In accordance with Regulation (EC) 1907/2006 (REACH), Annex II and all relevant Amendments

Urea - Ammonium nitrate

Version 7 / 2019

1. COMPANY AND PRODUCT / MIXTURE IDENTIFICATIONS	
1.1 Product identifier	
Trade name:	Urea Ammonium Nitrate, solution (min 32% N)
Other names:	Liquid fertilizer Urea Ammonium Nitrate; Solution UAN 32-0-0; UAN 32% nitrogen
Chemical name:	Nitric acid Ammonium salt (1:1), mixture with Urea
INDEX number as listed in Table 3.1-Application VI in CLP:	Not listed. Mixture.
ID number of the C&L inventory:	Not classified. Mixture.
CAS number:	15978-77-5
REACH registration no(s):	01-2119490981-27-0027: Ammonium nitrate 01-2119463277-33-0014: Urea
1.2 Relevant identified uses of the mixture and uses advised against	
Uses:	<u>Uses by workers in industrial settings:</u> 1: Manufacturing of the substance, including handling, storage and quality control. 2: Sampling, loading, filling, transfer, dumping, bagging of substance (charging/discharging) at (non-)dedicated facilities. Industrial/professional settings. 3: Storage. 4: Transfer of substance into small containers (dedicated filling line, including weighing). Industrial/professional setting. 5: Quality control. <u>Uses by professional workers</u>: 6: Spraying. 10: Professional use as fertilizer – liquid fertigation at open field (non industrial spraying). 11: Professional use as fertilizer– liquid fertigation in the soil. 12: Professional use as fertilizer – greenhouse liquid fertigation in the soil. 16: Professional use as fertilizer – greenhouse liquid fertigation (non industrial spraying). <u>Uses by consumers</u>: 17: Consumer end use – fertilization at open field. 18: Consumer end use – indoor use of fertilizers.
Uses advised against:	None

1.3 Details of the supplier of the safety data sheet	
Manufacturer:	AGROPOLYCHIM AD BULGARIA Industrial zone 9160, DEVNYA Tel: +359 / 519 97 419 URL website: www.agropolychim.bg
Person responsible for the Safety Data Sheet (with e-mail address)	Miroslava Tsvetkova, dipl. eng. AGROPOLYCHIM AD, BULGARIA Industrial zone 9160, DEVNYA Tel.: +359 / 519 97 419, 553 Email: m.tsvetkova@agropolychim.bg
1.4 Emergency telephone number	
Emergency phone number in the company:	Tel: + 359 / 519 97 530 (24 hours / day)
Emergency phone number in Bulgaria – Toxicology Clinique "Pirogov" Medical Institute:	+ 359 / 2 91 54 346 (24 hours / day)

2. HAZARDS IDENTIFICATION

2.1 Classification of the mixture		
Classification in accordance with Regulation 1272/2008 (CLP): based on a Chapter 3.3.3.3 / CLP classification rule, and according principle and limit values settled down into Table 3.3.3. This mixture is not included in Table 3.1 of CLP. According Orange book (Transport of Dangerous Goods) – mixtures, containing AN under 70% are not classified as a hazard and are not under class 5.1 i.e. oxidizing mixtures.		
Hazard statement(s):	H319 – Serious eye irritation	Causes serious eye irritation: Cat.2
2.2 Label elements		
Labelling in accordance with Regulation 1272/2008 (CLP)		
Hazard pictogram(s):	GHS07	
Signal word	Warning	
Hazard statement(s):	H319	Cat.2 - Causes serious eye irritation.

Precautionary statement(s):	P210 P220 P264 P280 P305+P351+P338	Keep away from heat/ sparks/open flames/hot surfaces. — No smoking. Keep/Store away from clothing and combustible materials. Wash hands thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3 Other hazards

PBT/vPvB criteria:	According to Annex XIII of Regulation (EC) No 1907/2006, no PBT and vPvB assessment has been conducted since ammonium nitrate and urea are inorganic substances.
Other hazards:	Not known

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances/preparation:

According to the REACH Regulation the product is a mixture between Urea and Ammonium nitrate.

