

SAFETY DATA SHEET

(according to Regulation (EC) No 1907/2006 (REACH), ANNEX II)

AQUEOUS UREA SOLUTION 32

Version 1.0

Date: 28/03/2023

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

1.1 Product identifier

1.1.1 Mixture

Trade name:	Aqueous Urea Solution 32 / AUS 32
Other names:	Diesel Exhaust Fluid / DEF / AdBlue®

1.1.2 Substance

Name IUPAC/international chemical name:	Urea
INDEX No. and name as listed in Annex VI of CLP:	Not listed
CAS No.:	57-13-6
EINECS No.:	200-315-5
REACH registration No.:	01-2119463277-33-0048
Molecular formula:	CH ₄ N ₂ O

1.2 Relevant identified uses of the mixture and uses advised against

Relevant identified uses:	NOx reducing agent
Uses advised against:	None

1.3 Details of the supplier of the safety data sheet

Only Representative:	Zangas Hoch-und Tiefbau GmbH Schwindgasse 5/1/4 1040 Vienna Austria Phone: +43 1 274 16 366 www.zangasgroup.com E-mail: info@zangasgroup.com
Manufacturer:	PrJSC "AZOT" 72, Heroiv Kholodnoho Yaru Str., Cherkassy, Ukraine Phone: +38 0472 39-63-03 +38 0472 39-23-33 URL website: http://www.azot.ck.ua Email: let@azot.ck.ua sale@azot.ck.ua
E-mail address of the person responsible for this Safety Data Sheet:	PrJSC "AZOT" REACH Department onr@azot.ck.ua
National contact:	Not available

1.4 Emergency telephone number

Emergency phone number:	Phone: +43 1 274 16 366 Opening hours: 9-18 (CET) Languages of the phone service: German, English, Russian Phone: + 38 (0472) 39 61 17 Opening hours: 0-24 Languages of the phone service: Russian, Ukrainian
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SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the mixture

Product definition: Mixture

The mixture is not classified as hazardous in accordance with Regulation 1272/2008 (CLP).

2.2 Label elements

Hazard pictograms:	Not applicable
Signal word:	No signal word
Hazard statements:	Not applicable
Precautionary statements	
Prevention:	Not applicable
Response:	Not applicable
Storage:	Not applicable
Disposal:	Not applicable

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2.3 Other hazards:	
Mixture meets the criteria for PBT according to Regulation (EC) No.1207/2006, Annex XIII	No. P: Not available. B: Not available. T: No.
Mixture meets the criteria for vPvB according to Regulation (EC) No.1207/2006, Annex XIII	Not available
Other hazards which do not result in classification	Not available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances/Mixtures

Description of the mixture: mixture of urea and water

Components	CAS No.	REACH Registration No.	Concentration	Regulation (EC) No.1272/2008 [CLP]	
				INDEX No. as listed in Annex VI	Classification
Urea	57-13-6	01-2119463277-33-0048	31,8-33,2 % (w/w) (32,5 % typical)	Not listed	Not classified
Water	7732-18-5	Exempted (Annex IV of REACH Regulation)	66,8-68,2 % (w/w) (67,5 % typical)	Not listed	Not classified

SECTION 4: FIRST-AID MEASURES

4.1 Description of first aid measures

General notes:	Appropriate first-aid equipment should be provided. No action shall be taken involving any personal risk or without suitable training.
Following eye contact:	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if symptoms occur.
Following skin contact:	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if skin symptoms occur.
Following ingestion:	Wash out mouth with water. Do not induce vomiting. If victim is conscious, give water to drink. Get medical attention if symptoms occur.
Following inhalation:	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
Self-protection for the first aider:	None

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact:	No known significant effects or critical hazards
Inhalation:	Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
Skin contact:	No known significant effects or critical hazards.
Ingestion:	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact:	Adverse symptoms may include the following: irritation, redness.
Inhalation:	Adverse symptoms may include the following: respiratory tract irritation, coughing.
Skin contact:	No specific data.
Ingestion:	No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician:	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Specific treatments:	No specific treatment.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media::	Water and extinguishers suitable to put out the cause of fire
Not suitable extinguishing media::	None

