SECTION 1. Identification of the substance / mixture and of the company / undertaking.

1.1. Product identifier:

Substance name: Urea
Substance manufacturer: "CrossChem" Ltd
REACH Registration No.: 01-2119463277-33-XXXXX
CAS No.: 57-13-6
EC No.: 200-315-5

1.2. Relevant identified uses of the substance or mixture and uses advised against:

Relevant identified uses: **SU1** - Agriculture, forestry, and fishery;
PC12 - Fertilizers;
PC21 - Laboratory chemicals;
Treatment of exhaust gases from combustion from diesel engines.
Uses advised against: Not applicable.
Reason why uses advised against: Not applicable.

1.3. Details of the Supplier of the safety data sheet:

Manufacturer/Supplier: **"**CrossChem" Ltd.;
Street address/P.O. Box: "Naftaluka", Olaines pagasts, Olaines novads,
LV-2127, Latvia. (Office, factory, warehouse).
National Registration No.: 40003888244
Telephone number: +371 67491030 (Administration)
E-mail: info@crosschem.lv
Homepage: https://crosschem.lv/
E-mail address of competent person, responsible for the SDS:
andris.matiss@crosschem.lv

1.4. Emergency telephone number:

State Fire and Rescue Service: **(+371) 112**
Working hours: 24 hours a day, 365 days a year.

National Toxicology Center: **(+371) 67042468; (+371) 67000610**
Opening hours: Working days from 8:00 to 17:00, weekends and public holidays from 9:00 to 15:30.

Other notes: Help is provided in Latvian, Russian and English.

SECTION 2. Hazards identification.

2.1 Classification of the substance or mixture:

Classification according to Regulation (EC) No. 1272/2008 (CLP):
This substance is not classified as dangerous under Regulation No.1272/2008.

2.2 Label elements:

Labelling according to Regulation (EC) No. 1272/2008 (CLP):
The product does not need to be labeled in accordance with CLP and relevant national laws.
Hazard pictograms: Not required.
Signal word: Not required.
Hazard statements: Not required.
Precautionary statements: **P261:** Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray;
P280: Wear protective gloves/protective clothing/eye protection/face protection;
P305+ P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing;
P401: Store away from food, drink and animal food.

Supplemental Hazard information (EU):
Not applicable.

2.3. Other hazards: Not applicable.

SECTION 3. Composition/ information on ingredients.

3.1. Substance:

Synonymous: Carbamide; Carbonyldiamide; Diaminomethanal; Diaminomethanon.
Molecular weight: 60.06 g/mol
Formula: $(NH_2)_2CO$
REACH Registration No. 01-2119463277-33-0020

Name of the substance	CAS No.	EC No.	Clasification according to (EC) No. 1272/2008.	W%/W
Urea	57-13-6	200-315-5	Not applicable.	98.3%

3.2. Mixtures: Not applicable.

SECTION 4. First aid measures.

4.1. Description of first aid measures:

General information:
Remove contaminated, saturated clothing immediately. In case of accident or unwelness, seek medical advice immediately. Keep the victim calm. If the person is unconscious, place person in stable recovery position.

Following inhalation:
If dust inhaled, remove affected person from the source of exposure. If not breathing, ensure open airway and initiate artificial respiration or cardiopulmonary resuscitation (CPR). If breathing is difficult, administer oxygen. In every cases where there is doubt of person's life or if symptoms remain, call for medical attention.

Following skin contact:
Wash the affected area thoroughly with soap and plenty of water. Remove contaminated clothing and launder clothing before reuse. For contact with molten product do not remove clothing, flush skin with cold water. If irritation remains, seek medical advice.

Following eye contact:
Promptly flush eyes with water, continuing for 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Remove contact lenses if possible and if safe to do. If irritation persists, consult a doctor immediately.

Following ingestion:
Rinse mouth with water, do not induce vomiting. Keep affected person warm and treat for shock.
If the person is conscious, give him/her to drink water. If the person feels unwell, seek medical advice.

Self-protection of the first aider:
Pay attention to self protection. Comply with general hygiene requirements. Avoid inhalation of urea dust. Product contact with eyes is prohibited. Avoid repeated or prolonged contact with skin or clothing. Wear suitable protective clothing and gloves.

4.2. Most important symptoms and effects, both acute and delayed:
Laboured breathing, cough, chest pain. Prolonged inhalation causes chronic inflammation of the respiratory organs.
By introducing substance orally, large amounts cause gastrointestinal dysfunction and abdominal pain as well as cyanosis, affecting the liver. Irritating to eyes (burning sensation); red eyes; dry skin; litchy skin; red skin.

4.3. Indication of any immediate medical attention and special treatment needed:
Notes to doctor: Treat Symptomatic.

SECTION 5. Firefighting measures.