Chemical name	**CAS no.**	**EC no.**	**IUPAC name**	**% by weight**
Nitric acid ammonium salt	6484-52-2	229-347-8	Ammonium nitrate, (NH_4NO_3)	45,70 ± 1
Carbonyl di amide	57-13-6	200-315-5	Urea, $CO(NH_2)_2$	34,50 ± 1
Water				Up to 100%

Ingredients Classification:

Nitric acid ammonium salt	Cat.3 - May intensify fire; oxidiser.	H272
	Cat.2 - Causes serious eye irritation.	H319
Carbonyl dy amide	Not classified.	

4. FIRST-AID MEASURES

4.1 Description of first aid measures

Eye contact:	Immediately wash eyes with plenty of running water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Remove contact lenses if present and easy to do. Seek medical advice if irritation develops and persists.
Skin contact:	Wash affected skin area with plenty of water and soap for at least 15 minutes thoroughly while removing contaminated clothing and shoes. Seek medical advice if irritation develops and persists
Ingestion:	Seek medical advice if the victim feels unwell. Wash out mouth with plenty of water and give plenty of water to drink. Do not induce vomiting. Never give anything by mouth to an unconscious person. Seek medical advice if symptoms occur.

Inhalation:	Remove the victim from exposure into fresh air immediately if adverse effects (e.g. dizziness, drowsiness or respiratory irritation) occur. If not breathing, give artificial respiration or if breathing is difficult, give oxygen and seek medical advice. Do not use mouth-to-mouth respiration. Seek medical advice immediately when vapours are intensively inhaled.

4.2 Most important symptoms and effects

Acute effects	Eye irritation
Delayed effects	Not known

4.3 Indication of any immediate medical attention and special treatment needed

Note to physician: Methaemoglobinaemia.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable:	Non-combustible. Water.
Not suitable:	Combustible material.

5.2 Special hazards arising from the substance or mixture

May be explosive in contact with flammable or organic substances and at confinement during fire. In case of fire, may produce hazardous decomposition products such as nitrogen oxides (NO, NO2 etc.), ammonia (NH3), amines.

5.3 Advice for firefighters

No special measures required. In the event of fire, wear a self-contained breathing apparatus and a chemical protective suit.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid creating dusty conditions and prevent wind dispersal. Avoid contact with eyes, skin, and clothing. Use suitable protective equipment. Keep away from sources of ignition.

6.2 Environmental precautions

Prevent the material from contact with soil, entering surface water or sanitary sewer system. Do not discharge directly to a water source. If accidental spillage or washings enter drains or watercourses contact local authority.

6.3 Methods and material for containment and cleaning up

Vacuum or sweep up and place into suitable labelled containers for recovery or disposal. Clean up affected area with a large amount of water. Do not collect spilled material in sawdust or other combustible material. Prevent formation of dust clouds. Residual trace can be wiped away.

6.4 Reference to other sections

See section 8 for personal protective equipment and section 13 for waste disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Technical measures/ Precautions:	Use with adequate ventilation. Local exhaust ventilation should be provided. Avoid contact with eyes, skin and clothing. Avoid creating dusty conditions and prevent wind dispersal. Keep away from sources of ignition. Avoid contamination by any source including metals, dust and organic materials. Keep away from moisture.
General occupation hygiene:	Do not eat, drink or smoke in work areas. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/ Storage conditions:	Keep in the original container. Keep container tightly closed in a cool, dry, well-ventilated place. Keep product away from heat, sparks, flame and other sources of ignition, out of direct sunlight and away from combustible and reducing materials and other incompatible materials. Packaging materials / tanks of storage: Carbon steel. Non suitable: Zinc, Copper
Incompatible products:	Combustible and reducing materials

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Regulated occupational exposure limit values:	No occupational exposure limits established.
Recommended occupational and consumer exposure limit values (following from the performed Ammonium nitrate CSA):	

Exposure pattern	**Derived No Effect Level (DNEL)**	
	Workers	
Oral[1]	Not applicable	Oral[1]
Dermal[1]	5.12 mg/kg bw/day	Dermal[1]
Inhalation[1]	36 mg/m^3	Inhalation[1]

[1]: As an acute toxicity hazard leading to Classification and Labelling of the substance has not been identified, the long-term DNEL is considered sufficient to ensure that effects from acute exposure to the substance do not occur (in accordance with ECHA Guidance on information requirements and chemical safety assessment: Chapter R.8: Characterization of dose [concentration]-response for human health, May 2008 and Part B: Hazard Assessment, Draft new chapter B.8 Scope of Exposure Assessment, March 2010).