5.2 Special hazards arising from the substance or mixture

Hazards from the	None
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substance or mixture:	
Hazardous combustion products:	Possible decomposition products: nitrogen oxides toxic fumes, ammonia
5.3 Advice for firefighters	
Special precautions for fire-fighters:	No special measures required
Special protective equipment for fire-fighters:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for firefighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
Remarks : References: SECTION 9: Physical and chemical properties.	
SECTION 6: ACCIDENTAL RELEASE MEASURES	
6.1 Personal precautions, protective equipment and emergency procedures	
<p>6.1.1 For non-emergency personnel <u>Protective equipment</u>: Put on appropriate personal protective equipment. <u>Emergency procedures</u>: Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation.</p> <p>6.1.2 For emergency responders: See Section 8 and 6.1.1.</p>	
6.2 Environmental precautions:	
Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).	
6.3 Methods and material for containment and cleaning up	
<p>6.3.1 For containment: Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas.</p> <p>6.3.2 For cleaning up: Collect spillage with non-combustible, absorbent material, e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations.</p> <p>6.3.3 Other information Dispose of via a licensed waste disposal contractor.</p>	
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	
<p><u>Protective measures</u>: Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Keep in the original container or in an approved one made from a compatible material, kept tightly closed when not in use.</p> <p><u>Measures to prevent fire</u>: Keep away from heat. Keep away from sources of ignition.</p> <p><u>Measures to prevent aerosol and dust generation</u>: Store in a well-ventilated area.</p> <p><u>Measures to protect the environment</u>: Prevent entering into sewage or ground/surface water.</p> <p><u>Advice on general occupational hygiene</u>: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Remove contaminated clothing and protective equipment before entering eating areas. 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. Ensure that eyewash stations and safety showers are close to the workstation location.</p>	
7.2 Conditions for safe storage, including any incompatibilities	
Technical measures/Storage conditions:	Store in original tightly closed container in dry, well-ventilated premises at temperature not below -11 °C and not above +30 °C.
Packing materials:	Austenitic Cr-Ni, Cr-Ni-Mo, and Cr-Ni-Mo-Ti stainless steels Titanium Polyethylene Polypropylene Polyisobutylene (PIB) Perfluoroalkoxy alkane (PFA) Polyfluoroethylene (PFE) Polyvinylidene fluoride (PVDF) Polytetrafluoroethylene (PTFE) Copolymers of vinylidene fluoride and hexafluoropropylene (PVDF-HFP)
Requirements for storage rooms and vessels: Storage class:	12
Further information on storage conditions:	None
Incompatible products:	Very strict cleanliness requirements! Contact with other substances is not allowed!

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7.3 Specific end use(s):	NOx reducing agent																																			
SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION																																				
8.1 Control parameters																																				
8.1.1 National occupational exposure limit values: Not available																																				
8.1.2 National biological limit values: Not available																																				
8.1.3 PNEC (Predicted No Effect Concentration):																																				
8.1.3.1 PNEC for AUS 32: Not available																																				
8.1.3.2 PNEC for Urea:																																				
Environmental protection target	PNEC																																			
Aqua – freshwater	0.047 mg/L																																			
Aqua - salt water	0.047 mg/L																																			
Aqua – intermittent releases	No exposure expected																																			
Sediment	No exposure expected																																			
Soil	No exposure expected																																			
Sewage treatment plant	No exposure expected																																			
Food chain: oral (secondary poisoning)	No exposure expected																																			
Air:	No exposure expected																																			
8.1.4 DNEL (Derived No Effect Level):																																				
8.1.4.1 DNEL for AUS 32: Not available																																				
8.1.4.2 DNEL for Urea:																																				
<table><tr><th colspan="3">ACUTE</th></tr><tr><th rowspan="2">Route</th><th colspan="2">Derived No Effect Level (DNEL)</th></tr><tr><th>Workers</th><th>General population</th></tr><tr><td>Oral</td><td>Not applicable</td><td>42 mg/kg bw/day</td></tr><tr><td>Dermal</td><td>580 mg/kg bw/day</td><td>580 mg/kg bw/day</td></tr><tr><td>Inhalation</td><td>292 mg/m³</td><td>125 mg/m³</td></tr></table> <table><tr><th colspan="3">LONG TERM</th></tr><tr><th rowspan="2">Route</th><th colspan="2">Derived No Effect Level (DNEL)</th></tr><tr><th>Workers</th><th>General population</th></tr><tr><td>Oral</td><td>Not applicable</td><td>42 mg/kg bw/day</td></tr><tr><td>Dermal</td><td>580 mg/kg bw/day</td><td>580 mg/kg bw/day</td></tr><tr><td>Inhalation</td><td>292 mg/m³</td><td>125 mg/m³</td></tr></table>			ACUTE			Route	Derived No Effect Level (DNEL)		Workers	General population	Oral	Not applicable	42 mg/kg bw/day	Dermal	580 mg/kg bw/day	580 mg/kg bw/day	Inhalation	292 mg/m ³	125 mg/m ³	LONG TERM			Route	Derived No Effect Level (DNEL)		Workers	General population	Oral	Not applicable	42 mg/kg bw/day	Dermal	580 mg/kg bw/day	580 mg/kg bw/day	Inhalation	292 mg/m ³	125 mg/m ³
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No evidence of local effects is seen in any of the dermal studies performed with urea; there is no evidence of local effects from human studies or from experience of human exposure. Respiratory irritation is not predicted. DNELs for local effects are therefore not relevant and are not calculated for urea.																																				
8.1.5 Monitoring procedures: Not available																																				
8.2 Exposure controls																																				
8.2.1 Appropriate engineering controls:																																				
Substance/mixture related measures to prevent exposure during identified uses: None required.																																				
Technical measures to prevent exposure: Use of adequate ventilation is good industrial practice. In addition, an eyewash facility and a safety shower for facilities storing or utilizing this material is good industrial practice.																																				
8.2.2 Personal protection equipment:																																				
8.2.2.1 Respiratory protection:	No special protection is required. In case of insufficient ventilation, wear suitable respiratory equipment.																																			
8.2.2.2 Skin protection: Hand protection: Other skin protection:	Gloves: leather, butyl rubber and neoprene. Working clothes																																			
8.2.2.3 Eye and face protection:	Safety glasses with side shields, suitable protective equipment.																																			
8.2.2.4 Thermal hazards:	None																																			
Advice on personal protection is applicable for high exposure levels. Select proper personal protection based on a risk assessment of the actual exposure situation																																				
8.2.3 Environmental exposure controls:	Dispose of rinse water in accordance with local and national regulations.																																			

