SC „Achema”

Safety data sheet

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II with all subsequent amendments and supplements and Commission Regulation (EU) No. 2020/878

Urea

Revision date: 2026-04-20
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SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Trade name: Urea
Chemical name: Urea
Index number according to Regulation No. 1272/2008: not applicable.
CAS number: 57-13-6
EC number: 200-315-5
REACH registration no: - 01-2119463277-33-XXXX

Other means of identification: None.

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

1.2.1 Uses: as fertilizer, for reduction of emission of formaldehyde.

Industrial use

- Industrial use: production of material (continuous and periodic production), including handling, warehousing, quality control;
- Industrial use: formation of chemicals, cosmetics and fertilizers (PC4, PC9a, PC12, PC21, PC39);
- Industrial use [SU8, SU9]: industrial use as an intermediate for the production of resins, polymers, pharmaceuticals, melamine, as raw material in the cement, steel, glass industry;
- Industrial use: industrial use as a cleaning agent and a support agent;
- Industrial use: exhaust gas cleaning - reduction of NOx gas;
- Industrial use [SU23]: use in sewage treatment systems;
- Industrial use [SU2a]: mining and quarrying industry;
- Industrial use [SU0]: for impregnation of packing paper (PC0).

Professional use

- Professional use: professional use as a cleaning and media support agent;
- Professional use: professional use as an intermediate product in the production of resins and polymers;
- Professional use [SU19]: as freezing agent;
- Professional use [SU1]: professional use as fertlizers (PC12);

Further customer use

- Further customer use: further customer use as fertilizers or in cosmetics industry (PC12, PC39).

Use in articles

Production of packing paper.

1.2.2 Uses advised against: None

1.3 Details of the supplier of the safety data sheet

Manufacturer: Company name: AB„Achema”
full address: Jonalaukio k. 1, Jonavos sen., LT55296
Tel.: +370 349 56736.
Manufacturer’s website: www.achema.lt
Person responsible for the Safety Data Sheet (with e-mail address): D. Bačianskas, d.bacianskas@achema.com

1.4 Emergency telephone number

Please contact: Poison Information and Control Office in the Republic of Lithuania by phone +370 52362052 or by the Common emergency Center by 112.
Helpdesk services work: 24 hours a day, 365 days a year.
Other remarks (language in which assistance is provided): assistance is provided in Lithuanian.
Poison Control Centers in Europe are available on site https://poisoncentres.echa.europa.eu/lt/appointed-bodies.
Telephone numbers of poison control centers in the European Economic Area: **IRELAND** (Dublin) +353 1 8379964; **AUSTRIA** (Vienna) +43 1 406 43 43; **BELGIUM** (Brussels) +32 70 245 245; **BULGARIA** (Sofia) +359 2 9154 409; **CZECH REPUBLIC** (Praha) +420 224 919 293; **DENMARK** (Copenhagen) 82 12 12 12; **ESTONIA** (Talinn) 112; **GREECE** (Athens) +30 10 779 3777; **ICELAND** (Reykjavik) +354 525 111, +354 543 2222; **ITALY** (Rome) +39 06 305 4343; **LATVIA** (Ryga) +371 704 2468; **MALTA** (Valletta) 2425 0000; **NORWAY** (Oslo) 22 591300; **NETHERLANDS** (Bilthoven) +31 30 274 88 88; **FRANCE** (Paris) +33 1 40 0548 48; **FINLAND** (Helsinki) +358 9 471 977; **SWEDEN** emergency cases 112; in less acute cases +46 040 456 6700; **HUNGARY** (Budapest) 06 80 20 11 99; **GERMANY** (Berlin) +49 30 19240.

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance

Classification in accordance with Regulation No. 1272/2008 [CLP]:
Is not sufficient for classification under Regulation No. 1272/2008

2.2 Label elements

Labeling in accordance with Regulation 1272/2008 [CLP]:
P102: Keep out of reach of children;
P280: Wear protective gloves/ protective clothing/ eye (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.

2.3 Other hazards

According to Annex XIII of Regulation (EC) No 1907/2006, no PBT and vPvB assessment has been conducted.
The product is non-flammable. At temperatures above 130 °C, decomposes to ammonia and isocyanic acid. Freely soluble in water. Hygroscopic.
This substance does not contain any components considered to have endocrine-disrupting properties in accordance with Article 59(1) of the REACH Regulation, Commission Delegated Regulation (EU) 2017/2100, or Commission Regulation (EU) 2018/605, in concentrations of 0.1% or higher.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

According to the REACH Regulation (EC) No 1907/2006 the product is a mono-constituent substance. Urea does not contain dangerous impurities that would affect the product's hazard classification.

CAS No.	Index No. in accordance with Regulation (EB) No. 1272/2008	IUPAC name	Purity, %	EC No.
57-13-6	Not applicable	Urea	98,8÷100	200-315-5

SECTION 4. FIRST-AID MEASURES

4.1 Description of first aid measures

The material can get through: urea dust through the respiratory tract.
Inhalation: remove the contaminated person from the exposure area; in severe cases, or if recovery is not fast or complete, seek specialized medical advice.
Skin contact: wash the affected area with plenty of water; remove contaminated clothing and wash them before reuse. If irritation persists, seek medical advice.
Eye contact: rinse/irrigate eyes with plenty of water for at least 10 minutes; if irritation persists, seek medical advice.
Ingestion: rinse mouth with water, do not induce vomiting; if the patient is conscious, give water to drink. If the patient feels unwell, seek medical advice.
Individual protection measures recommended for first-aiders: Comply with general hygiene requirements. Avoid inhalation of product 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

Inhaled: there is no available data on the inhalation of the product which causes adverse symptoms.
Skin Contact: may cause skin irritation on prolonged contact.
Eye Contact: eye irritation.
Ingestion: the product is not acutely toxic. Possible symptoms are: nausea, vomiting, possible fainting.

