MATERIAL SAFETY DATA SHEET
UREA

MSDS Revision Date: 2023/02/08

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Urea
Alternate Names:	Carbamide, Carbonyldiamine, Carbonyl Diamide, Urea
Active Ingredient:	Nitrogen 46%
Chemical Family:	Amides
Molecular Formula:	CH_4N_2O
Company:	COGNITO Group inc.
Emergency:	+1-888-CAN-UTEC (226-8832)
Customer Service:	+1 (514)212-4252

2. COMPOSITION / INFORMATION ON INGREDIENTS

This product contains the following substances that present a hazard within the meaning of the Controlled Products Regulations.

Property	Spec.
Nitrogen (Minimum)	46 (WT%)
Biuret (Maximum)	1.0[a] (WT%)
Moisture (Maximum)	0.5 (WT%)

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Caution When heated, decomposes to carbon dioxide and ammonia: if burned, emits small amounts of nitrogen oxides. Can cause redness and irritation of skin and *eyes.*

IMMEDIATE CONCERNS: White granules with ether no odor or having a slight odor of ammonia (in presence of moisture).

POTENTIAL HEALTH EFFECTS: Urea is not classified as a hazardous product. Normally, by paying usual attention to industrial hygiene and by avoiding inhalation of dusty powder, there are no risks in handling urea. The product contact should be avoided with oxidizing agents, hypochlorites, aldehydes, inorganic acids, olefins, monomers and polymerizable esters to avoid possible release of toxic fumes of ammonia, isocyanic acid, oxides of nitrogen and biuret.

Eyes: May cause irritation, redness and pain but does not inure eye tissue.

Skin: Not expected to be toxic by dermal exposure. May cause irritation, redness, itching, and pain.

Inhalation: Not expected to be toxic by inhalation. Urea dust may cause irritation of the nose, throat, and respiratory tract.

Ingestion: Not found to be toxic by oral exposure. May cause irritation of the digestive tract. Nausea and vomiting may occur after exposure to large quantities.

Medical Conditions Aggravated: Concerns aggravated by exposure may include skin disorders and respiration (asthma-like) disorders. Urea is not known to cause mutagenic and carcinogenic reproductive effects from concentrations or exposure normally experienced in the workplace.

4. FIRST AID MEASURES

General: In all cases of doubt, or when symptoms persist, seek medical attention. No specific antidote. Treatment is symptomatic. The dust may cause mild irritation to eyes and skin

Eyes: Flush irrigate eyes with clean water for at least 15 minutes until irritation subsides. Holding the eyelids apart and seek medical attention if irritation persists.

Skin: Wash the affected areas with soap and water.

Ingestion: Induce vomiting if conscious. Never give anything by mouth to an unconscious person. Consult physician.

Inhalation: Remove the source of exposure and keep the patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious, place in the recovery position and obtain immediate medical attention. Give nothing by mouth.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Use water to control surrounding fire if water is compatible with burning product.

Explosion Hazards: May be explosive on contact with halogens such as chlorine. Nonexplosive from open flames and sparks, shocks, heat, oxidizing materials, combustible materials, organic materials, metal, acids, alkalis, and moisture.

Fire Fighting Procedures: Fire fighters should wear NIOSH-MSHA approved self-contained breathing apparatus and full protective clothing/ Keep unnecessary people away, isolate hazard area and deny entry. Evacuate residents who are downwind of fire. Dike area to prevent runoff and contamination of water sources. Dispose fire control water later. Persons who may have been exposed to contaminated smoke should be immediately examined by a physician and checked for symptoms of poisoning. The symptoms should not be mistaken for heat exhaustion or smoke inhalation.

Hazardous Decomposition Products: Undergoes thermal decomposition at elevated temperatures to produce solid cyanuric acid and release toxic and combustible gases (ammonia, carbon dioxide and oxides of nitrogen.

6. Accidental Release Measures

Evacuation Procedures and Safety: Wear appropriate gear for the situation. See Personal Protection information.

