

Material Safety Data Sheet



Martrex, Inc.

Section 1: Chemical Product and Company Information

Product name: Urea

Reference Number:

Supplier/ Further Information: Martrex, Inc.

Web: www.martrexinc.com

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14525 Highway 7

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EPA Registration Number: n/a

CAS#: 57-13-6

Chemical Name: Carbonyldiamine

Synonyms: Carbamide, Carbonyldiamine, Carbonyl Diamine

Chemical Family: Amides

MSDS Number: n/a

24 Hour Emergency Phone - Chemtrec Transport: 1-800-424-9300; Medical: 1-800-441-3637

Section 2: Composition/Information on Ingredients

Component	SARA Listed Hazardous?	CAS#	%	RTECS#	Other Limits
1. Urea	Yes	57-13-6	96.6-97.6%	YR6250000	See Sections 11,12,15
2. Biuret (H ₂ NCONHCONH ₂)	Yes	108-19-0	1.0-1.5%	no data	See Section 11
3. Water	No	7732-18-5	0.1-0.4%	no data	no data
4. Urea reaction products with Formaldehyde	no data	68611-64-3	1.3-1.5%	no data	no data

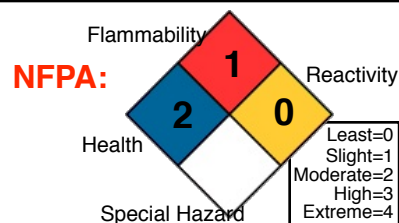
Comp.	OSHA PEL	OSHA STEL	OSHA CEIL	ACGIH TLV	ACGIH STEL	ACGIH CEIL
1. (above)	15 mg/m ³ 8-hr TWA (total); 5 mg/m ³ 8-hr TWA (respirable)	no data	no data	10 mg/m ³ (inhalable particulate); 3 mg/m ³ (respirable particulate)	no data	no data
2. (above)	no data	no data	no data	no data	no data	no data
3. (above)	no data	no data	no data	no data	no data	no data
4. (above)	no data	no data	no data	no data	no data	no data

Section 3: Hazards Identification

Emergency Overview: When heated, Urea forms hazardous decomposition products, including Ammonia, CO, CO₂; if burned emits NO, NO₂. Refer to Section 9 for details; Can cause redness and irritation of skin and eyes.

NFPA: Health: **2** Flammability: **1** Reactivity: **0**

Potential Health Effects: Hazardous in case of skin contact, of eye contact, of ingestion, of inhalation.



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Primary Routes of Exposure / Entry: Skin contact, Inhalation, Eye contact.

Target Organs: blood, cardiovascular system

Acute Exposure Symptoms

Inhalation (breathing): Urea dust may cause irritation of the nose, throat, and respiratory tract.

Eye Contact: Contact may cause eye irritation including stinging, watering and redness.

Skin Contact: Contact may cause irritation including redness, itching and pain.

Ingestion (swallowing): May cause irritation of the digestive tract if ingested. High exposures may cause nausea, vomiting and diarrhea.

Chronic Exposure Symptoms: Effects of overexposure may include irritation of the nose, throat, and digestive tract, nausea, vomiting, diarrhea, coughing and shortness of breath, and may affect behavior (altered sleep time, change in motor activity), cardiovascular system (heart rate).

Medical Conditions Aggravated By Long-Term Exposure: Conditions aggravated by exposure may include skin disorders and respiratory (asthma-like) disorders.

Carcinogenicity Data: Inadequate data available

NTP: **OSHA:** **IARC Monograph:** **Not Listed:**

Also See: Section 11 for more Toxicological information

Section 4: First Aid Measures

Inhalation: If inhaled, remove to fresh air and rest. If not breathing, give artificial respiration. If cough or difficulty in breathing develops, administer oxygen by qualified personnel. **Get Medical Attention.**

Eye Exposure: Hold eyelids open and flush eyes immediately with water for at least 15 minutes. **Get Medical Attention.**

Skin Exposure: In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. **Get Medical Attention.**

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. **Get Medical Attention.**

Ingestion: Rinse mouth and drink plenty of water. **Do not induce vomiting** unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. **Get Medical Attention if necessary.**

NOTE TO THE PHYSICIAN: no data

Section 5: Fire Fighting Measures

Flammability Classification: Urea is not flammable.

A Flash Point: no data

Auto-ignition Temperature: no data

Lower explosion limit (LEL): no data

Upper explosion limit (UEL): no data

Extinguishing Media: **Small Fires:** Use DRY chemical powder. **Large Fires: Do not use water jet.** Use dry chemical, water spray, fog or foam.

