Safety Data Sheet

In accordance with Commission Regulation (EU) No 2020/878

Publication date: 09.05.2024 **Edition:** 4 **Revision date:** 01.12.2022 **Revision:** 1

Nitric Acid 60%

SECTION 1	**Identification of the substance/mixture and of the company/undertaking**	
1.1	**Product identifier**	
	Trade name	Nitric Acid 60%
	Code	DS-008
	Chemical name	-
	Chemical formula	-
	Index Number	Not applicable
	EINECS Number	Not applicable
	CAS Number	Not applicable.
	Registration Number	It is a mixture and therefore has no registration number.
	UFI	1J10-F06W-D00D-R5UN
1.2	**Relevant identified uses of the substance or mixture and uses advised against**	
	Application of the substance / the mixture	Use as fertilizer or in the manufacture of fertilizing products Intermediate in various industrial processes Formulation of mixtures pH regulator Metal surface treatment Cleaning agents Process auxiliary agent in industry Regeneration of ion exchange resins Laboratory chemical Surface etchant for concrete
	Uses advised against	Others than those indicated.
1.3	**Details of the supplier of the safety data sheet**	ADP Fertilizantes, S.A. Avenida Termo de Lisboa, 24-30, Salgados da Póvoa Apartado 88 2616-907 ALVERCA DO RIBATEJO | PORTUGAL (00351) 210 300 400 e-mail: fdsinfo@grupofertiberia.com
1.4	**Emergency telephone number**	ADP – Fertilizantes, S.A., Lavradio - (00351) 210 300 400 (Only available during office hours; Monday-Friday; 09:00-18:00)
SECTION 2	**Hazards identification**	
2.1	**Classification of the substance or mixture according Regulation (EC) n° 1272/2008 (CLP)**	Acute Tox. 3 H331 Toxic if inhaled. Met. Corr.1 H290 May be corrosive to metals. Skin Corr. 1A H314 Causes severe skin burns and eye damage. Eye Dam. 1 H318 Causes serious eye damage.
2.2	**Label elements**	
	Hazard pictograms	

	Signal word	Danger
	Hazard-determining components of labelling	nitric acid
	Hazard statements	H290 May be corrosive to metals. H331 Toxic if inhaled. H314 Causes severe skin burns and eye damage.
	Precautionary statements	P102 Keep out of reach of children. P270 Do not eat, drink or smoke when using this product. P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310 Immediately call a POISON CENTER/doctor. P321 Specific treatment (see on this label). P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
	Additional information	Acquisition, possession or use by private individuals is subject to restrictions.
	Supplemental information on the label	Not applicable.
	Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	Not applicable.
	Special packaging requirements	Not applicable.
	Containers to be fitted with child-resistant fastenings	Not applicable.
	Tactile hazard warning	Not applicable.
2.3	**Other hazards**	
	Other hazards which do not result in classification	None known.

	Results of the PBT and vPvB assessment	Not applicable.
	Determination of endocrine disrupting properties	None substance listed.

SECTION 3 Composition/information on ingredients

3.1 Substances

Not applicable.

3.2 Mixtures

Name	Index Number	EC Number	CAS Number	Registration number	%(P/P)	Clasification Rgto. 1272/2008
Nitric acid	007-030-00-3	231-714-2	7697-37-2	01-2119487297-23-XXXX	≥26,5-<65%	Ox. Liq. 3, H272; Acute Tox. 3, H331; Met. Corr.1, H290; Skin Corr. 1A, H314; Eye Dam. 1, H318; EUH071 By inhalation: ETA = 2,65 mg/l (vapours) Ox. Liq. 3; H272: C >= 65 % Skin Corr. 1A; H314: C >= 20 % Skin Corr. 1B; H314: 5 % <= C < 20 %

Additional indications	For the wording of the listed hazard phrases refer to section 16.

SECTION 4 First aid measures

4.1 Description of first aid measures

General information	Provide medical assistance to those affected. People who dispense first aid are advised to wear personal protective equipment. There may be delayed effects on exposure.
Inhalation	If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
Ingestion	Do NOT induce vomiting (risk of perforation). Never give anything by mouth to an unconscious person. Rinse mouth with water. make victim drink water (two glasses at most), Consult a physician. Do not attempt to neutralise.
Skin contact	Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.
Eye contact	Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Eye contact	Risk of blindness.
Inhalation	Shortness of breath, labored breathing, wheezing, abdominal pain, nausea, vomiting, headache, weakness, convulsions, collapse.
Skin contact	Redness, burn, pain, blistering.

	Ingestion	Burns in mouth, oesophagus, may cause intestinal perforation.
4.3	**Indication of any immediate medical attention and special treatment needed**	
	No action involving personal risk or without adequate training should be taken. Avoid direct mouth-to-mouth resuscitation, as it can be dangerous for the person providing the help. Use other methods for resuscitation, preferably oxygen or compressed air equipment. Treat according to the following indications:	
	Notes to physician	Treat symptomatically.
	Specific treatments	There is no specific treatment. It depends on specialized medical observation.

SECTION 5	**Firefighting measures**	
5.1	**Extinguishing media**	
	The product is not flammable.	
	Suitable extinguishing agents	Dry powder, dry sand.
	Unsuitable extinguishing agents for safety reasons	Avoid water in straight hose stream; will scatter and spread fire.
5.2	**Special hazards arising from the substance or mixture**	
	Has a fire-promoting effect due to release of oxygen. Ambient fire may liberate hazardous vapours.	
	Hazardous thermal decomposition products	Nitrogen oxides, nitrous gases, ammonia.
5.3	**Advice for firefighters**	
	Open warehouse doors and windows for maximum ventilation. Fire-fighting personnel should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face mask operating in positive pressure mode. Clothing for fire-fighting personnel (including helmets, protective boots) should conform to European standard EN 469 and gloves to EN 659. It should provide a basic level of protection for chemical incidents and should be fire resistant. The facility shall have sufficient protective equipment available to deal with fires.	

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SECTION 6	**Accidental release measures**
6.1	**Personal precautions, protective equipment and emergency procedures**
	To avoid projections of corrosive liquid by overflow, both from tanks or reservoirs and from cisterns in loading and unloading operations, the following spill prevention measures shall be adopted: (a) In tanks and reservoirs. The protection system in tanks and reservoirs shall depend on the type of installation so as to ensure that there is no overfilling of the receptacles by means of two independent safety features, e.g. level indicators and independent high level alarm. The shut-off valve may be either automatically or manually operated. Constant observation of the tank level by an operator connected by radiotelephone or other effective means of communication with the operator of the shut-off valve is permitted. (b) In tanks. A telescopic diving tube shall be used to the bottom of the tank or filled from the bottom of the tank and the provisions laid down in the regulations on loading/unloading of dangerous goods shall be taken into account. (c) In hoses. Dripping from the ends of hoses shall be prevented. If dripping does occur, it shall be adequately collected.
	For non-emergency personnel
	Do not breathe vapors or spray mist. Avoid contact with skin, eyes and clothing. In case of non-flammable spills and leaks, wear vapor protective clothing. Stop leak if you can do so without risk. Keep unnecessary persons away, isolate the danger area and prevent entry. Eliminate sources of combustion. Keep upwind, out of low areas and ventilate confined spaces before entering. Assess the affected area to determine if evacuation is necessary. If it is necessary to evacuate the danger zone, you should follow the advice of an expert. If sheltering in place, tape windows and doors, close outside air intakes (attic fans, etc.) and place a damp towel or cloth over your face (if necessary).
	For emergency responders
	With proper training, self-contained breathing apparatus (SCBA) and protective clothing for structural firefighters used in conjunction with water spray will provide limited protection in outdoor emissions for short-term exposure.
6.2	**Environmental precautions**
	In case of accidental spills and leaks avoid dispersal of spilled material, runoff and contact with soil, watercourses (surface and groundwater), drains and sewers. Inform the competent authorities if the product has caused adverse impacts (sewers, watercourses, soil or air).
6.3	**Methods and material for containment and cleaning up**
	In case of accidental spills and leaks, avoid dispersal of spilled material. Use water spray or foam to control vapors. Make a protective barrier and ensure closure of drains with suitable containment material. Absorb with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Sweep and shovel into suitable containers for disposal.
6.4	**Reference to other sections**
	See Section 7 for information on safe handling. See Section 8 for information on personal protection equipment. See Section 13 for disposal information.

