

MATERIAL SAFETY DATA SHEET:

RSM[®]S (UREA AMMONIUM NITRATE SOLUTION WITH SULPHUR)

In compliance with Regulation (EC) No. 1907/2006 with further amendments.



P U Ł A W Y

Version: 2.1.

Creation date: 16.07.2013

Update: 14.02.2019

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING	
1.1. Product identifier	
Commercial product name	RSM [®] S - urea ammonium nitrate solution with sulphur
1.2. Relevant identified uses of the substance or mixture and uses advised against	
Urea ammonium nitrate solution with sulphur is used as a mineral fertiliser in agriculture.	
1.3. Details of the supplier of the safety data sheet	
Company name	Grupa Azoty Zakłady Azotowe „Puławy” S.A.
Company address	Al. Tysiąclecia Państwa Polskiego 13; 24-110 Puławy; Poland
Company telephone number	+48 (81) 886 34 31; +48 (81) 565 30 00 fax.: +48 (81) 565 28 56
E-mail	dyspozytor.zap@grupazoty.com
1.4. Emergency telephone number	
Company shift dispatcher: + 48 (81) 565 23 00 (24 hours / 7 days a week) Emergency telephone number: 112	
SECTION 2. HAZARDS IDENTIFICATION	
2.1. Classification of the substance or mixture	
Classification according to Regulation (EC) 1272/2008	
Hazard Class and Category Code(s)	The mixture is not classified as hazardous.
Hazard statement(s)	Not relevant.
Environmental hazards	
Product is not classified as hazardous for natural environment.	
Health hazards	
Skin contact	Prolonged contact with skin may cause redness.
Eye contact	Ammonium nitrate irritates the eyes, causes eye redness and eye pain.
Ingestion	Ingestion of large amounts of RSM [®] S solution may cause gastro - intestinal disturbances, which in extreme cases may lead to vomiting, diarrhea, methemoglobin creation and thus cyanosis may occur.
Inhalation	No risk at room temperature. Ammonia gas liberates from this product at high temperatures and may lead to irritation of mucous membranes of nose and eyes.
Long term effects	Within a few hours after poisoning by ingestion, the following symptoms of methemoglobinemia may occur:

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	<ul style="list-style-type: none">- headache and dizziness,- nausea and vomiting,- psycho-motor agitation, anxiety and stupefaction,- weakness, exhaustion and physical effort intolerance,- dyspnoea,- chest pain,- sleepiness,- fainting,- cardiac dysrhythmia,- cyanosis.																								
Adverse physicochemical effects	Not dangerous due to its physicochemical properties.																								
2.2. Label elements																									
Hazard pictogram(s)	Not relevant.																								
Signal Word	Not relevant.																								
Hazard statement(s)	Not relevant.																								
Precautionary statement(s)	Not relevant.																								
2.3. Other hazards																									
None of the components of the mixture is classified as PBT or vPvB.																									
SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS																									
3.1. Substance																									
Not relevant.																									
3.2. Mixtures																									
Product identifier	RSM [®] S - urea ammonium nitrate solution with sulphur.																								
Classification in accordance with Regulation (EC) 1272/2008																									
<table border="1"><thead><tr><th>Chemical name</th><th>Concentration</th><th>EC Number</th><th>Registration number</th><th>Hazard Class and Category Code(s)</th><th>Hazard statement(s)</th></tr></thead><tbody><tr><td>Ammonium nitrate (V)</td><td>23%</td><td>229-347-8</td><td>01-2119490981-27-0025</td><td>Oxid. Solid 3 Eye Irrit. 2</td><td>H272 H319</td></tr><tr><td>Urea</td><td>33%</td><td>200-315-5</td><td>01-2119463277-33-0025</td><td>Not relevant</td><td>Not relevant</td></tr><tr><td>Ammonium sulphate (VI)</td><td>13%</td><td>7783-20-2</td><td>01-2119455044-46-0011</td><td>Not relevant</td><td>Not relevant</td></tr></tbody></table>	Chemical name	Concentration	EC Number	Registration number	Hazard Class and Category Code(s)	Hazard statement(s)	Ammonium nitrate (V)	23%	229-347-8	01-2119490981-27-0025	Oxid. Solid 3 Eye Irrit. 2	H272 H319	Urea	33%	200-315-5	01-2119463277-33-0025	Not relevant	Not relevant	Ammonium sulphate (VI)	13%	7783-20-2	01-2119455044-46-0011	Not relevant	Not relevant	
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<i>Full text of Hazard statements mentioned in this Section are listed in Section 16.</i>																									
SECTION 4. FIRST AID MEASURES																									
4.1. Description of first aid measures																									

