

# Material Safety Data Sheet

Urea

## 1. Product and company identification

**Product name** : Urea  
**Synonym** : Carbamide  
**Chemical formula** : C-H4-N2-O  
**Supplier** : Thermo Fisher Scientific  
Pierce Biotechnology  
P.O. Box 117  
Rockford, IL 61105  
United States  
815.968.0747 or  
800.874.3723  
**Manufacturer** : Thermo Fisher Scientific  
Pierce Biotechnology  
P.O. Box 117  
Rockford, IL 61105  
United States  
815.968.0747 or  
800.874.3723  
**Code** : 0029700 0029700B 1862284 1889743  
**MSDS #** : 0360  
**Validation date** : 6/13/2012.  
**Print date** : 6/29/2012.  
**Responsible name** : MSDS (Regulatory Specialist)  
**In case of emergency** : **CHEMTREC:**  
**800.424.9300**  
**OUTSIDE US:**  
**703.527.3887**  
**Material uses** : **Refer to the instruction**  
**booklet for proper and**  
**intended use. Otherwise,**  
**contact supplier for specific**  
**applications.**  
**Product type** : Solid.

## 2. Hazards identification

### Emergency overview

**Physical state** : Solid. [Crystals.]  
**Color** : White.  
**Odor** : Characteristic.  
**Hazard statements** : MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CAN CAUSE TARGET ORGAN DAMAGE.  
**Precautionary measures** : Use only with adequate ventilation. Do not eat, drink or smoke when using this product. Avoid contact with eyes, skin and clothing. Keep container tightly closed. Wash thoroughly after handling.  
**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
**Routes of entry** : Dermal contact. Eye contact. Inhalation. Ingestion.  
**Potential acute health effects**  
**Inhalation** : Slightly irritating to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.  
**Ingestion** : No known significant effects or critical hazards.

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## 2. Hazards identification

**Skin** : Slightly irritating to the skin.  
**Eyes** : Slightly irritating to the eyes.  
**Potential chronic health effects**  
**Chronic effects** : Can cause target organ damage.  
**Carcinogenicity** : No known significant effects or critical hazards.  
**Mutagenicity** : No known significant effects or critical hazards.  
**Teratogenicity** : No known significant effects or critical hazards.  
**Developmental effects** : No known significant effects or critical hazards.  
**Fertility effects** : No known significant effects or critical hazards.  
**Target organs** : Causes damage to the following organs: mucous membranes, upper respiratory tract, eye, lens or cornea.  
May cause damage to the following organs: blood, cardiovascular system, skin, eyes.  
**Over-exposure signs/symptoms**  
**Inhalation** : Adverse symptoms may include the following:  
respiratory tract irritation  
coughing  
**Ingestion** : No specific data.  
**Skin** : Adverse symptoms may include the following:  
irritation  
redness  
**Eyes** : Adverse symptoms may include the following:  
irritation  
watering  
redness  
**Medical conditions aggravated by over-exposure** : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

## 3. Composition/information on ingredients

### United States

| Name | CAS number | %        |
|------|------------|----------|
| urea | 57-13-6    | 98 - 100 |

### Canada

| Name | CAS number | %        |
|------|------------|----------|
| urea | 57-13-6    | 98 - 100 |

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.**

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### 4. First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

### 5. Fire-fighting measures

- Flammability of the product** : No specific fire or explosion hazard.
- Extinguishing media**
- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide  
nitrogen oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Special remarks on fire hazards** : When exposed to heat, ammonia is released.

### 6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

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### 6. Accidental release measures

- Large spill** : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

### 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store between the following temperatures: 20 to 25°C (68 to 77°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

### 8. Exposure controls/personal protection

#### United States

| Ingredient | Exposure limits   |
|------------|---|
| urea       | AIHA WEEL (United States, 10/2011).<br>TWA: 10 mg/m <sup>3</sup> 8 hour(s). |

