

Safety Data Sheet

According to Commission Regulation (EU) No 2015/830

Issue date 31/05/2016
 Issue 4
 Review date 14/08/2017
 Review 5

Liquid ammonium nitrate in hot, concentrated solution (> 80% and ≤ 93%)

SECTION 1 Identification of the substance/mixture and of the company/undertaking								
1,1	Product identifier							
	Product commercial name	Ammonium nitrate liquor						
	Chemical name	Mixture, main ingredient Ammonium Nitrate						
	Other names	Between 80% and 93% ammonium nitrate solution, Liquid ammonium nitrate.						
	Chemical formula	Mixture, main ingredient NH ₄ NO ₃						
	EU index number (Appendix 1)	Not applicable						
	CE No	Not applicable						
	CAS No.	Not applicable						
	REACH or National product registration number	Not applicable						
1,2	Relevant identified uses of the substance or mixture and uses advised against							
	Identified uses	For the manufacture of fertilisers, as an intermediate substance for the synthesis of other substances.						
	Uses advised against	None						
1,3	Details of the supplier of the safety data sheet							
	Company name	FERTIBERIA. S.A.						
	Company address	Paseo de la Castellana, 259 D. Plantas 47 y 48 - 28046 Madrid						
	Company telephone number	Central: 91.586.62.00; Aviles factory: 985-57.78.50; Puertollano factory: 926.44.93.00; Sagunto Factory: 962.69.90.04						
	Company email for SDS	reachfertiberia@fertiberia.es						
1,4	Emergency telephone number	Aviles factory: 985-57.78.50; Puertollano factory: 926.44.93.00; Sagunto Factory: 962.69.90.04						
SECTION 2 Hazards identification								
2,1	Classification of the substance or mixture*	According to Regulation EC 1272/2008 [CLP] Oxidising solid. Cat3; H272 Eye Irritation. Cat2.; H319						
2,2	Label elements	Pictograms	Signal word	Hazard statements	Precautionary Statements			
		 	Warning	H272 H319	P210 P220 P280 P305+P351+P338 P337 + P313			
2,3	Other hazards							
	PBT/vBvP Criteria	In accordance with appendix XIII of the Regulation (EC) no. 1907/2006, it is not PBT or vPvB since it is an inorganic substance.						
	<u>Other hazards that do not involve product classification</u>							
	Physical and chemical hazards	When strongly heated it can decompose releasing toxic fumes that contain nitrogen and ammonium oxides. Heating under strongly confined conditions may lead to an explosive reaction. These solutions are hazardous due to their high temperature and because they attack the skin in response to their chemical properties. Contact with skin: Hot splashes can cause serious burns. Contact with eyes: Hot splashes cause burns to the eyes and can permanently damage them. Ingestion: Ingestión is unlikely due to the high temperature of the product. However, it is unlikely that small quantities of AN would have toxic effects. In large quantities it can produce disorders in the gastrointestinal tract and in extreme cases the formation of methemoglobin can occur (blue baby syndrome) and cyanosis (indicted by blueness around the mouth). Inhalation: Ammonia mist and low concentrations coming from the hot solutions can cause irritation to the eyes, nose, throat and upper respiratory tract. Long term local effects: Unknown. Other: Fire and heating: Inhaling decomposition gases containing nitrogen and ammonium oxides can cause irritation and have corrosive effects on the respiratory system. These gases may have delayed pulmonary oedema effects.						
	Health hazards							
	Environmental hazards	Ammonium nitrate is a nitrogen product. Heavy spillage may cause an adverse environmental impact such as eutrophication (developing undesirable flora in confined surface waters or nitrate contamination. (See section 12).						
* To understand the full meaning of hazard statements (H): see section 16								
SECTION 3 Composition/information on ingredients								
3.2	Name	% (w/w)	CAS No.	IUPAC	Index No R.1272/2008	REACH Registration No	Classification Regulation 1272/2008	Specific concentration limits
	Ammonium nitrate	> 80% and ≤ 93%	6484-52-2	ammonium nitrate	---	01-2119490981-27-0028	Oxid. Solid 3 Eye Irrit. 2	
	Water	< 20% and ≥ 7%	7732-18-5			Not required	Not classified	