Unusual Fire and Explosive Hazards: Reactive with oxidizing agents. Refer to Section 10 for details.

Hazardous Decomposition Materials: Urea forms hazardous decomposition products, including Ammonia, CO, CO₂, NO, NO₂. Refer to Section 10 for details.

Special Procedures:

Fire-Fighting Instructions: Keep personnel removed from and upwind of fire.

Personal Protective Equipment: Fire fighters should use NIOSH approved self-contained breathing apparatus and full protective equipment when fighting chemical fires.

Section 6: Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill:

Spill and Leak Personal Procedures: Wear Splash goggles, Full suit, Dust respirator, Boots, Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Consult the glove/clothing manufacturer to determine the appropriate type glove/ clothing **BEFORE handling this product**. Use caution as product may be slippery when wet.

Containment of Spill: Recover any reusable product, taking care not to generate excess dust. Use appropriate tools to put the spilled solid in a convenient waste disposal container. Keep product out of sewage and drainage systems and all bodies of water as it may be toxic to aquatic organisms. Clean up spills immediately.

Cleanup and Disposal of Spill: Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

Environmental and Regulatory Reporting: Urea is not considered a hazardous waste under Federal Hazardous Waste Regulations 40 CFR 261. Waste must be disposed of in accordance with state and local environmental control regulations. See Sections 15 for regulatory requirements.

Section 7: Handling and Storage

Minimum/maximum Storage Temperature: Do not store above 23°C (73.4°F).

Handling: Wear suitable protective clothing and eye protection. In case of insufficient ventilation or when dust concentrations exceed any established exposure limits (see Section 2), wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Keep dry. Urea will absorb moisture from air. If storage piles become wet, surrounding floor may be slippery. Reacts with hypochlorites to form nitrogen trichloride, which explodes spontaneously in air. Reacts with nitric acid to form urea nitrate that decomposes explosively when heated. Do not store above 23°C.

REGULATORY REQUIREMENTS: See Section 2 and 8 for employee exposure controls and Section 15 for other regulatory requirements.

Section 8: Exposure Controls / Personal Protection

Ventilation Protection: Use process enclosures, general dilution ventilation, or local exhaust systems, or other engineering controls to keep airborne levels below recommended exposure limits (the OSHA standard). If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Respiratory Protection (specify type): Wear a dust mask or other appropriate respiratory protection during operations that generate airborne dust concentrations exceeding the relevant standards or when effective engineering controls are not feasible. A respiratory protection program that meets OSHA's 29 CFR 1910.134 requirements must be followed whenever workplace conditions warrant a respirator's use.

Eye Protection: When dusting of dry product or splashing of solutions is possible, use chemical safety goggles and/or full-face shield.

Skin Protection: When dusting of dry product or splashing of solutions is possible, wear protective gloves and clothing.

Other Protective Clothing and Equipment: no data

Hygienic Work Practices: Clean protective equipment before reuse. Wash after handling. Wash clothing and clean shoes before reuse.

Section 9: Physical and Chemical Properties

Chemical Name: Urea

Percent Equivalent CH₄N₂O: 96.6-97.6%

Physical State: Solid
Color and Appearance: White
Odor: Odorless or may generate a slight ammonia odor in the presence of moisture
Odor Threshold: no data
pH (10% water): 7.2
Specific Gravity (water=1): 1.34 @ 20°C (68°F); (heavier than water)
Vapor Pressure: not applicable
Vapor Density (Air = 1): no data
Density @ 25°C(77°F): no data
Bulk Density: no data
Volatiles by Volume: no data
Boiling Point: no data
Freezing / Melting Point: Decomposes @ 132.7°C (270.8°F)
Evaporation Rate: no data
Solubility in water @ 25°C(77°F): 119g per 100g water
Viscosity: 1.78 mPas (46% solution) at 20°C (68°F); 1.81 mPas (46% solution) at 137°C(278.60°F); 1.90 mPas (saturated solution) at 20°C(68°F)
Other Solubilities: no data
Chemical Formula: CH₄N₂O or (NH₂)₂CO
Formula Wt: 60.06

Section 10: Stability and Reactivity

Chemical Stability (under normal conditions of storage, handling, use): Stable X Unstable _____

Hazardous Polymerization: May Occur _____
Will Not Occur X

Conditions to Avoid: Excess dust generation, incompatible materials. Decomposes when heated above melting point.

Chemical Incompatibility and Materials to Avoid: Nitric acid, sodium nitrite, nitresyl parahierate, gallium perchlorate, hypochlorites, phosphorus pentachloride. Reactive with oxidizing agents.