#### Canada

| Occupational exposure limits |                 | TWA (8 hours) |                   |       | STEL (15 mins) |                   |       | Ceiling |                   |       |           |
|------------------------------|-----------------|---------------|-------------------|-------|----------------|-------------------|-------|---------|-------------------|-------|-----------|
| Ingredient                   | List name       | ppm           | mg/m <sup>3</sup> | Other | ppm            | mg/m <sup>3</sup> | Other | ppm     | mg/m <sup>3</sup> | Other | Notations |
| urea                         | US AIHA 10/2011 | -             | 10                |       | -              | -                 | -     | -       | -                 | -     |           |

#### Consult local authorities for acceptable exposure limits.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

#### Personal protection

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### 8. Exposure controls/personal protection

- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### 9. Physical and chemical properties

- Physical state** : Solid. [Crystals.]
- Flash point** : Closed cup: >93.3°C (>199.9°F)
- Color** : White.
- Odor** : Characteristic.
- Taste** : Saline.
- Molecular weight** : 60.07 g/mole
- Molecular formula** : C-H4-N2-O
- pH** : 7 [Conc. (% w/w): 1%]
- Boiling/condensation point** : Decomposition temperature: 132°C (269.6°F)
- Melting/freezing point** : 132.7 to 135°C (270.9 to 275°F)
- Relative density** : 1.33
- Vapor pressure** : 0.0000016 kPa (0.000012 mm Hg) [20°C]
- Vapor density** : 2.07 [Air = 1]
- Solubility** : Easily soluble in the following materials: hot water.  
Soluble in the following materials: cold water.  
Partially soluble in the following materials: methanol and diethyl ether.  
Insoluble in the following materials: n-octanol.

### 10. Stability and reactivity

- Chemical stability** : The product is stable.
- Conditions to avoid** : No specific data.
- Incompatible materials** : No specific data.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

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### 11. Toxicological information

#### United States

##### Acute toxicity

| Product/ingredient name | Result    | Species | Dose       | Exposure |
|-------------------------|-----------|---------|------------|----------|
| urea                    | LD50 Oral | Rat     | 8471 mg/kg | -        |

**Conclusion/Summary** : Not available.

##### Chronic toxicity

**Conclusion/Summary** : Not available.

##### Irritation/Corrosion

| Product/ingredient name | Result                   | Species | Score | Exposure                            | Observation |
|-------------------------|--------------------------|---------|-------|-------------------------------------|-------------|
| urea                    | Skin - Mild irritant     | Human   | -     | 72 hours 22 milligrams Intermittent | -           |
|                         | Skin - Moderate irritant | Human   | -     | 24 hours 20 Percent                 | -           |

**Conclusion/Summary** : Not available.

##### Sensitizer

**Conclusion/Summary** : Not available.

##### Carcinogenicity

**Conclusion/Summary** : Not available.

##### Classification

| Product/ingredient name | ACGIH | IARC | EPA | NIOSH | NTP | OSHA |
|-------------------------|-------|------|-----|-------|-----|------|
| urea                    | A5    | -    | -   | None. | -   | -    |

##### Mutagenicity

**Conclusion/Summary** : Not available.

##### Teratogenicity

**Conclusion/Summary** : Not available.

##### Reproductive toxicity

**Conclusion/Summary** : Not available.

#### Canada

##### Acute toxicity

| Product/ingredient name | Result    | Species | Dose       | Exposure |
|-------------------------|-----------|---------|------------|----------|
| urea                    | LD50 Oral | Rat     | 8471 mg/kg | -        |

**Conclusion/Summary** : Not available.

##### Chronic toxicity

**Conclusion/Summary** : Not available.

##### Irritation/Corrosion

| Product/ingredient name | Result                   | Species | Score | Exposure                            | Observation |
|-------------------------|--------------------------|---------|-------|-------------------------------------|-------------|
| urea                    | Skin - Mild irritant     | Human   | -     | 72 hours 22 milligrams Intermittent | -           |
|                         | Skin - Moderate irritant | Human   | -     | 24 hours 20 Percent                 | -           |

**Conclusion/Summary** : Not available.

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## 11. Toxicological information

### Sensitizer

Conclusion/Summary : Not available.

### Carcinogenicity

Conclusion/Summary : Not available.