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SECTION 7	**Handling and storage**	
7.1	**Precautions for safe handling**	
	Technical precautionary measures	Wear appropriate personal protective equipment. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering food areas. Avoid contact with eyes, skin or clothing. Do not breathe vapours or mist. Do not ingest. Avoid release to the environment. Keep in original container or approved alternative made of compatible material, kept tightly closed when not in use. Keep away from acids. Empty containers retain product residues and may be hazardous. Do not reuse container.
	Advice on general occupational hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
7.2	**Conditions for safe storage, including any incompatibilities**	
	Avoid contact and packaging with incompatible substances or mixtures. See section 10; Avoid proximity to potential sources of ignition (including electrical equipment); Store in a place that avoids adverse weather conditions (high temperatures); Avoid direct sunlight; Ensure good ventilation of the storage area. Ensure that the quantities that can be stored are not exceeded. See section 15.	
7.3	**Specific end use(s)**	
	Use only as described in section 1.2.	
SECTION 8	**Exposure controls/personal protection**	
8.1	**Control parameters**	
	Occupational exposure limits	There is no limit of occupational exposure value for the mixture.
	Recommended monitoring procedures	If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of ventilation or other control measures and/or the need to use respiratory protective equipment. Monitoring standards such as the following may be used as reference: European Standard EN 689 (Atmospheres in the workplace. Guidelines for the evaluation of inhalation exposure of chemical agents for comparison with limit values and measurement strategy), European Standard EN 14042 (atmospheres in the workplace. Guidelines for the application and use of procedures to assess exposure to chemical and biological agents) European Standard EN 482 (atmospheres in the workplace. General requirements for the performance of procedures for measuring chemical agents). National guidance documents on methods for the determination of hazardous substances should also be used as a reference.
	Derived effect levels	No DELs available.
	Predicted effect concentrations	No PECs available.

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Ingredients with limit values that require monitoring at the workplace	CAS: 7697-37-2 nitric acid IOELV: Short-term value: 2.6 mg/m³, 1 ppm				
DNEL					
Substance				7697-37-2	
				Nitric acid	
Industrial/Professional worker	**Inhalation (mg/m3)**	**Long-term**	**Systemic**	Low risk (no threshold was derived)	
			Local	Low risk (no threshold was derived)	
		Short-term	**Systemic**	2,6 mg/m3	
			Local	2,6 mg/m3	
	Dermal (mg/kg pc/día)	**Long-term**	**Systemic**	Low risk (no threshold was derived)	
			Local	No hazard has been identified	
		Short-term	**Systemic**	High risk (no threshold was derived)	
			Local	High risk (no threshold was derived)	
	Ocular (mg/kg pc/día)	**Long-term**	**Systemic**	Not available	
			Local	Not available	
		Short-term	**Systemic**	High risk (no threshold was derived)	
			Local	High risk (no threshold was derived)	
Consummer	**Inhalation (mg/m3)**	**Long-term**	**Systemic**	Low risk (no threshold was derived)	
			Local	Low risk (no threshold was derived)	
		Short-term	**Systemic**	1,3 mg/m3	
			Local	1,3 mg/m3	
	Dermal (mg/kg pc/day)	**Long-term**	**Systemic**	Low risk (no threshold was derived)	
			Local	Low risk (no threshold was derived)	
		Short-term	**Systemic**	High risk (no threshold was derived)	
			Local	High risk (no threshold was derived)	
	Oral (mg/kg pc/day)	**Long-term**	**Systemic**	Low risk (no threshold was derived)	
			Local	No hazard has been identified	
		Short-term	**Systemic**	Not available	
			Local	Not available	
	Ocular (mg/kg pc/day)	**Long-term**	**Systemic**	Not available	
			Local	Not available	
		Short-	**Systemic**	High risk (no threshold was derived)	

			term	Local	High risk (no threshold was derived)

PNEC

Substance	7697-37-2 Nitric acid
Fresh water (mg/L)	No hazard has been identified
Salt water (mg/L)	No hazard has been identified
STP (mg/L)	No hazard has been identified
Fresh water sediment (mg/L)	No hazard has been identified
Salt water sediment (mg/L)	No hazard has been identified
Air (mg/L)	No hazard has been identified
Soil (mg/L)	No hazard has been identified
Predators (secondary poisonment) (mg/L)	No hazard has been identified

Components with biological limit values	Non-existent.
Additional indications	The Occupational exposure limits lists valid during the making were used as basis.

8.2 Exposure controls

Appropriate engineering controls		As a general rule, access shall be prohibited to unauthorised personnel. The prohibition shall be posted on a clearly visible and legible sign. Ventilation. Storerooms and loading and unloading or transfer facilities shall be designed with natural or forced ventilation so that the risk of exposure of workers is adequately controlled. For this purpose, the design shall take special account of the characteristics of the vapours to which they may be exposed and of the source of the emissions, their collection at source and their possible transmission to the environment of the storage or installation. Where they are located inside buildings, ventilation shall be channelled to a safe place outside through dedicated ducts, taking into account the permissible emission levels to the atmosphere. Where forced ventilation is used, it shall be provided with an alarm system in case of failure. Premises with pits or basements where vapours may accumulate shall have adequate forced ventilation in such pits or basements to prevent the accumulation of vapours.
Personal protective measures, such as personal protective equipment	**General protection and hygiene measures**	Wash completely the hands, forearms and face after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Use the appropiate techniques to remove the contaminated clothes. Wash the contaminated clothes before reusing. Verify that the eyes washing stations and safety showers were near to working stations.
	Respiratory protection	In case of hazardous fumes, wear self-contained breathing apparatus. See respiratory protection standard EN 137 for further information.
	Hand protection	Wear leather gloves to avoid frostbite injuries due to the rapid expansion of the gas when handling pressurised gas cylinders. Skin protection creams do not sufficiently protect against the substance. Where there is a risk of direct contact with the substance, chemical resistant gloves are required.
	Glove material	Butyl-rubber.
	Other	Use personal protective equipment during use and handling of the product.

		Eye/face protection	Wear chemical goggles (with indirect ventilation) when there is a possibility of contact with liquid or mist. The use of a full face shield in addition to goggles is recommended for additional protection. See eye and face protection standard EN 166 for further information. A safety shower and eye wash fountain should be provided in the ammonia handling area.
		Thermal hazards	Not available.
	Environmental exposure controls		General ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.
SECTION 9	**Physical and chemical properties**		
9.1	**Information on basic physical and chemical properties**		
	Physical state		Liquid
	Colour		Colourless
	Odour		Not available
	Melting point/freezing point		-20 ° C
	Initial boiling point and boiling range		120 ° C
	Flammability		Non-flammable
	Upper/lower flammability or explosive limits		
	Lower		Not applicable due to physico-chemical characteristics
	Upper		Not applicable due to physico-chemical characteristics
	Flash point		Not applicable due to physico-chemical characteristics
	Auto-ignition temperature		Not available.
	Decomposition temperature		83 ° C
	pH		1
	Viscosity		
	Kinematic		Undeterminated
	Dynamic		at 25 ° C 0.7 mPas
	Solubility		
	In water		at 20 ° C 500 g/l
	Partition coefficient: n-octanol/water		Not applicable due to physico-chemical characteristics

	Vapour pressure (20ºC)	at 20 ° C 770 Pa
	Density and/or relative density	at 20 ° C 1.36
	Relative vapour density	Not available.
	Particle characteristics	Not applicable due to physico-chemical characteristics
9.2	**Other information**	No additional information No further relevant information available.
	Appearance	Liquid
	Explosives properties	Not explosive
	Oxidizing properties	Not available
	Information with regard to physical hazard	
	Explosives	Not applicable due to physico-chemical characteristics.
	Flammable gases	Not applicable due to physico-chemical characteristics.
	Aerosols	Not applicable due to physico-chemical characteristics.
	Oxidising gases	Not applicable due to physico-chemical characteristics.
	Gases under pressure	Not applicable due to physico-chemical characteristics.
	Flammable liquids	Not applicable due to physico-chemical characteristics.
	Flammable solids	Not applicable due to physico-chemical characteristics.
	Pyrophobic liquids	Not applicable due to physico-chemical characteristics.
	Pyrophobic solids	Not applicable due to physico-chemical characteristics.
	Self-reactive substances and mixtures	Not applicable due to physico-chemical characteristics.
	Substances and mixtures, which emit	Not applicable due to physico-chemical characteristics.
	Oxidising liquids	Not applicable due to physico-chemical characteristics.
	Oxidizing solids	Not applicable due to physico-chemical characteristics.
	Organic peroxides	Not applicable due to physico-chemical characteristics.
	Corrosive to metals	May be corrosive to metals.
	Desensitised explosives	Not applicable due to physico-chemical characteristics.
	Other safety characteristics	
	Mechanical sensitivity	Not applicable due to physico-chemical characteristics.
	Self-accelerating polymerisation	Not applicable due to physico-chemical characteristics.