5.1. Extinguishing media:

Suitable extinguishing media: Use the most efficient and the most suitable extinguishing agent for surroundings to extinguish the fire. All standard agents are acceptable: Water spray, water fog, chemical foam, dry fire powder, carbon dioxide (CO_2).

Unsuitable extinguishing media:

Do not use strong jet of water as it will spread the burning mass.

5.2. Special hazards arising from the substance or mixture:

Hazardous combustion products:

Thermal destruction of urea is happening in temeratures above 130°C. Urea decomposes to Biuret, Ammonia (NH_3), Nitrogen Oxides (NOx), Carbon Monoxide (CO) and Carbon dioxide (CO_2). In the case of lack of Oxygen, Hydrogen Cyanide (HCN) is formed. Short-term expousures to smoke and gases may lead to irreversible lung injury without early signs of symptoms.

5.3. Advice for firefighters:

Special protective equipment for fire-fighters:

During thermal destruction, irritating and poisonous gases can be released, therefore use self-contained breathing apparatus (SCBA) with a comprehensive facial mask, and protective fire-fighting clothing (including: fire helmet, overalls, pants, boots, gloves, eye and face protection.) must be worn.

Cool containers with a cold water spray. If there is no risk, move the containers away from the heat source. Stay down-wind during firefighting. If possible, collect used extinguishing water separately, to prevent it from entering drains. Evacuate area promptly.

5.4. Additional information:

Urea becomes slippery when wet. Guard against slips and falls.

Fire fighter's clothing conforming to European standard EN469 provides a basic level of protection for chemical incidents and includes helmets, protective boots and gloves. Clothing not conforming to EN469 may not be suitable in any chemical incident.

Use SCBA with a chemical protection suit only where personal (close) contact is likely to happen.
Use SCBA with gas-tight suit when in close proximity to the substance or if its vapours is likely to arise.

SECTION 6. Accidental release measures.

6.1. Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:

Use of appropriate protective equipment (see Section 8.). Consult an emergency expert. The recommendations are the same as for emergency help providing staff.

For emergency responders:

Wear appropriate protective equipment (see Section 8.), to prevent contact with the substance and inhalation of dusts. Avoid generation of dusts. Ensure to supply adequate ventilation and fresh air in closed rooms. Eliminate sources of ignition and heat. Isolate and evacuate the danger zone, reduce the presence of persons, who are not participating in the rescue operation.

Personal precautions and collective precautions: filtering gas masks containing K mark cartridge, as well as personal protection equipment as specified in Section 8.
Particular danger of slipping on leaked/spilled product if wet in the event of fire fighting.

6.2. Environmental precautions:

Avoid contact of large quantities with vegetation or water courses. Prevent animals from accesing the area where a large quantity of the product was discharged. Do not allow large quantities of product to enter drains, surface waters,

ground water, and in case of accidental discharge into the water supply, inform local authorities immediately, to stop the water supply and use.

6.3 Methods and material for containment and cleaning up:

For containment:
Clogging or covering drains. In the event of a major leak, stop the flow of material by using a spill kit if, it is safe to do. Absorb in vermiculite, dry sand, sawdust or silica gel, place the used absorbent in closed, secure containers. After containing the substance, rinse the area with plenty of water.

For cleaning up:
Collect dust or granules mechanically – by vacuuming or sweeping. Dispose of the material collected in secure containers according to regulations in section 13. Clean up remains of solid particles by wet cleaning. In the case of small spills, wipe the surface with absorbent material such as fabric or wool and clean with general cleaning products afterwards.

6.4. Other information:

Do not use brush or compressed air to clean clothing as it will contaminate the surroundings.
See Section 8. for personal protective equipment and Section 13. for waste disposal.

SECTION 7. Handling and storage.

7.1. Precautions for safe handling:

Protective measures:
Use only in well ventilated areas. Handle opened container or bag with care, close after use. Avoid contact with the eyes. Avoid repeated or prolonged contact with skin. Avoid dust inhalation. Use appropriate protective equipment: protective clothing, gloves, goggles and dust mask if necessary.

Measures to prevent fire:
This substance is not flammable, special fire protection measures are not required. Follow preventative fire protection regulations.

Measures to prevent aerosol and dust generation:
Prevent dust formation wherever possible. Do not drop it at high altitude during packing or transfer. Use a conveyor belt for packing bulk product.

Measures to protect the environment:
Air ventilation systems must be equipped with solid particulate filters. Clean your shoes at special cleaning points after exiting storage or packing area.

