SECTION 1. IDENTIFICATION OF THE MIXTURE AND OF THE COMPANY

1.1. Product identifier

Product name NOXy® (Urea solution 32.5%)
Alternative name AdBlue®
Chemical formula $(NH_2)_2CO$

1.2. Relevant identified uses of the mixture and uses advised against

Identified uses: NOXy® is used for selective reduction of nitrogen oxides in diesel SCR-equipped engines (selective catalytic reduction).

Uses advised against: None.

1.3. Details of the supplier of the safety data sheet

Name	Grupa Azoty Zakłady Azotowe Kędzierzyn Spółka Akcyjna
Address	skr. poczt. 163, ul. Mostowa 30A, 47-220 Kędzierzyn-Koźle
Telephone	/+48 77/ 481 20 00 (head office)
Person responsible for safety data sheet (e-mail)	karta_nawozy@grupaazoty.com

1.4. Emergency telephone number

Poland	**997**	Police
	998	Fire service
	999	Emergency medical services
	112	Rescue number in Poland
	+48 77 481 34 01	Shift Dispatcher at the Company Grupa Azoty ZAK S.A. (24h/d, only in Polish)
France	**+33 14 542 59 59**	Centres Antipoison et de Toxicovigilance
Iceland	**+35 45 43 22 22**	Landspítali
Lithuania	**+37 05 236 20 52**	Lithuanian Poison Information Bureau
	+37 06 875 33 78	
Malta	**112**	
Romania	**+40 21 318 36 06**	
Slovakia	**+42 12 547 741 66**	Národné Toxikologické Informačné Centrum
Slovenia	**112**	
Italy	**+39 64 997 80 00**	Centro antiveleni di Roma - Policlinico Umberto I

SECTION 2. HAZARDS IDENTIFICATION

2.1. Classification of the mixture

Classification according to Regulation (EC) No. 1272/2008

Does not meet classification criteria of the CLP Regulation.

2.2. Label elements

Not applicable (no labeling).

2.3. Other hazards
None.

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS
3.1. Substances
Not applicable

3.2. Mixtures

Name of the substance	EC Number	CAS Number	Content [%]
Urea	200-315-5	57-13-6	31.8 ÷ 33.2
Water	231-791-2	7732-18-5	-

SECTION 4. FIRST AID MEASURES
4.1. Description of first aid measures
Inhalation:
If symptoms are experienced, take out the victim from the place of exposure and move to fresh air.
Skin contact:
Washed contaminated skin with water.
Eye Contact:
Immediately flush eyes with large amounts of lukewarm water. In each case of eye contamination, an ophthalmological consultation is required.
Ingestion:
Move victim from the place of exposure. Lay victim in lateral position, ensure calmness and warmth. Give 2/3 glass of water to drink. Provide medical care.

4.2. Most important symptoms and effects, both acute and delayed
No data.

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:
Small fire: powder, snow (ABC or BC) or foam extinguisher.
Big fire: water sprays, foam, extinguishing powders.
Packages exposed to fire or high temperature, if possible, remove from the affected area or cool with water from a safe distance until the fire is extinguished. Do not allow the after-extinguishing sewage to escape into the rainwater drainage system or groundwater.

5.2. Special hazards arising from the mixture
In high temperature, the urea may decompose, toxic gases, ammonia, carbon dioxide may be generated, and nitrogen oxides may also occur under fire conditions.

5.3. Advice for firefighters
Use gas-tight protective suit with breathing apparatus insulating respiratory tract.

SECTION 6. ACCIDENTAL RELEASE MEASURES
6.1. Personal precautions, protective equipment and emergency procedures
Persons providing assistance: Use protective gloves made of urea resistant materials. Wear work clothing.

6.2. Environmental precautions

Take the following precautions:

- Do not let mixture into watercourses and groundwater, protect grates and sewage sumps, especially during rainfall (the product causes water eutrophication).
- Remove spilled mixture by pumping it out of the surface;
- If the mixture is introduced into surface water, warn its users;
- Inform relevant authorities.

6.3. Methods and material for containment and cleaning up

Removal:

Large quantities - pump out, put in properly labeled containers and use as fertilizer; contaminated waste provide for recycling to specialized companies.

Small amounts - rinse contaminated surface with water; wastewater should be directed to the biological treatment plant.

6.4. Reference to other sections

See SECTION 8 and SECTION 13.

SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Use in adequate ventilated place. Provide local exhaust ventilation. Avoid possible sources of ignition (sparks or flame).

Environmental exposure controls: see SECTION 8.