4.3 Indication of any immediate medical attention and special treatment needed

None.

SECTION 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable: CO_2, water foam jet.
Not suitable: chemical jet.

5.2 Special hazards arising from the substance or mixture

Heated under vacuum at its melting point (120÷130 ºC) it sublimes without change. At 160÷190 ºC under vacuum urea sublimes and is converted to ammonium cyanate. At atmospheric pressure at 180÷190 ^{0}C it sublimes completely and decomposes partially to biuret, cyanic acid. At higher temperature than 200 ºC urea sublimes and is converted to ammonium and cyanic acid. Self-inflammable temperature: +715 ºC.

5.3 Advice for firefighters

Wear protective work clothing, safety boots, protective gloves, eye, face and respiratory protective equipment according to LST EN 469.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For none help providing staff: In the event of an accident, safely leave the place using personal protective equipment.
6.1.2 For help providing staff:
Wear protective clothing. Particular danger of slipping on leaked/spilled product. Avoid substance contact. Avoid generation of product dusts. Avoid inhalation of dusts. Ensure supply of fresh air in enclosed rooms.
Personal precautions and collective precautions: filtering gas masks containing K mark cartridge, as well as personal protection measures as specified in Clause 8.

6.2 Environmental precautions

In case of accidental spillage or spillage, do not allow to enter drains, surface or ground water.

6.3 Methods and material for containment and cleaning up

Collect mechanically. Dispose of the material collected according to section 13 regulations. Depending on the degree of contamination dispose of by use on farm or to an authorized waste facility (e.g. producer). Wash up residues with much water.

6.4 Reference to other sections

See section 8 for personal protective equipment and section 13 for waste disposal.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Technical measures/ Precautions:
General occupation hygiene: keep common occupational hygiene requirements. Avoid formation of urea dust and inhalation of dust. Avoid contact with the eyes. Wear protective glasses, while spraying the fertilizer dissolved in water. Avoid repeated or prolonged contact with skin or clothing. Wear suitable protective clothing. Wear gloves when spreading the product. After working with fertilizers – wash your hands.
Requirements for product packaging: the product is packaged in polyethylene, polypropylene bags,

bigbags or other packaging that ensures safe transportation and storage of the product.

7.2 Conditions for safe storage, including any incompatibilities

In Lithuania, warehouses where urea fertilizers are stored must comply with the regulations of the Minister of Agriculture of the Republic of Lithuania of 2013 December 9th order No. 3D-825, “On Approval of the Rules for Technological Design of Warehouses for Mineral Fertilizers and Plant Protection Products”, UAA TPT 10: 2013, as amended and supplemented thereafter. In other countries, the product must be stored in accordance with the storage requirements in force in those countries.
Pre-packaged urea may be stored in warehouses or outdoor sites.
Unpackaged urea must be stored in warehouses. Unpackaged urea is not allowed to be stored outdoors.
Storage conditions for the product in warehouses.
1. Warehouses must be closed, covered, dry, ventilated and clean.
2. The warehouse room must be a single store building, without any basement or semi-basement. Once a year, the warehouse room must be emptied and the warehouse floor must be thoroughly cleaned.
3. In warehouses, the temperature must not exceed 30°C.
4. Warehouses of urea must be equipped with natural ventilation ensuring the change of the air in the room at least once an hour during non-working hours. Mechanical ventilation must be activated during work. Its intensity is calculated aiming to prevent the accumulation of harmful substances above the limit in the indoor air during work.
5. The size of the product piles and stacks in the warehouse must comply with the national regulations.
6. The height of piles of the unpackaged product or stacks of the pre-packaged product must be such that the distance between their tops and the ridge, beams and lamp holders is at least 1 m. This is necessary to prevent the product from being affected by heat (including frictional heat) and to prevent contamination of it.
7. In warehouses, a space of at least 1 meter wide must be left around each stack of the pre-packaged product (as well as from walls of the building). Inside the warehouses, fire and emergency vehicle paths must be left between all stacks of the pre-packaged product and piles of the unpackaged product and between all stacks of the pre-packaged product, which must be at least 0.5 m wider than the vehicle, but not narrower than 3 m.
8. When storing the unpackaged product, the storage room can be divided into several compartments of convenient shape and dimensions. Their size, shape and other parameters must comply with the national regulations.
9. In warehouses, big bags of the pre-packaged product must be stored stacked on flat pallets without protruding nails, wood screws, wood chips or other sharp objects that may damage the big bag.
10. As a rule, the product is loaded into the warehouse at temperatures of 30–55°C. Temperatures above 55°C should be avoided in order to prevent the product from collapsing.
11. The product is hygroscopic, so it can absorb moisture from the air when stored unpackaged in a pile. Adequate precautions must be taken to protect the product from moisture. This can be done by covering the product piles with a waterproof film. Warehouse doors should be kept closed as much as possible.
12. It is STRICTLY PROHIBITED to use explosives for breaking up the piles of the product that has stuck together into pieces. The product can be crushed by mechanical means.
Storage conditions for the product in outdoor sites.
1. The outdoor sites must have a hard floor coating.
2. In outdoor sites, the pre-packaged product must be stored in stacks.
3. For outdoor storage of packaged product in stacks, the fertiliser stacks should be placed on pallets to reduce the possibility of the lower bags getting wet and to reduce the amount of spoilt product.
4. The amount of product stored in outdoor sites, the size of the stacks, the distances between them must meet the national requirements.
5. When storing the pre-packaged product on outdoor sites, it must be protected from direct atmospheric precipitation, moisture (rain, snow; the package may not be located in water and water may not collect on it)

