program Results - Urea 46-0-0 :^

As formulated above:  
 Acute oral toxicity: 14,300 mg/kg rat; 11,500 mg/kg mouse; 510 mg/kg cattle  
 Chronic oral toxicity, NOAEL: 6,750 mg/kg mouse; 2,250 mg/kg rat

Ecotoxicity:  
 Acute toxicity to fish, Barilius barna, LC<sub>50</sub>, 96hr: >9,100 mg/L  
 Acute toxicity to invertebrates, Daphnia, EC<sub>50</sub> (24hr) >10,000 mg/L  
 Acute toxicity to birds, pigeon, LDLo = 16,000 mg/kg subcutaneous  
 Toxicity to algae, Scenedesmus quadricauda, cell multiplication inhibition, TT(192 hr) > 10,000 mg/L

Continued on Next Page

**Section III. Hazards Identification.**

<b>POTENTIAL ACUTE HEALTH EFFECTS</b>	Not considered to be toxic for humans under normal conditions of use. However, in keeping with good industrial hygiene practises, exposure to any chemical should be kept to a minimum. This product may cause irritation to the eyes and skin due to mechanical action.
<b>POTENTIAL CHRONIC HEALTH EFFECTS</b>	<b>CARCINOGENIC EFFECTS:</b> NONE by ACGIH, EPA, IARC, OSHA. <b>MUTAGENIC EFFECTS:</b> NONE by ACGIH, EPA, IARC, OSHA. <b>TERATOGENIC EFFECTS:</b> NONE by ACGIH, EPA, IARC, OSHA. There is no known effect from chronic exposure to this product. Urea is approved as a food and cosmetic additive, is an ingredient in clinical preparations, and is a normal human metabolite found in urine.

**Section IV. First Aid Measures**

<b>EYE CONTACT</b>	May cause eye irritation by mechanical action. Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Obtain medical attention if irritation persists.
<b>MINOR SKIN CONTACT</b>	May cause skin irritation (salt effect). Wash contaminated skin with soap and water. Cover dry or irritated skin with a good quality skin lotion. If irritation persists, seek medical attention.
<b>EXTENSIVE SKIN CONTACT</b>	No additional information.
<b>MINOR INHALATION</b>	Repeated or prolonged inhalation of dust may lead to respiratory irritation. Loosen tight clothing around the individual's neck and waist. Allow the person to rest in a well ventilated area. Obtain medical attention if irritation persists.
<b>SEVERE INHALATION</b>	No additional information.
<b>SLIGHT INGESTION</b>	Have conscious person drink several glasses of water or milk. Induce vomiting. Lower the head so that the vomit will not reenter the mouth and throat. NEVER give an unconscious person anything to drink. Obtain medical attention.
<b>EXTENSIVE INGESTION</b>	No additional information.

**Section V. Fire and Explosion Data**

<b>THE PRODUCT IS</b>	Non-flammable.
<b>AUTO-IGNITION TEMPERATURE</b>	Not applicable.
<b>FLASH POINT</b>	Not applicable.
<b>FLAMMABILITY LIMITS</b>	Not applicable.
<b>PRODUCTS OF COMBUSTION</b>	Material will not burn. Undergoes thermal decomposition at elevated temperatures to produce solid cyanuric acid and release toxic and combustible gases (ammonia, carbon dioxide, and oxides of nitrogen).
<b>FIRE HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES</b>	Not applicable.
<b>EXPLOSION HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES</b>	May be explosive on contact with halogens such as chlorine. Non-explosive from open flames and sparks, shocks, heat, oxidizing materials, combustible materials, organic materials, metals, acids, alkalis, or moisture.
<b>FIRE FIGHTING MEDIA AND INSTRUCTIONS</b>	Material will not burn. Undergoes thermal decomposition at elevated temperatures to release toxic and combustible gases (ammonia, carbon dioxide, and oxides of nitrogen). If fumes or gases are suspected to be present, fire fighters should wear self-contained breathing apparatus. Use extinguishing media suitable for surrounding materials.
<b>SPECIAL REMARKS ON FIRE HAZARDS</b>	Flammable/toxic gases will form at elevated temperatures by thermal decomposition. When exposed to heat, ammonia is released.