	Formation of explosible dust/air mixtures	Not applicable due to physico-chemical characteristics.
	Acid/alkaline reserve	Not applicable due to physico-chemical characteristics.
	Evaporation rate	Not applicable due to physico-chemical characteristics.
	Miscibility	Not applicable due to physico-chemical characteristics.
	Conductivity	Not applicable due to physico-chemical characteristics.
	Corrosiveness	Not applicable due to physico-chemical characteristics.
	Gas group	Not applicable due to physico-chemical characteristics.
	Redox potential	Not applicable due to physico-chemical characteristics.
	Radical formation potential	Not applicable due to physico-chemical characteristics.
	Photocatalytic properties	Not applicable due to physico-chemical characteristics.
SECTION 10	**Stability and reactivity**	
10.1	**Reactivity**	Oxidizing.
10.2	**Chemical stability**	Chemically stable under the indicated storage, handling and use conditions.
10.3	**Possibility of hazardous reactions**	Risk of explosion with: Acetone, acetonitrile, acetylidene, alcohols, anilines, antimony hydride, arsenic hydride, organic combustible substances, phosphides, benzene/benzene derivatives, amines, alkenes, halogenated hydrocarbon, ether, hydrazine and derivatives, sulphides, dioxane, acetic acid, acetic anhydride, fluorine, glycerol, rubber, oils, chlorates, potassium permanganate, hydrocarbons, copper, lithium silicide, organic solvent, cyanides, powdered metals, methanol, ketones, organic nitro compounds, nonmetallic halides, mercury(II) nitrate, reducing agents, sulphur dioxide, cyanide complexes, titanium, hydrogen peroxide, Tin, sugars, formaldehyde, Impurities, dichloromethane, diethylether, ethanol, boranes. Risk of ignition or formation of inflammable gases or vapours with: Amines, Ammonia, combustible substances, Aldehydes, hydrogen iodide, Potassium, magnesium, sodium, hydrides, iodides, phosphorus, pyridine, hydrogen sulphide, turpentine oils and/or turpentine substitutes, halogen-halogen compounds, anilines, furfuryl alcohol. Exothermic reaction with: Nitriles, formic acid, antimony, arsenic, selenium, boron, lithium, nonmetallic halides, strong alkalis, nitrides, sodium hypochlorite, uranium, semimetals, water, ferric oxide, in powder form Generates dangerous gases or fumes in contact with: conc. sulfuric acid.
10.4	**Conditions to avoid**	Avoid the contact with the substances indicated in the previous section.
10.5	**Incompatible materials**	Reacts with alkali.
10.6	**Hazardous decomposition products**	Nitrogen oxides (NOx) (in case of fire).

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SECTION 11 Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Component	CAS number	Method	Species	Route	Result
Nitric acid	7697-37-2	OECD 403	Rat	Inhalation	CL50 > 2,65 mg/l air

Toxic if inhaled.

Skin corrosion/irritation

Component	CAS number	Method	Species	Route	Result
Nitric acid	7697-37-2	-	-	-	There are no available studies but a trial is not considered necessary due to the known corrosive properties of acid. Nitric acid is classified as a skin-corrosive substance of category 1A and category 1B according to Annex VI of the CLP Regulation.

Causes severe skin burns and eye damage.

Serious eye damage/irritation

Component	CAS number	Method	Species	Route	Result
Nitric acid	7697-37-2	-	-	-	There are no available studies but based on the properties of the substance it is classified as corrosive to the eyes.

Causes severe skin burns and eye damage.

Respiratory or skin sensitation

Component	CAS number	Method	Species	Route	Result
Nitric acid	7697-37-2	-	-	-	There are no available studies. The substance is classified as corrosive to the skin therefore it is not necessary to carry out other studies for sensitization.

Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Component	CAS number	Method	Species	Result
Nitric acid	7697-37-2	OECD 471 OECD 473 OECD 476	Bacteria Cromosomic aberration Mutation of mammal cells	Non mutagenic

Based on available data, the classification criteria are not met.

Carcinogenicity

Component	CAS number	Method	Species	Route	Result
Nitric acid	7697-37-2	-	-	-	Two unreliable studies are available for nitric acid with respect to carcinogenicity. These studies are of limited value due to the short duration of exposure and the inadequate way in which the design and results of the studies were reported. A 2-year study of Rats showed that the incidence of tumors had not increased. The substance is not carcinogenic.

Based on available data, the classification criteria are not met.

Reproductive toxicity

Component	CAS number	Method	Species	Route	Result
Nitric acid	7697-37-2	OECD 422	Rat	Oral	Effects on fertility: NOAEL > 1500 mg/kg bw/d. Toxicity for the development: NOAEL > 1500 mg/kg bw/d

Based on available data, the classification criteria are not met.

STOT- single exposure

Component	CAS number	Method	Species	Route	Result
Nitric acid	7697-37-2	Not available	Not available	Not available	Not available

Based on available data, the classification criteria are not met.

STOT-repeated exposure

Component	CAS number	Method	Species	Route	Result
Nitric acid	7697-37-2	OECD 422 OECD 412 OECD 413	Rat Rat	Oral Inhalation	NOAEL: 1500 mg/kg bw/d NOAEL: 4,11 mg/m3

Based on available data, the classification criteria are not met.

Aspiration hazard

Component	CAS number	Result
Nitric acid	7697-37-2	No significant effects or critical hazards are known.

Based on available data, the classification criteria are not met.

11.2 Information on other hazards

Endocrine disruptive properties

Not available

Other information

Not available

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SECTION 12 Ecological information

12.1 Toxicity

Aquatic toxicity

Component	Nº CAS		Fish	Crustacea	Algae
Nitric acid	7697-37-2	Short term	pH lethal (96h): 3-3,5 (Lepomis	It is not necessary to carry out studies	pH lethal (48h): 4,4-4,7 (ceriodaphnia dubia)
		Long term	According to Annex IX of REACH, testing is not necessary if the results of the chemical safety study indicate that there is no need to investigate the effects on aquatic organisms.	An exemption is proposed for this section, and a study conducted with potassium nitrate is presented as evidence.	An exemption is proposed for this section, and a study conducted with potassium nitrate is presented as evidence.

Terrestrial toxicity

Component	Nº CAS	Macro-organism	Micro-organism	Terrestrial plants	Other organisms
Nitric acid	7697-37-2	Not available	Not available	Not available	-

Microbiological activity in wastewater treatment plants

Component	Nº CAS	Toxicity to aquatic micro-organisms
Nitric acid	7697-37-2	A waiver is proposed for this section and a study conducted with sodium nitrate is presented as supporting evidence.

12.2 Persistence and degradability

Component	Nº CAS	Degradation	
Nitric acid	7697-37-2	**Hydrolysis**	Scientifically not necessary
		Photolysis	Not available.
		Biodegradation	Not available.

12.3 Bioaccumulative potential

Component	Nº CAS	Octanol-water partition coefficient (Kow)	Bioacumulation factor (BFC)	Observations
Nitric acid	7697-37-2	Not applicable.	-	-

12.4 Mobility in soil

Component	Nº CAS	Result
Nitric acid	7697-37-2	No information available.