Cleanup and Disposal of Spill: Sweep up spilled material and place it in suitable containers for recycling or disposal. Any spillage of fertilizer should be cleaned up promptly, swept up and placed in a clean, labelled, open container for safe disposal. See Disposal Consideration information.

Containment of Spill: Follow procedure under Cleanup and Disposal of Spill.

Environmental and Regulatory Reporting: Relevant authorities must be consulted before the disposal of urea into drains or water courses. If spilled urea enters a watercourse, then the appropriate water authority and local authorities should be informed. Depending on the degree and nature of the contamination, dispose of it by use as a fertilizer on a farm by spreading thinly on open ground or to an authorized waste facility.

7. HANDLING AND STORAGE

Handling Procedures: Avoid excessive generation of dust. Avoid unnecessary exposure into the atmosphere to prevent moisture pick-up. When handling the product over long periods use appropriate personal protective equipment (e.g., gloves).

Storing Procedures: Storage should be in absence of a source of heat or fire and moisture to prevent lumps and dust from forming. Storage may be in bulk or polyethylene bags. Ensure a high standard of housekeeping in the storage area. Any building used for storage should be dry and well-ventilated. To preserve product integrity, store at 25C, excursions permitted between 15C and 30C. Store in a tightly closed container. Protect container from physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

Work-hygienic Procedures: exposure control measure and the following general measures should be taken when working with or handling this material. Do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored. Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet. Wash exposed skin promptly to remove accidental splashes of contact with this material.in addition, based upon the specific hazards of this product. Do not take clothing/objects contaminated by this material from the work site. Shower and change clothes before leaving the work site.

MIN/MAX Storage Temperatures: Melting potin at 133 °C (decomposes).

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Personal Protection: For open systems where contact is likely, wear safety glasses with side shields, long sleeves, and chemical resistant gloves. When over-exposure by Inhalation occurred and other means of exposure reduction are not adequate, approved respirators may be necessary. Wear suitable gloves when handling the product over long periods. Use suitable dust respirator if dust concentration is high.
Exposure Guidelines: The recommended time-weighted average exposure are as follows:

Long Term Exposure Limit:
(OEL) (TWA 8hr)

	mg/mJ	ppm
Ammonia	18	25
Nitrogen Dioxide	5	3
Nitrogen Dioxide	30	25
Iso cyanic acid	0.02	

Short Term Exposure Limit:
(TWA 10 min)

	mg/mJ	ppm
Ammonia	24	35
Nitrogen Dioxide	9	5
Nitrogen Dioxide	45	35
Iso cyanic acid	0.07	

*Most toxic component of NOX

Exposure Limit Values: Airborne Exposure Limits: For Urea: -AIHA Workplace Environmental Exposure Limit (WEEL): 10 mg/m3, 8-hour TWA
Exposure Controls: Ventilation System: A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Protective Equipment: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Respiratory Protection: NIOSH approved dust mask. Personal Respirators (NIOSH Approved): If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier,

whichever is lowest. If oil particles (e.g., lubricants, cutting fluids, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-

pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. If heat is involved, an ammonia/methylamine, dust/mist cartridge may be necessary.
Hand Protection: Wear appropriate protective gloves as latex or vinyl to prevent skin exposure.
Skin and Body Protection: Wear appropriate protective gloves to prevent skin exposure.
Environmental Exposure Controls: Prevent large quantities from contacting vegetation or waterways. Keep animals away from large spills. Vacuum or sweep up and place into approved containers for later disposal.

9. PHYSUCAL AND CHEMICAL PROPERTIES

Appearance:	White, Granular Solid
Odor:	No odor or slight odor of ammonia
Odor Threshold:	Not determined
Chemical Name:	Carbamide
Molecular Weight:	60
Decomposition Temperature:	133 °C
Water solubility:	1079 g/L at 20°C
Solubility In Other Solvents:	Soluble in common organic solvents including acetone, toluene, and xylene
Boiling Point:	Melting at 133°C
Solidifying Point:	NA
Vapor Pressure:	80 Pa at 20°C
Viscosity:	NA
pH of 10% Water Solution:	8.0 – 10.0
Nitrogen:	46% minimum
Bulk Density:	700 – 800 Kg/m^3
Flammability:	Not Applicable
Explosive Properties:	Uncontaminated Urea is not an explosion hazard. However, it may form explosive mixtures subjects to spontaneous detonation when contaminated with strong acid (nitric or perchloric) or nitrates.
Oxidizing Properties:	Not Applicable