Continued on Next Page

**SPECIAL REMARKS ON EXPLOSION HAZARDS**

May be explosive when mixed with hypochlorites. Forms nitrogen trichloride which explodes spontaneously in air.

**Section VI. Accidental Release Measures**

**SMALL SPILL**

Use appropriate tools to put the spilled solid in a suitable container for intended use or disposal.

**LARGE SPILL**

Prevent additional discharge of material, if possible to do so without hazard. Prevent spills from entering sewers, watercourses, wells, etc. Product will promote algae growth which may degrade water quality and taste. Notify downstream water users. Recover and place material in suitable containers for recycle, reuse, or disposal.

**Section VII. Handling and Storage**

**PRECAUTIONS**

If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**STORAGE**

Store in a dry, cool and well ventilated area. Do not blend or store in contact with ammonium nitrate. Dry urea and dry ammonium nitrate will react together to produce a slurry.

**Section VIII. Exposure Controls/Personal Protection**

**ENGINEERING CONTROLS**

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, ventilation to keep exposure to airborne contaminants below the exposure limit.

**PERSONAL PROTECTION**

The selection of personal protective equipment varies, depending upon conditions of use. Wear appropriate respiratory protection for dust/mist when ventilation is inadequate. A filtering facepiece dust mask is recommended for most applications if respiratory protection is needed. Where skin and eye contact may occur as a result of brief periodic exposures, wear long sleeved clothing, coveralls, chemical resistant gloves, and safety glasses with side shields.

**PERSONAL PROTECTION IN CASE OF LARGE RELEASE**

No additional information.

**EXPOSURE LIMITS**

AIHA Workplace Environmental Exposure Limits: 10 mg/m<sup>3</sup> TWA for Urea as inhalable dust. OSHA PEL: 15 mg/m<sup>3</sup> for Particulates Not Otherwise Regulated.

Federal, State or Provincial exposure limits may vary by jurisdiction. Consult local authorities for acceptable exposure limits in your area.

**Section IX. Physical and Chemical Properties**

**PHYSICAL STATE AND APPEARANCE**

Granular solid.

**MOLECULAR WEIGHT**

60.06

**COLOR**

White.

**pH (10% SOLN/WATER)**

8

**ODOR**

Odorless to slightly ammoniacal.

**BOILING POINT**

Decomposes at 135°C.

**ODOR THRESHOLD**

17 PPM as ammonia.

**MELTING POINT**

132.7°C (270.9°F)

**TASTE**

Saline.

**CRITICAL TEMPERATURE**

Not applicable.

**VOLATILITY**

Not available.

**SPECIFIC GRAVITY g/cc**

0.8 (Water = 1)

**SOLUBILITY**

Soluble in cold or hot water.

**BULK DENSITY kg/m<sup>3</sup> ; lbs/ft<sup>3</sup>**

Loose: 800 kg/m<sup>3</sup>; 50 lbs/ft<sup>3</sup>; Tapped: 825 kg/m<sup>3</sup>; 52 lbs/ft<sup>3</sup>;

**DISPERSION PROPERTIES**

Easily dispersed in any proportion in cold water and hot water.

**VAPOR PRESSURE**

0.08 kPa

**WATER/OIL DIST. COEFF.**

Soluble in water.

**VAPOR DENSITY**

Not available.

**Section X. Stability and Reactivity Data**

STABILITY	The product is stable.
INSTABILITY TEMPERATURE	Not available.
CONDITIONS OF INSTABILITY	No additional remark.
INCOMPATIBILITY WITH VARIOUS SUBSTANCES	Reactive with halogens. Slightly reactive with oxidizing agents, reducing agents, acids, alkalis, moisture. Non-reactive with combustible materials, organic materials, most metals.
CORROSIVITY	Corrosive to mild steel. Slightly corrosive to aluminum, zinc, or copper. Non-corrosive to glass, 304 or 316 stainless steel.
SPECIAL REMARKS ON REACTIVITY	Absorbs moisture from the air. Hygroscopic; keep container tightly closed.
SPECIAL REMARKS ON CORROSIVITY	Avoid contact with moisture. Slow hydrolysis may produce acids corrosive to metals. Contact your sales representative or a metallurgical specialist to ensure compatibility with system equipment.

