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

1.1. Product identifier:

Substance name:	32.5% urea aqueous solution - **AdBlue**
Substance manufacturer:	"CrossChem" Ltd
REACH Registration No.:	Not applicable for mixtures.
CAS No.:	Not applicable for mixtures.
EC No.:	Not applicable for mixtures.
Index No.:	Not applicable for mixtures.

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

Relevant identified uses:	**SU1** – Agriculture, forestry, and fishery; **SU23** – Cleaning of exhaust gases **PC12** – Fertilizers; **PC21** – Laboratory chemicals;
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 mixture 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:	**P102** – Keep out of reach of children; **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;
P302+P352 – IF ON SKIN: Wash with plenty of water and soap.
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: Not applicable.

3.2. Mixtures:

Name of the substance	CAS No.	EC No.	REACH No.	Clasification according to (EC) No. 1272/2008.	W%/W
Water	7732-18-5	231-791-2	Not available.	Not applicable.	67.5%
Urea	57-13-6	200-315-5	01-2119463277-33-XXXXX	Not applicable.	32.5%

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:
Although the product is not classified as toxic, inhalation of vapor, spray or mist must be avoided. The product has a slight odor of ammonia. If inhaled, remove the person to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial resuscitation (CPR). In every cases where there is doubt of person's life or if symptoms remain, seek medical advice.

Following skin contact:
Wash the affected area thoroughly with soap and plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. If irritation remains, seek medical advice.

Following eye contact:
Promptly flush eyes with water, continuing for at least 15 minutes, occasionally lifting the upper and lower eyelids, to ensure thorough rinsing. Remove contact lenses if possible and if safe to do. If irritation, redness or blinking persists, consult a doctor immediately.

Following ingestion:
If the product has been swallowed, rinse mouth with water, do not induce vomiting. Keep affected person warm and treat for shock. If the person is conscious, give him/her small quantities of water to drink. Never introduce anything into the mouth of an unconscious person. 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 mist and vapour. 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. 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: None identified.

5.2. Special hazards arising from the substance or mixture:

Hazardous combustion products:
Not combustible but may decompose at high temperatures 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. Product is not explosive. 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:
Do not enter fire area without proper protective equipment, including respiratory protection. When the potential chemical hazard is unknown, in enclosed or confined spaces, a selfcontained breathing apparatus should be worn (SCBA). During thermal destruction, irritating and poisonous gases can be released, therefore use 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.

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 vapors is likely to arise.

5.4. Additional information:

Stay down-wind during firefighting.

Promptly isolate the scene by removing all unauthorized persons from the area of the incident if there is a fire.
A pressure increase will occur if containers are exposed to heat, therefore evaporation of water or decomposition of solution can result in rupture of container, it may burst. Cool containers with a cold water spray. If there is no risk, move the containers away from the heat source. Stop spill/release if it can be done with minimal risk. If possible, collect used extinguishing water separately, to prevent it from entering drains. Water mistmay be useful in minimizing or dispersing vapors.

SECTION 6. Accidental release measures.

6.1. Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:
Put on appropriate protective equipment (see Section 8.). Consult an emergency expert. Eliminate sources of ignition. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material 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 fumes or mist. Ensure to supply adequate ventilation and fresh air in closed rooms. Eliminate sources of ignition and heat. Stop leak if possible, without risk. Isolate and evacuate the danger zone, reduce the presence of persons, who are not involved in the rescue operation. Particular danger of slipping on leaked/spilled product.

6.2. Environmental precautions:
Avoid contact of large quantities with soil or water courses. Do not allow large quantities of product to enter drains, surface waters, ground water, and in case of accidental spill into the water supply, inform local authorities immediately, to stop the water supply and use. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up:
For containment:
Clogging or cover drains. In the event of a major leak, stop the flow of productl by using: booms and pads, which can be found in spill kit if, it is safe to do. Scoop as much product as possible in to tight and secure containers. Absorb remains in vermiculite, dry sand, sawdust, silica gel or any absorbent non-combustile material, place the used absorbent in closed, secure and suitable containers. After containing the substance, rinse the area with plenty of water.

