

SECTION 1: IDENTIFICATION OF THE MIXTURE AND OF THE COMPANY

1.1. Product identifier

Commercial product name RSM[®]- urea-ammonium nitrate solution
RSM[®]- 32N

Chemical formula $\text{NH}_4\text{NO}_3 + \text{CO}(\text{NH}_2)_2 + \text{H}_2\text{O}$

Unique Formula Identifier RSM[®] - 32N UFI: 2H00-Y0XR-200T-SSE8

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

Identified uses: RSM[®] - urea - ammonium nitrate solution is used in agriculture as a fertiliser.
Uses advised against: None.

1.3. Details of the supplier of the safety data sheet

Name Grupa Azoty Zakłady Azotowe Kędzierzyn Spółka Akcyjna
Address p.o. box 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@grupazoty.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 Grupy 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 antiveneni di Roma - Policlinico Umberto I

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 (CLP)
Serious damage to eyes/eye irritation, Category 2 (Eye Irrit. 2: H319)

2.2. Label elements



Signal note: "Caution"

Hazard Statements:

H319: Causes serious eye irritation.

Precautionary statements:

P264: Wash thoroughly after handling.

P280: Wear eye 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.

P337+P313: If eye irritation persists: Get medical advice/attention.

2.3. Other hazards

On the basis of the available data it is stated that RSM[®] - urea-ammonium nitrate solution does not fulfill the criteria of toxicity, persistence and bioaccumulation (PBT) or the criteria of high persistence and high bioaccumulation (vPvB).

Prevent entry of the mixture into surface and ground waters. In high concentrations, the mixture causes secondary eutrophication of water bodies, rapid algae growth and decreased oxygen content in waters

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Not applicable.

3.2. Mixtures

Name of the substance	EC Number	CAS Number	Registration number	Classification	Content [%]
Ammonium nitrate	229-347-8	6484-52-2	01-2119490981-27-0017	Serious damage to eyes/eye irritation, Category 2 (Eye irrit. 2): H319 Oxidising solid, Category 3 (Ox. Sol. 3): H272	44-50
Urea	200-315-5	57-13-6	01-2119463277-33-0005	no classification	33-40

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation: Move to fresh air. In case of symptoms, seek medical care.

Skin contact: Rinse with plenty of running water. Remove contaminated clothing and shoes. In case of symptoms, seek medical care.

Eye contact: Rinse with plenty of running water. In case of symptoms, seek medical care.

Swallowing: If swallowed, rinse mouth with water (only when the victim is conscious). Do not induce vomiting. In case of symptoms, seek medical care.

4.2. Most important symptoms and effects, both acute and delayed

The mixture causes serious eye irritation. Blue colouring of lips, nails and skin due to methemoglobinemia, if ingested in large quantities.

Note for medical practitioner: methemoglobinemia.

4.3. Indication on any immediate medical attention and special treatment needed

In case of clinical symptoms of methemoglobinemia, the medical personnel should immediately: administer 100% oxygen for breathing, 1 g of ascorbic acid intravenously. If a medical practitioner is present at the event, administer methylene blue in quantity of 10-50 ml.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media: Non-flammable product. Extinguish with the use of extinguishing media suitable for surrounding materials under fire.

Unsuitable extinguishing media: Do not use extinguishing foams and powders.

5.2. Special hazards arising from the mixture

Non-combustible mixture. In case of fertiliser fire, toxic decomposition product may be produced i.e. nitrogen oxides (NO_x), ammonia (NH₃), carbon dioxide (CO₂). Avoid spilling fertilizer on flammable materials, e.g. straw, hay, wood wool, lubricants, paper, wood, etc. If the solution is spilled onto such materials, rinse thoroughly with water.

5.3. Advice for firefighters

No special advices. Wear protective clothing and self-contained breathing apparatus. Extinguish fire keeping a safe distance. Use water to keep the places at risk of fire spread cool.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear suitable protective clothing (SECTION 8 Exposure control/ personal protection).