7.2. Conditions for safe storage, including any incompatibilities

Storage	Store product in properly closed and labeled packages, in covered, dry and well ventilated rooms. The ground must be solid. Ensure efficient ventilation. Do not expose to high temperatures. To prevent solution solidification, avoid storage below -10 °C. Avoid contact with combustible materials. Packaging materials: austenitic-chromium-nickel steel, chromium-nickel-molybdenum steel or alloy steel of equivalent quality; polypropylene containers. Unsuitable materials: unalloyed and galvanized steel and copper; strong oxidants; nitrites - do not store or transport in one transport.
Shared storage	Do not store directly with nitrate fertilizers.

7.3. Specific end use(s)

No special recommendations.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

Maximum permissible concentrations (NDS) of health harmful agents in working environment		
Substance	NDS	NDSCh
Urea	none	none

Derived No-Effect Levels (DNELs) - employees		
Short-term exposure	Systemic effects	
	Skin	580 mg/kg wc/d
	Inhalation	292 mg/m^3
	Ingestion	No information available
	Local effects	
	Skin	No information available
	Inhalation	No information available
	Ingestion	No information available
Long-term exposure	Systemic effects	
	Skin	580 mg/kg wc/d
	Inhalation	292 mg/m^3
	Ingestion	No information available
	Local effects	
	Skin	No information available
	Inhalation	No information available
	Ingestion	No information available

Derived No-Effect Levels (DNELs) - general population		
Short-term exposure	Systemic effects	
	Skin	580 mg/kg wc/d
	Inhalation	125 mg/m^3
	Ingestion	42 mg/kg wc/d
	Local effects	
	Skin	No information available
	Inhalation	No information available
	Ingestion	No information available
Long-term exposure	Systemic effects	
	Skin	580 mg/kg wc/d
	Inhalation	125 mg/m^3
	Ingestion	42 mg/kg wc/d
	Local effects	
	Skin	No information available
	Inhalation	No information available
	Ingestion	No information available

Predicted No-Effect Concentration (PNEC)	
Freshwater	0.047 mg/l
Water (freshwater)	0.047 mg/l
Water (sea water)	0.047 mg/l
Water (discontinuous emissions)	No information available
Sewage treatment plant	No information available
Sediments (fresh water)	No information available
Sediments (sea water)	No information available

Soil	No information available
Ingestion / intake	No information available

8.2. Exposure controls

Technical control measures: Try to avoid exposure of workers to the urea solution by applying appropriate ventilation. Train employees how to apply security measures.

Personal protection measures: See below table

EYE/FACE PROTECTION

Well-fitting glasses or protective goggles.

HAND PROTECTION

Use protective gloves when working with the mixture.

SKIN/BODY PROTECTION

Wear work clothing.

RESPIRATORY PROTECTION

Not required under normal operating conditions.

GENERAL RULES FOR INDUSTRIAL HYGIENE

Do not eat, drink or smoke while working with NOXy® (AdBlue®).

HYGIENE PRODUCTS

Wash your hands after work.

Environmental exposure control: Do not allow NOXy® to enter watercourses or groundwater. Store in adequate ventilated rooms.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance:	at 20°C	colorless or light straw liquid
Odour:		weak odour of ammonia
Odour threshold:		no data
pH:		no data
Melting/solidification point:		-11.5°C
Initial boiling temperature:		no data
Boiling range:		no data
Flash point:		no data
Evaporation rate:		no data
Flammability (solid, gas):		no data
Flammability limits or explosion limits:	lower	no data
	upper	no data

Vapour pressure:		According to CSR Urea: 0.002 Pa at 298 K 1.2 x 10-5 mmHg at 25°C (Jones, 1960)
Vapour density:		no data
Density:	at 20°C	1.087÷1.093 g/cm3
Solubility:	at 20°C	Urea dissolves easily in water, alcohols and liquid ammonia; weakly in ether, ethyl acetate, benzene and pyridine; does not dissolve in chloroform and many other organic solvents; According to CSR Urea: 624 g/l at 20°C;
Partition coefficient n-octanol/water (log):	at 20°C	According to CSR Urea: L_{og} K_{ow} (P_{ow}): - 1.73
Self-ignition point:		no data
Temperature of decomposition:		no data
Viscosity:		no data
Explosive proprieties:		The mixture is a non-flammable material that does not have any chemical groups associated with explosive or self-igniting properties.
Oxidising properties:		none

9.2. Other information

Density:	at 20°C	no data available
Surface tension:		0.036 N/m (w T_T= 133.3°C)
Granulometry:		no data
Dissociation constant:		no data
Molecular weight		60.056 g/mol
Refractive index		1.3814÷1.3843 (20°C, 1013hPa)

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

Urea reacts with many chemical compounds, both organic and inorganic. In strong acid solutions it behaves like a weak base, and in strong base solutions it behaves like a weak acid.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

In the fire environment, emits toxic fumes (ammonia, carbon dioxide, nitrogen oxides).