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General	Provide sufficient general ventilation. Installation of safety showers and eyewash stations is recommended at workplace.
Inhalation	Remove victim from the area of exposure to fresh air. Obtain medical attention if symptoms of poisoning occur.
Ingestion	If swallowed, give plenty of water to drink. Do not induce vomiting. Ingestion of small amount of RSM®S solution usually does not cause intoxication. Swallowing larger amounts of this fertiliser can cause gastro - intestinal disturbances and methemoglobin creation. In some cases low blood pressure is also observed. Obtain medical attention.
Skin contact	Remove contaminated clothing and shoes. Wash contaminated skin with plenty of water. Get medical advice if symptoms of irritation occur.
Eye contact	Flush eyes with plenty of water for about 15 minutes. Avoid strong water stream due to the risk of mechanical damage to cornea. Obtain medical assistance.
4.2. Most important symptoms and effects, both acute and delayed	
In the event of intake by ingestion, methemoglobinemia may occur with the following symptoms: headache, pressure drop, cardiac arrhythmias, dyspnoea and weakness. When 15% of hemoglobin converts to methemoglobin, cyanosis may occur.	
4.3. Indication of any immediate medical attention and special treatment needed	
Medical personnel ought to diagnose and possibly introduce treatment for methemoglobinemia.	
SECTION 5. FIREFIGHTING MEASURES	
5.1. Extinguishing media	
Suitable extinguishing media	Not flammable mixture. In case of fire use extinguishing media appropriate to the material on fire.
Unsuitable extinguishing media	Do not use foam and dry chemical extinguishers.
5.2. Special hazards arising from the substance or mixture	
Not flammable mixture. In case of fire, the fertiliser may produce hazardous decomposition products such as nitrogen oxides NO _x , ammonia (NH ₃), carbon dioxide (CO ₂) and sulphur oxide SO ₂ . Avoid spill on combustible materials e.g. straw, hay, excelsior, grease, paper, wood, etc. In case of spillage on such materials, flush them intensively with water.	
5.3. Advice for firefighters	
Wear protective clothing and self-contained breathing apparatus. Put out the fire from a safe distance. Cool area with water to prevent fire spreading.	
SECTION 6. ACCIDENTAL RELEASE MEASURES	
6.1. Personal precautions, protective equipment and emergency procedures	
For non-emergency personnel	

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Suitable protective equipment	Depending on exposure route wear: <ul style="list-style-type: none">• clothing according to PN-EN ISO13688-12 standard,• non-permeable protective gloves according to EN 374 and EN 388 standards,• protective glasses or goggles according to EN 166 standard.
Emergency procedures	Not relevant.
For emergency responders	
Wear protective clothing, protective gloves, protective goggles.	
6.2. Environmental precautions	
Avoid contamination of drains and watercourses with large amounts of the product. In case of large spillage inform appropriate authorities. Dispose in accordance with national and local environmental regulations.	
6.3. Methods and material for containment and cleaning up	
Recommendations for preventing the spread of the spill and its elimination	Small leak: Rinse thoroughly with plenty of water. Large leak: Absorb with non - combustible absorbing agent, then sweep it up and place in appropriate waste containers for further utilization. In case of leakage from storage containers, neutralize affected areas and dilute the spill by intense watering.
6.4. Reference to other sections	
<i>Note: see section 8 for personal protective equipment and section 13 for waste disposal.</i>	
SECTION 7. HANDLING AND STORAGE	
7.1. Precautions for safe handling	
Stable and non-volatile mixture if stored under normal ambient conditions. Handle with care in accordance with good industrial hygiene and safety practice (wear suitable protective gloves). Avoid inhalation of vapours, contamination of skin and eyes. Protect from high temperatures.	
7.2. Conditions for safe storage, including any incompatibilities	
RSM®S solution should be stored in tightly closed tanks/containers equipped with venting. Tanks/containers with the product should be made of steel or plastic or concrete properly protected against leakages. Non-ferrous metals and their alloys are forbidden. Pumps and pipelines used for transportation of RSM®S should be made of product resistant materials i.e.: steel or polymers. Tanks/containers with RSM®S solution should be clearly labeled to indicate contents. Every storage area should be equipped with relevant instruction manuals. Storage temperature of RSM®S solution should be higher than its crystallization temperature i.e. (-7)°C. Water, which can evaporate during long-term storage, must be completed to its original level.	
<i>Note: See section 9 for chemical and physical properties.</i>	
7.3. Specific end use(s)	
Not relevant.	
SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION	

