Material Safety Data Sheet

Section I. Chemical Product and Company Identification

PRODUCT NAME/TRADE NAME  Duration CR Polymer Coated Urea 43-0-0

SYNONYM  This Material Safety Data Sheet applies to the following Agrium products:
- Duration CR Polymer Coated Urea Type I
- Duration CR Polymer Coated Urea Type II
- Duration CR Polymer Coated Urea Type III
- Duration CR Polymer Coated Urea Type IV
- Duration CR Polymer Coated Urea Type V

Please refer to the appropriate Product Specification Sheet for technical information on each product.

CHEMICAL NAME  Carbamide

CHEMICAL FAMILY  Aliphatic amide

CHEMICAL FORMULA  Urea: \( \text{CO(NH}_2 \text{)}_2 \), with an insoluble polymer time release coating.

MATERIAL USES  Agricultural industry: Controlled Release Specialty Fertilizer

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
Agrium
North American Wholesale
13131 Lake Fraser Drive, S.E.
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MSDS NUMBER:  14187

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MSDS prepared by the Environment, Health and Safety Department on:
January 17, 2005

24 HR EMERGENCY TELEPHONE NUMBER:
Transportation: 1-800-792-8311
Medical: 1-888-670-8123

Section II. Hazardous Ingredients

<table>
<thead>
<tr>
<th>NAME</th>
<th>CAS #</th>
<th>TLV-TWA mg/m³</th>
<th>TLV-TWA ppm</th>
<th>STEL mg/m³</th>
<th>STEL ppm</th>
<th>CEIL mg/m³</th>
<th>CEIL ppm</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea</td>
<td>57-13-6</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>~ 92</td>
</tr>
<tr>
<td>Polyurethane</td>
<td>68400-67-9</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>1-5</td>
</tr>
<tr>
<td>Imidodicarbonic diamide</td>
<td>108-19-0</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.5-1.5</td>
</tr>
<tr>
<td>(biuret)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methylene diurea</td>
<td>68611-64-3</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.5-1.5</td>
</tr>
</tbody>
</table>

Continued on Next Page
### Section III. Hazards Identification.

**POTENTIAL ACUTE HEALTH EFFECTS**

This product may irritate eyes and skin upon contact due to mechanical action. Urea granules are encapsulated within a polymeric shell coating which physically slows the release of contents from one to several months. Not considered to be toxic for humans. On ingestion, the material will pass through the digestive tract unchanged and with no effect. However, in keeping with good industrial hygiene practises, exposure to any chemical should be kept to a minimum.

**POTENTIAL CHRONIC HEALTH EFFECTS**

CARCINOGENIC EFFECTS: NONE by ACGIH, EPA, IARC, OSHA.

MUTAGENIC EFFECTS: NONE by ACGIH, EPA, IARC, OSHA.

TERATOGENIC EFFECTS: 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. The polymeric shell and coating is found in many manufactured products and is not considered hazardous by WHMIS (Canada) or HAZCOM (U.S.) definition.

### Section IV. First Aid Measures

**EYE CONTACT**

May cause eye irritation due to mechanical action. Flush eyes with running water for at least 15 minutes, keeping eyelids open. Obtain medical attention if irritation persists.

**MINOR SKIN CONTACT**

Wash contaminated skin with soap and water.

**EXTENSIVE SKIN CONTACT**

No additional information.

**MINOR INHALATION**

Repeated or prolonged inhalation of dust may lead to respiratory irritation. Allow the affected individual to rest in a well ventilated area. Watch for airway obstruction. If breathing is labored, give oxygen if available. Seek medical attention if not feeling well.

**SEVERE INHALATION**

No additional information.

**SLIGHT INGESTION**

The material is non-toxic on ingestion. Due to its slow release coating, the product will pass through the digestive tract unchanged and with no effect.

**EXTENSIVE INGESTION**

No additional information.

### Section V. Fire and Explosion Data

**THE PRODUCT IS**

Non-flammable.