Hazardous Decomposition Products: When heated above melting point, decomposes to ammonia, CO and CO₂. If burned, emits small amounts of NO and NO₂.

Section 11: Toxicological Information

Urea

Acute Data: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of the respiratory tract, nose, and throat, coughing and sneezing. May also affect blood, metabolism and urinary system.

Eye Effects: Contact may cause eye irritation including stinging, watering and redness.

Skin Effects: Urea dust may cause irritation of the nose, throat, and respiratory tract.

Acute Oral LD₅₀: (Rat)= 8471 mg/kg; (Mouse)= 11000 mg/kg.

Acute Dermal LD₅₀: Inadequate data available

ADOT Skin Corrosion: Inadequate data available

Additional Information: no data

Chronic Data

Potential Chronic Effects: Prolonged exposure may cause adverse reproductive effects. Laboratory experiments on animals have resulted in mutagenic effects. Prolonged exposure or exposure at high concentrations may cause eye damage.

Chronic Toxicity Studies: In a repeated dose toxicity study, urea at 10%, 20%, and 40% in ointment was applied to the back skin of rats for 4 weeks. No dose-dependent toxicity was observed. There were no consistent treatment-related effects on standard hematological parameters, clinical chemistry, organ

weights or organ histopathology. Including the testicles, prostate, seminal vesicles, ovaries and the uterus.

In a chronic toxicity and carcinogenicity screening study conducted in mice over 12 months, urea was administered at 0.45%, 0.9%, and 4.5% in the diet. No pathology was reported immediately following treatment period. After 4 months, testes, prostate, and uterus were histologically examined for occurrence of tumors in the survivors. Although there was a statistically increased incidence of interstitial cell adenomas of the testes in the high dose group. Its biological significance was deemed questionable, since the lesion may occur in 100% of controls.

Mutagenicity Data: Mutagenic for mammalian somatic cells.

Bacterial Genetic Toxicity: Urea was negative in tests of bacterial mutagenicity and demonstrated low clastogenic potential in non-bacterial mutagenicity tests. Chromosome breakage has been observed in some laboratory tests using extremely high concentrations of urea. At near lethal doses, urea was mutagenic in invivo non-bacterial tests in mice.

Non-Bacterial Genetic: no data

Developmental Toxicity/Teratological Data: In a single oral dose study in mice, 2,000 mg/kg administered on day 10 of pregnancy was not teratogenic. Urea in water was given in 2 doses 12 hours apart by gavage to rats during pregnancy for 14 days and the dams were allowed to deliver. No hypertrophy or other kidney changes were detected nor were any teratogenic effects noted. Urea caused developmental effects in chick embryos when injected into eggs.

Toxicity to Reproduction: May cause adverse reproductive effects (fetotoxicity) and genetic material (mutagenicity) based on animal studies. Passes through the placental barrier in human and is present in breast milk.

Carcinogenicity Data:

NTP: No **OSHA:** No **IARC Monograph:** No **Not Listed:**

Other Effects on Humans: The substance may be toxic to blood, cardiovascular system. Repeated or prolonged exposure to the substance can produce target organs damage. May also affect the blood and may cause tumorigenic effects.

Biuret

Acute Data:

Eye Effects: Inadequate data available

Skin Effects: Inadequate data available

Acute Oral LD₅₀: (Rat) > 5 g/kg

Acute Dermal LD₅₀: (Rat) > 2 g/kg

ADOT Skin Corrosion: Inadequate data available

Additional Information: no data

Chronic Data

Carcinogenicity Data:

NTP: No **OSHA:** No **IARC Monograph:** No **Not Listed:**

Other Effects on Humans: no data

Section 12: Ecological Information

Eco-acute Toxicity:

EPA Ecological Toxicity rating: no data

Acute Toxicity to Fish: no data

Aquatic Organism Toxicity: The cell multiplication toxicity threshold values for protozoa are 29 mg/L. At high concentrations, urea can be toxic to aquatic life. As a readily available source of nitrogen, urea can also foster excessive growth of algae or microorganisms in water systems. Notify local health and wildlife officials and operators of nearby water intakes upon contamination.

Chronic Toxicity to Fish: The critical range for the creek chub is 16,000 to 30,000 mg/L in Detroit river water.

Acute Toxicity to Aquatic Invertebrates: no data

Acute Toxicity to Aquatic Plants: The cell multiplication toxicity threshold values for green algae are > 10,000.

Toxicity to Bacteria: The cell multiplication toxicity threshold values for bacteria are > 10,000.

Toxicity to Soil Dwelling Organisms: Urea can be toxic to domestic animals and has caused poisonings when it was applied unevenly on pastures as a fertilizer.