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8.1. Control parameters		
Indicative occupational exposure limit values	Not established	
Biological limit values	Not established	
DNEL: Ammonium nitrate (for workers)		
Chronic toxicity; systemic effects	Exposure route: dermal	DNEL: 21.3 mg/kg bw./day
Chronic toxicity; systemic effects	Exposure route: inhalation	DNEL: 37.6 mg/m ³
DNEL: Urea (for workers)		
Acute toxicity; systemic effects	Exposure route: dermal	DNEL: 580 mg/kg bw./day
Acute toxicity; systemic effects	Exposure route: inhalation	DNEL: 292 mg/m ³
Chronic toxicity; systemic effects	Exposure route: dermal	DNEL: 580 mg/kg bw./day
Chronic toxicity; systemic effects	Exposure route: inhalation	DNEL: 292 mg/m ³
DNEL: Ammonium sulphate (for workers)		
Chronic toxicity; systemic effects	Exposure route: dermal	DNEL: 42.667 mg/kg bw./day
Chronic toxicity; systemic effects	Exposure route: inhalation	DNEL: 11.167 mg/m ³
PNEC: Ammonium nitrate		
Freshwater	0.45 mg/l	
Marine water	0.45 mg/l	
Accidental release	4.5 mg/l	
STP	18 mg/l	
PNEC: Urea		
Freshwater	0.047 mg/l	
PNEC: Ammonium sulphate		

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Freshwater	0.312 mg/l
Marine water	0.0312 mg/l
Soil	62.6 mg/kg of soil
Sediment	0.063 mg/kg of soil
STP	16.18 mg/l

8.2. Exposure controls

Engineering measures	Provide general ventilation.
Eye protection	Wear protective glasses or protective goggles according to EN 166 standard.
Skin protection	Wear clothing according to PN-EN ISO 13688-12 standard.
Hand protection	Wear non-permeable protective gloves according to EN 374 and EN 388 standards.
Respiratory system protection	Not required.
Thermal hazards	Not known.
Environmental exposure controls	Protect against contamination of municipal water and sewer systems, watercourses and drains with large amount of the product.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Brownish-green liquid
Odour	Slight odour of ammonia
Odour threshold	For ammonia: 0.4-40 mg/m ³
pH	7 - 9
Melting point/freezing point	(-7)°C
Initial boiling point and boiling range	110°C
Flash point	Not relevant (non-flammable mixture)
Evaporation rate	No data
Flammability	Non-flammable
Upper/lower explosion limits	Not relevant (non-explosive mixture)
Vapour pressure	-2,0 kPa (at 20°C)
Vapour density (air = 1)	No data

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Relative density	1.28 (water = 1)
Solubility	Unlimited in water
Partition coefficient: n-octanol/water	No data
Auto-ignition temperature	Not relevant (non-flammable mixture)
Decomposition temperature	Not relevant
Viscosity	No data
Explosive properties	Non-explosive mixture
Oxidising properties	No oxidising properties
9.2. Other information	
Not relevant.	
SECTION 10. STABILITY AND REACTIVITY	
10.1. Reactivity	
Mixture is characterized by a low chemical reactivity under normal ambient conditions (p = 1013 hPa; T=20°C).	
10.2. Chemical stability	
Stable under normal ambient conditions (p = 1013 hPa; T=20°C).	
10.3. Possibility of hazardous reactions	
Urea contained in this mixture may react with calcium or sodium hypochlorite to produce explosive nitrogen trichloride.	
10.4. Conditions to avoid	
Temperatures lower than crystallization temperature.	
10.5. Incompatible materials	
Acids, bases and reducing agents. Avoid spill on combustible materials e.g. straw, hay (except spraying stubbles), excelsior, grease, paper, wood, etc.	
10.6. Hazardous decomposition products	
Nitrogen oxides (NO _x), ammonia (NH ₃), carbon dioxide (CO ₂), sulphur oxides (SO _x).	
SECTION 11. TOXICOLOGICAL INFORMATION	
11.1. Information on toxicological effects	

