

NFPA Classification	DOT / TDG Pictograms	WHMIS Classification	HMIS		PROTECTIVE CLOTHING
			Health	1	
			Flammability	0	
			Reactivity	0	
			PPE	n	

## Section I. Chemical Product and Company Identification

**PRODUCT NAME/ TRADE NAME** Urea Solutions 30-60%

**SYNONYM** This MSDS applies to all formulations of fertilizer solution consisting exclusively of urea in water. This includes but is not limited to the following formulations:  
 14-0-0  
 23-0-0  
 28-0-0

**MSDS NUMBER:** 14121

**CHEMICAL NAME** Carbamide

**REVISION NUMBER** 4.9

**CHEMICAL FAMILY** Aliphatic amide

**MSDS prepared by** January 18, 2007  
 the Environment,  
 Health and Safety  
 Department on:

**CHEMICAL FORMULA** CO(NH<sub>2</sub>)<sub>2</sub>

**24 HR EMERGENCY TELEPHONE NUMBER:**

Transportation: 1-800-792-8311  
 Medical: 1-888-670-8123

**MATERIAL USES** Agricultural industry: Fertilizer.  
 Industrial applications: Manufacture of specialty fertilizers.

**MANUFACTURER**

Agrium  
 North American Wholesale  
 13131 Lake Fraser Drive, S.E.  
 Calgary, Alberta, Canada, T2J 7E8

Agrium U.S. Inc.  
 Suite 1700, 4582 South Ulster St.  
 Denver, Colorado, U.S.A., 80237

**SUPPLIER**

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## 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	---						30-60
Imidodicarbonic diamide (biuret)	108-19-0	---						0.3-0.7

**ACGIH TLV notations:**

--- No assigned TLV

(C) - Ceiling - the concentration not to be exceeded at any time

(I) - measured as the Inhalable fraction of the aerosol

(R) - measured as the Respirable fraction of the aerosol

(T) - measured as the Thoracic fraction of the aerosol

<b>TOXICOLOGICAL DATA ON INGREDIENTS</b>	<b>TFI Product Testing Program Results - Urea 46-0-0 :^</b> 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, Barillius barna, LC <sub>50</sub> , 96hr: >9,100 mg/L Acute toxicity to invertebrates, Daphnia, EC <sub>50</sub> (24kr) >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
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### Section III. Hazards Identification.

<b>POTENTIAL ACUTE HEALTH EFFECTS</b>	This product may irritate eyes and skin upon contact. Not considered to be toxic for humans. However, in keeping with good industrial hygiene practises, exposure to any chemical should be kept to a minimum.
<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. 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. Wash contaminated skin with soap and water. Cover dry or irritated skin with a good quality skin lotion. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.
<b>EXTENSIVE SKIN CONTACT</b>	No additional information.
<b>MINOR INHALATION</b>	Repeated or prolonged inhalation 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>	Do not induce vomiting. Low toxicity. May cause digestive tract irritation, with accompanying nausea, vomiting and diarrhea. If spontaneous vomiting does occur, lower the head so that the vomit will not reenter the mouth and throat.  If tolerated, give no more than 1 cup of milk or water for adults or 1/2 cup for children to rinse the mouth and throat, dilute the stomach contents, and minimize irritation. Obtain medical attention if irritation persists.
<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, but thermal decomposition may result in flammable/toxic gases being formed after material evaporates to dryness. These products are ammonia, carbon dioxide, and oxides of nitrogen.

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<b>FIRE HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES</b>	Not applicable.
<b>EXPLOSION HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES</b>	Reacts violently with chlorine bleach. Resultant product may explode.
<b>FIRE FIGHTING MEDIA AND INSTRUCTIONS</b>	Non-flammable. Material will not burn. Undergoes thermal decomposition at elevated temperatures to release toxic and combustible gases (ammonia, carbon dioxide, and oxides of nitrogen). Fire fighters should wear a 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.
<b>SPECIAL REMARKS ON EXPLOSION HAZARDS</b>	May be explosive when mixed with hypochlorites. Forms nitrogen trichloride which explodes spontaneously in air.

### Section VI. Accidental Release Measures

<b>SMALL SPILL</b>	Stop leak if possible to do so without risk. Dike and contain spilled material. Ensure that the spilled material does not enter sewers, wells, or watercourses. Pump up spilled material or absorb on inert material (sand or dirt) and place in suitable containers for reuse or disposal. Ensure disposal complies with local regulations.
<b>LARGE SPILL</b>	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

<b>PRECAUTIONS</b>	If user operations generate mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Keep out of reach of children.
<b>STORAGE</b>	Ensure compatibility with storage vessel materials of construction. Keep at an appropriate storage temperature to prevent freezing.

### Section VIII. Exposure Controls/Personal Protection

<b>ENGINEERING CONTROLS</b>	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate mists, use ventilation to keep exposure to airborne contaminants below the exposure limit.
<b>PERSONAL PROTECTION</b>	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.
<b>PERSONAL PROTECTION IN CASE OF LARGE RELEASE</b>	No additional information.
<b>EXPOSURE LIMITS</b>	Fed OSHA PEL: 15 mg/m <sup>3</sup> Total dust, 5 mg/m <sup>3</sup> Respirable fraction, 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**