Advice on general occupational hygiene:
Provide adequate ventilation in areas where dust is formed. Avoid contact with eyes and skin. Provide eye rinse fountain and show where to locate it. Wash your hands and face after use, before breaks at the end of the working day. Do not eat, drink or smoke when using the product. Remove contaminated clothing and protective equipment before entering eating areas. “NO SMOKING” signs are to be placed in the working area.

7.2. Conditions for safe storage, including any incompatibilities:

Technical measures and storage conditions:
Do not store in temperatures above 30°C. Do not store close to heat sources. Store away from direct sunlight.

Packaging materials:
Pack urea in polyethylene, polypropylene or durable paper bags, both in large and small quantities. Urea can be packed in the package chosen by the buying customer, as long as it ensures safe transportation and storage of the product.
Bulk urea may be loaded in the transportation or in th package, chosen by purchasing customer, that ensures safe producēt transportation and storage.

Requirements for storage rooms and vessels:
The product can be stored in closed, cool, dry and well ventilated warehouses. Bulk product can be stored on concrete floors. Floors must be leak-proof or covered with insulation material. Keep containers and bags tightly closed when not in use.

The product packed in big bags should be held vertically on wooden pallets that do not have piercing nails or sharp wood chips which could damage the bag. The product packed in large bags is allowed to be stacked and must not exceed 2 bags in height. If this height is exceeded, in the long run, the load can create cracks in the bags and tear them apart. Protect your bags from physical impact. Check regularly for leaks. When transporting, do not stack 500kg or 1000kg bags due to the safety reasons.

Storage class: Not applicable.

Further information on storage conditions:

Packed urea can be stored outside the warehouse for 9 months, if it is protected from direct sunlight, rainfall and moisture (in case of rain or snow, do not allow water to accumulate on the packaging, do not allow the packaging to sit in water volumes). Store the product in the concrete floor in the warehouse for 12 months. The product may also be stored in closed, dry and ventilated storing premises. Bulk product must be stored away from sun, in closed, dry and ventilated storing premises for 12 months.

7.3. Specific end use(s): In addition to the mentioned uses in Section 1.2. – product is used for production of AdBlue solution.

SECTION 8. Exposure controls/personal protection.

8.1. Control parameters:

Components with workplace control parameters:

Component	CAS No.	Value	Control parameter	Base
Urea	57-13-6	OEL 8h	10 mg/m^3	Occupational health and safety requirements for exposure to chemicals at work spaces
Urea	57-13-6	Short term, 15 min.	Not specified	Occupational health and safety requirements for exposure to chemicals at work spaces

DNEL values of exposure to human health:

Mode of exposure	Type of exposure	DNEL value (workers)	DNEL value (public consumers)	The most negative physicochemical effect
Inhalation	Acute effect systemic	(iii)	(iii)	Not applicable.
Inhalation	Acute effect, local	(iii)	(iii)	Not applicable.
Inhalation	Chronic effect, systemic	292 mg/m³	125 mg/m³	Toxicity
Inhalation	Chronic effect, local	292 mg/m³	125 mg/m³	Toxicity
Dermal	Acute effect systemic	(iii)	(iii)	Not applicable.
Dermal	Acute effect, local	(iii)	(iii)	Not applicable.
Dermal	Chronic effect, systemic	580 mg/kg, bw/day	580 mg/kg, bw/day	Toxicity
Dermal	Chronic effect, local	580 mg/kg, bw/day	580 mg/kg, bw/day	Toxicity
Through eyes	Acute effect, local	(iii)	(iii)	Toxicity

Oral	Acute effect systemic	(ii)	(iii)	Toxicity
Oral	Acute effect, local	(ii)	(iii)	Toxicity
Oral	Chronic effect, systemic	(ii)	42 mg/kg, bw/day	Toxicity
Oral	Chronic effect, local	(ii)	42 mg/kg, bw/day	Toxicity
i) hazard identified but no DNEL available; ii) no exposure expected, iii) no hazard identified				

Environmental protection target	**PNEC value**
Fresh water	0,47mg/l; Periodic exposure – PNEC value not available.
Freshwater sediments	(ii)
Marine water	0,47mg/l; Periodic exposure – PNEC value not available.
Marine sediments	(ii)
Food chain	(iii)
Microorganisms in sewage treatment	(iii)
Soil (agricultural)	The hazard is not known
Air	(iii)
i) hazard identified but no PNEC available; ii) no exposure expected; iii) no hazard identified.	

8.2. Exposure controls:

Appropriate engineering controls:

Provide general and local ventilation, especially in confined spaces. Use mechanisms, equipped with devices to reduce dust formation.

Personal protection equipment:

Eye and face protection:

Use eye and face accessories that have been tested and approved in accordance with relevant standards such as: NIOSH (US) or EN 166 (EU). It is recommended to use polycarbonate safety glasses, goggles, tightly fitting goggles or face shield.