6.2. Environmental precautions

Prevent entry to surface and ground waters.

6.3. Methods and materials for containment and cleaning up

Minor spill: pump down the product and place in a dedicated labelled waste container. Clean any contaminated surfaces with plenty of water.

Major spill: pump down the product and place in a dedicated labelled waste container. Dispose for recovery. Clean any contaminated surfaces with plenty of water. If spilled substance or mixture enters the ground waters, notify the local authorities.

6.4. Reference to other sections

See SECTION 8 and SECTION 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Use under relevant ventilation conditions.

Environmental exposure controls: see SECTION 8.

7.2. Conditions for safe storage, including any incompatibilities

Storage The urea - ammonium nitrate solution should be stored in closed containers with venting, made of steel, plastics or duly protected concrete. Non-ferrous metals or their alloys are not permitted. Pumps and pipelines via which the urea-ammonium nitrate solution is transported, should be made of materials resistant to its effect e.g. from enamel, steel or plastics. The containers should be labelled with inscription with the product name. Each warehouse point should be equipped with user's manual for warehouse devices. The urea-ammonium nitrate solution should be stored in temperature above the crystallisation temperature (-17°C) for 28N type, (-9°C) for 30N type and 0°C for 32 N type.

7.3. Specific end use(s)

RSM[®] - urea-ammonium nitrate solution is used in agriculture as a fertiliser.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

WEL - not applicable

Derived No-Effect Levels (DNELs) - employees			
Ammonium nitrate	<u>Long-term systemic effect:</u>		
	<i>Dermal</i>	5.12	mg/kg bw/d
	<i>Inhalation</i>	36	mg/m ³
Urea	<u>Acute systemic effect:</u>		
	<i>Dermal</i>	580	mg/kg bw/d
	<i>Inhalation</i>	292	mg/m ³
	<u>Long-term systemic effect:</u>		
	<i>Dermal</i>	580	mg/kg bw/d
	<i>Inhalation</i>	292	mg/m ³
Derived No-Effect Levels (DNELs) - general population			
Ammonium nitrate	<u>Long-term systemic effect:</u>		
	<i>Dermal</i>	2.56	mg/kg bw/d
	<i>Inhalation</i>	8.9	mg/m ³
	<i>Oral</i>	2.56	mg/kg bw/d
Urea	<u>Acute systemic effect:</u>		
	<i>Dermal</i>	580	mg/kg bw/d
	<i>Inhalation</i>	125	mg/m ³
	<i>Oral</i>	42	mg/kg bw/d
	<u>Long-term systemic effect:</u>		
	<i>Dermal</i>	580	mg/kg bw/d
	<i>Inhalation</i>	292	mg/m ³
	<i>Oral</i>	42	mg/kg bw/d

Predicted No-Effect Concentration (PNEC)	Ammonium nitrate	Urea
Freshwater	- mg/l	0.47 mg/l
Saltwater	- mg/l	0.047 mg/l
Sewage treatment plant	18.0 mg/l	- mg/l

8.2. Exposure controls

Technical controls:

Not required. Applying good ventilation is a good industrial practice.

Individual protection measures:

Do not eat, drink or smoke when using the product. Wash hands after using the product, before meal, smoking, using toilette and at the end of the day.



EYE/FACE PROTECTION



Wear face protection or protective glasses. The equipment must meet the requirements of EN 166 standard.



HAND PROTECTION

Wear protective gloves.



SKIN/BODY PROTECTION

Wear protective clothing. Wear safety shoes.



RESPIRATORY PROTECTION

In case of dust, wear respiratory protective equipment in a form of filtering respirator. The equipment must meet the requirements of EN 149 standard.

GENERAL INDUSTRIAL HYGIENE PRINCIPLES

Avoid contact with eyes. Ensure that an eye washer is located near the work station.