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SECTION 4	First aid measures	
4,1	Description of first aid measures	
	General	Seek medical attention when necessary. Administer oxygen, especially if there is blue colouring around the mouth.
	Inhalation	Inhalation of hot solution is not possible, however, toxic vapours may be inhaled: -Remove the person from the point of exposure. -Seek medical attention if there are any harmful effects.
	Ingestion	Unlikely when dealing with a hot product. Do not induce vomiting. Rinse the mouth and give water or milk to drink. Seek medical attention if more than a small quantity has been ingested.
	Contact with skin	If possible, immerse the area affected by the burn in cold water or in a bag containing ice. Wash the affected area with plenty of water and soap. Do not remove contaminated clothing without ensuring that it is not stuck to the skin.
	Contact with eyes	Wash or rinse the eyes with plenty of water for at least 15 minutes, including behind the eyelids. Remove contact lenses if present and easy to do. Seek medical attention if eye irritation persists.
4,2	Most important symptoms and effects, both acute and delayed	
		Serious thermal burns Eye irritation. Some effects on the lungs may be delayed.
4,3	Indication of any immediate medical attention and special treatment needed	
		Inhalation of gases, from a fire or thermal decomposition, that contain nitrogen and ammonium oxides may cause irritation and have corrosive effects on the respiratory system. Administer oxygen, especially if there is blue colouring (methaemoglobin) around the mouth.
SECTION 5	Firefighting measures	
5,1	Extinguishing media	
	Suitable extinguishing media	Water.
	Unsuitable extinguishing media	Do not use chemical or foam extinguishers or attempt to suffocate the fire with sand or mist.
5,2	Special hazards arising from the substance or mixture	
	Special hazards	Not combustible. If it is involved in a fire it will intensify it as it is an oxidising agent, it can maintain the fire even in the absence of air. There is a potential explosion risk during the fire when the product is strongly confined and/or contaminated with incompatible materials (e.g. organic material, halogen compounds - see section 10) Prilled ammonium nitrate must not be put in drains.
	Thermal decomposition or product combustion hazards	Nitrogen and ammonium oxides
5,3	Advice for firefighters	
	Specific firefighting methods	Open doors and windows in the area to give maximum ventilation. Avoid breathing the smoke (toxic). Position yourself upwind of the fire. Do not contaminate the solution with oils or other combustible materials. Cool equipment/containers exposed to heat with water spray.
	Special protective equipment for firefighting	Use self contained breathing apparatus in case of smoke.
SECTION 6	Accidental release measures	
6,1	Personal precautions, protective equipment and emergency procedures	
		Avoid walking on the spill product and exposure to the smoke.
6,2	Environmental precautions	
		Take care to prevent contamination of water courses and drains and inform the competent authorities in case of accidental contamination of water courses.
6,3	Methods and material for containment and cleaning up	
		Wash small spillages with large amounts of water Large spillages should be contained with sand or earth, or should be evacuated by pump if possible and safe to do so. Leave the product to solidify and then scoop it up. Place the solidified material in suitable containers for recycling or disposing as waste. Do not allow the spilled product to mix with combustible or organic materials.
6,4	Reference to other sections	
		See section 1 for contact data, section 8 for PPE and section 13 for waste disposal.
SECTION 7	Handling and storage	
7,1	Precautions for safe handling	
		Prevent contamination with combustible materials (e.g. gas-oil, greases, etc.) and other incompatible materials. Carefully clean the installations before carrying out maintenance and repair operations.
7,2	Conditions for safe storage, including any incompatibilities	
		Store in accordance with regulation ITC-MIE-APQ06 Place away from sources of heat and flames. Always keep away from combustible materials and substances mentioned in section 10. Do not allow smoking or the use of naked portable lamps in the storage area. Protect tanks from corrosion and physical hazards. Keep the product above its melting temperature to avoid crystallisation, without exceeding, at any time, 150 °C. During transport (ADR, IMDG) not exceeding 140 °C. The product's pH must be maintained above 4.5 (10% solution).
	Recommended and non-recommended packaging materials	Suitable materials for containers are: stainless steel (AISI 304L) and aluminium alloys. Do not use common metals, zinc and its alloys or copper and its alloys. Use mineral type insulation material.
7,3	Specific end use(s)	
		See section 1.2 and appendices for exposure scenarios.
Note: stability and reactivity, see section 10		

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SECTION 8	Exposure controls/personal protection							
8,1	Control parameters							
	Exposure limit values		Component	CAS				
			Ammonium nitrate	6484-52-2	Not established.			
	Derived from the CSR				Worker			consumer
					systemic	industrial	professional	
			oral	long term	Not applicable	Not applicable	12.8 mg/kg bw/day	
			inhalation	long term	37.6 mg/m ³	37.6 mg/m ³	11.1 mg/m ³	
			dermal	long term	21.3 mg/Kg bw/day	21.3 mg/Kg bw/day	12.8 mg/kg bw/day	
PNEC		water		air	soil	microbiological	sediment	oral
		fresh water: 0.45 mg/l salt water: 0.045 mg/l in intermittent releases: 4.5 mg/l		Not available	Insufficient data available	18 mg/l	Insufficient data available	

SECTION 8	Exposure controls	
8,2	Exposure controls	
	Hygiene controls	Protect yourself against thermal burns.
	Personal protection measures	
	Eyes	Use chemical panoramic safety goggles, or preferably a full face visor.
	Skin and body	Use heavy duty clothes and safety boots.
	Hands	Use heat resistant and waterproof gloves.
	Respiratory	For protection against smoke, use full face masks with ammonia and nitrogen oxide filters or self-contained or semi self-contained breathing apparatus.
Thermal	See previous points.	
Environmental exposure controls	See section 6.	
<i>Advice relating to personal protection is valid for high exposure levels.</i>		
<i>Choose personal protection equipment suitable to exposure risks.</i>		

SECTION 9	Physical and chemical properties	
9,1	Information on basic physical and chemical properties	
	Aspect	Liquid
	Colour	Colourless when free of crystals.
	Odour	Weak ammonia.
	Molecular weight	Not applicable
	pH	pH aqueous solution (100 g/l) > 4.5.
	Boiling point	AMMONIUM NITRATE (%) 80 82.5 85 87.5 90 92.5 Atmospheric boiling temperature (°C) 128 132 136 140 146 155
	Melting point	AMMONIUM NITRATE (%) 80 82.5 85 87.5 90 92.5 Crystallisation temperature (°C) 57 65 75 85 96 108
	Flash-point	Non flammable
	Flammability	Non flammable
	Explosive properties	Liquid ammonium nitrate (UN2426) is not classified as an explosive.
	Auto-ignition temperature	Non flammable
	Decomposition temperature	Begins to decompose above 170 °C
	Lower explosive limit	Not applicable
	Upper explosive limit	Not applicable
	Oxidising properties	UN2426: Classification for transport: Class 5.1; GE unknown.
	Density	AMMONIUM NITRATE (%) 90 91 92 93 Temperature °C 100 100 140 140 Density g/cm ³ 1.39 1.41 1.39 1.42
	Vapour pressure	Vapour pressure at 100 °C 39.6 kPa (80%); 22.6 kPa (89.9%).
Vapour density	Not applicable	
Partition coefficient n-octanol/water	Not applicable	
Viscosity	Not applicable	
Water solubility	Ammonium nitrate: 1920 g/l to 20 °C	
9,2	Other information	
	Molecular weight 80 g/mol for the main ingredient (ammonium nitrate)	