Body protection:

Choose the type of body protection according to the situation, concentration and quantity of the hazardous substance, and the specific concentration at the workplace. Workwear must comply with EN ISO 13688 standard and special work shoes must comply with EN ISO 20347:2012 standard.

Respiratory protection:

Use dust mask N95 (US) or P1 (EN 143) or P2 to protect against dust concentration in the air. Use respirators and accessories tested and approved in accordance with relevant national and international standards, NIOSH (USA) or CEN (EU). In the event of an accident (for example, accidentally pouring the product), wear mask class P3.

Skin protection:

Gloves should be inspected before use. Use appropriate glove removal techniques (without touching the inside of the glove) to avoid contact with the product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practice. Wash and dry your hands. The gloves used must be chemically resistant in accordance with EN 420, EN ISO 374-1 and must be mechanically resistant in accordance with EN 388 standard. Protective gloves must be made of one of the materials, with the relevant specifications listed in the table below:

Glove material	**Glove Thickness (mm)**	**Penetration time (min)**
Buthyl rubber	0.50	>480
Nitrile rubber/ Nitrile latex	0.11	>480
Fluorocarbon rubber	0.40	>480

Polychloroprene	0.50	>480
Natural rubber/Natural latex	0.50	>480
Polyvinyl chloride	0.50	>480

Please note that the penetration time of the glove material in this section has been set at 22°C and using pure Ammonium Nitrate. When working at a higher temperature, the resistance of the glove material may be considerably lower, and in such cases, the permitted life of the glove must be shortened. We recommend that when you start using a new type or other manufacturer's gloves, make sure that they are chemically and mechanically resistant to working conditions. If you have any doubt about the suitability of the gloves, please contact the suppliers of gloves.

Thermal hazards: In temperatures above 133°C urea decomposes to Ammonia (NH_3), Nitrogen Oxides (NOx), Carbon Monoxide (CO) and Carbon dioxide (CO_2).

8.3. Environmental exposure controls:

Do not allow substance to enter drains, surface waters or ground waters. See Section 6. for substance related measures to prevent exposure to environment.

SECTION 9. Physical and chemical properties.

9.1. Information on basic physical and chemical properties:

a) **Appearance**: White solid granules at 20°C and 101.3 kPa (Lewis, R.J., Sr (Ed.). Hawley's Condensed Chemical Dictionary. 13th ed. New York, NY: John Wiley & Sons, Inc. 1997., p. 1157.).
Granulometry: From 2mm to 5mm in diameter , not less than 93%;
Less than 2mm in diameter, not less than 5%;
More than 1mm in diametere, not found;
More than 6mm in diametere,, not found.

b) **Odour:** Slight ammonia odour. (Osol, A. and J.E. Hoover, et al. (eds.). Remington's Pharmaceutical Sciences. 15th ed. Easton, Pennsylvania: Mack Publishing Co., 1975., p. 864.).

c) **Odour threshold:** Data not available.

d) **pH:** (32% aqueous solution) 7,2-9,5 at 25°C. (Environment Canada; Tech Info for Problem Spills: Urea p.4 (1985.)).

e) **Melting point:** 132-135°C. (133.3°C, CRC Handbook, 2006; 134 °C, Using differential scanning caliometric methoid, Gwerder et al, 2009).

f) **Initial boiling point and boiling range:** At 101.3 kPa, the product decomposes without reaching the boiling point (CRC Handbook, 2006).

g) **Flash point:** Non Flammable. Based on column 2 of Annex VII of REACH Regulation, no clarification is provided.

h) **Evaporation rate:** Not applicable to solids.

i) **Flammability:** Non-flammable. (Handbook Sax & Lewis, 1987; Gwerder etal, 2009).

j) **Upper/lower flammability or explosive limits:**
Non-flammable. Non-combustible.

k) **Vapour pressure:** 0.002 Pa at 25°C. (Jones AH; J Chem Eng Data 5: 196-200 (1960.)).

l) **Vapour density:** Not applicable to solids.

m) **Relative density:** 1.323 g/cm³ 20°C (CRC Handbook, 2006).

n) **Solubility;** 624 g/L (water) at 20°C; (Gwerder etal, 2009.)
500 g/L glycerol,
50 /L ethanol.

o) **Partition coefficient: n-octanol/water:**
(Log Kow (Log Pow)): -2.11 at 20°C. (Hansch, C., Leo, A., D. Hoekman. Exploring QSAR - Hydrophobic, Electronic, and Steric Constants. Washington, DC: American Chemical Society., 1995., p. 3.).

p) **Auto-ignition temperature**:
Not charactheristic. (Gwerder etal, 2009.).

q) **Decomposition temperature**:
>132°C.

r) **Viscosity:** Not applicable to solids.

s) **Explosive properties:** Based to column 2 of Annex VII to the REACH Regulation, does nbot apply, substance is not explosive. There are no chemical groups associated with explosive properties.

t) **Oxidising properties:** Based on column 2 of Annex VII to the REACH Regulation, does not apply substance is not oxidising. There are no chemical groupos associated with ozidising properties.

