



Safety Data Sheet

Section 1: Identification

Product Name: Urea

Product Type: Solid

Recommended Uses: For use in ethanol production.

Synonyms: Carbamide, carbonyl diamide, carbonydiamine, diaminomethanal, diaminomethanone

Company Identification:

Origination, LLC
1802 Wooddale Drive, Suite 200
Woodbury, MN 55125

For information, call: 1-800-625-6079

Emergency Number: 1-800-625-6079

For CHEMTREC assistance, call: 1-800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2: Hazard(s) Identification

OSHA/HCS status: This material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification and labeling have been performed following the guidelines and recommendation of GHS and the intended use.

Classification of the substance or mixture: Not classified.

GHS label elements

Signal Word: No signal word.

Hazard statements: Not applicable.

Precautionary statements

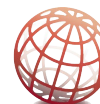
General: Not applicable.

Hazards not otherwise classified: Product forms slippery surface when combined with water.

Section 3: Composition / Information on Ingredients

Substance/mixture: Substance.

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CAS number/other identifiers

Other means of identification: Urea.

CAS number: 57-13-6.

| Product/ingredient name | CAS number | % |
|-------------------------|--------------|-----|
| Urea | CAS: 57-13-6 | 100 |

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

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.

Occupational exposure limits, if available are listed in Section 8.

Section 4: First Aid Measures

Description of necessary first-aid measures

In case of eye contact: Rinse with plenty of running water. Check for and remove any contact lenses. Get medical attention if irritation occurs.

In case of inhalation effects: If inhaled, remove to fresh air. 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.

In case of skin contact: Wash off with soap and water. Get medical attention if irritation develops.

In case of ingestion: Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if adverse health effects persist or are severe.

Most important symptoms and effects, both acute and delayed

Potential acute health effects

In case of eye contact: No known significance effects or critical hazards.

In case of inhalation: Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

In case of skin contact: No known significant effects or critical hazards.

In case of ingestion: No known significant effects or critical hazards.

Over-exposure signs/symptoms

In case of eye contact: No specific data.

In case of inhalation: No specific data.



In case of skin contact: No specific data.

In case of ingestion: No specific data.

Indication of any immediate medical attention and special treatment needed, if necessary

Notes to physician: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. 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.

Specific treatments: No specific treatment.

Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training.

See toxicological information (section 11)

Section 5: Fire Fighting Measures

Extinguishing media

Suitable extinguishing media: Use extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media: None identified.

Special hazards arising from the chemical: No specific fire or explosion hazard.

Hazardous thermal decomposition products: Decomposition products may include the following materials: carbon dioxide, carbon monoxide, nitrogen oxides, ammonia. Avoid breathing dusts, vapors or fumes from burning materials. In case of inhalation of decomposition products in a fire, symptoms may be delayed.

Special protective actions for fire-fighters: 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.

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.

Remark: Non-flammable.

Remark: None.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures



For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding area. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

For emergency responders: If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in “For non-emergency personnel”.

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 and materials for containment and cleaning up

Small spill: Move containers from the spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

Large spill: Move containers from spill area. 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.

Section 7: Handling and Storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene: 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. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : 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.

Section 8: Exposure Controls, Personal Protection

Control parameters

Occupational exposure limits

| Ingredient name | Exposure limits |
|-----------------|-----------------|
|-----------------|-----------------|

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| Urea | AIHA WEEL (1999-01-01) Time Weighted Average (TWA) 10 mg/m ³ NIOSH REL (2005-09-30) |
|------|--|

Appropriate engineering controls: Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

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.

Individual protection measures

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. Wash contaminated clothing before reusing. A washing facility or water for eye and skin cleaning purposes should be present.

Eye/face protection: 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, gases or dusts.

Skin protection

Hand protection: 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.

Body protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved.

Other skin protection: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection: Use a properly fitted, particulate filter 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.

Section 9: Physical and Chemical Properties

Physical State: Solid [Granular or prill] .

Color: White.

Odor: Odorless

Odor thresholds: Not determined.

pH: 9 [Conc.: 100 g/l] @ 20 °C (68.00 °F)

Melting/freezing point: 133 - 134 °C (271.40 - 273.20 °F)

Boiling/condensation point: Not determined.

Sublimation temperature: Not determined.

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Flash point: Not applicable.