<b>PHYSICAL STATE AND APPEARANCE</b>	A clear, colorless or slightly hazy liquid.		
<b>MOLECULAR WEIGHT</b>	Not applicable	<b>COLOR</b>	Colorless.
<b>pH (10% SOLN/WATER)</b>	8.5-10.5	<b>ODOR</b>	Odorless to slightly ammoniacal.
<b>BOILING POINT</b>	Not available	<b>ODOR THRESHOLD</b>	17 PPM recognition threshold as ammonia.
<b>MELTING POINT</b>	17.8°C 64°F (Salt out temp, 50% soln)	<b>TASTE</b>	Saline.
<b>CRITICAL TEMPERATURE</b>	Not applicable.	<b>VOLATILITY</b>	Not available.
<b>SPECIFIC GRAVITY g/cc</b>	~1.14 (Water = 1)	<b>SOLUBILITY</b>	Easily soluble in cold water, hot water.
<b>BULK DENSITY kg/m<sup>3</sup> ; lbs/ft<sup>3</sup></b>	Variable depending on formulation	<b>DISPERSION PROPERTIES</b>	Easily dispersed in any proportion in cold water and hot water.
<b>VAPOR PRESSURE</b>	14mm Hg	<b>WATER/OIL DIST. COEFF.</b>	Not available.
<b>VAPOR DENSITY</b>	Not available.		

**Section X. Stability and Reactivity Data**

<b>STABILITY</b>	The product is stable.
<b>INSTABILITY TEMPERATURE</b>	Not available.
<b>CONDITIONS OF INSTABILITY</b>	No additional remark.
<b>INCOMPATIBILITY WITH VARIOUS SUBSTANCES</b>	Reactive with halogens. Slightly reactive with oxidizing agents, reducing agents, acids, alkalis, moisture. Non-reactive with combustible materials, organic materials, most metals.
<b>CORROSIVITY</b>	Slightly corrosive to mild steel, aluminum, zinc, and copper. Non-corrosive to stainless steel (304 or 316).
<b>SPECIAL REMARKS ON REACTIVITY</b>	May react explosively with hypochlorite bleach.
<b>SPECIAL REMARKS ON CORROSIVITY</b>	Corrosive to ferrous metals and alloys. Incompatible with copper and its alloys. Contact your sales representative or a metallurgical specialist to ensure compatibility with your equipment.

**Section XI. Toxicological Information**

<b>SIGNIFICANT ROUTES OF EXPOSURE</b>	Ingestion. Inhalation.
<b>TOXICITY TO ANIMALS</b>	<p>Acute oral toxicity (LD50): 14300 mg/kg (Rat.).</p> <p>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>
<b>SPECIAL REMARKS ON TOXICITY TO ANIMALS</b>	Low toxicity for humans or animals. Urea ingestion may be toxic to mammals and birds at body burdens of several thousands of mg/kg. Urea is used in small quantities as a feed supplement for livestock.

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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

ECOTOXICITY	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 ingestion may be toxic to mammals and birds at body burdens of several thousands of mg/kg. Urea is used in small quantities as a feed supplement for livestock. U.S. D.O.T.: This material NOT listed as a Marine pollutant.
BOD and COD	Not available.
PRODUCTS OF DEGRADATION	Ammonia, carbon dioxide and water.
TOXICITY OF THE PRODUCTS OF DEGRADATION	The product itself and its products of degradation are not harmful under normal conditions of use. Avoid spills or releases to watercourses.
SPECIAL REMARKS ON THE PRODUCTS OF DEGRADATION	Urea will promote algae growth which may degrade water quality and taste. Notify downstream water users. Will disperse in water. Reclaiming material may not be viable.

### Section XIII. Disposal Considerations

WASTE DISPOSAL OR RECYCLING	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

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

### Section XV. Other Regulatory Information and Pictograms

OTHER REGULATIONS	<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>CERCLA/SUPERFUND, 40 CFR 117,302: This product contains no Reportable Quantity (RQ) Substances.</p> <p>EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances. 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 the California Safe Drinking Water and Toxic Enforcement Act of 1986 (CA Health and Safety Code Sec 25249.5):</p> <p>This product contains no chemicals known to the State of California to cause cancer, birth</p>
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defects, or other reproductive harm.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and is not subject to control under WHMIS (Canada), or the Hazcom Standard (US).

**OTHER CLASSIFICATIONS****HCS (U.S.A.)**

Not controlled under the HCS (United States). Exempt under 1910.1200(b)(6)(x).

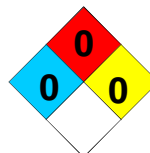
**DSCL (EEC)**

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, 2006.
- 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> (2007). The TOMES® System includes MEDITEXT® Medical Management; HAZARDTEXT® 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. (2007); HSDB: Hazardous Substances Data Bank. National Library of Medicine, Bethesda, Maryland (2007); IRIS: Integrated Risk Information System. U.S. Environmental Protection Agency, Washington, D.C. (2007); NIOSH: Pocket Guide to Chemical Hazards. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2007); OHM/TADS: Oil and Hazardous Materials Technical Assistance Data System. U.S. Environmental Protection Agency, Washington, D.C. (2007); REPROTOX®: Scialli A.R. Georgetown University Medical Center and Reproductive Toxicology Center, Columbia Hospital for Women Medical Center, Washington, D.C. (2007); RTECS®: Registry of Toxic Effects of Chemical Substances. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2007); and SHEPARDS: Shepard T.H.: Shepard's Catalog of Teratogenic Agents (2007).
- The Fertilizer Institute Product Testing Program Results, March 2003

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**OTHER SPECIAL  
CONSIDERATIONS**

HMIS information added in this revision.

**FOR FURTHER SAFETY, HEALTH, OR  
ENVIRONMENTAL INFORMATION ON  
THIS PRODUCT, CONTACT**

**AGRIUM  
Wholesale Environment, Health and Safety  
Telephone (780) 998-6906 or Fax (780) 998-6677**

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