9.2 Other safety information:

a) **Density:** 1,33 g/cm³ at 20°C (Lide, DR (ed.). CRC Handbook of Chemistry and Physics. 81st Edition. CRC Press LLC, Boca Raton: FL 2000, p. 3-328.).

b) **Granular density:** 750-800 kg/m^3 at 20°C**.**

SECTION 10. Stability and reactivity.

10.1. Reactivity:

Stable under regular conditions of transportation and use (see Section 7. "Handling and Storage").

10.2. Chemical stability:

Stable under storage, transportation and using conditions at normal ambient temperatures (minus 40° C to + 40°C), (see Section 7. "Handling and Storage").

10.3. Possibility of hazardous reactions:

No hazardous reaction when handled and stored according to provisions. Carbamide reacts with sodium or calcium hypochlorite to form nitrogen tri-chloride which is explosive.

10.4. Conditions to avoid:

Temperatures higher than 133°C should be avoided.

10.5. Incompatible materials:

Strong acids (Nitric acid); Strong alkalines; Strong oxidizers; Calcium or Sodium Hypochlorites; Halogens; Sodium Nitrite; Nitrates; Phosphorus pentachloride and nitrosyl or gallium perchlorate.

10.6. Hazardous decomposition products:

Ammonia (NH_3), Carbon monoxide (CO), Carbon dioxide (CO_2), Nitrogen oxides (NOx). See. Section 5.2.

SECTION 11. Toxicological information.

11.1. Information on toxicological effects:

Acute toxicity:

Effects on humans: No data available.

Effects on animals:

Routes of exposure	Exposure dose, concentration	Species	Method	Symptoms, effects	Remark
Acute oral toxicity	LD50: 14 300 - 15 000 mg/kg bw	Rat	OECD 423	No adverse effect observed.	TOXNET; Echa.europa.eu
Acute dermal toxicity	LD50: 8200 - 9400 mg/kg	Rat	OECD 402	No adverse effect observed.	TOXNET
Acute intravenous toxicity	LD50: 5300 - 5400 mg/kg	Rat	OECD 402	No adverse effect observed.	TOXNET
Acute inhalation toxicity	No data available, low toxicity is expected.				
Acute oral toxicity	LD50: 28.5 g/100 kg	Sheep	OECD 401	No adverse effect observed.	TOXNET
Acute oral toxicity	LD100: 2 g/kg	Lamb	OECD 401	Dies within 90 – 200 min.	TOXNET
Acute oral toxicity	LD100: 50g/kg bw	Goat	OECD 401	Dies within 30 min.	TOXNET
Acute oral toxicity	LD50: 11 500 – 13 000 mg/kg	Mouse	OECD 401	No adverse effect observed.	TOXNET; Echa.europa.eu
Acute dermal toxicity	LD50: 9200 - 10700 mg/kg	Mouse	OECD 402	No adverse effect observed.	TOXNET

Acute intravenous toxicity	LD50: 4600 – 5200 mg/kg	Mouse	OECD 402	No adverse effect observed.	TOXNET
Acute oral toxicity	LD50: 16 000 mg/kg	Pig (Landrace)	OECD 401	No adverse effect observed.	TOXNET
Acute oral toxicity	LDlo: 600 mg/kg bw	Cattle (Holstein & Shorthorn)	OECD 401	No adverse effect observed.	TOXNET

Other information: No data available.

Assessment / Classification:
After studying all the routes of exposure, urea is considered as very low toxic substance. According to CLP, the substance is not considered to make acute toxicity and does not meet the criteria for classification.

Skin corrosion/irritation:

Effects on humans: No data available.
Effects on animals:

Exposure dose, concentration	Exposure time	Observation time	Species	Method	Symptoms, effects	Remark
0,5 g of moistened test substance was applied to a spot of shaved skin.	4h	72h (Measures after 1h, 24h, 48h un 72h)	Rabbit (New Zealand white)	OECD 404	Non corrosive, non irritant.	Echa.europa.eu

Other information: No data available.
Assessment / Classification:
Following the studied routes of exposure, urea is not classified as a skin corrosive / irritant.

