



Terra Industries Inc.  
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**Urea**

MSDS Number 2043 (Reissued October 8, 2009)

6 Pages

**1. CHEMICAL PRODUCT and EMERGENCY TELEPHONE CONTACT**

Product Name:..... Urea  
 Chemical Family:..... Amide  
 Synonyms:..... Carbamide, Carbamide Resin, Carbamimidic Acid, Carbonyl Diamide, Carbonyldiamine, Isourea, Ureaphil, Ureophil, Urevert  
 Formula:..... CH<sub>4</sub>N<sub>2</sub>O or NH<sub>2</sub>CONH<sub>2</sub>  
 Product Use:..... Fertilizer; SCR NO<sub>x</sub> Control

**EMERGENCY TELEPHONE NUMBER**

CHEMTREC (U.S.):..... 800-424-9300  
 CANUTEC (Canada):..... 613-996-6666

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Component Name	Percentage by Weight	CAS Number
Urea	97.8 – 98.6%	57-13-6
Biuret	1.0 – 1.5%	108-19-0
Methylenediurea	0.3 – 0.4%	13547-17-6
Water	0.1 - 0.3%	7732-18-5

Exposure Limits				
Component	TWA	STEL	PEL	IDLH
Urea, No limits established				
Biuret, No limits established				
Methylenediurea, No limits established				

**3. HAZARDS IDENTIFICATION**

**EMERGENCY OVERVIEW**

White solid, granular form. Urea is odorless. Reacts with sodium hypochlorite or calcium hypochlorite to form the explosive nitrogen trichloride. When heated, urea releases ammonia and when heated to decomposition it emits toxic fumes of nitrogen oxides (NO<sub>x</sub>), ammonia, and cyanuric acid. Use water to control fires involving urea if water is compatible with burning material. Urea itself is non-flammable.

## **POTENTIAL HEALTH EFFECTS**

**Primary Routes of Entry:** Skin contact/absorption, eye contact, and dust inhalation.

**General Acute Exposure:** At high dust concentrations, irritation of eyes, skin, and mucous membranes by chemical or mechanical action may occur.

**General Chronic Exposure:** No test data available.

### **Carcinogenicity:**

NTP: ..... Not Listed

IARC: ..... Not Listed

OSHA: ..... Not Regulated

**Medical Conditions Aggravated by Exposure:** No test data available.

## **4. FIRST AID MEASURES**

**First Aid for Eyes:** 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.

**First Aid for Skin:** If irritation occurs, 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.

**First Aid for Inhalation:** If irritation develops 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.

**First Aid for Ingestion:** If conscious, give the patient large quantities of water to drink and induce vomiting. Seek medical attention.

## **5. FIRE FIGHTING MEASURES**

**Extinguishing Media:** Urea is not flammable. Use water to extinguish a fire involving urea if water is compatible with the burning material.

### **Special Fire Fighting Procedures:**

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

### **Caution:**

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

## 6. ACCIDENTAL RELEASE MEASURES

**Spill or Leak Measures:** Keep unnecessary people away and isolate spill area. Urea may be toxic to cattle (ruminants) when ingested.

**Determining Spill Size:** Generally, a small spill is one that involves a single, small package or container (i.e. up to a 55 gallon drum), or a small (non-continuing) leak from a large container.

### **Small or Large Spill:**

- a. Spilled urea, wet or dry, may cause slippery conditions.
- b. Recover and use as fertilizer.
- c. If disposal of product or contaminated by-products is necessary, follow guidelines set forth by local, state, and federal environmental agencies.
- d. Runoff may cause pollution.

## 7. HANDLING AND STORAGE

No unusual storage precautions are necessary.

**Handling Precautions:** Use proper personal protective equipment when working with or around urea (See section 8).

## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

**Respiratory Protection Requirements:** A NIOSH approved dust respirator (either single use or multiple use) should be worn when applicable dust\* standards are exceeded.

\*Nuisance Dust: PEL: Total 15 mg/m<sup>3</sup>, respirable 5 mg/m<sup>3</sup>

**Engineering Controls:** Adequate ventilation should be available to maintain dust levels below applicable dust standards.