**Section XI. Toxicological Information**

SIGNIFICANT ROUTES OF EXPOSURE	Ingestion. Inhalation.
TOXICITY TO ANIMALS	<p>Acute oral toxicity (LD50): 14300 mg/kg (Rat.). Under controlled feeding conditions, urea is used as a nutritional supplement in cattle and other animals. The toxic dose in cattle given urea for the first time is considered to be 0.45 g/kg or a total of 100-200 g. Mature bullocks can digest as much as 400 g a day without ill effect. As little as 50 g may cause adverse effects in cattle not accustomed to it.</p> <p>Animal Antidote and Emergency Treatment: In animals, the cold water - acetic acid treatment may work. The adult cow is given 19-38 liters cold water and 3.8 liters of 5% acetic acid (vinegar) orally. This treatment limits absorption of ammonia from the rumen by diluting the rumen contents and slowing the rate of hydrolysis of urea by decreasing rumen pH and temperature. The treatment also promotes urine flow that, if maintained by fluid therapy, may assure recovery from urea toxicity. Gaseous or fluid bloat should be relieved before pumping water into the rumen. Consult your veterinarian immediately.</p>
SPECIAL REMARKS ON TOXICITY TO ANIMALS	Very low toxicity for humans or animals under normal conditions of careful, responsible use. Urea is used in small quantities as a feed supplement for livestock. Urea ingestion may be harmful to wildlife, livestock and birds at body burdens of several thousands of mg/kg if ingested without adequate mixing. Clean up all spilled material, especially where bulk fertilizer loading of equipment occurs to prevent animal overexposure. If used for the manufacture of feeds, mix thoroughly by making a preblend with one of the ingredients, then adding and mixing the preblend with all other ingredients. Equivalent protein from Urea should not exceed one-third of the protein in the mixture.
OTHER EFFECTS ON HUMANS	Our data base contains no additional remark on the toxicity of this product
SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS	No effects.
SPECIAL REMARKS ON OTHER EFFECTS ON HUMANS	May cause irritation of the mucous membranes and upper respiratory tract.


**Section XII. Ecological Information**

<b>ECOTOXICITY</b>	Will slowly release ammonia and degrade to nitrate. Ammonia is a toxic hazard to fish. However, ammonia release is slow making urea much less toxic than ammonium salts. Aquatic toxicity tests indicate 24 Hr exposure at 16,000 mg/L of urea did not kill Creek Chubs. Urea is added in small quantities as a feed supplement for cattle. Urea ingestion may be harmful to mammals and birds at body burdens of several thousands of mg/kg. Ensure that livestock and wildlife do not ingest urea unless adequately mixed with feed rations. Non-persistent. Non-cumulative when applied using normal agricultural practices. The product itself and its products of degradation are not harmful under normal conditions of careful and responsible use. U.S. D.O.T.: This material is NOT listed as a Marine pollutant.
<b>BOD and COD</b>	Not available.
<b>PRODUCTS OF DEGRADATION</b>	Ammonia, nitrogen oxides (NO, NO <sub>2</sub> ), carbon oxides (CO, CO <sub>2</sub> ) and water.
<b>TOXICITY OF THE PRODUCTS OF DEGRADATION</b>	The product itself and its products of degradation are not harmful under normal conditions of use. Avoid spills or releases to watercourses.
<b>SPECIAL REMARKS ON THE PRODUCTS OF DEGRADATION</b>	Urea will promote algae growth which may degrade water quality and taste. Notify downstream water users. Will dissolve and disperse in water. Reclaiming material may not be viable.