Evaporation rate: Not determined.

Flammability: Not-flammable.

Lower and upper explosive (flammable) limits: Lower: Not determined. **Upper:** Not determined.

Vapor pressure: 0.000016 hPa

Vapor density: 2.07 [Air = 1]

Bulk density: 760 - 800 kg/m³

Density: 1.33 g/cm³ @ 20 °C (68.00 °F)

Relative density: Not determined

Solubility: Easily soluble in the following materials cold water.

Solubility in water: 624 g/l @ 20 °C (68.00 °F)

Partition coefficient: noctanol/water: Not determined.

Auto-ignition temperature: Not determined.

Decomposition temperature: Not determined.

Viscosity: Dynamic: Not determined. **Kinematic:** Not determined.

Explosive properties: None.

Oxidizing properties: None.

Section 10: Stability and Reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

Chemical Stability: The product is stable.

Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to Avoid: Avoid contamination by any source including metals, dust and organic materials.

Incompatible materials: Urea reacts with calcium hypochlorite or sodium hypochlorite to form the explosive nitrogen trichloride.

Remark: acids alkalis Nitrites and nitrates

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.



Section 11: Toxicological Information

Information on toxicological effects

Acute toxicity

| Product / ingredient name | Result | Species | Dose | Exposure | References |
|---------------------------|-----------|---------|--------------------------|----------|------------|
| Urea | | | | | |
| | LD50 Oral | Rat | 14,300 mg/kg OECD 401 | - | IUCLID 5 |

Conclusion/Summary: No known significant effects or critical hazards.

Irritation/Corrosion

Conclusion/Summary

Skin: No known significant effects or critical hazards.

Eyes: No known significant effects or critical hazards.

Respiratory: No known significant effects or critical hazards.

Sensitization

Conclusion/Summary

Skin: No known significant effects or critical hazards.

Respiratory: No known significant effects or critical hazards.

Mutagenicity

Conclusion/Summary: No known significant effects or critical hazards.

Carcinogenicity

| Product / ingredient name | Result | Species | Dose | Exposure | References |
|---------------------------|----------------------------|---------|------------|----------|------------|
| Urea | Negative - Oral - NOAEL | Rat | 2250 mg/kg | - | IUCLID 5 |

Conclusion/Summary: No known significant effects or critical hazards.

Reproductive toxicity

| Product / ingredient name | Maternal toxicity | Fertility | Developmental toxin | Species | Dose | Exposure | References |
|---------------------------|-------------------|-----------|---------------------|---------|--------------------|-----------------|------------|
| Urea | - | - | Negative | Rat | Oral: 500 mg/kg | 7 days per week | IUCLID 5 |

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Conclusion/Summary: No known significant effects or critical hazards.

Teratogenicity

Conclusion/Summary: No known significant effects or critical hazards.

Specific target organ toxicity (single exposure): No known significant effects or critical hazards.

Specific target organ toxicity (repeated exposure): No known significant effects or critical hazards.

Aspiration hazard: No known significant effects or critical hazards.

Information on the likely routes of exposure: Not available.

Potential acute health effects

Eye contact: No known significant effects or critical hazards.

Inhalation: Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact: No known significant effects or critical hazards.

Ingestion: No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact: No specific data.

Inhalation: No specific data.

Skin contact: No specific data.

Ingestion: No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects: Not available.

Potential delayed effects: Not available.

Long term exposure

Potential immediate effects: Not available.

Potential delayed effects: Not available.

Potential chronic health effects

| Product / ingredient name | Result | Species | Dose | Exposure | References |
|---------------------------|---------------|---------|---------------|-----------------------------|------------|
| Urea | NOAEL Oral | Rat | 2250 mg/kg | 12months 7 days per week | IUCLID 5 |

Conclusion/Summary: No known significant effects or critical hazards.

General: No known significant effects or critical hazards.

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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.

Over-exposure signs/symptoms

Eye contact: No specific data.

Inhalation: No specific data.

Skin contact: No specific data.

Ingestion: No specific data.

Numerical measures of toxicity

Acute toxicity estimates: Not available.