Serious eye damage/irritation:

Effects on humans: No data available.
Effects on animals:

Exposure type	Exposure time	Observation time	Species	Method	Symptoms, effects	Remark
In right eye conjunctival of each rabbit, a dose of 0.1 ml was administered.	Single application	8 days (Measures after 1h, 24h, 48h, 72h and 8 days	Rabbit (Vienna white)	OECD 405	Severe redness and slight swelling of the conjunctiva. All symptoms disappeared after 8 days.	Echa.europa.eu

Other information: No data available.
Assessment / Classification:
Carbamide can be classified as mildly irritating to the eyes.

Respiratory or skin sensitisation:

Effects on humans: No data available.
Effects on animals: No data available.
Other information: No data available.
Assessment / Classification:
Studies indicate that urea is not a sensitive substance for skin or respiratory system.

Germ cell mutagenicity:

Effects on humans: No data available.
Effects on animals: No data available.
Other information: No data available.
Assessment / Classification:

Based on the results of the "Ames" study with different concentrations of urea on bacteria, it was interpreted that urea does not exhibit mutagenic effects (source – urea registration according to the REACH dossier).

Carcinogenicity:

Effects on humans: No data available.

Effects on animals:

Exposure dose, concentration	Exposure time	Obserbvation time	Species	Method	Symptoms, effects	Remark
Orally: 4500, 9000 and 45000 ppm concentrations	Once a day	365 days	F344 Rats	OECD 451	There is a significant linear trend between the dose and the formation of interstitial cell tumors.	Echa.europa.eu
Orally: 4500, 9000 and 45000 ppm conmcentrations	Once a day	365 days	B6C3F1 Mice	OECD 451	In the mid-dose group, a significant increase in haematopoietic tumors (malignant lymphomas) is observed in rats.	Echa.europa.eu

Other information: No data available.
Assessment / Classification:

No classification is proposed for carcinogenicity. There is no evidence from animal studies that urea is carcinogenic. The physiological role of urea and level of production by the human body indicates that the substance is not carcinogenic.

Reproductive toxicity:

Effects on humans: No data available.
Effects on animals:

Exposure dose, concentration	Exposure time	Obserbvation time	Species	Method	Symptoms, effects	Remark
Orally: 100, 300 or 1000 mg/kg bw per day.	Once a day, (From day 6 to day 20.)	22 days	Rats	OECD 414	No embryotoxic properties were observed in rats.	Echa.europa.eu

Other information: No data available.
Assessment / Classification:

Standard studies are not available. Professional, primary or secondary urea exposure is unlikely to affect fertility. The level of exposure to urea is lower than that produced by the catabolism of proteins in the body. Based on available data, the classification criteria are not met.

Summary of evaluation of the CMR properties:

Effects on humans: No data available.
Effects on animals: No data available.
Other information: No data available.
Assessment / Classification:

Carbamide does not meet the criteria for classification as mutagenic for reproduction category 1A or 1B (CLP).

STOT-single exposure:

Effects on humans: No data available.
Effects on animals: No data available.
Other information: No data available.
Assessment / Classification:
Based on available data, the classification criteria are not met.

STOT-repeated exposure:

Effects on humans: No data available.

Effects on animals:

Exposure dose, concentration	Exposure time	Obserbvation time	Species	Method	Symptoms, effects	Remark
Orally, in nominal diet 4500, 9000, 45000 ppm concentrations.	Once a day	365 days	C57BL mice	OECD 414	No toxicity was observed. Exposure did not affect survival and body weight.	Journal of Environmental Pathology and Toxicology 3(5-6): 149-70; Echa.europa.eu
Dose/ Concentrations: 10%, 20%, 40% (urea level in the ointment), on the back skin of 20 cm² area.	Once a day	28 days	Rats (Wistar)	OECD 410	No dose-related toxicity was observed. No change in body weight, food and water intake was observed based on dose.	Oyo Yakuri (Pharmacometrics) 13(5): 749-772. Echa.europa.eu
Dosages / Concentrations: 3000 to 4000 mg/kg bw	Every 8 h	45 days	Dogs	OECD 410	Increase in diuresis, plasma urea levels 200 - 700 mg / 100ml. Dogs showed slight signs of drowsiness. Hematocrit, platelets and EEG were not affected.	Experimentia 27: 811-812; Echa.europa.eu

Other information: No data available.
Assessment / Classification:
Dose toxicity was not observed in any of the studies. Based on available data, the classification criteria are not met.

Aspiration hazard:

Effects on humans: No data available.
Effects on animals: No data available.
Other information: No data available.
Assessment / Classification:
Based on available data, the classification criteria are not met.

SECTION 12. Ecological information.