HYGIENE PRODUCTS

Do not eat, drink or smoke when using the product. Take off contaminated clothing immediately. Wash hands before the break and immediately after finishing work with the product.

Environmental exposure control: In case of high exposure, personal protection measures are recommended. Suitable personal protection equipment should be selected depending on exposure level.

In case of release of a substance to surface and ground water, notify the applicable authorities.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

<i>Appearance:</i>		Transparent liquid of yellow colour
<i>Odour:</i>		Weak odour of ammonia
<i>Odour threshold</i>		For ammonia: 0.4-40 mg/m ³
<i>pH:</i>		6,5-7,5
<i>Melting/solidification point</i>		RSM [®] 32N: 0 °C
<i>Initial boiling point/Boiling range:</i>		>100 °C
<i>Flash point:</i>		Not applicable (non-flammable mixture)
<i>Evaporation rate:</i>		No data
<i>Flammability (solid, gas):</i>		Non-flammable
<i>Flammability limits or explosion limits:</i>	lower	Not applicable (non-flammable mixture)
	upper	Not applicable (non-flammable mixture)
<i>Vapour pressure:</i>		-2.0 kPa (in temperature of 20 °C)
<i>Vapour density:</i>		1,8
<i>Relative density depending on concentration (water=1):</i>		RSM [®] 32 N - 1.32
<i>Solubility:</i>		Unlimited
<i>Log K_{OW}</i>		No data
<i>Auto-ignition temperature:</i>		Not applicable (non-flammable mixture)
<i>Decomposition temperature:</i>		Not applicable
<i>Viscosity:</i>		No data
<i>Explosive properties:</i>		Non-explosive mixture
<i>Oxidising properties:</i>		Non-oxidising mixture

9.2. Other information

None.

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

The mixture demonstrates low chemical reactivity in standard conditions (temperature = 20°C; p = 1013 hPa).

10.2. Chemical stability

The mixture is stable in standard use conditions (temperature = 20°C; p = 1013 hPa).

10.3. Possible hazardous reactions

Urea contained in the mixture reacts with calcium hypochlorite or sodium hypochlorite forming an explosive nitrogen trichloride.

10.4. Conditions to avoid

Avoid temperatures below solidification point.

10.5. Incompatible materials

Acids, alkalis, reducers.

10.6. Hazardous decomposition products

Ammonia (NH₃), nitrogen oxides (NO_x), carbon dioxide (CO₂).

SECTION 11: TOXICOLOGICAL INFORMATION

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

Bioaccumulative potential

Skin penetration

Acute toxicity (for hazardous agent)	Ingredient name	Route	Species	Effect
	Ammonium	Inhalation (30 minutes)	-	Not applicable
	Nitrate	Swallowing	Rat	LD50>2000 mg/kg
	(100%)	Skin contact	Rat	LD50>5000 mg/kg

Corrosive/
irritating to skin

The mixture ingredients causes skin irritation

Serious eye damage/
eye irritation

The mixture causes serious eye irritation.

Sensitising
to respiratory tracts or skin

No sensitising effect of mixture according to available information.

Germ cells
mutagenicity

No mutagenic effect of mixture according to available information.

Carcinogenicity

No carcinogenic effect of mixture according to available information.

Reproductive
toxicity

No embryotoxic effect of mixture according to available information.

STOT
- single exposure

No target organ toxicity at single exposure observed.

STOT
- repeated exposure

No target organ toxicity at repeated exposure observed.

Aspiration hazards

No harmful effect of mixture according to available information, if aspired.

Symptoms related to physical, chemical and toxicological characteristics

Inhalation:

In standard storage and manipulation conditions, the mixture is stable and its ingredients are volatile. In high temperature, ammonia released from the product may cause irritation of nasal and eye mucous membranes.

Ingestion:

Swallowing of high amounts of RSM[®] solution may cause gastro-intestinal disorders and in extreme cases (in particular in small children) result in vomiting, diarrhoea, formation of methemoglobin and cyanosis.