### Classification

| Product/ingredient name | ACGIH | IARC | EPA | NIOSH | NTP | OSHA |
|-------------------------|-------|------|-----|-------|-----|------|
| urea                    | A5    | -    | -   | None. | -   | -    |

### Mutagenicity

Conclusion/Summary : Not available.

### Teratogenicity

Conclusion/Summary : Not available.

### Reproductive toxicity

Conclusion/Summary : Not available.

## 12. Ecological information

Ecotoxicity : This product shows a low bioaccumulation potential.

### United States

#### Aquatic ecotoxicity

| Product/ingredient name | Result                              | Species  | Exposure |
|-------------------------|-------------------------------------|--|----------|
| urea                    | Acute EC50 6573.1 mg/L Fresh water  | Crustaceans - Ceriodaphnia dubia - Neonate - <24 hours | 48 hours |
|                         | Acute EC50 3910000 ug/L Fresh water | Daphnia - Daphnia magna - Neonate - <24 hours          | 48 hours |
|                         | Acute LC50 5000 ug/L Fresh water    | Fish - Colisa fasciata - Fingerling                    | 96 hours |

Conclusion/Summary : Not available.

### Persistence/degradability

Conclusion/Summary : Not available.

### Canada

#### Aquatic ecotoxicity

| Product/ingredient name | Result                              | Species  | Exposure |
|-------------------------|-------------------------------------|--|----------|
| urea                    | Acute EC50 6573.1 mg/L Fresh water  | Crustaceans - Ceriodaphnia dubia - Neonate - <24 hours | 48 hours |
|                         | Acute EC50 3910000 ug/L Fresh water | Daphnia - Daphnia magna - Neonate - <24 hours          | 48 hours |
|                         | Acute LC50 5000 ug/L Fresh water    | Fish - Colisa fasciata - Fingerling                    | 96 hours |

Conclusion/Summary : Not available.

### Persistence/degradability

Conclusion/Summary : Not available.

Partition coefficient: n-octanol/water : -2.11

Bioconcentration factor : Not available.

Other adverse effects : No known significant effects or critical hazards.

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## 13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14. Transport information

| Regulatory information | UN number      | Proper shipping name | Classes | PG* |
|------------------------|----------------|----------------------|---------|-----|
| DOT Classification     | Not regulated. | -                    | -       | -   |
| IATA-DGR Class         | Not regulated. | -                    | -       | -   |

PG\* : Packing group

## 15. Regulatory information

### United States

HCS Classification : Target organ effects

U.S. Federal regulations : TSCA 8(a) IUR Exempt/Partial exemption: Not determined  
United States inventory (TSCA 8b): This material is listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: urea

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

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## 15. Regulatory information

### State regulations

- Massachusetts** : This material is not listed.  
**New York** : This material is not listed.  
**New Jersey** : This material is not listed.  
**Pennsylvania** : This material is not listed.  
**United States inventory (TSCA 8b)** : This material is listed or exempted.

### Canada

- WHMIS (Canada)** : Not controlled under WHMIS (Canada).

### Canadian lists

- Canadian NPRI** : This material is not listed.  
**CEPA Toxic substances** : This material is not listed.  
**Canada inventory** : This material is listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

### International regulations

- International lists** : **Australia inventory (AICS)**: This material is listed or exempted.  
**China inventory (IECSC)**: This material is listed or exempted.  
**Japan inventory**: This material is listed or exempted.  
**Korea inventory**: This material is listed or exempted.  
**New Zealand Inventory of Chemicals (NZIoC)**: This material is listed or exempted.  
**Philippines inventory (PICCS)**: This material is listed or exempted.

## 16. Other information

- Label requirements** : MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CAN CAUSE TARGET ORGAN DAMAGE.

**Hazardous Material Information System (U.S.A.)** :

|                  |   |
|------------------|---|
| Health           | 1 |
| Flammability     | 0 |
| Physical hazards | 0 |
|                  |   |

The customer is responsible for determining the PPE code for this material.

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



- References** : -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.

**Date of printing** : 6/29/2012.

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**Date of previous issue** : 1/24/2011.

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## 16. Other information

**Version** : 1.01

**Prepared by** : MSDS (Regulatory Specialist)

✓ Indicates information that has changed from previously issued version.

### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

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