10. SABILITY AND REACTIVITY

Conditions To Avoid: Heating above melting point. Welding or hot work on equipment or plant which may have contained Urea without washing toughly to remove all the Urea material.
Stability: The product is stable under normal conditions of storage, handling, and use.
Incompatible Materials: Strong oxidizers acids. Alkalis, nitrates, sodium, and calcium hypochlorite.
Hazardous Decomposition: Urea reacts with sodium or calcium hypochlorite to form explosive nitrogen trichloride.

Hazardous Reactions: Not Applicable

11. TOXICOLOGICAL INFORMATION

Acute Toxicity:

Note: When no route specific LD50 data is available for an acute toxin, the converted acute toxicity point estimate was used in the calculation of the product's ATE (Acute Toxicity Estimate).

LD50, oral, rat (mg.kg-1): 8471 mg/kg
LD50, oral, mouse (mg.kg-1): 11000 mg/kg
LD50, dermal (mg.kg-1): 2000 mg/kg rabbit

Sub Chronic – Chronic Toxicity:

Sub chronic toxicity: 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.

Chronic Toxicity: In a chronic toxicity and carcinogenicity screening study conducted in mice over 12 months, urea was administered at 0, 0.45%, 0.9% and 4.5% in the diet. No pathology was reported immediately following treatment period. After 4 months tests, 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 testis in the high close group, its biological significance was deemed questionable, since the lesion may occur in 100% of controls.

Sensibilization: Not Reported

Carcinogenicity: May cause adverse reproductive effects (fetotoxicity) and genetic material (mutagenicity) based on animal studies.

Human Experience: Not Reported
Other Information: None

12. ECOLOGICAL INFORMATION

Unless otherwise indicated, the date presented blew are for the technical grade of active ingredient.

Urea is highly soluble le in water. Therefore, it is rapidly diluted in water courses and leached form soils. When dissolve urea will act as plant nutrient. It has low intrinsic aquatic toxicity but will exert a substantial oxygen demand when significant quantities as in a spillage reach a watercourse and may cause damage to aquatic.
Large amounts of Urea can damage plant seedings and inhibit germination. As a readily available source of nitrogen, Urea can also foster excessive growth of algae or microorganisms in water systems. Urea is non-toxic to aquatic organisms as defined by USEPA.

Ecotoxicity:	This product is biodegradable
Bio accumulative potential:	Does not bioaccumulate.
Mobility:	Water contaminating.
Persistence and degradability:	Inherently biodegradable. Non-persistence.
Other adverse effects:	Do not apply directly to lakes, streams, or ponds.

13. DISPOSAL CONSIDERATIONS

Disposal of product: Depend on local regulations. Urea is a fertilizer and is applicable in agricultural lands.
Disposal of packaging: Urea is bagged in 50 kg. Special double-envelope polyethylene. Disposal of the bags is depending on local regulations for disposal of polyethylene bags.

DISPOSAL METHOD: Relevant authorities must be informed before disposal of urea to drains or water courses. Sweep up spilled material and place it in suitable containers for recycle or disposal. If spilled urea enters a water course, then the appropriate water authority and local authorities should be informed. Any spillage of fertilizer should be cleaned up promptly. swept up and placed in a clean, labeled, open container for safe disposal. Depending on the degree and nature of contamination, dispose by using as a fertilizer on a farm by speeding thinly on open ground or to an authorized waste facility.

14. TRANSPORT INFORMATION

Land Transport: Not classified, i.e. considered non-hazardous material according to UN Orange Book and international transport codes e.g. RID (rail), ADR (road) and IMDG (sea).

ADR/RID:	N/A
Packaging group:	N/A
Maritime transport:	N/A
Air transport:	Not Applicable