and direct sunlight.
Conditions for the number of rows allowed for stacking the product.
1. Urea pre-packaged in big bags of 500 kg cannot be stacked on top of each other in more than 4 rows when stored in stacks.
2. Urea pre-packaged in big bags of 1000 kg cannot be stacked on top of each other in more than 3 rows when stored in stacks.
Storage conditions for urea with other products.
1. When storing the pre-packaged and unpackaged product in the same room as other non-explosive and non-flammable pre-packaged and unpackaged solid mineral fertilizers, it must be protected from the possibility of mixing.
2. A sufficient distance must be maintained between stacks of the pre-packaged product and piles of the unpackaged product to prevent contamination of the product with other substances.
3. If ammonium nitrate, nitrophoska and mineral fertilizer mixtures containing nitrates are stored in the same room or place as the product, it must be ensured that they are not stored next to each other and may not come into contact. Storage of the product and the above fertilizers must be organized in such a way that they may not contaminate or affect each other even in the event of fire.
4. Precautions must be taken to avoid accidental mixing of different fertilizer products, even if they are not classified as hazardous. During such accidental mixing, incompatible substances, including those classified as hazardous, with unpredictable properties could be mixed together.
Other conditions for all storage sites.
1. Big bags of the product are stored in a vertical position.
2. For port storage, packed fertiliser bags/spools should be placed on pallets to reduce the possibility of the lower bags getting wet and to reduce the amount of spoiled produce.
3. The storage area of the product at a manufacturer’s site, a port, a distributor’s site and an end-user’s site must be kept out of reach of unauthorized personnel. The warnings “Permitted access only” and other requirements for the safe storage of the product must be posted in clearly visible places in the product storage area.
4. Smoking, open flames, electric heaters with open radiant filaments are prohibited in the product storage area. Do not store the product where it can be exposed to any heat or heating source. “No smoking” warning signs must be posted in highly visible places of the product storage area.
5. Do not transport flammable materials through the product storage area.
6. Do not carry out activities that are not directly related to the storage area (e.g., vehicle maintenance or equipment repair) in warehouses and other storage areas of the product.
7. Do not use organic materials (e.g., sawdust) for cleaning the floor of the product warehouse; use inorganic absorbents (e.g., limestone, sand, dolomite, gypsum).
8. The product spilled during handling must be swept up and safely disposed of. It must be ensured that the spaces between the piles are clean.
9. Avoid storing the product in hot rooms or in direct sunlight, damage to the product packaging, ingress of moisture into the product, and contamination with incompatible substances.
10. Do not store the product near explosives. If explosives are stored in the same place as the product, they must be stored under strict compliance with the national requirements for explosives.
11. The product is not subject to restrictions in accordance with Regulation (EU) No 2019/1148; however, economic operators selling, using and protecting the product must report suspicious transactions, material disappearances and thefts of this substance to a national contact point in the Member State where the suspicious transaction, disappearance or theft occurred. Refer to:
https://home-affairs.ec.europa.eu/policies/internal-security/counter-terrorism-and-radicalisation/protection/legislation-chemicals-used-home-made-explosives_en
12. In addition to the storage conditions for the product presented here, the recommendations provided in the

document “Guidelines for the storage, handling and transportation of solid mineral fertilizers” (2007) published by the European Fertilizer Manufacturers Association “Fertilizers Europe” must be followed.
The guaranteed shelf life of urea stored in warehouses is 12 months from the date of manufacture, and 9 months from the date of manufacture when stored outdoors.

The product is not subject to requirements according to the Government Resolution No. 966 of the Government of the Republic of Lithuania of 2004.08.07 „On Approval of the Description of the List and Attribution Criteria for List of Materials, Mixtures or Preparations of Hazardous Substances in the Hazardous Objects“ (Official Gazette, 2004, No. 130-4649) with all subsequent amendments and supplements) or according to European Parliament and Council regulation 2012/18/EU I annex part 2.

7.3 Specific final uses

All final uses specified in subsection 1.2.1.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Regulated occupational exposure limit values:
Maximum allowable value for long-term exposure (IPRD): 10 mg/m^3 according to urea (applicable in Lithuania according to HN 23).
Maximum allowable value for short-term exposure (TPRD): not applicable (in Lithuania according to HN 23).
Non-limit value (s) (DNEL): A DNEL is given for the physicochemical property of the product that is likely to cause the greatest adverse effect.