12.5 Results of PBT and vPvB assessment

Not applicable.

12.6 Endocrine disrupting properties

Not applicable.

12.7 Other adverse effects

Significative effects or critcs risks are not known.

SECTION 13	Disposal considerations	
13.1	**Waste treatment methods**	
	Methods of disposal	Waste management (disposal and recovery): Consult the authorised waste manager for recovery and disposal operations, in accordance with Annex 1 and Annex 2 (Directive 2018/851/EC). Packaging: According to codes 15 01 (Commission Decision 2014/955/EU), if the packaging has been in direct contact with the product, it should be treated in the same way as the product itself, otherwise it should be treated as non-hazardous waste. Discharge into waste water is not recommended. See section 6.2. Waste management provisions: In accordance with Annex II of Regulation (EC) No 1907/2006 (REACH), the Community or national provisions on waste management are presented. Community legislation: Directive 2018/851/EC, Commission Decision 2014/955/EU, Regulation (EU) no. 1357/2014 and the national legislation.
	Hazardous waste code	HP6: Acute Toxicity HP8: Corrosive

SECTION 14	Transport information				
	Regulatory information	**ADR/RID**	**ADNR**	**IMDG**	**IATA**
14.1	**UN number**	UN2031			
14.2	**UN proper shipping name**	UN2031 NITRIC ACID solution		NITRIC ACID solution	
14.3	**Transport hazard class(es)**				
	Class	8 (C1) Corrosive substances.		8 Corrosive substances.	
	Label	8		8	
14.4	**Packing group**	II			
14.5	**Environmental hazards**	Not applicable.			
14.6	**Special precautions for user**	Not applicable.			
		Hazard identification number (Kemler code): 80 EMS Number: F-A,S-Q Segregation groups (SGG1a) Strong acids Stowage Category D			
	Segregation Code	SG6 Segregation as for class 5.1 SG16 Stow "separated from" class 4.1 SG17 Stow "separated from" class 5.1 SG19 Stow "separated from" class 7 SG36 Stow "separated from" SGG18-alkalis. SG49 Stow "separated from" SGG6-cyanides			
14.7	**Maritime transport in bulk according to IMO instruments**	Not applicable.			

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Aditional information	Limited quantities (LQ) 1L Excepted quantities (EQ) Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml Transport category 2 Tunnel restriction code E	Limited quantities (LQ): 1L Excepted quantities (EQ): Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml	-
UN "Model Regulation":	UN 2031 NITRIC ACID SOLUTION, 8, II		

SECTION 15	**Regulatory information**	
15.1	**Safety, health and environmental regulations/legislation specific for the substance or mixture**	
	Regulation (EC) No 1907/2006 (REACH)	This product complies with the REACH Regulation.
	SEVESO Category	H2 ACUTE TOXICITY
	Qualifying quantity (tonnes) for the application of lower-tier requirements	50 t
	Qualifying quantity (tonnes) for the application of upper-tier requirements	200 t
	Named dangerous substances - ANNEX VI (CLP)	Contains nitric acid according to index entry No. 007-030-00-3.
	Regulation (EC) No 1907/2006 - ANNEX XVII	Not applicable.
	REGULATION (EU) 2019/1148	
	Annex I - Restricted Explosives Precursors (Upper limit value for licensing purposes under Article 5(3))	CAS: 7697-37-2 nitric acid: Limit value: >3-<=10 % (>=50-<65%)
	Annex II - Reportable Explosives Precursors	None substance listed.
	Regulation (EC) No 273/2004 on Drug Precursors	None substance listed.
	Regulation (EC) No 111/2005 laying down rules for the monitoring and trade in drug precursors between the Community and third countries.	None substance listed.
	Regulation (UE) 2019/1009	This product complies with the Fertilizer Regulation.

	Regulation (EC) No. 1272/2008 (CLP)	This product complies with the CLP Regulation.
	Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.	Not applicable.
	Regulation (EC) No 649/2012 concerning the export and import of dangerous chemicals.	Not applicable.
	PBT/mPmB Evaluation	None substance listed.
15.2	**Chemical safety assessment**	
	A chemical safety assessment has been carried out and exposure scenarios are annexed to this sheet.	
SECTION 16	**Other information**	
	Relevant phrases	H272 May intensify fire; oxidiser. H290 May be corrosive to metals. H314 Causes severe skin burns and eye damage. H318 Causes serious eye damage. H331 Toxic if inhaled. EUH071 Corrosive to respiratory system.
	Abbreviations and acronyms	ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road). STP: Sewage treatment plant. OECD: Organisation for Economic Co-operation and Development. NOAEL: No observed adverse effect level. IMDG: International Maritime Code for Dangerous Goods. IATA: International Air Transport Association. GHS: Globally Harmonised System of Classification and Labelling of Chemicals. CAS: Chemical Abstracts Service (division of the American Chemical Society). DNEL: Derived No-Effect Level (REACH). PNEC: Predicted No-Effect Concentration (REACH).
	Data compared to the previous version altered	Correction of errors in the sections 13, 14 and 15. New data on the SDS supplier. Correction of errors in section 14.
	References	This safety data sheet has been prepared in accordance with: - ANNEX II: Guidance for the preparation of Safety Data Sheets of Regulation (EC) No 1907/2006 (Regulation (EU) 2015/830) based on the data included in the chemical safety report of registered substances. - Guidance available on the European Chemicals Agency (ECHA) website: (http://echa.europa.eu/). - Guidance for the compilation of safety data sheets for fertilizer materials (www.fertilizerseurope.com).

	Methods used for the classification of the mixture (Article 9 of Regulation (EC) No 1272/2008)	Classification and Labeling in accordance with the principle of extrapolation of Regulation No. 1272/2008 (CLP).
	Advice on any training appropriate for workers to ensure protection of human health and the environment	Minimum training in the prevention of occupational hazards is recommended for personnel who will handle this product, in order to facilitate the understanding and interpretation of this safety data sheet, as well as the product label.

The information contained in this safety data sheet is provided in good faith and its accuracy is based on knowledge of the product at the time of publication. The information presented is only intended to describe the product from the point of view of human and environmental protection and safety, and therefore cannot be regarded as product specifications. It does not imply acceptance of any commitment or legal responsibility on the part of the Company, for the consequences of its use or misuse in any circumstances. The information provided is considered accurate and current at the time of this edition, referring only to the product and may not be valid in compositions or formulations with other products. The responsibility for its use belongs to the users.

Nitric Acid 60%

Exposure Scenarios

Nitric Acid <70%

ES 1:	Formulation or re-packing - Formulation of mixtures using Nitric acid < 70%

1. Title section

ES name: *Formulation or re-packing - Formulation of mixtures using Nitric acid < 70%*

Environment	
Formulation of mixtures using Nitric acid < 70%	ERC 2
Worker	
All worker activities combined*	PROC 1; PROC 2; PROC 3; PROC 4; PROC 5; PROC 8a; PROC 8b; PROC 9; PROC 15

*The PROC's do not represent worker exposures, but rather processes. As the actual worker activities have not been determined in detail, they are combined into 1 scenario.