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Acute toxicity	<table border="1"> <thead> <tr> <th>Ingredient name</th> <th>Route</th> <th>Specie(s)</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Ammonium nitrate (100%)</td> <td>Ingestion</td> <td>rat</td> <td>LD₅₀ > 2000 mg/kg</td> </tr> <tr> <td>Skin contact</td> <td>rat</td> <td>LD₅₀ > 5000 mg/kg</td> </tr> </tbody> </table>	Ingredient name	Route	Specie(s)	Result	Ammonium nitrate (100%)	Ingestion	rat	LD ₅₀ > 2000 mg/kg	Skin contact	rat	LD ₅₀ > 5000 mg/kg
	Ingredient name	Route	Specie(s)	Result								
	Ammonium nitrate (100%)	Ingestion	rat	LD ₅₀ > 2000 mg/kg								
Skin contact		rat	LD ₅₀ > 5000 mg/kg									
Skin corrosion/irritation	Components of the mixture do not cause skin irritation.											
Serious eye damage/irritation	Mixture does not cause eye irritation.											
Respiratory or skin sensitisation	No respiratory or skin sensitization.											
Germ cell mutagenicity	There is no evidence for genotoxicity.											
Carcinogenicity	There is no evidence for carcinogenicity.											
Reproductive toxicity	There is no evidence for reproductive toxicity.											
STOT (<i>Specific target organ Toxicity</i>) - single exposure	Not observed.											
STOT-repeated exposure	Not observed.											
Aspiration hazard	There is no evidence for aspiration hazards.											
Symptoms related to the physical, chemical and toxicological characteristics												
Inhalation	Stable and non-volatile mixture if stored and handled under normal ambient conditions. Ammonia gas liberates from this product at high temperatures and may lead to irritation of mucous membranes of nose and eyes.											
Ingestion	Ingestion of large amounts of RSM®S solution may cause gastro - intestinal disturbances. In extreme cases (especially in kids) these observed gastro - intestinal disturbances may lead to vomiting, diarrhea, methemoglobin creation and thus cyanosis may occur.											
Skin contact	Prolonged and repeated contact with skin may cause temporary irritation.											
Eye contact	May causes eye irritation. Eye redness and eye pain may occur.											
Delayed and immediate effects as well as chronic effects from short and long-term exposure												
In the event of intake by ingestion, methemoglobinemia may occur with the following symptoms: headache, pressure drop, cardiac arrhythmias, dyspnoea and weakness. When 15% of hemoglobin converts to methemoglobin, cyanosis may occur.												
SECTION 12. ECOLOGICAL INFORMATION												
12.1.Toxicity												

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Acute toxicity							
<table border="1"><thead><tr><th>Ingredient name</th><th>Test</th><th>Result</th></tr></thead><tbody><tr><td>Ammonium nitrate (V) (100%)</td><td>Freshwater fish</td><td>LC₅₀ (48 h): 447 mg/l</td></tr></tbody></table>	Ingredient name	Test	Result	Ammonium nitrate (V) (100%)	Freshwater fish	LC ₅₀ (48 h): 447 mg/l	
Ingredient name	Test	Result					
Ammonium nitrate (V) (100%)	Freshwater fish	LC ₅₀ (48 h): 447 mg/l					
12.2. Persistence and degradability							
In accordance with the Regulation (EC) No. 1907/2006 biodegradability of ammonium nitrate and ammonium sulphate need not be tested (inorganic chemical). Urea is a stable substance in its aqueous solution. Compound does not hydrolyze in presence of water and is easily biodegradable.							
12.3. Bioaccumulative potential							
Product does not have any bioaccumulative properties.							
12.4. Mobility in soil							
Based on its physico-chemical properties the product is expected to have mobility in soil.							
12.5. Results of PBT and vPvB assessment							
None of the components of the mixture is classified as PBT or vPvB.							
12.6. Other adverse effects							
High concentration of nitrates in water promotes algae growth and lowers oxygen levels in water (eutrophication).							
SECTION 13. DISPOSAL CONSIDERATIONS							
13.1. Waste treatment methods							
Waste treatment methods	Reuse as a mineral fertiliser or give it away for further disposal. Avoid disposal into drains and sewers.						
Package waste disposal	Empty containers must be handed over to a licensed waste disposal contractor.						
Waste code	02 01 09 - Agrochemical waste other than those mentioned in 02 01 08*						
Special precautions	See Section 7 for more details.						
Relevant Community provisions	The disposal of this product and its packaging after use must conform to the requirements of environment protection and regulations referring to waste disposal as well as the requirements of local authorities.						
SECTION 14. TRANSPORT INFORMATION							
14.1. UN number							
Not relevant.							
14.2. UN proper shipping name							