8.2 Exposure controls

Appropriate engineering controls:	None required: 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.
Environmental exposure controls:	Dispose of rinse water in accordance with local and national regulations.
Individual protection measures, such as personal protective equipment	
Respiratory protection:	No (effectiveness inhalation: 0%
Hand protection:	long sleeved overall; chemically resistant gloves conforming to EN374 with basic employee training) [Effectiveness Dermal: 90%]
Eye protection:	Chemical goggles or face shield
Skin and body protection:	Protective work clothes
Hygiene measures:	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.
9. PHYSICAL AND CHEMICAL PROPERTIES	
9.1 Information on basic physical and chemical properties	
Appearance:	Clear liquid
Odour:	Odourless
Odour threshold:	Not applicable
Melting/Freezing temperature:	Not applicable
Boiling temperature:	~ 107 ^{0}C
Flash-point:	Not applicable
Flammability:	Not flammable (based on molecular structure).
Explosive properties:	Incompatible with strong reducing agents or other oxidisers. Possible incompatibility with finely powdered metals (cadmium, copper, lead, cobalt, nickel, bismuth, chromium, magnesium, zinc, sodium, potassium and aluminium). May explode by detonation, heat or shock when evaporated by near dryness. Solution may detonate if subjected to heat and pressure.
Oxidizing properties:	Slightly corrosive to zinc, copper and aluminium. Non corrosive to mid or stainless steal (304 or 316).
Vapour pressure:	17.2 mm Hg (20^{0}C) (solution)
Relative density (D4 (20)):	Not applicable
Solubility in water:	100%
Partition coefficient n-octanol/water:	Not relevant as the substance is inorganic, considered to be low (based on high water solubility)
Viscosity:	*40^{0}F: 6,1 cP; 60^{0}F: 4,7 cP (32% N)*
Specific conductivity:	Not applicable

Auto ignition temperature:	Not relevant (due to explosive properties)
pH (10% water solution)	6.7 – 7.5
Surface tension:	Not surface active (based on molecular structure)

9.2 Other information

Taste: Disagreeable, saline.
Volatility: 20% (w/w)
Evaporation rate: Not available.

10. STABILITY AND REACTIVITY

10.1 Reactivity

Stable under recommended storage and handling conditions (see section 7, handling and storage).

Stable in normal temperatures and pressure.

10.2 Chemical stability

Stable under recommended storage and handling conditions (see section 7, handling and storage).

10.3 Possibility of hazardous reactions

When heated, decomposition products. UAN will form urea – nitrate when mixed with nitric acid at low pH. Urea – nitrate may become unstable and / or explosive under certain conditions.

10.4 Conditions to avoid

Decomposes on heating. Confinement must be avoided. Avoid heat, flames, sparks and other sources of ignitions. Avoid contact with incompatible materials.

10.5 Incompatible materials

Oxidizing materials, metal salts, metals, acids, basis, combustible materials.

10.6 Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. In case of fire, nitrogen oxides (NO, NO2).

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

ACUTE TOXICITY	
Acute oral toxicity:	LD_{50}: 2000 mg/kg bw (OECD 401)
Acute dermal toxicity:	LD_{50}: > 5000 mg/kg bw (OECD 402)
Acute inhalation toxicity:	LC_{50}: > 88.8 mg/l (no guideline followed)
LOCAL EFFECTS	
Skin irritation:	No adverse effect observed (not irritating)
Eye irritation:	Adverse effect observed (irritating)
Respiratory irritation:	No study available
Corrosivity	No data available
Sensitisation	No adverse effect observed (not sensitising)