2. Conditions of use affecting exposure

2.1. Control of environmental exposure

Amount used, frequency and duration of use (or from service life)

• Annual use amount at site: Not relevant for the required assessment(s)

• Daily use amount at site: Not relevant for the required assessment(s)

Conditions and measures related to biological sewage treatment plant

• Biological STP: Not relevant for the required assessment(s)

Other conditions affecting environmental exposure

• Adjust pH of waste water when containing the substance

• There is no release of the substance to air (as the substance is rigorously contained by technical means)

2.2. Control of worker exposure

Product (Article) characteristics

• Percentage (w/w) of substance in mixture/article: < 70%

• Physical form of the used product: Liquid (aqueous solution)

Amount used (or contained in articles), frequency and duration of use/exposure

• Duration of activities in the working area: ≤ 8 hours/day (all worker activities combined)

Nitric Acid 60%
• Amount used: Not relevant
Technical and organisational conditions and measures
• Containment: Under standard operating conditions the substance is rigorously contained by technical means in the working area. The activities take place in a standardized way, under controlled conditions with dedicated equipment. In case a certain amount of the substance is not contained, a worker is not exposed to the substance as the use takes place in a fume hood or as the worker wears personal protective equipment and uses local exhaust ventilation. Formation of aerosols/mists/splashes is prevented.
• Organisational measures: Minimise the number of staff in the working area. Minimise manual activities. Train employees how to safely handle the substance, incl. how to use personal protection equipment. Regularly clean up the working area. Have supervision in place to regularly check that the conditions of use are followed by the workers. Ensure that all equipment is well maintained. Ascertain that personal protection equipment is available and used according to the instructions. Ensure that eyewash stations and safety showers are available in the working area.
• Suitable material: The recommended material for tanks, vessels and accessories is low carbon austenitic stainless steel.
• Unsuitable materials: Do not use any metal, carbon steel or polypropylene
• Ventilation conditions in the working area: Use only outdoors or in a well-ventilated area (approximately 5 air changes per hour)
• Local exhaust ventilation: Use indoor local exhaust ventilation when vapour/mist/spray of nitric acid could be present in the air within the breathing zone of a worker.
• Storage conditions: Store in a well-ventilated place (preferably outside). In an area equipped with acid resistant flooring. Protect from sunlight. Keep containers tightly closed. Keep away from combustible materials, heat, hot surfaces, sparks, open flames and other ignition sources.
• Gas monitoring: Use stationary and/or portable NOx monitors in the working place, monitoring normal NOx levels at well below 2.6 mg/m3
Conditions and measures related to personal protection, hygiene and health evaluation
• General: Work under a high standard of personal hygiene. Wash hands and face before breaks. Do not eat, drink or smoke in the working area.
• Respiratory Protection: In case there is any risk of inhalation exposure to the substance, always wear a full-face mask with an acid gas cartridge or wear a supplied air respirator/helmet/suit. Potential inhalation exposure to the substance must be kept to a minimum. The smallest amount inhaled may already have (acute and/or delayed) effects on the respiratory tract.
• Dermal and Eye protection: In case there is any risk of dermal exposure (via contaminated equipment), always wear suitable acid resistant protective clothing in the working area and wear acid resistant gloves conforming to EN374 (and chemical safety goggles/full-face shield conforming to EN166). Potential dermal exposure to the substance must be kept to a minimum. The smallest amount of an aqueous solution of the substance may already cause severe burns and/or eye damage.
• When aerosols/mists of nitric acid can be formed, wear a suitable acid resistant chemical safety suit with a supplied air respirator/helmet/suit.
• Suitable material: butyl/fluorinated rubber.
3. Exposure estimation and reference to its source **3.1. Environmental release and exposure**

Nitric Acid 60%		
Release route	**Release rate**	**Explanation / Justification:**
Water	Not applicable, see explanations	The release to waste water is not determined nor needed for the required assessment(s). Moreover, independent on this release, the risk management measure of adjusting the pH of the waste water is only needed.
Air	Estimated release rate	Local release rate: 0 kg/day The substance is rigorously contained by technical means.
Soil	Not applicable, see explanations	The release to non-agricultural soil is not determined nor needed for the required assessment(s).

Protection target	**Exposure estimate**		**RCR**
Man via environment - Inhalation (systemic effects)	0 mg/m3		Qualitative risk (see below)
Man via environment - Inhalation (local effects)	0 mg/kg bw/day		<0,01
Man via environment - Oral	-		Qualitative risk (see below)

Risk characterisation

Qualitative risk characterisation
Man via environment - Inhalation (systemic effects):
Local effects emerge before systemic effects potentially appear. Moreover, nitric acid is not expected to become systemically available. The performed exposure assessment and risk characterisation for Man via environment - Inhalation (local effects) is therefore protective for Man via environment - Inhalation (systemic effects).

Man via environment - Oral:
Potential risks from oral indirect exposure to nitric acid is considered negligible. Indirect oral exposure to humans, through the consumption of food (e.g. fish, crops, meat and milk) and drinking water, is not relevant for nitric acid. As soon as nitric acid is in contact with water, it is present as nitrate, considered to be regulated in the human body similar to the endogenous nitrate. Nitric acid is not expected to become systemically available.

3.2. Worker exposure

Route of exposure and type of effects	**Risk quantification**
Inhalation, systemic, long term	Qualitative (see below)
Inhalation, systemic, acute	Qualitative (see below)

Nitric Acid 60%	
Inhalation, local, long term	Qualitative (see below)
Inhalation, local, acute	Qualitative (see below)
Dermal, systemic, long term	Qualitative (see below)
Dermal, systemic, acute	Qualitative (see below)
Dermal, local, long term	Qualitative (see below)
Dermal, local, acute	Qualitative (see below)
Eye, local	Qualitative (see below)

Conclusion on risk characterisation

Taking into account the operational conditions and risk management measures (when there is any possibility of exposure), the risk of causing effects is considered to be controlled. Potential exposure to the substance is kept to a minimum.

4. Guidance to DU to evaluate whether they work inside the boundaries set by the ES

In any of the exposure scenarios (ES) described above, the downstream user (DU) works within the limits established by ES if the operational conditions (OC) and risk management measures (RMM) described in the same are complied. When the conditions for the DU are not explicitly described in the general conditions of the ES, the DU must ensure that its specific CO and RMM comply with what is established in them. If the concentration of the substance in the mixture is not explicitly indicated in the ES, no restriction should be applied, that is, up to 100% of the substance may be used. Depending on the basis of the exposure assessment conducted for the ES, this can be done in different ways, as described in each of the environmental and occupational EEs.

Any deviation from the described conditions of use implies:
(i) inform the SDS provider about deviations and request their inclusion in the ES, or
(ii) develop an CSR (Chemical Safety Report) for DU (in accordance with article 37, paragraph 4), submit it to ECHA and keep it as its own documentation.

Nitric Acid 60%

ES 2: Use at industrial sites - Use of Nitric acid < 70% at industrial site as intermediate

1. Title section

ES name: *Use at industrial sites - Use of Nitric acid < 70% at industrial site as intermediate*

Environment	
Use of Nitric acid < 70% at industrial site as intermediate	ERC 6a
Worker	
All worker activities combined*	PROC 1; PROC 2; PROC 3; PROC 4; PROC 5; PROC 8a; PROC 8b; PROC 9; PROC 15

*The PROC's do not represent worker exposures, but rather processes. As the actual worker activities have not been determined in detail, they are combined into 1 scenario.

2. Conditions of use affecting exposure

2.1. Control of environmental exposure

Amount used, frequency and duration of use (or from service life)

• Annual use amount at site: Not relevant for the required assessment(s)

• Daily use amount at site: Not relevant for the required assessment(s)

Conditions and measures related to biological sewage treatment plant

• Biological STP: Not relevant for the required assessment(s)

Other conditions affecting environmental exposure

• Adjust pH of waste water when containing the substance

• There is no release of the substance to air (as the substance is rigorously contained by technical means)

2.2. Control of worker exposure

Product (Article) characteristics

• Percentage (w/w) of substance in mixture/article: < 70%

• Physical form of the used product: Liquid (aqueous solution)

Amount used (or contained in articles), frequency and duration of use/exposure

• Duration of activities in the working area: ≤ 8 hours/day (all worker activities combined)