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SECTION 10		Stability and reactivity
10,1	Reactivity	Stable under normal conditions of storage, handling and use (see section 7)
10,2	Chemical stability	Stable under normal conditions of storage, handling and use (see section 7)
10,3	Possibility of hazardous reactions	When heated above 150 °C it decomposes releasing NOx and Ammonia. Contamination with incompatible materials.
10,4	Conditions to avoid	Acidic conditions. Crystallisation. Increasing the concentration above 93%. Proximity to sources of heat or fire. Contamination by incompatible materials. Heating when confined. Welding or heating work of the equipment or plant that may contain residues of ammonium nitrate solution, without preliminary cleaning to remove the product residues.
10,5	Incompatible materials	Inflammable materials, reducing agents, acids, alkalis, sulphur, chlorates, chlorides, chromates, nitrites, permanganate, metal powders and metal-containing substances such as copper, nickel, cobalt, zinc and their alloys.
10,6	Hazardous decomposition products	In case of fire: see Section 5 When strongly heated it decomposes releasing toxic gases (e.g. NOx and ammonia). When it is in contact with alkaline materials, such as lime, ammonia gases may be produced. When in contact with strong acids NOx may be produced.

SECTION 11		Toxicological information				
11,1	Information on toxicological effects					
Acute toxicity						
Component	CAS No.	Method	Species	Via	Result	
Ammonium nitrate	6484-52-2	OECD 401 OECD 402	rat rat rat	oral skin respiratory	LD50: 2950 mg/Kg bw. LD50: > 5000 mg/Kg bw. LC50: >88.8 mg/m ³ .	
Skin corrosion/irritation						
Component	CAS No.	Method	Species	Via	Result	
Ammonium nitrate	6484-52-2	OECD 404	Rabbit	skin	Non-irritant.	
Serious eye damage/irritation						
Component	CAS No.	Method	Species	Via	Result	
Ammonium nitrate	6484-52-2	OECD 405	Rabbit	eye	Irritant	
Respiratory or skin sensitisation						
Component	CAS No.	Method	Species	Via	Result	
Ammonium nitrate	6484-52-2	OECD 429	mouse	skin	Non-sensitising.	
Germ cell mutagenicity						
Component	CAS No.	Method	Species	Result		
Ammonium nitrate	6484-52-2	OECD 471 OECD 473 OECD 476	bacteria Chromosomal aberrations mutation in mammal cells	Negative. Non-mutagenic. Ames test. Negative. Non-mutagenic. Negative. Non-mutagenic.		
Carcinogenicity						
Component	CAS No.	Method	Species	Via	Result	
Ammonium nitrate	6484-52-2		rat	All	Non carcinogenic.	
Reproductive toxicity						
Component	CAS No.	Method	Species	Via	Result	
Ammonium nitrate	6484-52-2	OECD 422	rat	oral	-Effects on fertility: NOAEL: ≥1500 mg/kg bw/d. -Toxicity for development: NOAEL: ≥1500 mg/kg bw/d	
Single and Repeated exposure (STOT)						
Component	CAS No.	Method	Species	Via	Result	
Ammonium nitrate	6484-52-2	OECD 422 OECD 453	rat rat rat	oral (28 days) oral (52 weeks) oral (13 weeks) Inhalation (2 s)	Sub-acute oral route. NOAEL: ≥ 1500 mg/kg body weight/day. Chronic oral route. NOAEL: 256 mg/kg body weight/day. Sub-chronic oral route. NOAEL: 886 mg/kg body weight/day. Inhalation route. NOAEC (systemic): ≥ 185 mg/m ³	
Aspiration hazard		No known significant effects or critical hazards.				

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SECTION 12		Ecological information						
12,1	Toxicity							
Water toxicity								
	Component	CAS No.		Fish (Cyprinus carpio)	Crustaceans	Algae (benthic diatoms)		
	Ammonium nitrate	6484-52-2	Short term	LC50(48h) = 447 mg/l.	EC50/LC50 (48h) = 490 mg/l (of potassium nitrate) (Daphnia magna)	LC50/EC50 (10 days) > 1700 mg/l (of potassium nitrate)		
			Long term	Not necessary.	NOEC (168h) = 555 mg/l (Bullia digitalis)	Not available		
Land Toxicity								
	Component	CAS No.	Macroorganisms	Microorganisms	Land plants	Other organisms		
	Ammonium nitrate	6484-52-2	Not scientifically justified	Not scientifically justified	Not scientifically justified	Not available		
Microbiological activity in waste water treatment plants								
	Component	CAS No.	Toxicity for aquatic microorganisms					
	Ammonium nitrate	6484-52-2	CE50/CL50 (180 min) >1000 mg/l (of sodium nitrate)					
12,2	Persistence and degradability							
	Component	CAS No.	Degradation					
	Ammonium nitrate	6484-52-2	Hydrolysis	Non-hydrolysable. Test not necessary.				
			Photolysis	No information available				
			Biodegradation	Not necessary, inorganic substance.				
12,3	Bioaccumulative potential							
	Component	CAS No.	Octanol-water partition coefficient (Kow)	Bioconcentration factor (BCF)	Comments			
	Ammonium nitrate	6484-52-2	Not applicable. Inorganic substance.	-				
12,4	Mobility in soil							
	Component	CAS No.	Result					
	Ammonium nitrate	6484-52-2	low absorption potential (based on its properties)					
12,5	Results of PBT and vPvB assessment							
	Not required. Inorganic substance. See REACH appendix XIII.							
12,6	Other adverse effects							
	No more information.							
SECTION 13		Disposal considerations						
13,1	Waste treatment methods							
	Depending on the degree and nature of the contamination, once solidified and cold dispose of as a fertiliser over the ground, as a raw material for liquid fertiliser, or in an authorised waste facility. Do not put the waste in the drain, dispose of the product waste and containers in a safe way. Dispose of in accordance with all local and national regulations.							
SECTION 14		Transport Information						
14.1 - 14.6	Regulatory Information	UN Number	Proper shipping name	Class	Packing group	Label	Environmental hazards	Special precautions for users
	ADR/RID	UN 2426	LIQUID AMMONIUM NITRATE, in hot, concentrated solution at more than 80% but at a maximum of 93%.	5,1		 	NO	Hazard identification number: 59 See ADR and RID
	ADNR							Prohibited in bulk.
	IMDG							Emergency procedures (EmS): F-H, S-Q
	IATA							See ICAO regulation for quantity limitation
14,7	Transport in bulk according to Annex II of MARPOL and the IBC Code: Not applicable							