Skin contact:

Frequent and prolonged skin contact may cause temporary skin irritation.

Eye Contact:

May cause irritations, redness and pain in the eye.

Delayed, immediate and chronic effects from short- and long-term exposure

Blue colouring of lips, nails and skin due to methemoglobinemia in several hours after intoxication by ingestion.

11.2. Information on other hazards

Not applicable.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Water

Acute toxicity (hazardous agent - ammonium nitrate):

Fish LC50/48h: *Cyprinus carpio*: 447 mg/l

Crustaceans EC50/24h/48h: *Daphnia magna*: 490 mg/l

Algae EC50/10d KNO₃ algae test: numerous benthic algae > 1700 mg/l

Terrestrial environment

Nitrate absorbed by the plants is reduced to nitrite by nitrate reductase enzyme. This enzyme is present in plants, certain bacteria species and digestive tissues of mammals. Nitrate will be reduced in case of photosynthesis and synthesis of carbohydrates. In draught, frost or shadow conditions, or absence of other nutrients, the process of photosynthesis and protein synthesis is reduced. In such case, the nitrate will continue to be absorbed and deposited in plant tissues.

Sewage treatment plant

EC50/180min NaNO₃ active sediment, household > 1000 mg/l

EC10/180min NaNO₃ active sediment, household 180 mg/l

12.2. Persistence and degradability

Persistence / Abiotic degradation

Ammonium nitrate is completely soluble in water. Other information is not required/available.

Biodegradation

No testing is needed since the substance is inorganic (Annex VII, REACH). In addition, in process of anaerobic ammonium transformation, one group of bacteria oxidises ammonium to nitrite, while the other one oxidises nitrite to nitrate. An average biodegradation rate in sewage treatment plants in temperature of 20°C is 52 g N/kg of dissolved substance/day. Decomposition of nitrate is more rapid in anaerobic conditions. During anaerobic transformation of nitrate to N₂, N₂O and NH₃, the biodegradation rate in sewage treatment plants in temperature of 20°C is 70 g N/kg of dissolved substance/day.

12.3. Bioaccumulative potential

In aquatic environment:

Simple inorganic salts highly soluble in water are present in dissociated form in water solution. Such substances have low bioaccumulability.

In soil:

As in the case of bioaccumulation in aquatic environment, bioaccumulability in terrestrial organisms is also assessed as low.

12.4. Mobility in soil

Simple inorganic soils highly soluble in water will be present in dissociated form in water solution, thus they will be of low absorption potential.

The nitrate is not bound in soil and will be transferred with water, and therefore if soil is watered with greater amount of water that it is able to absorb, it can be washed out. This is possible primarily in late autumn, winter and early spring.

12.5. Results of PBT and vPvB assessment

Pursuant to Annex XIII of the Regulation (EC) No.1907/2006, the assessment of criteria properties - persistence, bioaccumulation and toxicity (PBT) and very persistent and very bioaccumulative (vPvB) criteria was not performed, since ammonium nitrate is inorganic compound.

12.6. Endocrine disrupting properties

Not applicable.

12.7. Other adverse effects

High level of nitrates in waters results in rapid algae growth and reduced content of oxygen in water (eutrophication).

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Product information

Waste collection and processing shall comply with the local and national provisions on waste management. The selection of relevant waste treatment/recovery depends on local conditions and capacity of treatment/recovery. Waste is classified as non-hazardous -pursuant to the Ordinance of the Minister of Climate of 2nd January 2020 on waste catalogue (Journal of Laws of 2020, item 10).

The collected product, if possible, should be primarily returned for re-use as fertiliser. The remain product being waste should be disposed to the authorised waste collection entities, primarily for recovery. Do not dispose product into aquatic environment. Diluted solutions can be transferred to sewage treatment plants capable of nitrogen compound disposal.