• Amount used: Not relevant

Technical and organisational conditions and measures

Nitric Acid 60%
• Containment: Under standard operating conditions the substance is rigorously contained by technical means in the working area. The activities take place in a standardized way, under controlled conditions with dedicated equipment. In case a certain amount of the substance is not contained, a worker is not exposed to the substance as the use takes place in a fume hood or as the worker wears personal protective equipment and uses local exhaust ventilation. Formation of aerosols/mists/splashes is prevented.
• Organisational measures: Minimise the number of staff in the working area. Minimise manual activities. Train employees how to safely handle the substance, incl. how to use personal protection equipment. Regularly clean up the working area. Have supervision in place to regularly check that the conditions of use are followed by the workers. Ensure that all equipment is well maintained. Ascertain that personal protection equipment is available and used according to the instructions. Ensure that eyewash stations and safety showers are available in the working area.
• Suitable material: The recommended material for tanks, vessels and accessories is low carbon austenitic stainless steel.
• Unsuitable materials: Do not use any metal, carbon steel or polypropylene
• Ventilation conditions in the working area: Use only outdoors or in a well-ventilated area (approximately 5 air changes per hour)
• Local exhaust ventilation: Use indoor local exhaust ventilation when vapour/mist/spray of nitric acid could be present in the air within the breathing zone of a worker.
• Storage conditions: Store in a well-ventilated place (preferably outside). In an area equipped with acid resistant flooring. Protect from sunlight. Keep containers tightly closed. Keep away from combustible materials, heat, hot surfaces, sparks, open flames and other ignition sources.
• Gas monitoring: Use stationary and/or portable NOx monitors in the working place, monitoring normal NOx levels at well below 2.6 mg/m3
Conditions and measures related to personal protection, hygiene and health evaluation
• General: Work under a high standard of personal hygiene. Wash hands and face before breaks. Do not eat, drink or smoke in the working area.
• Respiratory Protection: In case there is any risk of inhalation exposure to the substance, always wear a full-face mask with an acid gas cartridge or wear a supplied air respirator/helmet/suit. Potential inhalation exposure to the substance must be kept to a minimum. The smallest amount inhaled may already have (acute and/or delayed) effects on the respiratory tract.
• Dermal and Eye protection: In case there is any risk of dermal exposure (via contaminated equipment), always wear suitable acid resistant protective clothing in the working area and wear acid resistant gloves conforming to EN374 (and chemical safety goggles/full-face shield conforming to EN166). Potential dermal exposure to the substance must be kept to a minimum. The smallest amount of an aqueous solution of the substance may already cause severe burns and/or eye damage.
• When aerosols/mists of nitric acid can be formed, wear a suitable acid resistant chemical safety suit with a supplied air respirator/helmet/suit.
• Suitable material: butyl/fluorinated rubber.

3. Exposure estimation and reference to its source

3.1. Environmental release and exposure

Release route	Release rate	Explanation / Justification:
Water	Not applicable, see explanations	The release to waste water is not determined nor needed for the required assessment(s). Moreover, independent on this release, the risk management measure of adjusting the pH of the waste water is only needed.
Air	Estimated release rate	Local release rate: 0 kg/day The substance is rigorously contained by technical means.
Soil	Not applicable, see explanations	The release to non-agricultural soil is not determined nor needed for the required assessment(s).

Protection target	Exposure estimate		RCR
Man via environment - Inhalation (systemic effects)	0 mg/m3		Qualitative risk (see below)
Man via environment - Inhalation (local effects)	0 mg/kg bw/day		<0,01
Man via environment - Oral	-		Qualitative risk (see below)

Risk characterisation

Qualitative risk characterisation
Man via environment - Inhalation (systemic effects):
Local effects emerge before systemic effects potentially appear. Moreover, nitric acid is not expected to become systemically available. The performed exposure assessment and risk characterisation for Man via environment - Inhalation (local effects) is therefore protective for Man via environment - Inhalation (systemic effects).

Man via environment - Oral:
Potential risks from oral indirect exposure to nitric acid is considered negligible. Indirect oral exposure to humans, through the consumption of food (e.g. fish, crops, meat and milk) and drinking water, is not relevant for nitric acid. As soon as nitric acid is in contact with water, it is present as nitrate, considered to be regulated in the human body similar to the endogenous nitrate. Nitric acid is not expected to become systemically available.

3.2. Worker exposure

Route of exposure and type of effects	Risk quantification
Inhalation, systemic, long term	Qualitative (see below)
Inhalation, systemic, acute	Qualitative (see below)
Inhalation, local, long term	Qualitative (see below)
Inhalation, local, acute	Qualitative (see below)
Dermal, systemic, long term	Qualitative (see below)
Dermal, systemic, acute	Qualitative (see below)
Dermal, local, long term	Qualitative (see below)
Dermal, local, acute	Qualitative (see below)
Eye, local	Qualitative (see below)

Conclusion on risk characterisation

Taking into account the operational conditions and risk management measures (when there is any possibility of exposure), the risk of causing effects is considered to be controlled. Potential exposure to the substance is kept to a minimum.

4. Guidance to DU to evaluate whether they work inside the boundaries set by the ES

In any of the exposure scenarios (ES) described above, the downstream user (DU) works within the limits established by ES if the operational conditions (OC) and risk management measures (RMM) described in the same are complied. When the conditions for the DU are not explicitly described in the general conditions of the ES, the DU must ensure that its specific CO and RMM comply with what is established in them. If the concentration of the substance in the mixture is not explicitly indicated in the ES, no restriction should be applied, that is, up to 100% of the substance may be used. Depending on the basis of the exposure assessment conducted for the ES, this can be done in different ways, as described in each of the environmental and occupational EEs.

Any deviation from the described conditions of use implies:
(i) inform the SDS provider about deviations and request their inclusion in the ES, or
(ii) develop an CSR (Chemical Safety Report) for DU (in accordance with article 37, paragraph 4), submit it to ECHA and keep it as its own documentation.

Nitric Acid 60%	
ES 3:	**Use at industrial sites - Use of Nitric acid < 70% at industrial site as reactive processing aid (Cleaning agent, pH regulator, waste gas treatment, ion exchange resins regeneration, metal treatment, plastic treatment, surface treatment product, water treatment)**

1. Title section

ES name:	*Use at industrial sites - Use of Nitric acid < 70% at industrial site as reactive processing aid (Cleaning agent, pH regulator, waste gas treatment, ion exchange resins regeneration, metal treatment, plastic treatment, surface treatment product, water treatment)*

Environment	
Use of Nitric acid < 70% at industrial site as reactive processing aid (Cleaning agent, pH regulator, waste gas treatment, ion exchange resins regeneration, metal treatment, plastic treatment, surface treatment product, water treatment)	ERC 4, ERC 6b
Worker	
All worker activities combined*	PROC 1; PROC 2; PROC 3; PROC 4; PROC 5; PROC 7; PROC 8a; PROC 8b; PROC 9; PROC 10; PROC 13; PROC 15

*The PROC's do not represent worker exposures, but rather processes. As the actual worker activities have not been determined in detail, they are combined into 1 scenario.

2. Conditions of use affecting exposure

2.1. Control of environmental exposure

Amount used, frequency and duration of use (or from service life)

• Annual use amount at site: Not relevant for the required assessment(s)

• Daily use amount at site: Not relevant for the required assessment(s)

Conditions and measures related to biological sewage treatment plant

• Biological STP: Not relevant for the required assessment(s)

Other conditions affecting environmental exposure

• Adjust pH of waste water when containing the substance

• There is no release of the substance to air (as the substance is rigorously contained by technical means)

2.2. Control of worker exposure

Product (Article) characteristics

• Percentage (w/w) of substance in mixture/article: > 70%

• Physical form of the used product: Liquid (aqueous solution)

Amount used (or contained in articles), frequency and duration of use/exposure

• Duration of activities in the working area: ≤ 8 hours/day (all worker activities combined)

• Amount used: Not relevant

Technical and organisational conditions and measures

• Containment: Under standard operating conditions the substance is rigorously contained by technical means in the working area. The activities take place in a standardized way, under controlled conditions with dedicated equipment. In case a certain amount of the substance is not contained, a worker is not exposed to the substance as the use takes place in a fume hood or as the worker wears personal protective equipment and uses local exhaust ventilation. Formation of aerosols/mists/splashes is prevented.

• Organisational measures: Minimise the number of staff in the working area. Minimise manual activities. Train employees how to safely handle the substance, incl. how to use personal protection equipment. Regularly clean up the working area. Have supervision in place to regularly check that the conditions of use are followed by the workers. Ensure that all equipment is well maintained. Ascertain that personal protection equipment is available and used according to the instructions. Ensure that eyewash stations and safety showers are available in the working area.

• Suitable material: The recommended material for tanks, vessels and accessories is low carbon austenitic stainless steel.

• Unsuitable materials: Do not use any metal, carbon steel or polypropylene

• Ventilation conditions in the working area: Use only outdoors or in a well-ventilated area (approximately 5 air changes per hour)

• Local exhaust ventilation: Use indoor local exhaust ventilation when vapour/mist/spray of nitric acid could be present in the air within the breathing zone of a worker.