**Skin Protection Requirements:** Normally, skin protection should not be required. If irritation occurs, long sleeves and impervious gloves should be worn.

**Eye Protection Requirements:** Normally, eye protection should not be required. It is recommended that if there is a potential for urea to contact eyes that safety glasses or goggles be used.

**Other Protective Equipment:** Safety shower and eyewash fountain or at least 5 gallons of accessible clean water should be provided in a urea handling area.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form: .....	Solid granules
Color: .....	White
Odor: .....	Odorless
Boiling Point: .....	Does not boil, decomposes at 275 <sup>0</sup> F (132.7 <sup>0</sup> C)
Melting point:.....	275 <sup>0</sup> F (133 <sup>0</sup> C)
pH:.....	7.2 – 9.0 (10% solution)
Solubility:.....	1,193 g/L @ 25 <sup>0</sup> C
Specific Gravity: .....	1.33
Vapor Density: .....	Not applicable
Vapor Pressure: .....	Not applicable
% Volatile by Volume: .....	No test results
Molecular Weight: .....	60.06
Bulk Density: .....	47 lb/ft <sup>3</sup> (750 kg/m <sup>3</sup> )
Critical Temperature: .....	No test results
Critical Pressure: .....	No test results

## 10. REACTIVITY

Stability: ..... This is a stable material.  
Hazardous Polymerization: ..... Will not occur.

**Decomposition:** Urea forms ammonia, cyanuric acid, and/or nitrogen oxides (NO<sub>x</sub>) upon decomposition.

**Incompatibilities:** Reacts with sodium hypochlorite or calcium hypochlorite to form nitrogen trichloride, which may explode spontaneously in air. Incompatible with sodium nitrite, phosphorus pentachloride, and nitrosyl or gallium perchlorate. Urea will form urea nitrate when mixed with nitric acid at low pH. Urea nitrate may become unstable and/or explosive under certain conditions.

## 11. TOXICOLOGICAL INFORMATION

### Toxicity

#### Acute Oral Toxicity

LD <sub>50</sub> , Rat: .....	14,300 – 15,000 mg/kg
LD <sub>50</sub> , Mouse:.....	11,500 – 13,000 mg/kg
LD <sub>50</sub> , Cattle: .....	510 mg/kg

#### Repeated Dose Toxicity

Rat: ..... NOAEL = 40% in ointment (24 wks; dermal)

### Ecotoxicity

#### Acute Toxicity to Fish

LC<sub>50</sub> *Barillius barna* ..... 9,100 mg/L (96 hr)

#### Acute Toxicity to Aquatic Invertebrates

EC<sub>50</sub> *Daphnia magna* ..... >10,000 mg/L (DIN 38412 Part II; 24 hr)

Toxicity to Aquatic Plants

TT *Scenedesmus quadricauda* ..... >10,000 mg/L (192 hr cell multiplication inhibition test)

Source: TFI Product Testing Program April 2003

**12. ECOLOGICAL INFORMATION**

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

**Note:** See Ecotoxicity information in section 11.

**13. DISPOSAL CONSIDERATIONS**

Urea is not listed by the Federal EPA as a hazardous waste. Consult state/provincial and local environmental agencies for acceptable disposal methods. Recover product for use as a fertilizer if possible.

**14. TRANSPORTATION INFORMATION**

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

**15. REGULATORY INFORMATION**

**SARA TITLE III:** Not Listed

**CERCLA Hazardous Substances List:** Not Listed

**TSCA Inventory:** Listed

**16. OTHER INFORMATION**

Nov. 5, 1996: The MSDS was rewritten to comply with ANSI Standard Z400.1-1993.

July 1, 2003: Added toxicity information from the TFI Product Testing Program April 2003.

Sept. 14, 2006: Reviewed and reissued without revisions.

October 4, 2006: Revised Reactivity section to add information concerning the hazards of urea nitrate formation when urea is mixed with nitric acid.

October 8, 2009: Reviewed and reissued without revisions.

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. Terra Industries Inc. makes no guarantee, warranty or other representation concerning this substance, since conditions of its use are beyond the control of the company. Terra Industries Inc. disclaims any liability for loss or damage incurred in connection with the use of this substance.