OTHER	
Repeated dose toxicity:	**Via oral route - systemic effects:** No adverse effect observed (NOAEL: 256 mg/kg bw/day) (subacute; rat) **Dermal - systemic effects:** No study available **Dermal - local effects:** No study available **Inhalation - systemic effects:** No adverse effect observed (NOAEC: 185 mg/m³) (subacute; rat) **Inhalation - local effects:** No study available
Mutagenicity:	**In vitro:** No adverse effect observed (negative) **In vivo:** No adverse effect observed (negative)
Reproductive toxicity:	No relevant information available
Carcinogenicity:	Ammonium nitrate is not genotoxic
12. ECOLOGICAL INFORMATION	
12.1 Toxicity	
Fish (acute):	LC_{50}: > 100 mg/L
Fish (long-term):	NOEC 58 mg/L (study on sodium nitrate)
Aquatic invertebrates (acute):	> 100 mg/L
Aquatic invertebrates (long-term):	No data
Algae (acute):	EC_{50}: > 100 mg/L
Algae (long-term)	NOEC 100 mg/L
12.2 Persistence and degradability	
Biodegradation:	Standard test is not applicable as the substance is inorganic. In addition, in the anaerobic transformation of ammonium, one group of bacteria oxidizes ammonium to nitrite while another group oxidizes nitrite into nitrate. The average biodegradation rate in wastewater plant at 20ºC is 52 g N/kg dissolved solid/day. Nitrate degradation is fastest in anaerobic conditions. In the anaerobic transformation of nitrate into N2, N2O and NH3, the biodegradation rate in wastewater plant at 20ºC is 70 g N/kg dissolved solid/day.
Hydrolysis:	No hydrolysable group is present, will completely dissociate into ions.
12.3 Bioaccumulative potential	
Octanol-water partition coefficient (K_{ow}):	Not relevant as the mixture is inorganic, but considered to be low (based on high water solubility)
Bio concentration factor (BCF):	Low potential for bioaccumulation (based on ammonium nitrate substance properties).
12.4 Mobility in soil	
Adsorption coefficient:	Low potential for adsorption (based on substance properties).
12.5 Results of PBT and vPvB assessment According to Annex XIII of Regulation (EC) No 1907/2006, no PBT and vPvB assessment has been	

conducted since both components, ammonium nitrate and urea are inorganic.	
13. DISPOSAL CONSIDERATIONS	
Waste from residues:	In accordance with local and national regulations, disposed by landfill or incineration. Controlled biodegradation in waste water treatment is possible.
Container:	Containers should be cleaned by appropriate method and then re-used or disposed by landfill or incineration as appropriate, in accordance with local and national regulations. Do not remove label until container is thoroughly cleaned.
14. TRANSPORT INFORMATION	
UN Number:	ADR/RID: not available ADN/ADNR: not available IMDG: not available ICAO/IATA: not available
Proper shipping name:	Urea Ammonium nitrate, solution
Transport hazard classes:	ADR/RID: no classification assign ADN/ADNR: no classification assign IMDG: no classification assign ICAO/IATA: no classification assign
Packaging group:	ADR/RID: no classification assign ADN/ADNR no classification assign IMDG: no classification assign ICAO/IATA no classification assign
Label Special precautions:	Not applicable Not applicable
15. REGULATORY INFORMATION	
15.1 Safety, health and environmental regulation/legislation specific for the substance or mixture:	Regulation EC 1907/2006 (REACH), Fertilizer Regulation EC 2003 / 2003, Regulation CLP 1272/2008, Directive 2012/18/EU of the EP and EC of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC.
15.2 Chemical safety assessment:	In accordance with REACH Article 14, a Chemical Safety Assessment has been carried out for the classified ingredients of this mixture – Ammonium nitrate.
15.3 Regulation of 2019 г for	Classified component Ammonium Nitrate with Nitrogen conc.

amendment of Regulation EC №98/2013 on a marketing and use of explosive precursors harmonized rules across Europe	above 16% mass, connected to the AN is under the list of Appendix 1 with code 3102 30 10 (in a water solution) и 3102 30 90 (others). **Substances under limitation according this Regulation ARE NOT provided, introduced, owned or used by the general public!**

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.