Workers exposure

Exposure mode	Exposure type	Hazardous	Physicochemical property that could have the greatest negative effect
Inhalation	Systemic effect – long lasting	DNEL: 292 mg/m^3	Toxicity
Inhalation	Systemic effect - acute	DNEL: 292 mg/m^3	Toxicity
Inhalation	Local effect – long lasting	The hazard is not known, but there is no need to collect more hazard information because there is no human exposure	
Inhalation	Local effect – acute	The hazard is not known, but there is no need to collect more hazard information because there is no human exposure	
Dermal	Systemic effect – long lasting	DNEL: 580 mg/kg bw/day	Toxicity
Dermal	Systemic effect - acute	DNEL: 580 mg/kg bw/day	Toxicity
Dermal	Local effect – long lasting	The hazard is not known	
Dermal	Local effect – acute	The hazard is not known	
If in eyes	Local effect	The hazard is not known	

Public exposure

Exposure mode	Exposure type	Hazardous	Physicochemical property that could have

			the greatest negative effect
Inhalation	Systemic effect – long lasting	DNEL: 125 mg/m³	Toxicity
Inhalation	Systemic effect - acute	DNEL: 125 mg/m³	Toxicity
Inhalation	Local effect – long lasting	The hazard is not known, but there is no need to collect more hazard information because there is no human exposure	
Inhalation	Local effect – acute	The hazard is not known, but there is no need to collect more hazard information because there is no human exposure	
Dermal	Systemic effect – long lasting	DNEL: 580 mg/kg bw/day	Toxicity
Dermal	Systemic effect - acute	DNEL: 580 mg/kg bw/day	Toxicity
Dermal	Local effect – long lasting	The hazard is not known	
Dermal	Local effect – acute	The hazard is not known	
If swallowed	Systemic effect – long lasting	DNEL: 42 mg/kg bw/day	Toxicity
If swallowed	Systemic effect - acute	DNEL: 42 mg/kg bw/day	Toxicity
In in eyes	Local effect	The hazard is not known	

Predicted Inactive Concentration (s) (PNEC)

Section	Hazardous	Comments / Grounds
Fresh water	PNEC aqua (fresh water): 0,47 mg/l Periodic releases: there is no PNEC	Exposure factor: 100 Extrapolation method: exposure factor The PNEC of water was derived using an effect factor of 100, up to 47 mg / l in aeruginosa (the most sensitive culture) Justification for the re-release of the PNEC: Separate PNEC re-release was not proposed.
See water	PNEC aqua (see water): 0,047mg/L Periodic releases: there is no PNEC	Exposure factor: 100 Extrapolation method: exposure factor No effect is expected due to the inclusion of urea in the urea cycle.
Freshwater sediment	There is no probability of sediment exposure	No data available: It is proposed that the PNEC value should not be set.
See water sediment	There is no probability of sediment exposure	No data available: It is proposed that the PNEC value should not be set.
Microorganisms in sewage treatment system	The hazard is not known	Urea is naturally low toxic to microorganisms and is used as a nutrient and source of nitrogen (N). Based on this, PNEC is not proposed.
Soil	No hazard to soil	No data available: It is proposed that the PNEC value should not be set.
Air	The hazard is not known	
Food chain	No bioaccumulation potential	

The product must be manufactured and used in a professional manner by the Minister of Social Security and Labor of the Republic of Lithuania and the Minister of Health of 2001 July 24 order No. 97/406 “On Approval of Regulations for the Protection of Workers from Chemical Agents at Work and for the Protection of Workers against the Exposure to Carcinogens and Mutagens at Work” (Official Gazette, 2001, No. 65-2396), as subsequently amended.

8.2 Exposure controls

Dispose of rinse water in accordance with local and national regulations.

8.2.1 Appropriate engineering controls: Adequate natural ventilation of good quality must be provided in the storing premises of the product, which would change the air in the premises at least once an hour during non-working hours. Mechanical ventilation must be switched on during operation. Its intensity is calculated taking into account that the amount of harmful substances in the indoor air during operation is not exceeded. When vehicles with internal combustion engines are used for loading, it is necessary to take this into account when calculating the ventilation of the premises.

8.2.2 Individual protection measures, such as personal protective equipment

Respiratory protection: In the event of an accident (for example, accidentally pouring the product), wear mask class P3. Wear dust protection mask with A2B2E2K2P3 filter according to EN 405.

Hand protection: adequate protection gloves according to EN 420, EN ISO 21420 due to chemical protection, EN 388 due to mechanical protection. Protective gloves must be made of one of the materials listed in the table, at least as specified, for penetration of thickness and resistance.

Glove material	Glove thickness, mm	Penetration time of glove material, min*
Butyl rubber - butyl	0.50	> 480
Nitrile rubber/Nitrile latex	0.35	> 480
Fluorocarbon rubber	n.m. 0.40	> 480
Polychloroprene	n.m. 0.50	> 480
Natural rubber/Natural latex	0.50	> 480
Polyvinyl chloride	0.50	> 480

*- the breakthrough time of the glove material is the time taken for the product to come in full contact with the glove. The shorter the penetration time, the less resistant the glove material to the product.

Skin protection creams do not adequately protect from the product.

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 using calcium ammonium nitrate consisting of a mixture of ammonium nitrate and dolomite, the time of penetration of the glove material should be similar in size. 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 questions about the suitability of the gloves, please contact the manufacturers / suppliers of gloves.

The inside of the gloves should not contain powders which can cause hand skin allergies.

Before using the gloves, please always make sure there are no tears, cracks, or other defects.

When the work is finished, the gloves must be cleaned and washed thoroughly before they are dry. After work, care must be taken to the hand skin.

Eye and (or) face protection: protective hermetic goggles according to EN ISO 16321-1 and EN ISO 16321-3.

Skin and body protection: Working clothes according EN ISO 13688, special working boots according to EN ISO 20345.