• Storage conditions: Store in a well-ventilated place (preferably outside). In an area equipped with acid resistant flooring. Protect from sunlight. Keep containers tightly closed. Keep away from combustible materials, heat, hot surfaces, sparks, open flames and other ignition sources.

• Gas monitoring: Use stationary and/or portable NOx monitors in the working place, monitoring normal NOx levels at well below 2.6 mg/m3

Conditions and measures related to personal protection, hygiene and health evaluation

• General: Work under a high standard of personal hygiene. Wash hands and face before breaks. Do not eat, drink or smoke in the working area.

• Respiratory Protection: In case there is any risk of inhalation exposure to the substance, always wear a full-face mask with an acid gas cartridge or wear a supplied air respirator/helmet/suit. Potential inhalation exposure to the substance must be kept to a minimum. The smallest amount inhaled may already have (acute and/or delayed) effects on the respiratory tract.

• Dermal and Eye protection: In case there is any risk of dermal exposure (via contaminated equipment), always wear suitable acid resistant protective clothing in the working area and wear acid resistant gloves conforming to EN374 (and chemical safety goggles/full-face shield conforming to EN166). Potential dermal exposure to the substance must be kept to a minimum. The smallest amount of an aqueous solution of the substance may already cause severe burns and/or eye damage.

• When aerosols/mists of nitric acid can be formed, wear a suitable acid resistant chemical safety suit with a supplied air respirator/helmet/suit.

• Suitable material: butyl/fluorinated rubber.

3. Exposure estimation and reference to its source

3.1. Environmental release and exposure

Release route	Release rate	Explanation / Justification:

Nitric Acid 60%		
Water	Not applicable, see explanations	The release to waste water is not determined nor needed for the required assessment(s). Moreover, independent on this release, the risk management measure of adjusting the pH of the waste water is only needed.
Air	Estimated release rate	Local release rate: 0 kg/day The substance is rigorously contained by technical means.
Soil	Not applicable, see explanations	The release to non-agricultural soil is not determined nor needed for the required assessment(s).

Protection target	**Exposure estimate**		**RCR**
Man via environment - Inhalation (systemic effects)	0 mg/m3		Qualitative risk (see below)
Man via environment - Inhalation (local effects)	0 mg/kg bw/day		<0,01
Man via environment - Oral	-		Qualitative risk (see below)

Risk characterisation

Qualitative risk characterisation
Man via environment - Inhalation (systemic effects):
Local effects emerge before systemic effects potentially appear. Moreover, nitric acid is not expected to become systemically available. The performed exposure assessment and risk characterisation for Man via environment - Inhalation (local effects) is therefore protective for Man via environment - Inhalation (systemic effects).

Man via environment - Oral:
Potential risks from oral indirect exposure to nitric acid is considered negligible. Indirect oral exposure to humans, through the consumption of food (e.g. fish, crops, meat and milk) and drinking water, is not relevant for nitric acid. As soon as nitric acid is in contact with water, it is present as nitrate, considered to be regulated in the human body similar to the endogenous nitrate. Nitric acid is not expected to become systemically available.

3.2. Worker exposure

Route of exposure and type of effects	Risk quantification
Inhalation, systemic, long term	Qualitative (see below)
Inhalation, systemic, acute	Qualitative (see below)
Inhalation, local, long term	Qualitative (see below)
Inhalation, local, acute	Qualitative (see below)
Dermal, systemic, long term	Qualitative (see below)
Dermal, systemic, acute	Qualitative (see below)
Dermal, local, long term	Qualitative (see below)
Dermal, local, acute	Qualitative (see below)
Eye, local	Qualitative (see below)

Conclusion on risk characterisation

Taking into account the operational conditions and risk management measures (when there is any possibility of exposure), the risk of causing effects is considered to be controlled. Potential exposure to the substance is kept to a minimum.

4. Guidance to DU to evaluate whether they work inside the boundaries set by the ES

In any of the exposure scenarios (ES) described above, the downstream user (DU) works within the limits established by ES if the operational conditions (OC) and risk management measures (RMM) described in the same are complied. When the conditions for the DU are not explicitly described in the general conditions of the ES, the DU must ensure that its specific CO and RMM comply with what is established in them. If the concentration of the substance in the mixture is not explicitly indicated in the ES, no restriction should be applied, that is, up to 100% of the substance may be used. Depending on the basis of the exposure assessment conducted for the ES, this can be done in different ways, as described in each of the environmental and occupational EEs.

Any deviation from the described conditions of use implies:
(i) inform the SDS provider about deviations and request their inclusion in the ES, or
(ii) develop an CSR (Chemical Safety Report) for DU (in accordance with article 37, paragraph 4), submit it to ECHA and keep it as its own documentation.

Nitric Acid 60%	
ES 4:	**Widespread use by professional workers - Use of Nitric acid < 70% by professional worker (outdoor and indoor of reactive substances in open systems as cleaning agent, pH regulator, metal treatment)**

1. Title section

ES name:	*Widespread use by professional workers - Use of Nitric acid < 70% by professional worker (outdoor and indoor of reactive substances in open systems as cleaning agent, pH regulator, metal treatment)*

Environment	
Use of Nitric acid < 70% by professional worker (outdoor and indoor of reactive substances in open systems as cleaning agent, pH regulator, metal treatment)	ERC 8b, ERC 8e
Worker	
All worker activities combined*	PROC 1; PROC 2; PROC 3; PROC 5; PROC 8a; PROC 8b; PROC 9; PROC 10; PROC 11; PROC 13; PROC 15; PROC 19

*The PROC's do not represent worker exposures, but rather processes. As the actual worker activities have not been determined in detail, they are combined into 1 scenario.

2. Conditions of use affecting exposure

2.1. Control of environmental exposure

Amount used, frequency and duration of use (or from service life)

- Annual use amount at site: Not relevant for the required assessment(s)
- Daily use amount at site: Not relevant for the required assessment(s)

Conditions and measures related to biological sewage treatment plant

- Biological STP: Not relevant for the required assessment(s)

Other conditions affecting environmental exposure

- Adjust pH of waste water when containing the substance
- There is no release of the substance to air (as the substance is rigorously contained by technical means)

2.2. Control of worker exposure

Product (Article) characteristics

- Percentage (w/w) of substance in mixture/article: < 70%
- Physical form of the used product: Liquid (aqueous solution)

Amount used (or contained in articles), frequency and duration of use/exposure

- Duration of activities in the working area: ≤ 8 hours/day (all worker activities combined)
- Amount used: Not relevant

Nitric Acid 60%
Technical and organisational conditions and measures
• Containment: Under standard operating conditions the substance is rigorously contained by technical means in the working area. The activities take place in a standardized way, under controlled conditions with dedicated equipment. In case a certain amount of the substance is not contained, a worker is not exposed to the substance as the use takes place in a fume hood or as the worker wears personal protective equipment and uses local exhaust ventilation. Formation of aerosols/mists/splashes is prevented.
• Organisational measures: Minimise the number of staff in the working area. Minimise manual activities. Train employees how to safely handle the substance, incl. how to use personal protection equipment. Regularly clean up the working area. Have supervision in place to regularly check that the conditions of use are followed by the workers. Ensure that all equipment is well maintained. Ascertain that personal protection equipment is available and used according to the instructions. Ensure that eyewash stations and safety showers are available in the working area.
• Suitable material: The recommended material for tanks, vessels and accessories is low carbon austenitic stainless steel.
• Unsuitable materials: Do not use any metal, carbon steel or polypropylene
• Ventilation conditions in the working area: Use only outdoors or in a well-ventilated area (approximately 5 air changes per hour)
• Local exhaust ventilation: Use indoor local exhaust ventilation when vapour/mist/spray of nitric acid could be present in the air within the breathing zone of a worker.
• Storage conditions: Store in a well-ventilated place (preferably outside). In an area equipped with acid resistant flooring. Protect from sunlight. Keep containers tightly closed. Keep away from combustible materials, heat, hot surfaces, sparks, open flames and other ignition sources.
• Gas monitoring: Use stationary and/or portable NOx monitors in the working place, monitoring normal NOx levels at well below 2.6 mg/m3
Conditions and measures related to personal protection, hygiene and health evaluation
• General: Work under a high standard of personal hygiene. Wash hands and face before breaks. Do not eat, drink or smoke in the working area.
• Respiratory Protection: In case there is any risk of inhalation exposure to the substance, always wear a full-face mask with an acid gas cartridge or wear a supplied air respirator/helmet/suit. Potential inhalation exposure to the substance must be kept to a minimum. The smallest amount inhaled may already have (acute and/or delayed) effects on the respiratory tract.
• Dermal and Eye protection: In case there is any risk of dermal exposure (via contaminated equipment), always wear suitable acid resistant protective clothing in the working area and wear acid resistant gloves conforming to EN374 (and chemical safety goggles/full-face shield conforming to EN166). Potential dermal exposure to the substance must be kept to a minimum. The smallest amount of an aqueous solution of the substance may already cause severe burns and/or eye damage.
• When aerosols/mists of nitric acid can be formed, wear a suitable acid resistant chemical safety suit with a supplied air respirator/helmet/suit.
• Suitable material: butyl/fluorinated rubber.