Classification in accordance with Regulation 1272/2008, as listed in Annex VI: ***None.***

Classification in accordance with Regulation 1272/2008, by self-classification based on the performed CSA:

Causes serious eye irritation (H319), category 2.

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Created/Revised by:	“AGROPOLYCHIM”AD

ANNEX (Ammonium Nitrate ingredient ES – ies)

1 Exposure scenario (1) **Manufacturing of the substance including handling, storage and quality controls**	
Use descriptors related to the life cycle stage	SU8/9 PROC1/2/3/8a/8b/9/14/15 ERC1
Name of contributing environmental scenario (1) and corresponding ERC	1. Manufacturing of substances (ERC1)
List of names of contributing worker scenarios (2) and corresponding PROC	1. Use in closed process, no likelihood of exposure (PROC1) 2. Manufacturing in a closed continuous process, with occasional exposure (PROC2) 3. Use in closed batch process (synthesis or formulation) (PROC3) 4. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a) 5. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b) 6. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9) 7. Production of preparations* or articles by tabletting, compression, extrusion, pelletisation (PROC14) 8. Use as laboratory reagent (PROC15)
2.1 Contributing scenario (1) controlling environmental exposure	
Environmental release during manufacturing ERC1 An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for manufacturing of the substance including handling, storage and quality controls	
All Process Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical. PROC1/2/3/8a/8b/9/14/15	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure	Solid, low dustiness
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable.
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of	More than 4 hours per day

exposure	
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Not applicable
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	1. Containment as appropriate 2. Good standard of general ventilation
Organizational measures to prevent /limit releases, dispersion and exposure	
Specific organizational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	1. Chemical goggles
3 Exposure information and reference to its source	
Information for contributing scenario 1	
An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
Information for contributing scenario 2	
A qualitative approach was used to conclude safe use for workers. The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As minimal systemic effects were only noted at such high levels of substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.	
4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES	
No additional risk management measures, besides those that are mentioned above, are needed to guarantee	

safe use for workers.

5 Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimize number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimization of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene.

1 Exposure scenario (2) **Industrial use for formulation of preparations/articles, intermediate use and end-use in industrial settings.**	
Use descriptors related to the life cycle stage	SU3/10 PC1/11/12/19/37 PROC1/2/3/5/8a/8b/9/13/15 ERC2/6a
Name of contributing environmental scenario (1) and corresponding ERC	1. Formulation of preparations (ERC2) 2. Industrial use resulting in manufacture of another substance (use of intermediates) (ERC6a)
List of names of contributing worker scenarios (2) and corresponding PROC	1. Use in closed process, no likelihood of exposure (PROC1) 2. Use in closed, continuous process with occasional controlled exposure (PROC2) 3. Use in closed batch process (synthesis or formulation) (PROC3) 4. Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC5) 5. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a) 6. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b) 7. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9) 8. Treatment of articles by dipping and pouring (PROC13) 9. Use as laboratory reagent (PROC15)
2.1 Contributing scenario (1) controlling environmental exposure	
Formulation of preparations (ERC2) and industrial use resulting in manufacture of another substance (use of intermediates) (ERC6a) An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for industrial use for formulation of preparations/articles, intermediate use and end-use in industrial settings.	
All Process Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical. PROC1/2/3/5/8a/8b/9/13/15	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure	Solid, low dustiness Liquid
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable
Frequency and duration of use/exposure	

Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Not applicable
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	1. Containment as appropriate 2. Good standard of general ventilation
Organizational measures to prevent /limit releases, dispersion and exposure	
Specific organizational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	1. Chemical goggles
3 Exposure information and reference to its source	
Information for contributing scenario 1	
An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
Information for contributing scenario 2	
A qualitative approach was used to conclude safe use for workers. The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As minimal systemic effects were only noted at such high levels of	

substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.

