CF Industries, Inc

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: UREA

EFFECTIVE DATE: 11/25/85

EMERGENCY QUICK REFERENCE:

- TRANSPORTATION - CALL CHEMTREC - 1-800-424-9300
- HEALTH - CALL YOUR LOCAL POISON CENTER
- READ THE ENTIRE PRODUCT LABEL, IF AVAILABLE

PRECAUTIONARY INFORMATION SUMMARY:

Urea can irritate the eyes, skin, and throat.

I. PRODUCT INFORMATION

PRODUCT NAME: Urea

CAS NUMBER: 57-13-6

FORMULA: NH_2CONH_2

CHEMICAL NAME: Urea

CHEMICAL FAMILY: Amides

SYNONYMS AND COMMON TRADE NAMES: Carbamide, carbonyldiamine, carbamimidic acid

Typical Composition	Percentage	CAS Number
Urea	98.6 minimum	57-13-6
Biuret ($H_2NCONHCONH_2$)	1.5 maximum	108-19-0
Water	0.4 maximum	7732-18-5
Methylene ureas	0.35-0.45	

EXPOSURE STANDARDS: Although standards for urea have not been established, the following nuisance dust standards are applicable:

ACGIH TLV: 10 mg/m^3
OSHA PEL: 15 mg/m^3

II. PERSONAL PROTECTION INFORMATION

VENTILATION: Use process enclosure, local exhaust, or general dilution ventilation, where necessary, to keep airborne concentrations below the OSHA standards.

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

Eyes: Wear chemical goggles, face shield, or other protective equipment, when necessary.

Skin: Wear appropriate protective clothing, when necessary.

Respiratory: Protection is not normally required unless relevant exposure standards are exceeded. Wear a dust mask or other appropriate respiratory protection, when necessary.

Other: None

III. HEALTH HAZARD INFORMATION

Eyes: Dust and vapors can cause irritation and pain.

Skin: Can cause irritation.

Inhalation: Dust can cause sore throat, coughing, and shortness of breath.

Ingestion: Can cause sore throat and abdominal pain.

Toxicity Values: LD_{50}: 14,300 mg/kg for rats exposed orally

Late Toxicities: No carcinogenic, mutagenic, or teratogenic effects were reported in the literature reviewed.

EMERGENCY & FIRST AID PROCEDURES

Eyes: Hold eyelids open and flush eyes immediately with plenty of water. Seek medical attention if necessary.

Skin: Remove contaminated clothing immediately and flush affected areas with plenty of water.

Urea (Continued)

Inhalation: Move to fresh air and rest. Seek medical attention if necessary.

Ingestion: Rinse mouth, drink plenty of water. Seek medical attention if necessary.

NOTE TO PHYSICIAN: See above.

IV. REACTIVITY DATA

STABILITY (thermal, light, etc.): Stable X Unstable ___
Conditions to avoid: Decomposes when heated above melting point.

INCOMPATIBILITY (Materials to avoid): Sodium nitrite, nitrosyl perchlorate, and phosphorus pentachloride.

HAZARDOUS DECOMPOSITION PRODUCTS: When heated above melting point, decomposes to ammonia, biuret, triuret, cyanuric acid, nitrogen oxides, and ammelide.

HAZARDOUS POLYMERIZATION: May occur ___ Will not occur X
Conditions to avoid: Not applicable

V. PHYSICAL & CHEMICAL PROPERTIES

BOILING POINT: Not applicable

MELTING POINT: Decomposes at 132.7°C (270.8°F)

SOLUBILITY IN WATER: 119 g per 100 g water at 25°C (77°F).
1 g per 1 ml water

VAPOR DENSITY (Air = 1): Not applicable

EVAPORATION (Butyl acetate = 1): Not applicable

SPECIFIC GRAVITY (H_2O = 1): 1.34 at 20°C (68°F)
Heavier than water X Lighter than water ___

MOLECULAR WEIGHT: 60.07

PERCENTAGE VOLATILE BY VOLUME: High potential for nitrogen loss by volatilization

pH: 7.2 (10% water solution)

VAPOR PRESSURE: 0.08 psi at 0°C (32°F); 4.25 psi at 100°C (212°F)

APPEARANCE AND ODOR: Tasteless or slightly saline white granules; odorless or slight ammonia odor

OTHER (e.g., wt. per gal): Not applicable

VI. HANDLING & STORAGE PRECAUTIONS

HANDLING & STORAGE PROCEDURES: Keep dry and avoid exposure to high temperatures.

OTHER PRECAUTIONS: Do not store or mix with ammonium nitrate; mixture will liquefy.

VII. FIRE PROTECTION INFORMATION

NFPA FIRE RATING: Not listed

FLASH POINT (test method): Not applicable

FLAMMABLE LIMITS (by volume in air): Not flammable

LOWER EXPLOSIVE LIMIT: Not applicable

UPPER EXPLOSIVE LIMIT: Not applicable

AUTOIGNITION TEMPERATURE: Not applicable

EXTINGUISHING MEDIA: Water

SPECIAL FIREFIGHTING PROCEDURES: Wear full protective clothing and self-contained breathing apparatus to protect against the decomposition products of urea, which can be toxic.

VIII. TRANSPORTATION REQUIREMENTS: Not listed

IX. ENVIRONMENTAL PROTECTION

ENVIRONMENTAL IMPACT: Large amounts of urea can damage seeds and vegetation. At relatively high concentrations, urea can be toxic to aquatic life. As a readily available source of nitrogen, urea can foster excessive growth of algae or microorganisms in water systems; and oxidation by nitrifying bacteria can increase biological oxygen demand.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED: Cleanup workers should wear the appropriate protective clothing (see Section II). Take immediate steps to contain the spill, if possible, and recover any reusable product. Flush away remainder with plenty of water. Notify the local fire department, CHEMTREC (800-424-9300), and the National Response Center, if applicable.

Urea (Continued)

NEUTRALIZING CHEMICALS: Not applicable

WASTE DISPOSAL METHODS: Consult local, state, or federal environmental regulatory agencies for acceptable disposal procedures and locations. Disposal in streams or sewers may be prohibited.

REPORTABLE QUANTITIES: No specific quantity listed in 40 CFR 320.