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing**.**

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Physical state: prilled granules in the physical state at a temperature of 20 °C and a pressure of 101.3 kPa.

b) Color: white granules.

c) Odor: light ammonia smell.

d) Melting and solidifying temperature: 407 K or 134 ºC at a pressure of 101,3 kPa. Justification: according to the literature, CRC Handbook, 2006 – the melting point at atmospheric pressure is 133.3 ºC. The melting temperature determined by the differential scanning calorimetry method was 134 °C (source Gwerder et al, 2009).
e) Boiling point or initial boiling point and boiling range: at 101.3 kPa, the product decomposes without reaching the boiling point (source: CRC Handbook, 2006).
f) Flammability: Nonflammable. Justification: On the basis of the literature – Handbook Sax & Lewis, 1987 – and the results of the analyzes carried out (source Gwerder etal, 2009).
g) Upper and lower explosion limits: non-combustible and non-explosive.
h) Flash-point: Based on column 2 of Annex VII to the REACH Regulation, no clarification is provided: the product is a solid material which decomposes below the melting point, so it is technically impossible to determine the flash point.
i) Auto ignition temperature: not characteristic at a pressure of 1013 hPa. Justification: there was no evidence of autoinflammability in a proprietary study (Gwerder etal, 2009): the substance melted at 134 °C.
j) Decomposition temperature: urea heated under vacuum up to 120÷130 °C sublimes without decomposition. Decomposes at higher temperatures (160÷190 °C) to form ammonium cyanate. At atmospheric pressure, it decomposes at 180÷190 °C to form biuret, cyanuric acid and amelide. At temperatures above 200 °C, urea decomposes into ammonia and cyanuric acid.
k) pH-value: 9.2 ÷ 9.5 (determined with a solution of 100 g/l at 20 ºC).
l) Kinematic viscosity: production in the form of granules and therefore not detectable.
m) Solubility:
Highly soluble in water: 624 000 mg/l at 20 ºC. Justification: Solubility in water was determined at 624 g / l at 20 °C (source – Gwerder etal, 2009). In the literature – Yalkowsky, 1989 – the declared solubility is 545000 mg / l at 25 °C.
Highly soluble in acetone;
Soluble in glycerin (33,3 % at 15 ºC);
Soluble in ethanol (5,1 % at 20 ^{0}C) (13,1 % at 60 ºC);
Insoluble in chloroform, ether and xylene.
n) Partition coefficient: n-octanol/water (log value): -1.73 at 20 °C. Justification: The logKow set was -1.56, the calculated coefficient was similar to -1.73.
o) Vapor pressure: 0.002 Pa at a temperature of 298 K. Justification: Jones, 1960, states that the vapor pressure is equal to 1.2 x 10 – 5mmHg at 25 °C.
p) Density and / or relative density: according to LST EN 1236 the bulk density of the product is determined 680 ÷ 720 kg/m^3.
q) Relative vapor density: not determined for solids.
r) Granulomere:
- from 2.0 mm to 5.0 mm in size, the amount of prilled granules is not less than 93.0 %;
- the amount of prilled granules smaller than 2 mm, not more than 5%;
- at least 100.0 % of the product can be sifted through a sieve with a mesh size of 6.0 mm.

The average granule size is not less than 2.3 mm.

9.2 Other information:
Evaporation rate: not applicable to solids.
Explosive properties: based to column 2 of Annex VII to the REACH Regulation, no explanation is given: Urea is a non-combustible substance and does not contain any groups that could lead to explosive properties.
Oxidizing properties: based on column 2 of Annex VII to the REACH Regulation, no explanation is given: Urea is not an oxidizing agent based on the chemical structure of urea, the experience with urea, other data found in the scientific literature, the criteria applicable under the ADR (urea contains oxygen, but it is connected only with coal).

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 regular storage, transportation and using conditions (see section 7, “Handling and Storage”). Need for and the presence of stabilizers: not necessary.

10.3 Possibility of hazardous reactions
None

10.4 Conditions to avoid
High ambient temperature. The temperature in product warehouses must not be higher than 30 °C. As a rule, the product is loaded into the warehouse at a temperature of 30 – 55 °C. Temperatures above 55 °C should be avoided in order to prevent the product from collapsing.

10.5 Incompatible materials
Contact with other incompatible (eg ammonium nitrate) and unpacked chemical substances is not allowed.

10.6 Hazardous decomposition products
Heated under vacuum at it’s melting point (120÷130 ºC) it sublimes without change. At 160÷190 ºC under vacuum urea sublimes and is converted to ammonium cyanate. At atmospheric pressure at 180÷190 ºC it sublimes completely and decomposes partially to biuret, cyanic acid and alkali metals. At higher temperature than 200 ºC urea sublimes and is converted to ammonium and cyanic acid.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on hazard classes as defined in Regulation (EC) No. 1272/2008
Acute toxicity:

Human information: no available data.

Effects on animals

	Exposure dose / concentration	Routes	Method	Symptoms / delayed effects	Notes
Acute oral toxicity	LD50: 14300 mg/kg bw (male) LD50: 15000 mg/kg bw (female)	Rats	OECD 423	Negative effects have not been established	Direct ATE Validation for Trusted Data
Acute dermal toxicity	Data not available				
Acute inhalation toxicity (vapour)	Data not available				

Other information: data not available.

Assessment/Classification: according to available data, does not fulfill the classification criteria according to Regulation (EC) No. 1272/2008.

Skin corrosion and / or irritation: urea is demonstrated to be of very low acute toxicity by the oral, subcutaneous and intravenous routes in the rat and mouse. Testing for acute dermal toxicity is not justified on

scientific grounds and for reasons of human welfare (source – urea registration under the REACH dossier). According to available data, does not fulfill the classification criteria according to Regulation (EC) No. 1272/2008.