Used empty 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, Poviast Starost's Office). It is recommended to transfer waste to the closest 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 EU of 2008, Volume 51, L312, as amended).
2. The Act of 14 December 2012 on waste (consolidated text in Journal of Laws of 2020, item 797, as amended) together with executive acts.
3. Act of 13 June 2013 on the management of packaging and packaging waste (consolidated text in Journal of Laws of 2020, item 1114, as amended) together with executive acts.

SECTION 14: TRANSPORT INFORMATION

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 users

Not applicable.

14.7. Maritime transport in bulk according to IMO instrument

Not applicable.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or 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 EU of 2006, vol. 49, L396 as amended)

Urea contained in the product is listed in Annex XIV to the REACH and therefore **is not subject to authorisation**.

Urea contained in the product is **not subject to restrictions** pursuant to Annex XVII to the REACH.

Nitrate contained in the product is listed in Annex XIV to the REACH and therefore **is not subject to authorisation**.

Ammonium nitrate contained in the product is **subject to restrictions** pursuant to Annex XVII to the REACH (item 58).

Ammonium nitrate:

- shall not be placed on the market for the first time after 27 June 2010 as a substance, or in mixtures that contain more than 28 % by weight of nitrogen in relation to ammonium nitrate, for use as a solid fertiliser, straight or compound, unless the fertiliser complies with the technical provisions for ammonium nitrate fertilisers of high nitrogen content set out in Annex III to Regulation (EC) No 2003/2003 of the European Parliament and of the Council.
2. Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on the classification, labelling 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 EU of 2008, Volume 51, L 353, as amended)
 3. REGULATION (EU) 2019/1148 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 June 2019 on the marketing and use of explosives precursors, amending Regulation (EC) No 1907/2006 and repealing Regulation (EU) No 98/2013) (OJ EU, L 186, 11 July 2019 as amended)

Ammonium nitrate is listed in Annex II, therefore any suspicious transactions and their attempts, losses and thefts should be reported to the National Contact Point.

4. Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC (SEVESO III) (OJ EU, L 197, 24 July 2012)

Ammonium nitrate is listed in Annex I, part 2, therefore, having qualifying quantities may qualify establishment for a 'lower-tier establishment or 'upper-tier establishment' of major accident hazard.

National

Local regulations

15.2. Chemical safety assessment

No chemical safety assessment was performed for the mixture. Safety report for ammonium nitrate was prepared.

SECTION 16: OTHER INFORMATION

16.1. Implemented amendments

Compliant with REACH and CLP.

16.2. Legend to abbreviations and acronyms

CLP	Classification, labelling and packaging of chemical substances and mixtures
PBT	Persistent, bioaccumulative and toxic
vPvB	very persistent and very bioaccumulative
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	Number assigned to a substance by Chemical Abstracts Service
WEL	Maximum permissible concentrations
DNEL	Derived no-effect level

LCx	Lethal concentration x%
ECx	Effective concentration inhibiting growth of studied population x%
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
UN	United Nations Organization (UN)
RID	Regulations on carriage of dangerous goods to the Convention concerning International Carriage by Rail
ADR	International convention concerning the International Carriage of Dangerous Goods by Road

16.3. Key literature and data sources

Registration dossier of ammonium nitrate.

16.4. Trainings

1. Employer is obliged to inform all employees who are in contact with the fertiliser about the hazards and personal protection measures specified herein.
2. The distributor is obliged to provide the RSM[®] recipient with information contained herein.

16.5. Replaces

RSM[®] Safety Data Sheet No.: PZ-038-02-01.3

This Safety Data Sheet IS NOT a quality specification of the product and CANNOT BE treated as guarantee of its quality or compliance with customer requirements for individual uses. Its task is to provide guidance in the safe handling of the mixture (work safety and environmental protection), its transport and storage. Data provided in this safety data sheet are based on our best knowledge and legal regulations currently in force. Recipients should ensure that this information complies with the laws and/or regulations that apply in their countries and/or enterprises.