



# Material Safety Data Sheet (MSDS) – UREA

## Company Identification

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## SECTION 1: Product and Company Identification

- **Product Name:** Urea
- **Synonyms:** Carbamide, Feed Urea, Fertilizer Urea, Automotive Urea, Technical Urea
- **Molecular Formula:**  $\text{CO}(\text{NH}_2)_2$
- **Molecular Weight:** 60.06 g/mol
- **CAS No.:** 57-13-6
- **EINECS No.:** 200-315-5
- **Intended Uses:**
  - Fertilizer Grade: Agricultural nitrogen fertilizer
  - Feed Grade: Non-protein nitrogen supplement for ruminant diets (biuret controlled  $\leq 1.5\%$ )
  - Technical Grade: Resin, adhesive, and plastic production
  - Automotive Grade (DEF/AdBlue®): Reducing agent in SCR systems for NOx emission control



## SECTION 2: Hazard Identification

- **Classification (GHS):** Not hazardous
- **Signal Word:** None
- **Pictograms:** None required
- **Hazards:**
  - Dust may cause mechanical irritation to eyes, skin, and respiratory tract
  - Ingestion of large amounts may cause gastrointestinal upset (nausea, vomiting)
  - Thermal decomposition releases ammonia, isocyanic acid, and nitrogen oxides
- **Environmental Hazard:** Large releases may cause eutrophication (algal blooms) in water

## SECTION 3: Composition / Information on Ingredients

Component	CAS No.	Concentration	Notes
Urea	57-13-6	98-100%	Main component
Biuret	–	≤1.5% (Feed grade)	Controlled for animal safety
Additives (anti-caking agent, formaldehyde, etc.)	–	≤0.5% (Fertilizer/Feed)	Improves stability
Moisture	–	≤0.5%	Strictly controlled in automotive grade

## SECTION 4: First Aid Measures



- **Inhalation:** Move to fresh air. Seek medical advice if symptoms persist.
- **Skin Contact:** Wash with soap and water. Remove contaminated clothing.
- **Eye Contact:** Flush with water for 15 minutes. Seek medical attention if irritation continues.
- **Ingestion:** Rinse mouth, drink water. Large ingestion may require medical treatment.
- **Note to Physicians:** High intake may cause osmotic diuresis; treat symptomatically.

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## SECTION 5: Firefighting Measures

- **Flammability:** Non-flammable
- **Extinguishing Media:** Water spray, foam, dry powder, CO<sub>2</sub>
- **Hazardous Decomposition Products:** Ammonia, isocyanic acid, nitrogen oxides (NO<sub>x</sub>)
- **Protective Equipment:** Self-contained breathing apparatus recommended

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## SECTION 6: Accidental Release Measures

- **Personal Precautions:** Avoid dust generation. Use mask and goggles.
- **Environmental Precautions:** Prevent large spills from entering surface waters.
- **Methods for Cleanup:** Sweep or vacuum without generating dust. Collect in clean container for reuse or disposal. Wash affected area with water.

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## SECTION 7: Handling and Storage

- **Handling:**
  - Avoid dust inhalation and eye contact
  - Ensure proper ventilation



- Prevent contact with acids and oxidizing agents
- **Storage:**
  - Store in a cool, dry, well-ventilated place
  - Protect from moisture (urea is hygroscopic)
  - Packaging: polyethylene-lined bags, jumbo bags, or bulk silo

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## SECTION 8: Exposure Controls / Personal Protection

- **Occupational Exposure Limits:** Not established
- **Engineering Controls:** Provide local exhaust ventilation if dusty
- **Personal Protective Equipment:**
  - Respiratory: Dust mask if airborne particles are present
  - Skin: Protective gloves (PVC/rubber)
  - Eyes: Safety glasses or goggles
  - Hygiene: Wash hands and face after handling

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## SECTION 9: Physical and Chemical Properties

- Appearance: White crystalline solid or granules
- Odor: Odorless; slight ammonia smell when decomposed
- Density: 1.32 g/cm<sup>3</sup>
- Bulk Density: 720–770 kg/m<sup>3</sup>
- pH (10% solution): 7.5 – 9.5





- Solubility: Very soluble in water (1080 g/L at 20 °C)
- Melting Point: 132–135 °C
- Decomposition Temperature: >133 °C

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## SECTION 10: Stability and Reactivity

- **Stability:** Stable under normal storage conditions
- **Hazardous Decomposition Products:** Ammonia, nitrogen oxides, isocyanic acid
- **Incompatible Materials:** Strong acids, oxidizers, sodium nitrite, hypochlorites
- **Conditions to Avoid:** Moisture, prolonged heating

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## SECTION 11: Toxicological Information

- **Acute Oral LD50 (rat):** >14,300 mg/kg → practically non-toxic
- **Dermal LD50 (rabbit):** >8,200 mg/kg
- **Skin Irritation:** Mild, reversible
- **Eye Irritation:** Mild, reversible
- **Carcinogenicity/Mutagenicity/Reproductive Toxicity:** Not classified
- **Special Notes:** In feed use, excessive intake can cause ammonia toxicity in ruminants

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## SECTION 12: Ecological Information

- **Aquatic Toxicity:** LC50 (fish, 96h) > 9,100 mg/L → low acute toxicity
- **Persistence/Degradability:** Readily biodegradable
- **Bioaccumulation Potential:** Low



- **Environmental Impact:** Risk of eutrophication if large amounts enter natural waters

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## SECTION 13: Disposal Considerations

- Dispose according to local, national, and international regulations
- Small amounts may be diluted and disposed into sewer with permission
- Large spills should be reused as fertilizer or in industrial processes

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## SECTION 14: Transport Information

- **UN Number:** Not regulated
- **Proper Shipping Name:** UREA
- **Transport Classification:** Not dangerous goods (IMDG, IATA, ADR, RID)
- **Packaging:** 25–50 kg bags, 500–1000 kg jumbo bags, or bulk containers

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## SECTION 15: Regulatory Information

- **EU:** Complies with REACH
- **US:** Listed on TSCA inventory
- **Turkey:** Registered under KKDIK
- **Other:** Conforms to FAO and ISO standards for fertilizer and feed additives



## SECTION 16: Other Information (Disclaimer & Legal Responsibility)

This Material Safety Data Sheet (MSDS) is based on information believed to be accurate and reliable at the time of publication. It is provided for informational purposes only and does not constitute a guarantee of product performance under specific conditions.

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