Eye irritation: studies in rats have shown that urea is easily irritating to the eyes. Based on medical data on urea-related incidents reported by urea manufacturers, it was interpreted that urea is not classified as irritating to humans (source – urea registration under the REACH dossier). According to available data, does not fulfill the classification criteria according to Regulation (EC) No. 1272/2008.

Respiratory sensitization: no data available (source – urea registration under the REACH dossier). According to available data, does not fulfill the classification criteria according to Regulation (EC) No. 1272/2008.

Mutagenicity: based on the results of the Ames-test study with the various urea concentrations so far (negative results of the research), it was interpreted that urea does not exhibit mutagenic effects (source - urea registration according to the REACH dossier). According to available data, does not fulfill the classification criteria according to Regulation (EC) No. 1272/2008.

Carcinogenicity: does not meet the criteria. Ames-test: negative (source – urea registration in REACH dossier). According to available data, does not fulfill the classification criteria according to Regulation (EC) No. 1272/2008.

Reproductive toxicity: does not meet the criteria. Ames-test: negative (source – urea registration in REACH dossier). According to available data, does not fulfill the classification criteria according to Regulation (EC) No. 1272/2008.

Specific toxicity for particular organ (STOT) (one time effect): according to available data, does not fulfill the classification criteria according to Regulation (EC) No. 1272/2008.

Specific toxicity for particular organ (STOT) (repeated effect): according to available data, does not fulfill the classification criteria according to Regulation (EC) No. 1272/2008.

Aspiration hazard: does not meet the criteria for classification.

11.2. Information on the other hazards

11.2.1. Endocrine disrupting properties

Data not available on the current product.

11.2.2. Other information

None.

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity

The product does not comply with the Regulation (EC) No 1272/2008 for classification criteria on environmental hazards.

Maximum allowable concentration of urea in portable water reservoirs cannot exceed the calculated amount of organic substances in accordance with allowable biochemical concentration (ABC) and dissolved oxygen levels. Maximum allowable urea concentration in water reservoirs of fishery farms shall not exceed 80 mg/dm^3.

Leuciscus idus (orfe) 96-h LC_{50}> 6810 mg/l

Daphnia magna (short-term): 24-h EC_{50}: > 10000 mg/l

Daphnia magna (long-term): No data.

Toxicity for fish:

Exposure dose /	Test duration	The name of the	Results	Method

concentration		organism used in the tests		
LC50: > 10 000 mg/l	48 h	Golden orphan	Urea is of inherently low toxicity for fish	OECD 203
LC50: 6 810 mg/l	96 h	Golden orphan	Urea is of inherently low toxicity for fish	OECD 203

Toxicity to aquatic invertebrates (short-term effects)

Exposure dose / concentration	Test duration	The name of the organism used in the tests	Results	Method
LC50: > 10 000 mg/l	24 h	Daphnia magna	Low toxicity level	OECD 202
LC50: 14 241 mg/l	24 h	Herisoma trivolvis	Low toxicity level	OECD 202

Toxicity to aquatic invertebrates (long-term effects): no data available.

Toxicity to algae and aquatic plants

Exposure dose / concentration	Test duration	The name of the organism used in the tests	Results	Method
LC50: > 10 000 mg/l	192 h	Algae	Low toxicity level	OECD 202
LC50: > 10 000 mg/l	7 days	Algae	Low toxicity level	OECD 202

12.2 Persistence and degradability

The compound is well degradable. 4 mg/l in 1 h at 20 ºC / 68 °F
Zahn-Wellens-Test / 400 mg/l: 3h: 2 %, 7d: 52 %, 14d: 85 %, 16 d: 96 %
In soil urea is easily transformed into forms, well-assimilated by vegetation.
Low potential for adsorption (based on substance properties).

12.3 Potential of bioaccumulation

Octanol- water partition coefficient (K_{ow}): considered to be low (based on high water solubility). The product 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): low potential for bioaccumulation (based on substance properties).

12.4 Mobility in soil

Rate of absorption: low (according to the parameters of substance).

12.5 Results of PBT and vPvB assessment

According to Annex XIII of Regulation (EC) No 1907/2006, no PBT and vPvB assessment has been conducted.

12.6 Endocrine disrupting properties:

This substance does not contain any components considered to have endocrine-disrupting properties in accordance with Article 59(1) of the REACH Regulation, Commission Delegated Regulation (EU) 2017/2100, or Commission Regulation (EU) 2018/605, in concentrations of 0.1% or higher.

12.7 Other side effects:

Undetermined.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste from residues. The contaminant free urea waste according to Regulation (EC) No. 1357/2014 is classified as non-hazardous waste. Depending on degree and nature of contamination dispose of by use as fertilizer on farm, as raw material or liquid fertilizer, or to an authorized waste facility. Do not empty into drains. Dispose of this material and its container in a safe way and in accordance with all applicable local and national regulations. The final product waste code is assigned by the waste manager / holder.

Package waste disposal. The bags should be empty by shaking to remove as much as possible of its contents. According to Regulation (EC) No. 1357/2014 the contaminant free packaging of urea is classified as non-hazardous waste. Dispose of package waste in a safe way and in accordance with all applicable local and national regulations. The final product waste code is assigned by the waste manager / holder.

Do not remove label, prepared according to Regulation (EC) No. 1272/2008, until package is thoroughly cleaned.

Care must be taken to prevent product waste from entering drains. It is recommended not to encourage disposal of the product with leaks.