Toxicity to Terrestrial Plants: Large amounts of urea can damage plant seedlings and inhibit germination.

Environmental Fate:

Stability in Water: In water, biodegradation to carbon dioxide and ammonia is the major fate pathway.

Stability in Soil: In the soil, urea degrades rapidly, usually within 24 hours; however, degradation may be slower depending on soil type, moisture content, and urea formulation. The ultimate degradation products are carbon dioxide and ammonia.

Transport and Distribution: Particulate-phase urea is physically washed out of the atmosphere by dry and wet deposition. The soil mobility is high based on an organic carbon partition coefficient of 8.

Toxicity: no data

Degradation Products:

Biodegradation: In water, biodegradation to carbon dioxide and ammonia is the major fate pathway.

The biodegradation rate increases with increasing temperature and presence of phytoplankton.

Oxidation of urea by nitrifying bacteria can increase biological oxygen demand. Bioaccumulation of urea is very low. The 72-hour bioconcentration factor (BCF) for carp is reported to be 1.

Photo-degradation: no data

Section 13: Disposal Considerations

Disposal Procedures: Urea is not considered a hazardous waste under Federal Hazardous Waste Regulations 40 CFR 261. Waste must be disposed of in accordance with state and local environmental control regulations.

RCRA Hazardous Waste Number: no data

Best demonstrated available treatment: no data

Container Cleaning And Disposal: no data

Disposal Regulatory Requirements: Consult local or state environmental regulatory agencies for acceptable disposal procedures and locations. Follow standard disposal procedures.

Section 14: Transport Information

Not a DOT controlled material

Section 15: Regulatory Information

TSCA: Listed

DSL (Canadian): no data

WHMIS Classification no data

EPA Regulations:

TSCA 8(b) inventory: Urea

RCRA Hazardous Waste Number: no data

CERCLA Hazardous Substance: no data

CERCLA Reportable Quantity no data

SARA 311/312 Codes: This product has been reviewed according to the U.S. EPA "Hazard Categories" promulgated under Sections 311 and 312 of SARA Title III and is considered, under applicable definitions, to meet the following categories: immediate health.

SARA (Hazard Categories Title III rules): No federal requirements. User should contact local and state regulatory agencies for information on additional or more stringent reporting requirements.

SARA 313 Toxic Chemical: no data

SARA 302 EHS: no data

SARA 302 EHS Threshold Planning Quantity: no data

OSHA Regulations: This material is considered to be hazardous as defined by the OSHA Hazard Communication Standard. (29 CFR 1910.1200).

**24 Hour Emergency Phone - Chemtrec: 1-800-424-9300 Transportation
1-800-441-3637 Medical**

OSHA: PEL = 15 mg/m³ 8-hr TWA (total); 5 mg/m³ 8-hr TWA (respirable)

ACGIH: TLV = 10 mg/m³ (inhalable particulate); 3 mg/m³ (respirable particulate)

State Regulations: Since state and local laws vary, consult your attorney or appropriate regulatory officials for information relating to spill reporting.

Section 16: Other Information

ACGIH - American Conference of Governmental Industrial Hygienists

ANSI - American National Standards Institute

CAS - Chemical Abstracts Service

CERCLA - Comprehensive Environmental Response, Compensation & Liability Act of 1980

CFR - Code of Federal Regulations

CHEMTREC - Chemical Transportation Emergency Center

DOT - U.S. Department of Transportation

DSL - Canadian Domestic Substance List

EHS - Extremely Hazardous Substance

EPA - U.S. Environmental Protection Agency

HMIS - Hazardous Material Identification System

IARC - International Agency for Research on Cancer

LEL/UEL - Lower and Upper Explosive Limit

mg/m³ - Milligrams per cubic meter

MSDS - Material Safety Data Sheet

NAERG - North American Emergency Response Guidebook

NIOSH - National Institute of Occupational Safety and Health

NFPA - National Fire Protection Association NTP - National Toxicology Program

OSHA - Occupational Safety and Health Administration

PEL - Permissible Exposure Limit (set by OSHA)

PPE - Personal Protective Equipment

RCRA -

SARA - Superfund Amendments and Reauthorization Act

TDG (Canadian): Transport of Dangerous Goods Regulations

TLV - Threshold Limit Value (set by ACGIH)

TWA - 8-hour Time Weighted Average

TSCA - US Toxic Substance Control Act

WHMIS - US Workplace Hazardous Material Information System

MSDS Issue Date: n/a

Revised Date: 5-21-09

Supersedes: n/a

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