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SECTION 15		Regulatory information
15,1	Safety, health and environmental regulations and legislation specific for the substance or mixture	
	Regulation 1907/2006 (REACH). Entry 58 of appendix XVII. Regulation 1272/2008 (CLP) Directive 18/2012 (Seveso Directive) R.D. 840/2015 (Seveso) R.D. 374/2001 (Chemical agents) R.D. 145/1989: National Regulation for Admission, Handling and Storage of Hazardous Materials in ports. Royal Decree 656/2017. APQ	
15,2	Chemical safety assessment	
	Chemical Safety Assessment for ammonium nitrate as a substance.	
SECTION 16		
Other information		
	Hazard statements	H272: May intensify a fire; oxidizer. H319: Causes serious eye irritation.
	Precautionary statements	P102: Keep out of reach of children. P210: Keep away from heat, sparks, open flames and hot surfaces. No smoking. P220: Keep/Store away from clothing/combustible materials. P264: Wash hands thoroughly after handling. P280: Wear eye protection. P305+P351+P338: IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. P337+P313: If eye irritation persists: get medical attention. P370+P378: In case of fire: Use water for extinction.
	Bibliographical references and data sources	Ammonium nitrate chemical safety assessment; Guidance documents EFMA/FERTILIZER EUROPE; Data for TFI HPV; NOTOX
	Abbreviations and acronyms	ELV-DE: Environmental limit value (daily exposure) ELV-ST: Environmental limit value (short term) NOAEL: No observable adverse effect level LD50: Lethal dose 50% LC50: Lethal concentration 50% EC50: Effective concentration 50% DNEL: Derived no effect level PNEC: Predicted no effect concentration LOEC: Lowest observed effect concentration NOEC: No observed effect concentration NOAEC: No observed adverse effect concentration
	Adequate training for workers	Obligatory training in occupational risk prevention
	Date of prior SDS	Version 4 dated 31/05/2016
	Modifications made to present revision	9,1 and 15,1
Exposure scenarios 1,2,3 and 4 are attached		
The information contained in this Safety Data Sheet is given in good faith. It is accurate to the best of our knowledge and belief and represents the most up to date information about the product at the time of publication. The information given in this data sheet does not constitute or replace the user's own assessment of workplace risks as required by other health and safety legislation.		

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Safety Data Sheet Appendices Exposure Scenario 1