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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance:	Liquid, clear, colourless
Odour:	Slight ammonia
Odour threshold:	Not available
pH:	8,0-10,0 (10% sol)
Melting/Freezing point:	minus 11,5 °C
Initial boiling point and boiling range:	About 100,0 °C
Flash-point:	Not applicable
Evaporation rate:	Not available
Flammability:	Non-flammable
Auto-ignition temperature	Not applicable
Upper/lower flammability or explosive limits	Not applicable
Explosive properties:	Not available
Oxidising properties	None
Vapour pressure:	Not available
Vapour density:	Not available
Relative density (at 20 °C):	between 1087,0 and 1093,0 kg/m ³
Solubility in water:	Very soluble
Partition coefficient n-octanol/water:	Not applicable to inorganic substances
Decomposition temperature:	Not available
Viscosity (at 25 °C):	approx. 1,4 mPa·s
Thermal conductivity (at 25 °C):	approx. 0,570 W/m·K
Specific heat (at 25 °C):	approx. 3,40 kJ/kg·K
Surface tension (at 20 °C):	min. 65 mN/m

9.2 Other information

Molar mass: 60.06 g/mol

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability

The product is stable.

10.3 Possibility of hazardous reactions

No hazardous reaction when handled and stored according to these provisions (see section 7, handling and storage).

10.4 Conditions to avoid

Temperatures below - 11 °C and higher than + 30 °C. Contact with any materials other than compatible.

10.5 Incompatible materials

Contact with any materials other than compatible makes the product unusable.

10.6 Hazardous decomposition products

Ammonia, nitrous oxides.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

11.1.1 Acute toxicity:

11.1.1.1 Acute toxicity for AUS 32: Not available

11.1.1.2 Acute toxicity for Urea:

Route of exposure	Species	Method	Effective dose	Exposure time	Results
inhalation	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
oral	rat (Wistar) male/female	oral: OECD Guideline 401 (Acute Oral Toxicity)	–	–	LD ₅₀ : 14300 mg/kg bw
dermal	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

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11.1.2 Skin corrosion/irritation:	Not irritating
11.1.3 Serious eye damage/irritation:	Not irritating
11.1.4 Respiratory or skin sensitization:	Not sensitizing
11.1.5 Germ cell mutagenicity:	Negative
11.1.6 Reproductive toxicity:	Not available
11.1.7 Carcinogenicity:	Not carcinogenic
11.1.8 STOT-single exposure:	Not available
11.1.9 STOT-repeated exposure:	Not available
11.1.10 Aspiration hazard:	Not available
SECTION 12: ECOLOGICAL INFORMATION	
12.1 Toxicity	
12.1.1 Fish (freshwater, short-term):	
12.1.1.1 For AUS 32:	Not available
12.1.1.2 For Urea:	LC50 values range from >6810 to 28000 mg/l
12.1.2 Fish (long-term):	Not applicable, urea and its aqueous solutions are of inherently low toxicity
12.1.3 Freshwater invertebrates (short-term):	
12.1.3.1 For AUS 32:	Not available
12.1.3.2 For Urea:	EC50/LC50 - 10000 mg/l
12.1.4 Freshwater invertebrates (long-term):	Not applicable, urea and its aqueous solutions are of inherently low toxicity
12.1.5 Freshwater algae:	
12.1.5.1 For AUS 32:	Not available
12.1.5.2 For Urea:	EC10/LC10 or NOEC - 47 mg/l
12.1.6 Terrestrial plants:	Urea and its aqueous solutions are widely used as a plant nutrient (N-source) in fertilizer, hence toxicity is unlikely
12.1.7 Soil macro-organisms:	Urea and its aqueous solutions are of low toxicity and rapidly assimilated into the nitrogen cycle by soil microorganisms
12.1.8 Birds:	The limited data available indicate that urea and its aqueous solutions are of low toxicity to birds
12.1.9 Mammals:	Low toxicity is predicted base on the physiological production of urea and its aqueous solutions by mammalian species
12.2 Persistence and degradability	
12.2.1 Abiotic degradation:	
12.2.1.1 Hydrolysis:	Not predicted based on a theoretical assessment of the structure of the molecule.
12.2.1.2 Phototransformation/photolysis:	No data are available: not required.
12.2.2 Biodegradation:	Urea and its aqueous solutions are considered to be readily biodegradable.
12.3 Bioaccumulative potential	
12.3.1 Partition coefficient n-octanol /water (log Kow)	
12.3.1.1 For AUS 32:	Not available
12.3.1.2 For Urea:	-1.73 at 20 °C
12.3.2 Bioconcentration factor (BCF)	Not available
Due to the low log Kow value, urea and its aqueous solutions are not likely to undergo bioaccumulation	
12.4 Mobility in soil	
12.4.1 Adsorption coefficient:	
12.4.1.1 For AUS 32:	Not available
12.4.1.2 For Urea:	from 0,037 to 0,064
12.5 Results of PBT and vPvB assessment	
Urea and its aqueous solutions are neither a PBT nor a vPvB substance/mixture.	
12.6 Other adverse effects:	
No known significant effects or critical hazards	
Remarks: No ecological problems are to be expected when the product is handled and used with due care and attention.	