SECTION 14. TRANSPORT INFORMATION

14.1 UN Number or ID number

Not available because the product is not subject to ADR requirements.

14.2 UN proper shipping name

Not available because the product is not subject to ADR requirements.

14.3 Transport hazard classes

Not available because the product is not subject to ADR requirements.

14.4 Packaging group

Not available because the product is not subject to ADR requirements.

14.5 Hazard to environment

The product is not classified as hazardous substance according to the Orange Book and International Transport Codes RID (Railway), ADR (Road) and IMDG (Sea transport).

14.6 Special precautions for users

The product is transported in all vehicles in accordance with the applicable freight regulations.

Mixing of unpackaged product with other substances is not permitted.

When transporting the product, packed in big bags of 500 kg, by vessels, it is possible to load it for a short time (up to 7 days) by stacking the bags on top of each other no more than 7 rows.

When transporting a product that has not been sprayed with the conditioning additives, packed in big bags of 500 kg by vessel, it is not recommended to load it in stacks of 4 rows or more, as the product sticks to pieces that collapse when pressed by hand.

When the product is loaded and unloaded on board, when the rain begins to fall, the hold of the vessel must be

closed and loading stopped.
When transporting the product packed in big bags in sea containers, bags can be stacked on top of each other in no more than 2 rows.
Do not transport together with incompatible materials.

14.7 Carriage of bulk cargoes by sea in accordance with IMO measures

The product's hazard class according to the International Maritime Bulk Cargo Code (IMSBC Code) is urea.

SECTION 15. REGULATORY INFORMATION

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

EU legislation:

- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC;

- Commission Regulation no. (EU) 2020/878 amending Regulation of the European Parliament and of the Council Annex II to Regulation (EC) No 1907/2006 on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) (published in Official Journal of the European Union L 203 of 26 June 2020);

- Regulation (EC) No 1272/2008 2006 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006;

- 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;

- Regulation (EU) 2019/1148 of the European Parliament and of the Council 20th of June 2019 on trade in and use of explosives precursors and amending Regulation (EC) No. 1907/2006 and repealing Regulation (EU) No. 98/2013 (published in the Official Journal of the European Union L 186/1, 2019) as subsequently amended and supplemented;

- Regulation (EC) 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous chemicals and amending and subsequently repealing Council Directive 96/82 / EC (published in the Official Journal of the European Union No L197, 2012, July 27th);

- Regulation (EU) 2019/1009 of the European Parliament and of the Council of 2019 June 5 laying down rules for the supply of EU fertilizing products to the market and amending Regulation (EC) No. 1069/2009 and (EC) no. 1107/2009 and repealing Regulation (EC) No. 2003/2003 (published in the Official Journal of the European Union No. L 170, 25 June 2019) with all subsequent amendments and supplements;

- The International Maritime Dangerous Goods (IMDG);

- International Convention for the Prevention of Pollution from Ships (MARPOL 73/78);

- The International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (International Bulk Chemical Code) (the IBC Code).

National legislation (Lithuania):

- Minister of Agriculture of the Republic of Lithuania 2013 December 9 th order No. 3D-825 “On Approval of Rules for Technological Design of Warehouses for Mineral Fertilizers and Plant Protection Products in the UAA TPT 10: 2013” (Official Gazette, 2013, No. 128-6540, TAR identification code 1132330ISAK003D-825), including all subsequent amendments and supplements.

- Minister of Social Security and Labor of the Republic of Lithuania and Minister of Health of 2001 July 24 order No. 97/406 “On Approval of Provisions for the Protection of Workers from Chemical Agents at Work and the Protection of Workers from the Effects of Carcinogens and Mutagens at Work” (Official Gazette, 2001, No. 65-2396, TAR identification code 1012230ISAK0097 / 406), including all subsequent amendments and supplements.

- Applicable Law on Waste Disposal of the Republic of Lithuania;

- Applicable Law on Package and Package Waste Handling of the Republic of Lithuania;

- HN23 Maximum Allowable Concentrations of Hazardous Chemical Substances and Preparations in Working Environment. General Requirements;

- HN36 Banned and Restricted Substances;

- Applicable Regulations for Workers ”Protection against the Impact of Chemical Factors” and Regulations for Workers “Protection against Carcinogenous and Mutagenous Impacts”;

- Applicable Procedure of Safety Data Sheet Requirements and Supply thereof to Professional Users;

- Applicable Rules on Labeling of Items (Products) to be Sold in Lithuania and Referring Price thereof;

- Applicable Rules on Waste Disposal;

- 17 of August 2004 Governments of the LR resolution No. 966 „On Prevention, Response and Investigation of dangerous objects and substances, mixtures or preparations classified as hazardous materials, and a list of criteria for designation of the Approval, as subsequently amended and supplemented. (Official Gazette, 2004, No. 130-4649; 2005 No. 131-4731, 2008, No. 109-4159; 2009 No. 90-3855; 2010, No. 59-2894; 2012 No. 61-3078), as amended and supplemented.