12.1 Toxicity:

Acute (short-term) toxicity:

Target parameter	Value	Species	Method	Exposure time	Remark
LC50	> 6810 mg/L	Fish - Leuciscus idus	OECD 203	92 h	IUCLID
LC50	> 10000 mg/L	Fish - Leuciscus idus	OECD 203	48 h	ECHA
LC50	> 9100 mg/L	Fish - Opsarius barna	OECD 203	96 h	ECHA
LC50	22000 mg/L	Fish - Oreochromis mossambicus	OECD 203	24, 48, 72 un 96 h	ECHA
EC50	> 10000 mg/L	Water invertebrates - Daphnia magna	OECD 202	24 h	DIN 38412 Teil 11, Bringmann, G. & Kuhn, R. (1982) ; ECHA
LC50	14 241 mg/L	Water invertebrates - Herisoma trivolvis	OECD 202	24 h	ECHA
EC50	47 mg/L	Algae - Microcystis aeruginosa	OECD 201	192 h	Bringmann, G. & Kuhn, R. (1982) ; ECHA
LC50	60000 mg/L	Mosquitoes - Aedes aegypti	Nav piemērojams	4 h	ECHA

Chronic (long-term) toxicity:

Target parameter	Value	Species	Method	Exposure time	Remark
LC50	> 10000 mg/l	Algae - Scenedesmus quadricauda	OECD 201	7 days	ECHA
LC50	> 10000 mg/l	Algae - Scenedesmus quadricauda	OECD 201	192 h	ECHA; TOXNET

12.2. Persistence and degradability:

Biodegradation:

Aerobic:

The main biodegradation of urea is its enzymatic mineralization. In the absence of microorganisms, the urea hydrolyses very slowly to produce ammonium carbamate, which decomposes further to form ammonia and carbon dioxide. Hydrolysis of urea is catalyzed by elevated temperatures, alkalinity and the presence of urease, urease in soil and water.
Carbamide is biodegradable: 4 mg/l 1h at 20ºC /68°F
Zahn-Wellens-Test (OECD 302B) - 400 mg/l: 3h: 2%, 7d: 52%, 14d: 85%, 16d: 96%. Easily biodegradable (after 16 days).

***Other information*:** For the results of studies of urea biodegradation, see Toxnet, ECHA.

12.3. Bioaccumulative potential:

Partition coefficient n-octanol /water (log Kow): -2.11 (20 °C).
Bioconcentration factor (BCF):

Species	Exposure time	Method	Result value	Remark
Fish - Cyprinus carpio	72 h	OECD 305	BCF = 1	Gluth G et al; Comp Biochem Physiol 81C: 273-7 (1985); TOXNET
Fish- Leuciscus idus melanotus	72 h	OECD 305	BCF <10	Freitag D et al; Chemosphere 14: 1589-616 (1985); TOXNET

12.4. Mobility in soil:

Known or predetermined prevalence in environmental compartments:
No data available.

Surface tension: Not applicable to solids.

Adsorption / Desorption:

Spreading environment	Mode of transport	Method	Result value	Remark
Soil - water	Absorbption	OECD 106	*Koc*: 0.037-0.064	Hongprayoon, C., Patrick, W.H., Lindau, C.W., Bouldin, D.R. & Reddy, K.R. (1991.); TOXNET

Adsorption of urea is low in soil, the substance is expected to have high mobility in soil.

12.5. Results of PBT and vPvB assessment:
In accordance with Regulation (EC) No 1907/2006, Annex XIII, the urea does not meet the PBT and vPvB criteria and is not a PBT or vPvB substance.

12.6. Other adverse effects: None
12.7. Additional information: No data available.

SECTION 13. Disposal considerations.

13.1 Waste treatment methods:

Product / Packaging disposal:

In accordance with Regulation (EC) No. 1357/2014, urea, without impurities, is not classified as hazardous waste.
Depending on the type and degree of contamination, dispose of it as a fertilizer on farms, either as raw material or as liquid fertilizer, or hand it over to licensed waste managers. Dispose of collected material as unused material.
Empty the product bags, free them from as much of the product as possible. The bags need to be shaken and then washed. In accordance with Regulation (EC) No. 1357/2014, unpacked from urea, empty packaging is not classified as hazardous waste. Re-use or dispose clean bags.
Dispose of urea and its packaging safely in accordance with regional and national environmental regulations.

Waste codes / waste designations according to EWC:

According to the European Waste Catalog (EWC), the applicable code is:

EWC 06 10 99 - Other wastes from the production of nitrogen - containing chemicals and fertilizers (MN – Mirror, non-hazardous).

Sewage disposal-relevant information:
Waste should not be disposed of by release into sewers.

Other disposal recommendations:
It is the responsibility of the waste treatment company to make a final decision on the relevant waste management, disposal or recycling method in accordance with regional, national or European legislation and possible adaptation to local conditions.

SECTION 14. Transport information.