1	Title of Exposure Scenario (ES)																		
	Manufacture of ammonium nitrate																		
2	Description of activities or processes covered by the exposure scenario																		
	<p>List of all the use descriptors related to ES 1</p> <p>SU 8/9 * PROC 1/2/3/8a/8b/9/14/15 ERC 1</p> <p>Name/s of contributing scenario/s related to the environment and their corresponding Environmental Release Class (ERC)</p> <p>1. Manufacture of substances (ERC 1)</p> <p>Name/s of contributing scenario/s for the worker and their corresponding Process Category (PROC)</p> <p>1. Use in enclosed processes, no likelihood of exposure (PROC 1) 2. Use in closed, continuous processes with occasional controlled exposure (PROC 2) 3. Use in closed batch processes (synthesis or formulation) (PROC 3) 4. Transfer of substances or preparations (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC 8a) 5. Transfer of substances or preparations (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b) 6. Transfer of substances or preparations into small containers (dedicated filling line, including weighing) (PROC 9) 7. Production of mixtures or articles by tableting, compression, extrusion, pelletisation (PROC 14) 8. Use as laboratory reagent (PROC 15)</p> <p>* Agency Guidance Document, Chapter R.12: Use descriptor system: SU8 (Manufacture of bulk, large scale chemicals)/ SU9 (Manufacture of fine chemicals)</p>																		
2,1	Contributing scenario (1) controlling environmental exposure for the manufacture of ammonium nitrate (ES1)																		
	<p>Environmental exposure due to the manufacture of ammonium nitrate</p> <p>Section 2.1 describes emissions to the environment that can occur during the manufacture of ammonium nitrate (ERC 1).</p> <p>As this substance does fulfil criteria for classification as hazardous to the environment, the environmental risk assessment has not been carried out for this substance and therefore the conditions that affect the environment are not included during this use.</p>																		
2,2	Contributing scenario (2) controlling exposure of workers for manufacture of the substance, including handling, storage and quality controls																		
	<p>Section 2.2 describes potential exposure of workers from manufacture of the substance, including handling, storage and quality controls.</p> <p>All the relevant processes for the contributing scenarios identified by the PROC codes in point 1 of this scenario (PROC 1/2/3/8a/8b/9/14/15) have the same operating conditions and risk management measures for personnel. Consequently they are all covered by just one contributing scenario (2).</p>																		
	<table border="1"> <tr> <td>Product characteristics</td> <td>Solid with low dust formation index</td> </tr> <tr> <td>Quantities used</td> <td>Not relevant</td> </tr> <tr> <td>Frequency and duration of use or exposure</td> <td>> 4 hours a day</td> </tr> <tr> <td>Human factors not influenced by risk management</td> <td>Not relevant</td> </tr> <tr> <td>Other operational conditions that have an impact on worker exposure</td> <td>Ammonium nitrate is manufactured in enclosed environments.</td> </tr> <tr> <td>Technical conditions and measures at process level (source) to prevent release</td> <td>Not relevant</td> </tr> <tr> <td>Technical conditions and measures for controlling dispersion of the source to workers</td> <td>1.- Adequate containment of the substance 2.- Good ventilation conditions</td> </tr> <tr> <td>Organisational measures to prevent or limit releases, dispersion and exposure</td> <td>Not relevant</td> </tr> <tr> <td>Conditions and measures for personal protection, hygiene and health evaluation</td> <td>Use safety glasses</td> </tr> </table>	Product characteristics	Solid with low dust formation index	Quantities used	Not relevant	Frequency and duration of use or exposure	> 4 hours a day	Human factors not influenced by risk management	Not relevant	Other operational conditions that have an impact on worker exposure	Ammonium nitrate is manufactured in enclosed environments.	Technical conditions and measures at process level (source) to prevent release	Not relevant	Technical conditions and measures for controlling dispersion of the source to workers	1.- Adequate containment of the substance 2.- Good ventilation conditions	Organisational measures to prevent or limit releases, dispersion and exposure	Not relevant	Conditions and measures for personal protection, hygiene and health evaluation	Use safety glasses
Product characteristics	Solid with low dust formation index																		
Quantities used	Not relevant																		
Frequency and duration of use or exposure	> 4 hours a day																		
Human factors not influenced by risk management	Not relevant																		
Other operational conditions that have an impact on worker exposure	Ammonium nitrate is manufactured in enclosed environments.																		
Technical conditions and measures at process level (source) to prevent release	Not relevant																		
Technical conditions and measures for controlling dispersion of the source to workers	1.- Adequate containment of the substance 2.- Good ventilation conditions																		
Organisational measures to prevent or limit releases, dispersion and exposure	Not relevant																		
Conditions and measures for personal protection, hygiene and health evaluation	Use safety glasses																		
3	Estimation of exposure and reference to its source																		
	<p>Information for contributing scenario 1 (environmental exposure):</p> <p>No environmental assessment was completed because the substance does not fulfil criteria for classification as hazardous for the environment and therefore there is no additional assessment of environmental exposure.</p> <p>Information for contributing scenario 2 (exposure for personnel):</p> <p>A qualitative assessment has been included that concludes that this use is safe for workers.</p> <p>The toxicological effect of this substance is eye irritation (local parameter), for which a DNEL value cannot be estimated, because there is no dose-response information available. A minimal systemic effect was only observed at doses that were so high that personnel would never be exposed to them (see relevant DNEL: section 8 SDS), so it was not considered necessary to make a quantitative risk assessment.</p>																		
4	Guidance for intermediate users to assess if they working within the limits set by the ES																		
	Additional risk management measures apart from the ones mentioned above in the contributing scenarios (2.1, 2.2) are not required to guarantee safety during this use and thus work within the limits of the ES 1 exposure scenario.																		
5	Good practice advice in addition to that included in the Chemical Safety Assessment (CSA) required by REACH. Measures not subject to art. 37 (4) REACH																		
	<ul style="list-style-type: none"> - Adequate containment of the substance - Minimise the number of exposed personnel - Segregate the releasing processes - Utilise effective contamination extraction systems - Good ventilation conditions - Minimise manual handling - Avoid contact with contaminated objects and instruments - Regularly clean the work area and equipment - Supervise the area to check that risk management measures are being applied - Train personnel for good practices - Keep standard personal hygiene conditions 																		

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Safety Data Sheet Appendices Exposure Scenario 2