For cleaning up:
Dispose of the material collected in secure containers according to regulations in section 13. After containing spill, clean up remains by diluting with water and mop up. In the case of small spills, wipe the surface with absorbent material such as fabric or wool, clean surface with water and then clean with general cleaning products afterwards.

6.4. Other information:
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 with care, close after use. Handle in accordance with good industrial hygiene and safety procedures. Avoid contact with the eyes. Avoid repeated or prolonged contact with skin. Avoid mist inhalation. Use appropriate protective equipment: protective clothing, gloves, goggles and dust mask if necessary (see Section 8.).

Measures to prevent fire:
This substance is not flammable, special fire protection measures are not required. Follow preventative fire protection regulations. Do not allow any pump to run dry or over-heat e.g. due to blockage or closed valve in the lines, it may result in pumping against a dead-end. Under such conditions if over-heating occurs this may cause vaporization and possible decomposition of the product. This can create pressure build-up in the pump and, if unchecked, could lead to an explosion. Ensure that the pump is used correctly according to the manufacturers instructions at all times when pumping the product.

Measures to prevent aerosol and dust generation:
Not applicable.

Measures to protect the environment:
Air ventilation systems could be equipped with 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 aerosol is formed. Avoid contact with eyes and skin. Provide easy access to water supply and eye wash facilities, show where to locate those.. Wash your hands and face with mild soap and water after use, before breaks, at the end of the working day. Do not eat, drink or smoke when using the product and in areas where product is handled, stored and processed. Remove contaminated clothing and protective equipment before entering eating areas. "NO SMOKING" signs should be placed in the working area. Regular cleaning of equipment, work area and clothing is recommended.

7.2. Conditions for safe storage, including any incompatibilities:

Technical measures and storage conditions:
Do not store in temperatures below -11°C and above 30°C. Do not store close to heat sources or fire. Store away from direct sunlight. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product exceeds exposure limits, use process enclosures: local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Packaging materials:
Suitable packing material: Containers manufactured of high alloyed austenitic Cr-Ni, Cr-Ni-Mo steels; titanium; Ni-Mo-Cr-Mn-Cu-Si-Fe alloys, polyethylene, polypropylene, polyisobutylene, polyfluoroethylene (PFE), perfluoroalkoxy alkane (PFA), polytetrafluoroethylene (PTFE), copolymers (vinylidene fluorides(PVDF) and hexafluoropropylenes – viton - (HFP)).

Non suitable packaging materials: Copper and its alloys; galvanised steel containers; carbon (non alloyed or low-alloy) steels; aluminum and its alloys; magnesium and its alloys; paper; glass.

Product can be packed in the package chosen by the buying customer, as long as it ensures safe transportation and storage of the product.

Requirements for storage rooms and vessels:
Store product protected from direct sunlight in a dry, cool and well-ventilated area. Floors must be leak-proof or covered with insulation material. It is recommended to use anti-spill container under the IBC containers or drums. Contact local authorities for further information on storage requirements.

Containers that have been opened must be carefully reinforced and kept upright to prevent leakage. Keep containers tightly closed when not in use. Keep containers protected from physical damage. Check regularly for leaks. Keep preferably in the original container. Do not remove the hazard labels of the containers (even if they are empty). Do not store in unlabeled containers.

Storage class: Not applicable.

Further information on storage conditions:

Product has a shelf life of 1 year, if in unopened manufacturers packing, if stored in a cool and dry location and away from direct sunlight.

7.3. Specific end use(s):

Product is NO_x reducing agent. Product is used to inject in exhaust systems of diesel engines before a selective catalytic converter. Moreover as anti coniferous diseases (root sponges) spread.

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:
The product is aqueous urea solution. DNEL of the product is not determined. The physicochemical properties of the pure urea DNEL product which could have the greatest negative effect, according to urea REACH dossier are provided.

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				

Predicted no effect contrentation values:

PNEC of the product is not determined. PNEC of pure urea, according to urea REACH dossier, are provided.

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	The hazard is not known.
Soil (agricultural)	No hazard to soil.

Air	The hazard is not known.
i) hazard identified but no PNEC available; ii) no exposure expected; iii) no hazard identified.	