5 Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimize number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimization of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

1 Exposure scenario (3) Professional use in formulation of preparations and end-use	
Use descriptors related to the life cycle stage	SU22 PC12 PROC1/2/8a/8b/9/11/15/19 ERC8b/8e
Name of contributing environmental scenario (1) and corresponding ERC	1. Wide dispersive indoor use of reactive substances in open systems (ERC8b) 2. Wide dispersive outdoor use of reactive substances in open systems (ERC8e)
List of names of contributing worker scenarios (2) and corresponding PROC	1. Use in closed process, no likelihood of exposure (PROC1) 2. Use in closed, continuous process with occasional controlled exposure (PROC2) 3. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a) 4. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b) 5. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9) 6. Non industrial spraying (PROC11) 7. Use as laboratory reagent (PROC15) 8. Hand-mixing with intimate contact and only PPE available (PROC19)

2.1 Contributing scenario (1) controlling environmental exposure
Wide dispersive indoor use of reactive substances in open systems (ERC8b) and wide dispersive outdoor use of reactive substances in open systems (ERC8e). An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

2.2 Contributing scenario (2) controlling worker exposure for professional use in formulation of preparations and end-use	
All Process Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical. PROC1/2/8a/8b/9/11/15/19	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure	Solid, low dustiness Liquid, >25% substance in the product
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated)	More than 4 hours per day

of exposure	
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Not applicable
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors or outdoors
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	1. Containment as appropriate 2. Good standard of general ventilation 3. Avoid splashing. Use specific dispensers and pumps specifically designed to prevent splashes/spills/ exposure to occur
Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	1. Chemical goggles
3 Exposure information and reference to its source	
Information for contributing scenario 1	
An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
Information for contributing scenario 2	
A qualitative approach was used to conclude safe use for workers. The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As minimal systemic effects were only noted at such high levels of	

substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.

5 Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

1 Exposure scenario (4) **Consumer end-use of fertilizers and matches/fireworks**	
Use descriptors related to the life cycle stage	SU21 PC11/12 ERC8b/8e/10a
Name of contributing environmental scenario (1) and corresponding ERC	1. Wide dispersive indoor use of reactive substances in open systems (ERC8b) 2. Wide dispersive outdoor use of reactive substances in open systems (ERC8e) 3. Wide dispersive outdoor use of long-life articles and materials with low release (ERC10a)
List of names of contributing consumer scenarios (2) and corresponding PC and sub-product categories if applicable	1. Explosives (PC11) 2. Fertilizers (PC12)
2.1 Contributing scenario (1) controlling environmental exposure	
Wide dispersive indoor use of reactive substances in open systems (ERC8b), wide dispersive outdoor use of reactive substances in open systems (ERC8e) and wide dispersive outdoor use of long-life articles and materials with low release (ERC10a). An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) consumer end-use of fertilizers and matches/fireworks	
All Product Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical. Exposure to eye irritating dilutions can occur during consumer use of fertilizers (PC12). No exposure is expected from the use of matches/fireworks (PC11).	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure	Solid, low dustiness Liquid Products containing ≥10% and <10%.
Amounts used	
Amounts used per event	Not applicable
Frequency and duration of use/exposure	
Duration of exposure per event and frequency of events; please note: Tier 1 exposure assessment usually refers to external event exposure, without taking into account the duration and frequency of the event (see Guidance Chapter R.15);	Not applicable
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed; population potentially exposed (adults, children)	Not applicable
Other given operational conditions affecting workers exposure	
Other operational conditions e.g. room volume, air exchange rate, outdoor or indoor use	Indoors or outdoors
Conditions and measures related to information and behavioral advice to consumers	
Safety advice to be communicated to consumers in order to control exposure, e.g. technical	Avoid splashing

instruction, behavioral advice;	
Conditions and measures related to personal protection and hygiene	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant).	1. If ≥10% of ammonium nitrate: Use chemical goggles 2. If <10% of ammonium nitrate: no personal protection needed 3. Instructions addressed to the consumer via product labeling
3 Exposure information and reference to its source	
Information for contributing scenario 1	
An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
Information for contributing scenario 2	
A qualitative approach was used to conclude safe use for consumers. The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As minimal systemic effects were only noted at such high levels of substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.	
4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES	
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers/consumers for use of fertilizers: If ≥10% ammonium nitrate: Use chemical goggles If <10% ammonium nitrate: No personal protection needed	