**AUTO-IGNITION TEMPERATURE**

Not applicable.

**FLASH POINT**

Not applicable.

**FLAMMABILITY LIMITS**

Not applicable.

**PRODUCTS OF COMBUSTION**

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). The quantity of controlled release coating present on the product is insufficient to support combustion.

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*Continued on Next Page*
### 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. Product will dissolve slowly over a period of months. Recover and place material in suitable containers for recycle, reuse, or disposal. Ensure disposal complies with local regulations. |

### Section VII. Handling and Storage

| PRECAUTIONS | If user operations generate dust, use ventilation to keep exposure to airborne contaminants below the exposure limit. Keep out of reach of children. |
| STORAGE | Store in a dry, cool and well ventilated area. |

### Section VIII. Exposure Controls/Personal Protection

| ENGINEERING CONTROLS | If user operations generate dust, use ventilation to keep exposure to airborne contaminants below the exposure limit. Good general ventilation should be sufficient to control airborne levels. |
| PERSONAL PROTECTION | The selection of personal protective equipment varies, depending upon conditions of use. Where skin and eye contact may occur as a result of brief periodic exposures, wear long sleeved clothing, coveralls, leather gloves, and safety glasses with side shields. A filtering facepiece dust mask is recommended for most applications if respiratory protection is needed. |
| PERSONAL PROTECTION IN CASE OF LARGE RELEASE | No additional information. |
| EXPOSURE LIMITS | AIHA Workplace Environmental Exposure Limits: 10 mg/m³ TWA for Urea as inhalable dust. U.S. OSHA PEL: 15 mg/m³ 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**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHYSICAL STATE AND APPEARANCE</strong></td>
<td>Solid. (A white urea granule with an off-white or colored time release coating and protective overcoat.)</td>
</tr>
<tr>
<td><strong>MOLECULAR WEIGHT</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>pH (10% SOLN/WATER)</strong></td>
<td>7</td>
</tr>
<tr>
<td><strong>BOILING POINT</strong></td>
<td>Decomposes.</td>
</tr>
<tr>
<td><strong>MELTING POINT</strong></td>
<td>133°C (271.4°F)</td>
</tr>
<tr>
<td><strong>CRITICAL TEMPERATURE</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>SPECIFIC GRAVITY g/cc</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>BULK DENSITY kg/m³; lbs/ft³</strong></td>
<td>769 kg/m³; 48 lbs/ft³</td>
</tr>
<tr>
<td><strong>VAPOR PRESSURE</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>VAPOR DENSITY</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>PHYSICAL STATE AND APPEARANCE</strong></td>
<td>Solid. (A white urea granule with an off-white or colored time release coating and protective overcoat.)</td>
</tr>
<tr>
<td><strong>COLOR</strong></td>
<td>Off-white or brown.</td>
</tr>
<tr>
<td><strong>ODOR</strong></td>
<td>Odorless.</td>
</tr>
<tr>
<td><strong>ODOR THRESHOLD</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>TASTE</strong></td>
<td>Saline.</td>
</tr>
<tr>
<td><strong>SPECIFIC GRAVITY g/cc</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>SOLUBILITY</strong></td>
<td>Very slightly soluble in cold water, hot water due to the slow release coating.</td>
</tr>
<tr>
<td><strong>DISPERSION PROPERTIES</strong></td>
<td>Will slowly dissolve, releasing nutrients over a period of several months.</td>
</tr>
<tr>
<td><strong>WATER/OIL DIST. COEFF.</strong></td>
<td>Soluble in water.</td>
</tr>
</tbody>
</table>