3. Exposure estimation and reference to its source

3.1. Environmental release and exposure

Release route	Release rate	Explanation / Justification:
Water	Not applicable, see explanations	The release to waste water is not determined nor needed for the required assessment(s). Moreover, independent on this release, the risk management measure of adjusting the pH of the waste water is only needed.
Air	Estimated release rate	Local release rate: 0 kg/day The substance is rigorously contained by technical means.
Soil	Not applicable, see explanations	The release to non-agricultural soil is not determined nor needed for the required assessment(s).

Protection target	Exposure estimate		RCR
Man via environment - Inhalation (systemic effects)	0 mg/m3		Qualitative risk (see below)
Man via environment - Inhalation (local effects)	0 mg/kg bw/day		<0,01
Man via environment - Oral	-		Qualitative risk (see below)

Risk characterisation

Qualitative risk characterisation
Man via environment - Inhalation (systemic effects):
Local effects emerge before systemic effects potentially appear. Moreover, nitric acid is not expected to become systemically available. The performed exposure assessment and risk characterisation for Man via environment - Inhalation (local effects) is therefore protective for Man via environment - Inhalation (systemic effects).

Man via environment - Oral:
Potential risks from oral indirect exposure to nitric acid is considered negligible. Indirect oral exposure to humans, through the consumption of food (e.g. fish, crops, meat and milk) and drinking water, is not relevant for nitric acid. As soon as nitric acid is in contact with water, it is present as nitrate, considered to be regulated in the human body similar to the endogenous nitrate. Nitric acid is not expected to become systemically available.

3.2. Worker exposure

Route of exposure and type of effects	Risk quantification
Inhalation, systemic, long term	Qualitative (see below)
Inhalation, systemic, acute	Qualitative (see below)
Inhalation, local, long term	Qualitative (see below)
Inhalation, local, acute	Qualitative (see below)
Dermal, systemic, long term	Qualitative (see below)
Dermal, systemic, acute	Qualitative (see below)
Dermal, local, long term	Qualitative (see below)
Dermal, local, acute	Qualitative (see below)
Eye, local	Qualitative (see below)

Conclusion on risk characterisation

Taking into account the operational conditions and risk management measures (when there is any possibility of exposure), the risk of causing effects is considered to be controlled. Potential exposure to the substance is kept to a minimum.

4. Guidance to DU to evaluate whether they work inside the boundaries set by the ES

In any of the exposure scenarios (ES) described above, the downstream user (DU) works within the limits established by ES if the operational conditions (OC) and risk management measures (RMM) described in the same are complied. When the conditions for the DU are not explicitly described in the general conditions of the ES, the DU must ensure that its specific CO and RMM comply with what is established in them. If the concentration of the substance in the mixture is not explicitly indicated in the ES, no restriction should be applied, that is, up to 100% of the substance may be used. Depending on the basis of the exposure assessment conducted for the ES, this can be done in different ways, as described in each of the environmental and occupational EEs.

Any deviation from the described conditions of use implies:
(i) inform the SDS provider about deviations and request their inclusion in the ES, or
(ii) develop an CSR (Chemical Safety Report) for DU (in accordance with article 37, paragraph 4), submit it to ECHA and keep it as its own documentation.

Nitric Acid 60%	
ES 5:	**Consumer use - Use of Nitric acid containing products (< 3%)**

1. Title section

ES name: *Consumer use - Use of Nitric acid containing products (< 3%)*

Environment	
Use of Nitric acid containing products (< 3%)	ERC 8b, ERC 8e
Worker	
Use of Nitric acid containing products (< 3%)*	PC 3; PC 12; PC 31; PC 35

*Nitric acid is not expected to be found in consumer products, or if found it will be found only at trace levels.

2. Conditions of use affecting exposure

2.1. Control of environmental exposure

Amount used, frequency and duration of use (or from service life)

• Annual use amount at site: Not relevant for the required assessment(s)

• Daily use amount at site: Not relevant for the required assessment(s)

Conditions and measures related to biological sewage treatment plant

• Biological STP: Not relevant for the required assessment(s)

2.2. Control of consumer exposure

Exposure assessment and risk characterisation are not needed. Nitric acid is not expected to be found in consumer products, or if found it will be found only at trace levels. Therefore, performing exposure assessment and risk characterisation is not considered needed. Given the low concentration, any inhalation exposure will be negligible and dermal / oral / eye effects are not expected.

3. Exposure estimation and reference to its source

3.1. Environmental release and exposure

Release route	Release rate	Explanation / Justification:
Water	Not applicable, see explanations	The release to waste water is not determined nor needed for the required assessment(s). Moreover, independent on this release, the risk management measure of adjusting the pH of the waste water is only needed.
Air	Estimated release rate	Local release rate: 0 kg/day The substance is rigorously contained by technical means.

Nitric Acid 60%		
Soil	Not applicable, see explanations	The release to non-agricultural soil is not determined nor needed for the required assessment(s).

Protection target	**Exposure estimate**		**RCR**
Man via environment - Inhalation (systemic effects)	0 mg/m3		Qualitative risk (see below)
Man via environment - Inhalation (local effects)	0 mg/kg bw/day		<0,01
Man via environment - Oral	-		Qualitative risk (see below)

Risk characterisation

Qualitative risk characterisation
Man via environment - Inhalation (systemic effects):
Local effects emerge before systemic effects potentially appear. Moreover, nitric acid is not expected to become systemically available. The performed exposure assessment and risk characterisation for Man via environment - Inhalation (local effects) is therefore protective for Man via environment - Inhalation (systemic effects).

Man via environment - Oral:
Potential risks from oral indirect exposure to nitric acid is considered negligible. Indirect oral exposure to humans, through the consumption of food (e.g. fish, crops, meat and milk) and drinking water, is not relevant for nitric acid. As soon as nitric acid is in contact with water, it is present as nitrate, considered to be regulated in the human body similar to the endogenous nitrate. Nitric acid is not expected to become systemically available.

3.2. Consumer exposure

Exposure assessment and risk characterisation are not needed. Nitric acid is not expected to be found in consumer products, or if found it will be found only at trace levels. Therefore, performing exposure assessment and risk characterisation is not considered needed. Given the low concentration, any inhalation exposure will be negligible and dermal / oral / eye effects are not expected.

4. Guidance to DU to evaluate whether they work inside the boundaries set by the ES

In any of the exposure scenarios (ES) described above, the downstream user (DU) works within the limits established by ES if the operational conditions (OC) and risk management measures (RMM) described in the same are complied. When the conditions for the DU are not explicitly described in the general conditions of the ES, the DU must ensure that its specific CO and RMM comply with what is established in them. If the concentration of the substance in the mixture is not explicitly indicated in the ES, no restriction should be applied, that is, up to 100% of the substance may be used. Depending on the basis of the exposure assessment conducted for the ES, this can be done in different ways, as described in each of the environmental and occupational EEs.

Any deviation from the described conditions of use implies:
(i) inform the SDS provider about deviations and request their inclusion in the ES, or
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