1	Title of Exposure Scenario (ES)																		
	Industrial use of ammonium nitrate for formulating mixtures/articles, as intermediate substance and for end use by industry																		
2	Description of activities or processes covered by the exposure scenario																		
	<p>List of all the use descriptors related to ES 1</p> <p>SU 3/10 * PC 1/11/12/19/37 * PROC 1/2/3/5/8a/8b/9/13/15 ERC 2/6a</p> <p>Name/s of contributing scenario/s related to the environment and their corresponding Environmental Release Class (ERC)</p> <p>1. Formulation of preparations (ERC 2) 2. Industrial use resulting in manufacture of another substance (use of intermediates) (ERC 6a)</p> <p>Name/s of contributing scenario/s for the worker and their corresponding Process Category (PROC)</p> <p>1. Use in enclosed processes, no likelihood of exposure (PROC 1) 2. Use in closed, continuous processes with occasional controlled exposure (PROC 2) 3. Use in closed batch processes (synthesis or formulation) (PROC 3) 4. Mixing or blending in batch processes (multistage and/or significant contact) (PROC 5) 5. Transfer of substances or preparations (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC 8a) 6. Transfer of substances or preparations (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC 8b) 7. Transfer of substances or preparations into small containers (dedicated filling line, including weighing) (PROC 9) 8. Treatment of articles by dipping and pouring (PROC 13) 9. Use as laboratory reagent (PROC 15)</p> <p>* Agency Guidance Document, Chapter R.12: Use descriptor systems: SU 3 (Industrial manufacturing: Use of substances as such or in preparations in industrial facilities) / SU10 (Formulation of preparations and/or repackaging (excluding alloys). PC 1(Adhesives, sealants) / 11 (Explosives) /12 (Fertilisers) /19 (Intermediate substances) /37 (Chemical products for water treatment)</p>																		
2,1	Contributing scenario (1) controlling environmental exposure for formulating preparations and industrial use as intermediate substance (ES 2)																		
	<p>Environmental exposure due to formulation of preparations and industrial use of ammonium nitrate as intermediate substance</p> <p>Section 2.1 describes emissions to the environment that can occur during the formulation of preparations (ERC 2) and industrial use as an intermediate substance (ERC 6a).</p> <p>As this substance does fulfil criteria for classification as hazardous to the environment, the environmental risk assessment has not been carried out for this substance and therefore the conditions that affect the environment are not included during this use.</p>																		
2,2	Contributing scenario (2) controlling exposure of workers that corresponds to the industrial use of ammonium nitrate for formulating preparations/articles, as intermediate substance and end use by workers in industrial facilities																		
	All the relevant processes for this scenario identified by the PROC codes in point 1 of this scenario (PROC 1/2/3/5/8a/8b/9/13/15) have the same operating conditions and risk management measures for personnel. Consequently they are all covered by just one contributing scenario (2).																		
	<table border="1"> <tr> <td>Product characteristics</td> <td>Solid with low dust formation index Liquid</td> </tr> <tr> <td>Quantities used</td> <td>Not relevant</td> </tr> <tr> <td>Frequency and duration of use or exposure</td> <td>> 4 hours a day</td> </tr> <tr> <td>Human factors not influenced by risk management</td> <td>Not relevant</td> </tr> <tr> <td>Other operational conditions that have an impact on worker exposure</td> <td>Used in enclosed spaces</td> </tr> <tr> <td>Technical conditions and measures at process level (source) to prevent release</td> <td>Not relevant</td> </tr> <tr> <td>Technical conditions and measures for controlling dispersion of the source to workers</td> <td>1.- Adequate containment of the substance 2.- Good ventilation conditions</td> </tr> <tr> <td>Organisational measures to prevent or limit releases, dispersion and exposure</td> <td>Not relevant</td> </tr> <tr> <td>Conditions and measures for personal protection, hygiene and health evaluation</td> <td>Use safety glasses</td> </tr> </table>	Product characteristics	Solid with low dust formation index Liquid	Quantities used	Not relevant	Frequency and duration of use or exposure	> 4 hours a day	Human factors not influenced by risk management	Not relevant	Other operational conditions that have an impact on worker exposure	Used in enclosed spaces	Technical conditions and measures at process level (source) to prevent release	Not relevant	Technical conditions and measures for controlling dispersion of the source to workers	1.- Adequate containment of the substance 2.- Good ventilation conditions	Organisational measures to prevent or limit releases, dispersion and exposure	Not relevant	Conditions and measures for personal protection, hygiene and health evaluation	Use safety glasses
Product characteristics	Solid with low dust formation index Liquid																		
Quantities used	Not relevant																		
Frequency and duration of use or exposure	> 4 hours a day																		
Human factors not influenced by risk management	Not relevant																		
Other operational conditions that have an impact on worker exposure	Used in enclosed spaces																		
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Organisational measures to prevent or limit releases, dispersion and exposure	Not relevant																		
Conditions and measures for personal protection, hygiene and health evaluation	Use safety glasses																		
3	Estimation of exposure and reference to its source																		
	<p>Information for contributing scenario 1 (environmental exposure):</p> <p>No environmental assessment was completed because the substance does not fulfil criteria for classification as hazardous for the environment and therefore there is no additional assessment of environmental exposure.</p> <p>Information for contributing scenario 2 (exposure for personnel):</p> <p>A qualitative assessment has been included that concludes that this use is safe for workers.</p> <p>The toxicological effect of this substance is eye irritation (local parameter), for which a DNEL value cannot be estimated, because there is no dose-response information available. A minimal systemic effect was only observed at doses that were so high that personnel would never be exposed to them (see relevant DNEL: section 8 SDS), so it was not considered necessary to make a quantitative risk assessment.</p>																		
4	Guidance for intermediate users to assess if they working within the limits set by the ES																		
	Additional risk management measures apart from the ones mentioned above in the contributing scenarios (2.1, 2.2) are not required to guarantee safety during this use and thus work within the limits of the ES 2 exposure scenario.																		
5	Good practice advice in addition to that included in the Chemical Safety Assessment (CSA) required by REACH. Measures not subject to art. 37 (4) REACH																		
	<ul style="list-style-type: none"> - Adequate containment of the substance - Minimise the number of exposed personnel - Segregate the releasing processes - Utilise effective contamination extraction systems - Good ventilation conditions - Minimise manual handling - Avoid contact with contaminated objects and instruments - Regularly clean the work area and equipment - Supervise the area to check that risk management measures are being applied - Train personnel for good practices - Keep standard personal hygiene conditions 																		

Liquid ammonium nitrate in hot, concentrated solution (> 80% and ≤ 93%)