10.4. Conditions to avoid

Avoid exposure to sunlight and high temperature (above 30°C) while storage.

10.5. Incompatible materials

Do not mix with other chemicals (strong acids and bases, strong oxidants, nitrates, sodium and calcium hypochlorite), especially with pure ammonium nitrate. The resulting urea nitrate may decompose releasing gases in an explosive manner, similarly with hypochlorites may form an explosive nitrogen trichloride.

10.6. Hazardous decomposition products

Thermal decomposition products are ammonia and carbon dioxide, in fire conditions also nitrogen oxides.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity	According to column 2 of Annex VIII of the REACH Regulation, urea is a substance characterized by very low acute toxicity (for oral, subcutaneous and intravenous administration for rodents).
Corrosive/irritating to skin	Urea is a component of creams against skin diseases and is therefore considered unlikely to cause skin irritation in humans. In addition, it occurs in various levels of human skin, where it is a moisture absorber, maintaining hydration of the stratum corneum.
Serious eye damage/ eye irritation	No data.
Respiratory or skin sensitization	According to column 2 of Annex VIII of the REACH Regulation, urea is a solid and non-volatile substance. When mixed with water, as a liquid it is not a potential respiratory hazard. No information on people acquiring asthma as a occupational disease.
Mutagenic effects for reproductive cells	Urea is produced by body in large quantities as a normal metabolic product and is involved in the bloodstream at high concentrations so it is unlikely to have genotoxic properties.
Carcinogenicity	No studies indicating on carcinogenicity. The physiological role of urea and the level of production by the human body indicates that the substance is not carcinogenic.
Harmful effect for reproduction	No data available. Large amounts of urea are present in human body as a result of normal protein catabolism so it s unlikely to have harmful effect for reproduction.
Target organ toxicity - single exposure	No data.
Target organ toxicity - repeated exposure	No data.
Target organ toxicity - repeated exposure	No data.
Aspiration hazards	No data.

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

Water	<u>Acute toxicity</u>	
	Fish	Urea has very low acute toxicity towards fish: LC 50 includes values > 6810 do 28000 mg/L.
	Crustaceans	According to CSA: value of EC50/LC50 is 10000 mg/L.
	Algae	According to CSA: value of EC10/LC10 or NOEC for freshwater algae is 47 mg/L.
	<u>Chronic toxicity</u>	
	Fish	Urea has low toxicity for this species: it is a normal product of protein catabolism and therefore fish have developed effective mechanisms of its excretion.
	Crustaceans	Urea shows low toxicity for aquatic invertebrates.
	Algae	According to CSA: value of EC10/LC10 or NOEC for freshwater algae is 47 mg/L.

Sediment	Urea is processed quickly in soil by sedimentary bacteria and assimilated to the nitrogen cycle in nature. Its very high water solubility and low adsorption also indicate very low toxicity of substances to sediment organisms.	
Land	Soil microorganisms:	The use of urea reduces the number of earthworms and biomass as well as reduces soil pH. Long-term use of urea may have harmful consequences for earthworms due to the lack of liming.
	Land plants:	Urea has low toxicity to land plants. It is widely used as a fertilizer and therefore has beneficial consequences for plant growth.
	Land animals:	Urea has low toxicity to land arthropods.

12.2. Persistence and degradability

Persistence

According to Annex IX, column 2 of the REACH Regulation, the stability of substances in organic solvents is not a decisive physical property.

Biodegradation

According to CSA, urea is a readily biodegradable substance.

Biodegradation in soil:	The most widespread method of urea decomposition is enzymatic mineralization. In soil and water, at not too low temperature, urea is expected to biodegrade relatively quickly to ammonia and bicarbonate.

12.3. Bioaccumulative potential

No data.

12.4. Mobility in soil

Adsorption / desorption	Coefficient of soil adsorption: Koc: 0.037 - 0.064

12.5. Results of PBT and vPvB assessment

Based on available data, it can be concluded that urea, which is the main component of the mixture NOXy® (Adblue®):

- may be considered as unstable in the process of wastewater treatment in aerobic conditions,
- is not stable in the natural environment,
- has a low ability to bioaccumulate.

