Safety Data Sheet *according to Regulation (EC) 1907/2006*		
Urea solution 32.5%	**The date of:**	
	compilation	revision
	29.03.2007	21.12.2022

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

1.1. Product identifier

Product name **Urea solution 32.5%**

V60-0104, V60-0129, V60-0130, V60-0269, V60-0270

Synonyms urea solution 32.5%, urea solution

1.2. Relevant identified uses of the substance or mixture and uses advised against Used in the cleanning of exhaust gases from NOx and SOx. Used as a fertilizer, in manufacturing of cleaning and maintenance products, antifreeze products. Used as intermediate or processing aid in the chemical industry.
Uses advised against have not been identified.

1.3. Details of the supplier of the safety data sheet

VIEROL AG
Karlstraße 19, 26123 Oldenburg , GERMANY
Telefon 49 (0) 441 – 210 20 – 0, Telefax:+49 (0) 441 – 210 20 –111
E-Mail: info@vierol.de, Internet: www.vierol.de

1.4. Emergency telephone number

Giftinformationszentrum Nord (Göttingen), Telefon: +49 (0)551/19240

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
According to Regulation (EC) No 1272/2008 the mixture is not classified as a hazardous.

Human Heath effects

Skin effect	Longer contact may cause skin irritation
Eyes effect	Longer contact may cause eye irritation. Remove contact lenses.
Swallowing	Ingestion of a larger amount (above 50 g) leads to gastrointestinal discomforts.
Inhalation	Vapours may cause nose irritation and irritation of the upper respiratory tract.
Long - term effects	No negative effects are known.
Fire and products of thermal decomposition	Inhalation of gases coming from thermal decomposition may cause irritation and caustic action for the respiratory system. Influence on lungs may occur over some time.
Fire and warming	Urea decomposes when heating producing ammonia. In case of fire toxic thermal decomposition products containing ammonia, carbon dioxide and nitric oxides - NO_x may be released.

2.2. Label elements

According to Regulation (EC) No 1272/2008 the mixture is not classified as hazardous.

2.3. Other hazards
Component of mixture – urea – do not meet the criteria neither for a PBT nor a vPvB substance.
The substance is not included in the list established in accordance with Article 59(1) of Regulation (EC) 1907/2006 for having endocrine disrupting properties, there is no information if the substance is a substance identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

SECTION 3: Composition/information on ingredients

3.2. Mixtures
Aqueos solution containing containing urea 32,2%.

Ingredient	CAS number	EC number	The approximate amount of the component
Urea	57-13-6	200-315-5	32,5 %
	Registration number: 01-2119463277-33-0044		

SECTION 4: First aid measures

4.1. Description of first aid measures

Skin contact	Rinse contaminated area with plenty of water. Remove contaminated clothing and wash before reuse. If irritation persists seek medical attention.
Eye contact	Wash thoroughly with water for at least 15 minutes. Obtain specialized medical attention.
Swallowing	Wash out mouth with water. Do not induce vomiting. If patient is conscious, give water to drink. If patient feels unwell seek specialized medical attention.

4.2. Most important symptoms and effects, both acute and delayed
Acute and delayed symptoms and effects do not occur in normal conditions of use (see section 11).

4.3. Indication of any immediate medical attention and special treatment needed
No data.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Apply the best known means to extinguish fire.
Unsuitable extinguishing media	No data

5.2. Special hazards arising from the substance or mixture
Call the fire brigade. Avoid inhalation of thermal decomposition products (they are toxic). Evacuate in the direction perpendicular to the wind.
If water containing a dissolved product is released to sewage or waters, inform local authorities immediately.
Contact with skin
- Skin having contact with a melted material to be washed with a large amount of water.

- Provide medical attention.

Inhalation
- Remove the injured from area endangered with toxic gases.
- Provide the injured warmth and calmness.

Persons exposed to inhalation of gases being products of decomposition should be provided with immediate medical attention.

5.3. Advice for firefighters
When fighting fire (connected with water evaporation, thermal decomposition of urea and release of vapours) wear:
- respiratory protective equipment (RPE),
- gas-tight clothes.

Use plenty of water. Stand on windward side.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Provide adequate ventilation. Avoid contact with released product and inhalation of vapour or spray. Use appropriate personal protective equipment.

6.2. Environmental precautions
Pay attention to avoid pollution of waters and sewage ducts and inform proper authorities in case of their accidental pollution.

6.3. Methods and material for containment and cleaning up
If only it is possible the spilled product should be immediately removed and placed in a clean, marked container.
As a absorbent material use sand, dry soil or another non inflammable material. Place the gathered material in a marked container.
Depending of the degree and character of pollution use the gathered product as the liquid fertilizer for agricultural purposes or give over to a specialized firm for neutralization.

6.4. Reference to other sections
See section 13 for waste disposal.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Avoid contact with skin, eyes and clothes. When handling the product wear proper protective clothes and protective gloves (See Section 8).