**Section X. Stability and Reactivity Data**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STABILITY</strong></td>
<td>The product is stable.</td>
</tr>
<tr>
<td><strong>INCOMPATABILITY WITH FIBER</strong></td>
<td>Non-reactive with oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis.</td>
</tr>
<tr>
<td><strong>CORROSIVITY</strong></td>
<td>Slightly corrosive to steel. Very slightly corrosive to aluminum, zinc, and copper. Non-corrosive to 304 or 316 stainless steel.</td>
</tr>
<tr>
<td><strong>SPECIAL REMARKS ON REACTIVITY</strong></td>
<td>No additional remark.</td>
</tr>
<tr>
<td><strong>SPECIAL REMARKS ON CORROSIVITY</strong></td>
<td>Avoid contact with moisture. Slow hydrolysis will produce acids which may slowly corrode metals. Contact your sales representative or a metallurgical specialist to ensure compatibility with system equipment.</td>
</tr>
</tbody>
</table>

**Section XI. Toxicological Information**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SIGNIFICANT ROUTES OF EXPOSURE</strong></td>
<td>Ingestion. Inhalation.</td>
</tr>
<tr>
<td><strong>TOXICITY TO ANIMALS</strong></td>
<td>See Section II.</td>
</tr>
<tr>
<td><strong>SPECIAL REMARKS ON TOXICITY TO ANIMALS</strong></td>
<td>The product itself and its products of degradation are not harmful under normal conditions of use.</td>
</tr>
<tr>
<td><strong>OTHER EFFECTS ON HUMANS</strong></td>
<td>Our data base contains no additional remark on the toxicity of this product</td>
</tr>
<tr>
<td><strong>SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS</strong></td>
<td>No effects.</td>
</tr>
<tr>
<td><strong>SPECIAL REMARKS ON OTHER EFFECTS ON HUMANS</strong></td>
<td>No additional remark.</td>
</tr>
</tbody>
</table>

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Section XII. Ecological Information

ECOTOXICITY
Will very slowly release ammonia. Ammonia is a toxic hazard to fish, however, ammonia release is very slow making urea considerably 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. Very low toxicity to fish and other water organisms. This product has limited solubility. Recovery of spilled material from bodies of water should be considered. U.S. D.O.T.: This material is 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
The product itself and its products of degradation are not harmful under normal conditions of use if proper precautions are followed. Urea will promote algae growth which may degrade water quality and taste.

Section XIII. Disposal Considerations

WASTE DISPOSAL OR RECYCLING
Recover and place material in a suitable container for intended use or disposal. Ensure that disposal complies with government requirements and local regulations.

Section XIV. Transport Information

DOT / TDG CLASSIFICATION
Not controlled under TDG (Canada) or DOT (U.S.A.).

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
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product and all its components are on the Domestic Substances List (DSL) and acceptable for use under the provisions of CEPA.
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.
CERCLA/SUPERFUND, 40 CFR 117,302: This product contains no Reportable Quantity (RQ) Substances.
This product does not contain Section 313 reportable ingredients.
This product is not considered as a priority pollutant as regulated under the Clean Water Act.
TSCA (Toxic Substance Control Act): This product and all its components are listed on the TSCA Inventory.
CALIFORNIA PROPOSITION 65: This product contains no chemicals known to the State of California to cause cancer, birth 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).
DSCL (EEC) Not controlled under DSCL (Europe).

Continued on Next Page
### Hazards presented under acute emergency conditions only:

<table>
<thead>
<tr>
<th>Health</th>
<th>Fire Hazard</th>
<th>Reactivity</th>
<th>Specific Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Section XVI. Other Information

**REFERENCES**

- AIHA WEELs, American Industrial Hygiene Association, 2004
- ACGIH TLVs, American Conference of Governmental Industrial Hygienists, 2004
- Canadian Centre for Occupational Health and Safety Database Systems.
- Domestic Substances List, Canadian Environmental Protection Act, Environment Canada.
- 29 CFR Part 1910
- 40 CFR Parts 1-799
- 49 CFR Parts 1-199
- The Fertilizer Institute Product Testing Plan Results, March 2003

**OTHER SPECIAL CONSIDERATIONS**

Not applicable.

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

AGRIUM
Environment, Health and Safety Department
Telephone (403) 225-7380 or Fax (403) 225-7608

**NOTICE TO READER**

**Continued on Next Page**
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