14.1. UN Number:

ADR/RID: Not applicable.
IMDG: Not applicable.
ICAO-TI/IATA-DGR: Not applicable.
ADN: Not applicable.

14.2. UN proper shipping name:

ADR/RID:	Not applicable.
IMDG:	Not applicable.
ICAO-TI/IATA-DGR:	Not applicable.
ADN:	Not applicable.

14.3. Transport hazard class(es):

ADR/RID:	Not applicable.
IMDG:	Not applicable.
ICAO-TI/IATA-DGR:	Not applicable.
ADN:	Not applicable.

14.4. Packing group:

ADR/RID:	Not applicable.
IMDG:	Not applicable.
ICAO-TI/IATA-DGR:	Not applicable.
ADN:	Not applicable.

14.5. Environmental hazards:

ADR/RID:	Not classified as environmentally hazardous.
IMDG:	Not classified as environmentally hazardous.
ICAO-TI/IATA-DGR:	Not classified as environmentally hazardous.
ADN:	Not classified as environmentally hazardous.

14.6. Special precautions for users:

It is not allowed to mix bulk urea with other fertilizers.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code:

Not applicable.

SECTION 15. Regulatory information.

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture:

EU regulations:

- Regulation (EC) No. **1907/2006** of the European Parliament and Council of 18. December 2006 on Registration, Evaluation, Authorization and Restriction of Chemicals (REACH);
- Commission Regulation (EU) **2015/830** of 28 May 2015 amending Regulation (EC) No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH);
- Commission regulation (EU) No. **552/2009** of 22 June 2009 amending Regulation (EC) No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards Annex XVII;
- Regulation (EC) No. **1272/2008** - classification, labelling and packaging of substances and mixtures (CLP);
- Commission regulation (EU) No. **1357/2014** of 18 December 2014 replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives;
- European Agreement concerning the International Carriage of Dangerous Goods by Road **(ADR**);
- European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (**ADN**);
- **EN 469** - Protective clothing for firemen;

International regulations:

- Regulations concerning the International Carriage of Dangerous Goods by Rail (**RID**);
- International Maritime Dangerous Goods Code (**IMDG**);
- International Convention for the Prevention of Pollution from Ships (**MARPOL 73/78**);
- Internationall Aviation Transport Association regulations **(IATA)**;
- International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (**IBC Code**);

National regulations (Latvia):

- Chemical Substances Law;
- Republic of Latvia Cabinet of Ministers Regulation **No. 795**: "Procedures for Registration of Chemical Substances and Mixtures and Their Database";
- Republic of Latvia Cabinet of Ministers Regulation **No. 325**: "Labour Protection Requirements when Coming in Contact with Chemical Substances at Workplaces";
- Republic of Latvia Cabinet of Ministers Regulation **No. 107 (2002)**: "Procedure for Classification, Labeling and Packaging of Chemicals and Chemical Products";
- Labour Protection Law;
- **LVS EN 149 + A1:2009** - Standard for disposable dust respirators with or without valve according to which they are labeled with FFP1, FFP2 or FFP3 depending on protection class;
- **LVS EN 143:2002 + AC/AC:2005** - Standard for dust filters P1, P2, P3 for use with half masks and full face masks;
- **LVS EN 388** - "Protective gloves against mechanical effects";
- **LVS EN ISO 374-1** - "Protective gloves against dangerous chemicals and microorganisms";
- **LVS EN 166:2002** - "Individual eye protection. Specifications ";
- **LVS EN 340:1993** - "Protective clothing - General requirements;
- **LVS EN ISO 20347:2012** - "Personal protective equipment - Occupational footwear"

15.2. Chemical safety assessment:

Chemical safety assessment has not been made.

SECTION 16. Other information.

16.1. Indication of changes:

Release Date: **08.05.2011.**
Date of revision: **09.07.2019.**
Version. **3.0.**

16.2. List of abbreviations and acronyms used throughout the Safety Data Sheet:

CPR – Artificial respiration or cardiopulmonary resuscitation;
SCBA – Self-contained breathing apparatus;
OEL – Occupational exposure limit;
DNEL – Derived njo effect level;
PNEC – Predicted no effect contrentation;
STOT – Specific target organ toxicity;
CMR – Carcinogenic, mutagenic and reprotoxic chemicals;
LD50 – Median lethal dose;
LC50 – Median lethal concentration;
LD100 – 100% lethal dose;
PBT/ vPvB – Persistent, bioaccumulative and toxic and very persistent and very bioaccumulative;
OECD – Organisation for Economic Co-operation and Development;
ppm – parts per million;
bw – body weight;
BCF - Bioconcentration factor;

16.3. Key literature references and sources for data:

Toxnet, ECHA, GESTIS substance database.