7.2. Conditions for safe storage, including any incompatibilities
Do not store in temperature above 30°C.
Store the product in tightly closed tanks or containers, in a separate and marked place, on a protected surface against leakage of the solution into water and the ground.

7.3. Specific end use(s)
No specific use is identified.
Component of mixture – urea – is not classified as a hazardous substance. Exposure scenarios have not been made.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Values for component: urea

DNEL[1] for workers

Acute - systemic effects	Dermal	500 mg/kg bw/d
Acute - systemic effects	Inhalation	3526 mg/m³
Long-term - systemic effects	Dermal	500 mg/kg bw/d
Long-term - systemic effects	Inhalation	3526 mg/m³

DNEL for general population

Acute - systemic effects	Dermal	300 mg/kg bw/d
Acute - systemic effects	Inhalation	1043,5 mg/m³
Acute - systemic effects	Oral	50 mg/kg bw/d
Long-term - systemic effects	Dermal	300 mg/kg bw/d
Long-term - systemic effects	Inhalation	1043,5 mg/m³
Long-term - systemic effects	Oral	50 mg/kg bw/d

PNEC[2]

PNEC aqua (freshwater)	14,07 mg/L
PNEC aqua (marine water)	1,407 mg/L
PNEC (intermittent release)	100 mg/L
PNEC sediment (freshwater)	68,66 mg/kg
PNEC sediment (marine water)	6,866 mg/kg
PNEC STP	1000 mg/L
PNEC soil	121 mg/kg

8.2. Exposure controls

When handling the product for a longer time, wear proper protective gloves.
Before having meals, smoking and after finishing work wash carefully the hands, arms, and face.
Protective clothing: chemical protective clothing.
Respiratory protection: not required under normal conditions of work.
Eye protection: protective goggles / tight goggles,
Hand protection: Chemical-resistant gloves in accordance with EN 374.
Technical protective equipment: exhaust ventilation.

Environmental exposure controls
See section 6.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties of urea solution

Odour	Faint smell of ammonia
Appearance	Transparent liquid
pH	ca 10 (basic reaction)
Freezing point	-10,5ºC

[1] **DNEL** Derived No-Effect Level
[2] **PNEC** Predicted No-Effect Concentration

Boiling point	Decomposition in temp. 100ºC
Flammability	Non flammable
Vapour pressure	6,4 kPa (48 mm Hg) in 20ºC
Density	ca 1.09 g/cm^3 in 20ºC
Water solubility	Unlimited
Refractive index	ca 1,383
Oxidising properties	None

Properties of mixtures component (urea)

Physical state at 20°C and 1013 hPa	Solid
Odour	Odorless
Melting / freezing point	407 K at 1013 hPa
Boiling point (at 1013 hPa)	Urea decomposes before reaching the boiling point
Relative density	1330 at 20°C
Vapour pressure	0.002 Pa at 298 K
Water solubility	624000 mg/L at 20 °C
Partition coefficient n-octanol/water	Log Kow (Pow): -1.73 at 20 °C
Surface tension	Not applicable due to the chemical structure
Flammability	Non flammable
Flash point	The substance decomposes at the melting point.
Self-ignition temperature	No evidence of self-ignition property of urea
Explosive properties	No explosive properties
Oxidising properties	No oxidising properties
Stability in organic solvents and identity of relevant degradation products	The stability of the substance in organic solvents is not a critical property
Granulometry	Fraction 1 – 3 mm min. 90%
Dissociation constant	Above 0.6 (pKb)
Viscosity	The substance is a solid at room temperature

9.2. Other information
No data.

SECTION 10: Stability and reactivity

10.1. Reactivity
Non reactive during storage, handling and application in normal conditions.

10.2. Chemical stability
Stable during storage, handling and application in normal conditions.

10.3. Possibility of hazardous reactions
Unknown.

10.4. Conditions to avoid
Heating over 100ºC temperature
Welding or heat treatment of devices on the installation where the urea solution may be present before earlier thoroughly washing it in order to remove any rests of urea.

10.5. Incompatible materials
Strong oxidants, acids, alkalis, nitrates, calcium hypochlorite or sodium hypochlorite.

10.6. Hazardous decomposition products
Ammonia - NH_3, nitric oxides NOx and carbo oxides (CO, CO_2).
Urea in solution reacts with calcium or sodium hypochlorite creating explosive nitrogen trichloride.

SECTION 11: Toxicological information

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

Values for component: urea

Acute toxicity	LD50[3] (oral)	14300 mg/kg bw – rat (Wistar) male/female
Irritation	Skin	no adverse effect observed (not irritating)
	Eye	no adverse effect observed (not irritating)
Corrosivity	Human and animal data show that urea is not corrosive.	
Sensitization	Skin	not sensitizing – naturally present at relatively high concentrations in human skin (up to 1% by weight)
	Respiratory	not sensitizing
Repeated dose toxicity	NOAEL[4] (oral)	2250 mg/kg bw/day (chronic, rat)
Mutagenicity	Genetic toxicity: negative	
Carcinogenicity	NOAEL (oral)	2250 mg/kg bw/day
Reproductive toxicity:	Developmental toxicity NOAEL (oral)	1000 mg/kg bw/day (subacute; rat)
STOT-single exposure	-	
STOT-repeated exposure	-	
Aspiration hazard	-	

11.2. Information on other hazards

No information is available on endocrine disrupting properties according to the criteria set out in the relevant Regulations ((EC) No 1907/2006, (EU) 2017/2100, (EU) 2018/605).