Section 12: Ecological Information

Toxicity

| Product / ingredient name | Result | Species | Exposure | References |
|---------------------------|---------------------------------------|---|----------|------------|
| Urea | | | | |
| | Acute LC50 6,810 mg/l Fresh water | Fish - Labeo boga | 96 h | IUCLID 5 |
| | Acute EC50 10,000 mg/l Fresh water | Aquatic invertebrates. - Daphnia magna | 24 h | IUCLID 5 |
| | Acute NOEC 47 mg/l Fresh water | Aquatic plants - Heterosigma akashiwo | 192 h | IUCLID 5 |

Conclusion/Summary: No known significant effects or critical hazards.

Persistence/degradability

| Product / ingredient name | Test | Result | Dose | Inoculum | References |
|---------------------------|------|-------------|------|------------------|------------|
| Urea | | 96 % - 16 d | | Activated sludge | |

Conclusion/Summary: No known significant effects or critical hazards.

Bioaccumulative potential

| Product / ingredient name | LogPow | BCF | Potential |
|---------------------------|--------|-----|-----------|
|---------------------------|--------|-----|-----------|

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| Urea | 1.73-2.11-1.73 | - | low |
|------|----------------|---|-----|

Conclusion/Summary: No known significant effects or critical hazards.

Mobility in soil

Soil/water partition coefficient (KOC): Not available.

Mobility: This product may move with surface or groundwater flows because its water solubility is: high

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

Section 13: Disposal Considerations (non-mandatory)

Disposal Methods

Dispose in accordance with all applicable regulations. The U.S. EPA has not published waste numbers for this product's components. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components.

Section 14: Transport Information

US DOT Information No Classification assigned.

TDG Information No Classification assigned.

ADR Information No Classification assigned.

ADR Tunnel Code Restrictions No information is available.

RID Information No Classification assigned.

IATA Information No Classification assigned.

ICAO Information No Classification assigned.

IMDG Information No Classification assigned.

Section 15: Regulatory Information

United States U.S. Federal regulations :

United States - TSCA 12(b) - Chemical export notification: None of the components are listed.

United States - TSCA 4(a) - Final Test Rules: Not listed

United States - TSCA 4(e) - ITC Priority list: Not listed

United States - TSCA 4(a) - Proposed test rules: Not listed

United States - TSCA 4(f) - Priority risk review: Not listed

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United States - TSCA 5(a)2 - Final significant new use rules: Not listed
United States - TSCA 5(a)2 - Proposed significant new use rules: Not listed
United States - TSCA 5(e) - Substances consent order: Not listed
United States - TSCA 6 - Final risk management: Not listed
United States - TSCA 6 - Proposed risk management: Not listed
United States - TSCA 8(a) - Comprehensive assessment report (CAIR): Not listed
United States - TSCA 8(a) - Chemical risk rules: Not listed
United States - TSCA 8(a) - Dioxin/Furane precursor: Not listed
United States - TSCA 8(a) - Chemical Data Reporting (CDR): Not determined
United States - TSCA 8(a) - Preliminary assessment report (PAIR): Not listed
United States - TSCA 8(c) - Significant adverse reaction (SAR): Not listed
United States - TSCA 8(d) - Health and safety studies: Not listed

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

SARA 302/304: Not applicable.

SARA 304 RQ SARA 311/312: Not applicable.

Classification: Not applicable.

State regulations

Massachusetts: None of the components are listed.

New York: None of the components are listed.

New Jersey: None of the components are listed.

Pennsylvania: None of the components are listed.

California Prop. 65

This product contains a chemical (or chemicals) known to the State of California to cause cancer and birth defects or other reproductive harm.

Safety, health and environmental regulations: No known other specific national and/or regional regulations applicable to this product (including its specific for the product ingredients).

Section 16: Additional Information

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

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| | | |
|--------------|---|---|
| Health | - | 1 |
| Flammability | | 0 |
| Reactivity | | 0 |
| | | |

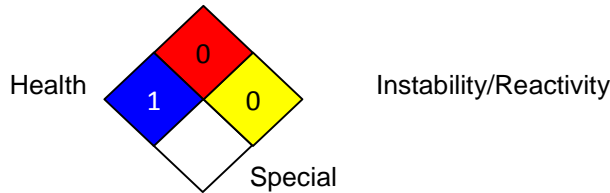
Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks

Chronic toxicity: No data available.

* Carcinogen, Target organs, Reproductive effects, Sensitizer to lungs

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

Flammability



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Prepared by: Origination, LLC

Prepared: February 5, 2021

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