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12.7 Additional information: None

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

13.1.1 Product / Packaging disposal:	Empty containers may retain some product residues. This material and its container must be disposed of in a safe way. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.
Waste codes/ waste designations according to LoW (Commission Decision 2001/118/EC):	06 10 99 Wastes not otherwise specified
13.1.2 Waste treatment-relevant information:	Dispose of surplus and non-recyclable products via a licensed waste disposal contractor.
13.1.3 Sewage disposal-relevant information:	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.
13.1.4 Other disposal recommendations:	The generation of waste should be avoided or minimized wherever possible.

SECTION 14: TRANSPORT INFORMATION

Mixture is not classified as a dangerous mixture when carried by road (ADR), train (RID) or maritime (IMDG)

	ADR/RID	ADN/ADNR	IMDG	IATA
14.1 UN number	Not regulated	Not regulated	Not regulated	Not regulated
14.2 UN proper shipping name	–	–	–	–
14.3 Transport hazard class(es)	–	–	–	–
14.4 Packing group	–	–	–	–
14.5 Environmental hazards	No	No	No	No
14.6 Special precautions for user	Not available	Not available	Not available	Not available
Additional information	–	–	–	–

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not available

SECTION 15: REGULATORY INFORMATION

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

EU Regulations

Authorisations and/or restrictions on use:
Authorisation: EU Regulation (EC) No. 1907/2006 (REACH); Annex XIV - List of substances subject to authorisation
Substances of very high concern

None of the components are listed

Restrictions on use: Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable

National regulations (country): Not available

15.2 Chemical safety assessment:

15.2.1 For AUS 32:	Not applicable
15.2.2 For Urea:	In accordance with REACH Article 14, the Chemical Safety Assessment has been carried out for this substance.

SECTION 16: OTHER INFORMATION

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.

16.1 Indication of changes:

16.2 Abbreviations and acronyms:

- ADN - European Agreement concerning the International Carriage of Dangerous Goods on Inland Waterway
- ADNR - ADN Rhine
- ADR - Agreement on Dangerous Goods by Road

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- CAS - Chemical Abstracts Service
- CLP - Classification, Labelling and Packaging of chemicals
- EC - European Commission
- EC50 - half maximal effective concentration
- EINECS - European Inventory of Existing Commercial Chemical Substances
- IATA - International Air Transport Association
- IBC Code - International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk
- IMDG - International Maritime Dangerous Goods
- IUPAC - International Union of Pure and Applied Chemistry
- LC50 - Lethal Concentration
- LD50 - Lethal Dose
- LoW - List of Wastes
- MARPOL - International Convention for the Prevention of Pollution From Ships
- NOAEL - No observable adverse effect level
- NOEC - No Observed Effect Concentration
- OECD - Organization for Economic Co-operation and Development
- PBT - Persistent, bioaccumulative, toxic chemical
- PJSC - Public Joint-Stock Company
- REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals
- RID - International Rule for Transport of Dangerous Substances by Railway
- STOT - Specific Target Organ Toxicity
- UN - United Nations
- vPvB - very persistent, very bioaccumulative

16.3 Key literature references and sources for data: CSR (Chemical Safety Report) on Urea, Guidance on safe use on Urea, etc.

16.4 Training advice:	In accordance with the local regulations
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16.5 Further information:	None
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