SECTION 12: Ecological information

12.1. Toxicity

Component of mixture does not fulfill the T criteria.

Values for component: urea

Aquatic compartment (including sediment)

Short-term toxicity to fish	Urea has a very low acute toxicity to fish: LC50 value = 21060 mg/L (*Danio rerio, FET*)
Long-term toxicity to fish	EC10: 7247 mg/L (*Oreochromis mossambicus*)
Short-term toxicity to aquatic invertebrates	EC50[5] for freshwater invertebrates: 10000 mg/L (Daphnia, freshwater snails and *Aedes egypti* larvae)
Long-term toxicity to aquatic invertebrates	EC10: 140,7 mg/L (*Daphnia magna*)
Algae and aquatic plants	EC50 for freshwater algae: 24541,9 mg/L EC10/LC10[6] lub NOEC for freshwater algae: 6895,8 mg/L
Sediment organisms	Very low exposure to sediment organisms, no testing necessary.
Toxicity to aquatic micro-organisms	The 72 hour toxicity threshold of *Entosiphon sulcatum* to urea was 29 mg/l, and the 16 hour toxicity threshold of urea to *Pseudomonas putida* was > 10000 mg/L.
Other aquatic organisms	Aquatic amphibians are not sensitive to urea

Terrestrial compartment

[3] **LD50** Median Lethal Dose .

[4] **NOAEL** No Observed Adverse Effect Level

[5] **EC50** Half maximal effective concentration

[6] **LC10** Lethal concentration 10

Toxicity to soil macro-organisms	Short-term EC50 or LC50 for soil macroorganisms: 2000 mg / kg Long-term EC10 / LC10 or NOEC for soil macroorganisms: 160 mg / kg Long-term EC10 / LC10 or NOEC for soil living arthropods: 640 mg / kg
Toxicity to terrestrial plants	EC10 for terrestrial plants: ≥1000 mg / kg
Toxicity to soil micro-organisms	Urea is of inherently low toxicity to microorganisms as it is utilized as a nutrient and nitrogen source. NOEC in a study similar to OECD 217: >2358 mg / kg
Toxicity to birds	Short-term EC50 or LC50 for birds: 150 g/kg food
Toxicity to mammals	Short-term EC50 or LC50 for mammals: 106 g/kg food Long-term EC10/LC10 or NOEC for mammals: 30 g/kg food

12.2. Persistence and degradability
Component of mixture does not fulfill the P or vP criteria.

12.3. Bioaccumulative potential
Component of mixture does not fulfill the B or vB criteria.

12.4. Mobility in soil
Highly biodegradable in soil and in water.

12.5. Results of PBT and vPvB assessment
Component of mixture is neither a PBT nor a vPvB substance.

12.6. Endocrine disrupting properties
No information is available on endocrine disrupting properties according to the criteria set out in the relevant Regulations ((EC) No 1907/2006, (EU) 2017/2100, (EU) 2018/605).

12.7. Other adverse effects
No data.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Remains of the product, including packaging waste, should be transferred to the specialized companies with an appropriate waste management permit.
Depending on a degree and type of contamination, the product is either used as a fertilizer for agricultural purposes or transferred to the specialized company for neutralization.
In case of spill of fertilizer - see Section 6 of the safety data sheet.

SECTION 14: Transport information

Urea solution is not classified, that means they are not considered as dangerous materials according to Orange Book of UN and international transport codes, eg. RID (railway), ADR (roads transport) and IMDG (see transport).

14.1. UN number or ID number
Not applicable.

14.2. UN proper shipping name
Not applicable.

14.3. Transport hazard class(es)
Not applicable.

14.4. Packing group

Not applicable.

14.5. Environmental hazards
Not applicable.

14.6. Special precautions for user
Not applicable.

14.7. Maritime transport in bulk according to IMO instruments
Not applicable.

SECTION 15: Regulatory information

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

- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18th December 2006 concerning Registration, Evaluation, Authorization 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/EEC and 2000/21/EC. *(Official Journal of the European Union of 30.12.2006, L 396. with later changes)*
- Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 *(Official Journal of the European Union of 31.12.2008, L 353. with later changes)*

15.2. Chemical safety assessment
The chemical safety assessment has been made.

SECTION 16: Other information

Training Employees should be trained in the scope of proper mixture handling. Read the safety data sheet before use.

Changes Section 1, 2, 4-9, 11, 12, 14-16. Safety Data Sheet amended in accordance with Regulation (EU) No. 2020/878.