Safety Data Sheet Appendices Exposure Scenario 3

1	Title of Exposure Scenario (ES)																		
	Professional use of ammonium nitrate for formulation of preparations and end use by professionals																		
2	Description of activities or processes covered by the exposure scenario																		
	<p>List of all the use descriptors related to ES 3</p> <p>SU 22 * PC 12 * PROC 1/2/8a/8b/9/11/15/19 ERC 8b/8e</p> <p>Name/s of contributing scenario/s related to the environment and their corresponding Environmental Release Class (ERC)</p> <p>1. Wide dispersive indoor use of reactive substances in open systems (ERC 8b) 2. Wide dispersive outdoor use of reactive substances in open systems (ERC 8e)</p> <p>Name/s of contributing scenario/s for the worker and their corresponding Process Category (PROC)</p> <p>1. Use in enclosed processes, no likelihood of exposure (PROC 1) 2. Use in closed, continuous processes with occasional controlled exposure (PROC 2) 3. Transfer of substances or preparations (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC 8a) 4. Transfer of substances or preparations from/to vessels/large containers at dedicated facilities (PROC8b) 5. Transfer of substances or preparations into small containers (dedicated filling line, including weighing) (PROC 9) 6. Non industrial spraying (PROC 11) 7. Use as laboratory reagent (PROC 15) 8. Hand mixing with intimate contact (only PPE available) (PROC 19)</p> <p>* Agency Guidance Document, Chapter R.12: Use descriptor systems: SU 22 (Professional uses: Public domain (administration, education, entertainment, services, craftsmen) PC 12 (Fertilisers)</p>																		
2,1	Contributing scenario (1) controlling environmental exposure for use of ammonium nitrate by professionals (ES3)																		
	<p>Environmental exposure due to use of ammonium nitrate by professionals</p> <p>Section 2.1 describes the emissions to the environment that may occur during wide dispersive indoor use of reactive substances in open systems (ERC 8b) and wide dispersive outdoor use of reactive substances in open systems (ERC 8e)</p> <p>As this substance does fulfil criteria for classification as hazardous to the environment, the environmental risk assessment has not been carried out for this substance and therefore the conditions that affect the environment are not included during this use.</p>																		
2,2	Contributing scenario (2) controlling worker exposure for professional use of ammonium nitrate for formulating preparations and end use.																		
	<p>All the relevant processes for this scenario identified by the PROC codes in point 1 of this scenario (PROC 1/2/8a/8b/9/11/15/19) have the same operating conditions and risk management measures for personnel. Consequently they are all covered by just one contributing scenario (2).</p> <table border="1"> <tr> <td>Product characteristics</td> <td>Solid with low dust formation index Liquid, ammonium nitrate concentration in the product > 25%</td> </tr> <tr> <td>Quantities used</td> <td>Not relevant</td> </tr> <tr> <td>Frequency and duration of use or exposure</td> <td>> 4 hours a day</td> </tr> <tr> <td>Human factors not influenced by risk management</td> <td>Not relevant</td> </tr> <tr> <td>Other operational conditions that have an impact on worker exposure</td> <td>Used indoors and outdoors</td> </tr> <tr> <td>Technical conditions and measures at process level (source) to prevent release</td> <td>Not relevant</td> </tr> <tr> <td>Technical conditions and measures for controlling dispersion of the source to workers</td> <td>1.- Adequate containment of the substance 2.- Good ventilation conditions 3- Avoid splashing. Use specific dispensers and pumps designed especially to prevent splashes/leaks/exposure</td> </tr> <tr> <td>Organisational measures to prevent or limit releases, dispersion and exposure</td> <td>Not relevant</td> </tr> <tr> <td>Conditions and measures for personal protection, hygiene and health evaluation</td> <td>Use safety glasses</td> </tr> </table>	Product characteristics	Solid with low dust formation index Liquid, ammonium nitrate concentration in the product > 25%	Quantities used	Not relevant	Frequency and duration of use or exposure	> 4 hours a day	Human factors not influenced by risk management	Not relevant	Other operational conditions that have an impact on worker exposure	Used indoors and outdoors	Technical conditions and measures at process level (source) to prevent release	Not relevant	Technical conditions and measures for controlling dispersion of the source to workers	1.- Adequate containment of the substance 2.- Good ventilation conditions 3- Avoid splashing. Use specific dispensers and pumps designed especially to prevent splashes/leaks/exposure	Organisational measures to prevent or limit releases, dispersion and exposure	Not relevant	Conditions and measures for personal protection, hygiene and health evaluation	Use safety glasses
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Quantities used	Not relevant																		
Frequency and duration of use or exposure	> 4 hours a day																		
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Other operational conditions that have an impact on worker exposure	Used indoors and outdoors																		
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Organisational measures to prevent or limit releases, dispersion and exposure	Not relevant																		
Conditions and measures for personal protection, hygiene and health evaluation	Use safety glasses																		
3	Estimation of exposure and reference to its source																		
	<p>Information for contributing scenario 1 (environmental exposure):</p> <p>No environmental assessment was completed because the substance does not fulfil criteria for classification as hazardous for the environment and therefore there is no additional assessment of environmental exposure.</p> <p>Information for contributing scenario 2 (exposure for personnel):</p> <p>A qualitative assessment has been included that concludes that this use is safe for workers.</p> <p>The toxicological effect of this substance is eye irritation (local parameter), for which a DNEL value cannot be estimated, because there is no dose-response information available. A minimal systemic effect was only observed at doses that were so high that personnel would never be exposed to them (see relevant DNEL: section 8 SDS), so it was not considered necessary to make a quantitative risk assessment.</p>																		
4	Guidance for intermediate users to assess if they working within the limits set by the ES																		
	Additional risk management measures apart from the ones mentioned above in the contributing scenarios (2.1, 2.2) are not required to guarantee safety during this use and thus work within the limits of the ES 3 exposure scenario.																		
5	Good practice advice in addition to that included in the Chemical Safety Assessment (CSA) required by REACH. Measures not subject to art. 37 (4) REACH																		
	<ul style="list-style-type: none"> - Adequate containment of the substance - Minimise the number of exposed personnel - Segregate the releasing processes - Utilise effective contamination extraction systems - Good ventilation conditions - Minimise manual handling - Avoid contact with contaminated objects and instruments - Regularly clean the work area and equipment - Supervise the area to check that risk management measures are being applied - Train personnel for good practices - Keep standard personal hygiene conditions 																		