- LST EN 388 “Protective gloves against mechanical hazards”;

- LST EN 405:2002+A1:2009 “Respiratory protective equipment. Valves with filter valves for protection against gas or gas and particles. Requirements, testing, marking”;

- LST EN 420 “Protective gloves. General requirements and testing methods”;

- LST EN 469 “Protective clothing for firefighters. Performance requirements for firefighting protective clothing”;

- LST EN 780:~~2016~~ “Packaging. Distribution packs. Graphical symbols for packaging handling and storage”;

- LST EN 1236 „Fertilizers. Determination of bulk density of loose fertilizers (modified ISO 3944:1992)”

- LST EN ISO 13688 „Protective clothing. General requirements (ISO 13688: 2013)”;

- LST EN ISO 16321-1 „Eye and face protection equipment for work”. Part 1. General requirements (ISO 16321-1:2021)“;

- LST EN ISO 16321-3 „Eye and face protection equipment for work”. Part 3. Additional requirements for mesh guards (ISO 16321-3:2021)“;

- LST EN ISO 20345 „Personal protective equipment. Safe footwear (ISO 20345: 2011)”;

- LST EN ISO 21420 „Protective gloves. General requirements and test methods“.

Additional information presented on the package (container) label of chemical substance:
- Visual signs No.6 “Protect from rain” and No.4 “Protect from sun” in compliance with LST EN ISO 780.

Additional information about the relevant Community provisions on safety, health and the environment for the product:
The product is not subject to requirements according to the Government Resolution No. 966 of the Government of the Republic of Lithuania of 2004.08.07 „On Approval of the Description of the List and Attribution Criteria for List of Materials, Mixtures or Preparations of Hazardous Substances in the Hazardous Objects“ (Official Gazette, 2004, No. 130-4649) with all subsequent amendments and supplements) and Regulation‘s No 2012/18 EU Annex 1, part 2.

Product Restrictions on Regulation (EU) No. 2019/1148: The product is not subject to restrictions in accordance with Regulation (EU) No. 2019/1148. However economic operators selling, using, and protecting the product must, in accordance with this regulation to report suspicious transaction of this substance, material disappearances and theft or theft or loss of theft to a national contact point according to contacts found on the internet link.
https://home-affairs.ec.europa.eu/policies/internal-security/counter-terrorism-and-radicalisation/protection/legislation-chemicals-used-home-made-explosives_en
For substances on the candidate list of substances of very high concern. The product does not contain chemicals included in the candidate list of substances of very high concern, which due to their content (≥ 0.1%) according to Regulation (EC) No. 1907/2006 should be declared.

15.2 Chemical safety assessment

Urea does not comply with Regulation (EC) No. 1272/2008. According to the classification criteria set out in Regulation (EC) No 1272/2008 [CLP] Chemical Safety Assessment has not been carried out according to Regulation (EC) No. 1907/2006 Annex 14.

SECTION 16. OTHER INFORMATION

Revision date: 2026-04-20
Version: 14.0
Revision No. 0
Issuing date: 2026-04-20

(i) A clear evidence of added, deleted or modified information:
The following changes were made to the safety data sheet as compared to the previous version:
- The headline: Revision date, version number and issuing date of this safety data sheet has been changed;
- sub-section 1.4: A cell phone number that is no longer in use has been removed, and the listed website has been updated;
- sub-section 2.3: Information regarding substances with endocrine-disrupting properties has been added;
- sub-section 12.6: Information regarding substances with endocrine-disrupting properties has been added;
- section 16: revision date, version number and issuing date of this safety data sheet has been changed;

(ii) List of abbreviations and acronyms used throughout the Safety Data Sheet:
ADR – European Agreement on Dangerous Goods by Road;
IATA – International Air Transport Organization;
IMO – International Marine Organization;
RID – Regulations Concerning the International Carriage of Dangerous Goods by Rail;
SMGS – International Agreement on Carriage of Loads by Rail.
PC0 – Other, UCN code: R20200 corrosion inhibitors;
PC4 – Freezing agents;
PC9a – Primers and paints, diluents, solvents;
PC12 – Fertilizers;
PC21 – Laboratory chemicals;
PC39 – Cosmetics, personal care products;
SDS – Safety Data Sheet;
SU0 – Other NACE C17.2.2 paper and cardboard manufacturing;
SU1 – Agriculture, Forestry and Fisheries;
SU2a – Mining (without the maritime industry);
SU8 – Production of large quantities of chemicals;
SU9 – Production of pure chemicals;
SU19 – Building and construction works;
SU23 – Electricity, current, gas supply and sewage treatment.

(iii) Bibliography:
1) Gwerder, C., Misslin, P.-P., Meier, P., Durrer, M., Schweighauser, U., Reuse, P. & Holzschuh, O. 2009: Determination of some physical-chemical properties of Urea (study report), Testing laboratory: Institute of Safety and Security, Report no: 204611.18.0640.03. Owner company; Borealis, Report date.
2) Sax, N.I. & Lewis, S.R. 1987: Hawley’s Condensed Chemical Dictionary. (review article or handbook), Hawley’s Condensed Chemical Dictionary. 11th ed. New York: Van Nostrand Reinhold Co., 1987., p. 1209. Report date.
3) Registration of urea according to the REACH dossier is published on the website of the European Chemicals Agency (data taken 2023-08-28).
4) https://gestis-database.dguv.de/data?name=013010 (data taken 2023-08-28).

(v) Relevant precautionary phrases:
P102 - „Keep out of reach of children“;
P280 - “Wear protective gloves/ protective clothing/ eye (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“,

(vi) Training Advice:
To ensure the protection of people and the environment, people who manufacture, handle and use this product must be trained to work with hazardous substances, hazardous materials, calcium ammonium nitrate properties, have adequate hygiene skills, first aid principles and information on emergency procedures. This safety data sheet must be made available to those working with the product. Persons must be instructed before working with the product.

NOTE. The information provided in this safety data sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any proceed, unless specified in the text.

Release info: This version replaces all previous documents.

The End of Safety Data Sheet