**Section XIII. Disposal Considerations**

<b>WASTE DISPOSAL OR RECYCLING</b>	Recover and place material in a suitable container for intended use or disposal. Ensure disposal complies with government requirements and local regulations.
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**Section XIV. Transport Information**

<b>DOT / TDG CLASSIFICATION</b>	Not controlled under DOT (US) or TDG (Canada).
<b>PIN and Shipping Name</b>	Not applicable.
<b>SPECIAL PROVISIONS FOR TRANSPORT</b>	Not applicable.
<b>DOT (U.S.A) (Pictograms)</b>	

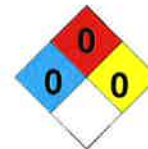
**Section XV. Other Regulatory Information and Pictograms**

<b>OTHER REGULATIONS</b>	<p>CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL) and acceptable for use under the provisions of CEPA.</p> <p>EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.</p> <p>CERCLA/SUPERFUND, 40 CFR 117,302: This product contains no Reportable Quantity (RQ) Substances.</p> <p>This product does not contain Section 313 reportable ingredients.</p> <p>This product is not considered as a priority pollutant as regulated under the Clean Water Act.</p> <p>TSCA (Toxic Substance Control Act): This product is listed on the TSCA Inventory.</p> <p>CALIFORNIA PROPOSITION 65: This product contains no chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.</p>	
<b>OTHER CLASSIFICATIONS</b>	<b>HCS (U.S.A.)</b>	Not controlled under the HCS (United States). Exempt under 1910.1200(b)(6)(x).
	<b>DSCL (EEC)</b>	Not controlled under DSCL (Europe).

**National Fire Protection Association (U.S.A.)**

Hazards presented under acute emergency conditions only:

Health



**Fire Hazard  
Reactivity**

**Specific Hazard**

**TDG (Pictograms - Canada)**



**DSCL (Europe) (Pictograms)**



**ADR (Europe) (Pictograms)**



**Section XVI. Other Information**

**REFERENCES**

- Transportation of Dangerous Goods Act and Clear Language Regulations, current revision.
- Canada Gazette Part II, Vol. 122, No. 2 Registration SOR/88-64 31 December, 1987 Hazardous Products Act "Ingredient Disclosure List".
- Domestic Substances List, Canadian Environmental Protection Act.
- 29 CFR Part 1910
- 33 CFR Parts 151, 153, 154, 156
- 40 CFR Parts 1-799
- 46 CFR Part 153
- 49 CFR Parts 1-199
- American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances, 2003.
- NFPA 704, National Fire Codes Online, National Fire Protection Association, current edition at time of MSDS preparation.
- Corrosion Data Survey, Sixth Edition, 1985, National Association of Corrosion Engineers
- TOMES® System: Heitland G & Hurlbut KM (Eds) (electronic version): MICROMEDEX, Greenwood Village, Colorado, USA. Available at: <http://csi.micromedex.com> (2004). The TOMES® System includes MEDITEXT® Medical Management; HAZARTEXT® Hazard Management; INFOTEXT® Documents; ERG2000 Emergency Response Guidebook Documents; REPROTEXT®: Heitland G & Hurlbut KM (Eds); CHRIS Hazardous Chemical Data: U.S. Department of Transportation, U.S. Coast Guard, Washington, D.C. (2004); HSDB: Hazardous Substances Data Bank. National Library of Medicine, Bethesda, Maryland (2004); IRIS: Integrated Risk Information System. U.S. Environmental Protection Agency, Washington, D.C. (2004); NIOSH: Pocket Guide to Chemical Hazards. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2004); OHM/TADS: Oil and Hazardous Materials Technical Assistance Data System. U.S. Environmental Protection Agency, Washington, D.C. (2004); REPROTOX®: Scialli A.R. Georgetown University Medical Center and Reproductive Toxicology Center, Columbia Hospital for Women Medical Center, Washington, D.C. (2004); RTECS®: Registry of Toxic Effects of Chemical Substances. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2004); and SHEPARDS: Shepard T.H.: Shepard's Catalog of Teratogenic Agents (2004).
- The Fertilizer Institute Product Testing Program Results, March 2003 -Veterinary Pharmacology and Therapeutics. 5th ed. Ames, Iowa: Iowa State University Press, 1982.

**OTHER SPECIAL CONSIDERATIONS**

Not applicable.