Liquid ammonium nitrate in hot, concentrated solution (> 80% and ≤ 93%)

Safety Data Sheet Appendices Exposure Scenario 4

1	Title of Exposure Scenario (ES)														
	End use for consumers of fertilisers, matches and fireworks														
2	Description of activities or processes covered by the exposure scenario														
	<p>List of all the use descriptors related to ES 3</p> <p>SU 21 * PC 11/12 ERC 8b/8e/10a</p> <p>Name/s of contributing scenario/s related to the environment and their corresponding Environmental Release Class (ERC)</p> <p>1. Wide dispersive indoor use of reactive substances in open systems (ERC 8b) 2. Wide dispersive outdoor use of reactive substances in open systems (ERC 8e) 3. Wide dispersive use of long-life articles and materials with low release (ERC 10a)</p> <p>Name(s) of contributing scenarios for the worker and their corresponding Chemical Product Category (PC)</p> <p>1. Explosives (PC11) 2. Fertilizers (PC 12)</p> <p>* Agency Guidance Document, Chapter R.12: Use descriptor systems: SU 21 (Uses by consumers: Private households (= general public = consumers))</p>														
2,1	Contributing scenario (1) controlling environmental exposure for use of fertilizers, matches and fireworks by consumers (ES4)														
	<p>Environmental exposure due to the use by consumers of ammonium nitrate in fertilisers, matches and fireworks</p> <p>Section 2.1 describes the emissions to the environment that may occur during wide dispersive indoor use of reactive substances in open systems (ERC 8b) and wide dispersive outdoor use of reactive substances in open systems (ERC 8e)</p> <p>As this substance does fulfil criteria for classification as hazardous to the environment, the environmental risk assessment has not been carried out for this substance and therefore the conditions that affect the environment are not included during this use.</p>														
2,2	Contributing scenario (2) controlling consumer exposure for use of fertilizers, matches and fireworks														
	<p>All the relevant chemical product categories for this scenario identified by the PC codes in point 1 of this scenario (PC 11, PC 12) have the same operating conditions and risk management measures for personnel. Consequently they are all covered by just one contributing scenario (2).</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 60%;">Product characteristics</td> <td>Solid with low dust formation index Liquid Products containing ammonium nitrate in concentrations of ≥ 10% Products containing ammonium nitrate in concentrations of < 10%</td> </tr> <tr> <td>Quantities used</td> <td>Not relevant</td> </tr> <tr> <td>Frequency and duration of use or exposure</td> <td>Not relevant</td> </tr> <tr> <td>Human factors not influenced by risk management</td> <td>Not relevant</td> </tr> <tr> <td>Other operational conditions that have an impact on worker exposure</td> <td>Used indoors and outdoors</td> </tr> <tr> <td>Conditions and measures with information and recommendations for consumer conduct</td> <td>Avoid splashes</td> </tr> <tr> <td>Conditions and measures for personal protection and hygiene</td> <td>1.- If concentration is ≥ 10%, use safety glasses 2.- If concentration is < 10%, no personal protection is necessary 3.- Indicate safe recommendations of use for consumers on the product labels</td> </tr> </table>	Product characteristics	Solid with low dust formation index Liquid Products containing ammonium nitrate in concentrations of ≥ 10% Products containing ammonium nitrate in concentrations of < 10%	Quantities used	Not relevant	Frequency and duration of use or exposure	Not relevant	Human factors not influenced by risk management	Not relevant	Other operational conditions that have an impact on worker exposure	Used indoors and outdoors	Conditions and measures with information and recommendations for consumer conduct	Avoid splashes	Conditions and measures for personal protection and hygiene	1.- If concentration is ≥ 10%, use safety glasses 2.- If concentration is < 10%, no personal protection is necessary 3.- Indicate safe recommendations of use for consumers on the product labels
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Frequency and duration of use or exposure	Not relevant														
Human factors not influenced by risk management	Not relevant														
Other operational conditions that have an impact on worker exposure	Used indoors and outdoors														
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3	Estimation of exposure and reference to its source														
	<p>Information for contributing scenario 1 (environmental exposure):</p> <p>No environmental assessment was completed because the substance does not fulfil criteria for classification as hazardous for the environment and therefore there is no additional assessment of environmental exposure.</p> <p>Information for contributing scenario 2 (exposure for personnel):</p> <p>A qualitative assessment has been included that concludes that this use is safe for consumers.</p> <p>The toxicological effect of this substance is eye irritation (local parameter), for which a DNEL value cannot be estimated, because there is no dose-response information available. A minimal systemic effect was only observed at doses that were so high that consumers or people would never be exposed to them (see relevant DNEL: section 8 SDS), so it was not considered necessary to make a quantitative risk assessment.</p>														
4	Guidance for intermediate users to assess if they working within the limits set by the ES														
	<p>Additional risk management measures apart from the ones mentioned above in the contributing scenarios (2.1, 2.2) are not required to guarantee safety during this use:</p> <p>If concentration of ammonium nitrate is ≥ 10%, use safety glasses If concentration is < 10%, no personal protection is necessary</p>														