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Not relevant.	
14.3. Transport hazard class(es)	
Not relevant.	
14.4. Packing group	
Not relevant.	
14.5. Environmental hazards	
See section 12.	
14.6. Special precautions for user	
Follow rules and guidelines of the traffic code.	
14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code	
Product name	Not applicable.
Ship type	Not applicable.
Pollution Category	Not applicable.
SECTION 15. REGULATORY INFORMATION	
15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture	
Authorisations	
None of the components of this mixture is subject to authorisation according to Annex XIV of Regulation (EC) No. 1907/2006.	
Restrictions	
Ammonium nitrate is subject to following restrictions on the manufacture, placing on the market and use according to Annex XVII of EC Regulation No. 1907/2006:	
<ol style="list-style-type: none">1. 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. Shall not be placed on the market after 27 June 2010 as a substance, or in mixtures that contain 16% or more by weight of nitrogen in relation to ammonium nitrate except for supply to:<ol style="list-style-type: none">a) downstream users and distributors, including natural or legal persons licensed or authorised in accordance with Council Directive 93/15/EEC;b) farmers for use in agricultural activities, either full time or part time and not necessarily related to the size of the land area.	
For the purposes of this subparagraph:	
<ol style="list-style-type: none">(i) 'farmer' shall mean a natural or legal person, or a group of natural or legal persons, whatever legal status is granted to the group and its members by national law, whose holding is situated within Community territory, as referred to in Article 299 of the Treaty, and who exercises an agricultural activity;	

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<p>(ii) 'agricultural activity' shall mean the production, rearing or growing of agricultural products including harvesting, milking, breeding animals and keeping animals for farming purposes, or maintaining the land in good agricultural and environmental condition as established under Article 5 of Council Regulation (EC) No 1782/2003;</p> <p>c) natural or legal persons engaged in professional activities such as horticulture, plant growing in greenhouses, maintenance of parks, gardens or sport pitches, forestry or other similar activities.</p> <p>3. However, for the restrictions in paragraph 2, Member States may until 1 July 2014, for socioeconomic reasons, apply a limit of up to 20% by weight of nitrogen in relation to ammonium nitrate for substances and mixtures placed on the market within their territories. They shall inform the Commission and other Member States thereof.</p>	
Other UE regulations	
<p>Product is in compliance with Regulation (EC) No 2003/2003 relating to fertilisers and is placed on the market as a fertiliser. RSM®S is designated as a EC Fertiliser.</p> <p>Ammonium nitrate is listed in Part 1 of Annex I to the Regulation (EU) 2012/18 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 (also known as the Seveso III Directive).</p> <p>Ammonium nitrate is listed in Annex II to the Regulation (EU) No 98/2013 on the marketing and use of explosives precursors.</p>	
15.2. Chemical safety assessment	
<p>Grupa Azoty Zakłady Azotowe „Puławy” S.A. conducted a relevant chemical safety assessment for all components of the mixture.</p>	
SECTION 16. OTHER INFORMATION	
Changes made	Section 1, Section 2, Section 4, Section 11.
Classification of RSM®S is based on classification of the mixture ingredients.	
Legend to abbreviations and acronyms: EC number - is the seven-digit code that is assigned to chemical substances that are commercially available within the European Union. DNEL - is the level of exposure to a substance above which humans should not be exposed. PNEC - is the concentration below which exposure to a substance is not expected to cause adverse effects for environmental. LC ₅₀ - in toxicology, the median lethal dose, LD ₅₀ (abbreviation for “Lethal Dose, 50%”), LC ₅₀ (Lethal Concentration, 50%) of a toxic substance or radiation is the dose required to kill half the members of a tested population after a specified test duration. LD ₅₀ - in toxicology, lethal dose (LD) is an indication of the lethality of a given chemical substance. It represents the amount of a material, which results in death of 50% of a group of test animals. Log K _{O/W} - is defined as the ratio of the molar concentrations of a chemical in n-octanol and water, in dilute solution.	
References	Chemical Safety Report for ammonium nitrate. Chemical Safety Report for urea. Ostra methemoglobinemia - przyczyny, objawy i leczenie /Acute

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	methemoglobinemia - causes, symptoms and medical treatment/ - Tomasz Janus, Jacek Piechocki, Anna Janus, /Anestezjologia i Ratownictwo Anaesthesiology and Medical Rescue/ 2015; 9: 327-333.
Instruction	Persons involved in product turnover should be trained in handling of the product and have appropriate training in occupational health and safety.
Hazard statements referred to under headings 2 - 15	
H272 - May intensify fire; oxidiser. H319 - Causes serious eye irritation.	
NOTE: <i>The information in this Safety Data Sheet is given in good faith and belief in its accuracy based on our knowledge of the substance/mixture concerned at the date of publication. It does not imply the acceptance of any legal liability or just responsibility whatsoever by the Company for the consequences of its use or misuse in any particular circumstances.</i>	