12.6. Other adverse effects

No data.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste:	Waste treatment should be carried out in accordance with national and local waste management regulations. The appropriate disposal/recovery method shall be chosen depending on local conditions and the possibilities of disposal/recovery of waste. Waste is classified as non-hazardous. Waste (dirty) urea solution should first be re-used (e.g. for fertilizing plants). If no such possibilities occur, waste should be transferred for recovery/disposal only to authorized recipients. Diluted urea solutions can be directed to biological sewage treatment plants to remove nitrogen compounds.

Packaging: Used packaging, after thorough emptying and cleaning, should be handed over to an authorized recipient of waste for recovery/disposal. Information on waste recipients can be obtained from local administrative authorities competent for environmental protection (e.g. Municipal Office, Poviat Starost's Office). It is recommended to transfer waste to the nearest recipients.

Regulations:

1. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (OJ of 2008, Volume 51, L312, as amended).
2. The Act of 14 December 2012 on waste (consolidated text, Dz.U. of 2016, item 1987, as amended) together with executive acts.
3. Act of 13 June 2013 on the management of packaging and packaging waste (consolidated text, Dz.U of 2016, item 1863, as amended) together with executive acts.

SECTION 14. TRANSPORT INFORMATION

14.1. UN number

RID/ADR -
IMDG -
ADN -
ICAO/IATA -

14.2. UN proper shipping name

RID/ADR -
IMDG -
ADN -
ICAO/IATA -

14.3. Transport hazard class(es)

RID/ADR -
IMDG -
ADN -
ICAO/IATA -

14.4. Packing group

RID/ADR -
IMDG -
ADN -
ICAO/IATA -

14.5. Environmental hazards

Mixture is not subject to the regulations on the transport of dangerous goods. Mixture does not pose hazard to environment.

14.6. Special precautions for user

Mixture is safe in transport. Avoid spilling.

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

No data.

SECTION 15. REGULATORY INFORMATION

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

European Union

1. Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 on the 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/EC and 2000/21/WE (OJ of 2006, Volume 49, L396, as amended).
Product is not listed in Annex XIV to the REACH, so **it is not subject to authorization**.
Urea **is not subject to restrictions** in accordance with Annex XVII of REACH.

2. Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on the classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC and amending the Regulation (EC) No. 1907/2006 (OJ of 2008, Volume 51, L 353, as amended).

National

1. Act of 25 February 2011 on chemical substances and their mixtures (Dz.U. 2011, No. 63, item 322, as amended) together with executive acts.

15.2. Chemical safety assessment

Chemical safety assessment of urea has been performed.

SECTION 16. OTHER INFORMATION

16.1. Applied modifications

Adaptation of the safety data sheet to the requirements of the CLP Regulation.

16.2. Abbreviations and acronyms

REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
CSR	Chemical Safety Report
NDS	Maximum Permissible Concentrations
NDSCh	Short-Term Exposure Limit (STEL)
DNEL	Derived No Effect Level
PNEC	Predicted No Effect Concentration
NOEC	No Observed Effect Concentration
PBT	Persistent, bioaccumulative and toxic
vPvB	Very persistent and very bioaccumulative
LCx	Lethal concentration x%
LDx	Lethal dose x%
EC	The EC list consists of three combined European inventories resulting from earlier EU legislation on chemicals: EINECS, ELINCS and the list of “No-longer polymers” (NLP)
CAS	Chemical Abstracts Service index number
IUPAC	International Union of Pure and Applied Chemistry
CLP	Classification, labeling and packaging of chemical substances and mixtures
ECx	Effective concentration inhibiting growth of studied population x%
CSA	Chemical safety assessment
ONZ (UN)	United Nations Organization (UN)

16.3. Key literature references and data sources

Registration dossier for urea.

16.4. Training

1. Employer is obliged to inform all employees who are in contact with NOXy® about the hazards and personal protection measures specified herein.
2. Distributor is obliged to provide the NOXy® recipient with information contained herein.

16.5. Replaces

Safety Data Sheet NOXy® No. PZ-025-02-01.1.

This Safety data sheet is NOT a quality specification of the product and can NOT be regarded as a guarantee of its quality or compliance with customer requirements in individual applications. Its task is to provide guidance in the safe handling of the mixture (work safety and environmental protection), its transport and storage. The data contained herein are based on the current state of our knowledge and on current legal regulations. Recipients should ensure that this information complies with the laws and/or regulations that apply in their countries and/or enterprises.