8.2. Exposure controls:

Appropriate engineering controls:

Good general ventilation should be provided to control worker exposure to airborne contaminants of vapor or mists, especially in confined spaces.

Emissions from ventilation or work process equipment should be recommended to checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

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 small amounts of product aerosol in the air. Use respirators and accessories tested and approved in accordance with relevant national and international standards, NIOSH (USA) or CEN (EU).

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: Not apllicable.

8.3. Environmental exposure controls:
Do not allow product 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**: Colorless liquid at 20°C and a pressure of 1013 hPa.
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:** Mild ammonia odor could be felt in a small quantity of product.
d) **pH:** (32% aqueous solution) 9.0-9,5 at 20°C. (Environment Canada; Tech Info for Problem Spills: Urea p.4 (1985.)).
e) **Melting/freezing point:** - 11°C to – 11.5°C (INTERNATIONAL JOURNAL OF ENVIRONMENTAL SCIENCES Volume 2, No 2, 2011.).
f) **Initial boiling point and boiling range:** At about 100°C.
g) **Flash point:** Non Flammable. Based on column 2 of Annex VII of REACH Regulation, no clarification is provided.
h) **Evaporation rate:** Not applicable.
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:** 23 mbar at 20°C.. (INTERNATIONAL JOURNAL OF ENVIRONMENTAL SCIENCES Volume 2, No 2, 2011.).
l) **Vapour density:** For none flamable liquids is not determined.
m) **Relative density:** 1,087 - 1,093 at 20°C (INTERNATIONAL JOURNAL OF ENVIRONMENTAL SCIENCES Volume 2, No 2, 2011.).
n) **Solubility;** Miscible with water.
o) **Partition coefficient: n-octanol/water:** (Log Kow (Log Pow)Urea): -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:** 1,4 mPa s at 25°C (INTERNATIONAL JOURNAL OF ENVIRONMENTAL SCIENCES Volume 2, No 2, 2011.).
s) **Explosive properties:** Based to column 2 of Annex VII to the REACH Regulation, does not 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: None.

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 (-11°C to + 30°C), (see Section 7. "Handling and Storage").

10.3. Possibility of hazardous reactions:
No hazardous reaction when handled and stored according to provisions.

10.4. Conditions to avoid:

Environmental temperature lower than crystallization temperature (-11ºC and higher than 30ºC should be avoided (hydrolysis takes place). Any entry material will contaminate the product and could not be used for its intended purpose.

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 (NO_x). See. Section 5.2.
Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11. Toxicological information.

11.1. Information on toxicological effects:

Acute toxicity studies of the product are not available. As the product is a urea aqueous solution, information on acute toxicity, according to REACH dossier, is provided of urea.

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 cm^2 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:
Studies of ecological information of the product are not available. As the product is a urea aqueous solution, information about ecological impact, according to REACH dossier, is provided of urea.

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). Considered to be low (based on high water solubility).
The main part of product – urea – does not have any bio accumulative properties, does not form any toxic compound with other substances present in the air or drainage waters.

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

Urea in the soil does not form any toxic compounds.

12.4. Mobility in soil:

Known or predetermined prevalence in environmental compartments:
No data available.
Surface tension: Min. 65 mN/m at 20°C.

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, product, 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 cans or drums, free them from as much of the product as possible. The packing needs to be cleaned. In accordance with Regulation (EC) No. 1357/2014, unpacked from product, empty packaging is not classified as hazardous waste. Re-use or dispose clean packing material.
Dispose of product 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) and European List of Waste (LoW), the applicable codes for product are:

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: Always transport in closed containers that are upright and secure.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:
The product is packed in packaging for carriage and therefore is not subject to MARPOL 73/78 Annex II and the IBC Code.

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**);
- Internationall Aviation Transport Association regulations (**IATA**);
- International Convention for the Prevention of Pollution from Ships (**MARPOL 73/78**);
- 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:

As in accordance with Regulation No. 1272/2008 [CLP] aqueous urea solution is not classified as hazardous in accordance with REACH Article 14 no Chemical Safety Assessment has been carried out for this mixture.

SECTION 16. Other information.

16.1. Indication of changes:

Release Date: **08.05.2011.**
Date of revision: **15.07.2019.**
Version: **6.0.**

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.