SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : Nitric acid 65%, Nitric acid 68%, Nitric acid 69%, Nitric acid 69,5%

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

Use of the Substance/Mixture : Manufacture, Intermediate, Formulation, Distribution, Fertilizers, Washing and cleaning products, Surface treatment, Laboratory use, Processing aid, pH-regulating agents, Ion exchanger

1.3 Details of the supplier of the safety data sheet

E-mail address : sds@borealisgroup.com

1.4 Emergency telephone number

+44 (0) 1235 239 670 (24h)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Oxidizing liquids, Category 3	H272: May intensify fire; oxidizer.
Corrosive to metals, Category 1	H290: May be corrosive to metals.
Acute toxicity, Category 3	H331: Toxic if inhaled.
Skin corrosion, Category 1A	H314: Causes severe skin burns and eye damage.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements : H272 May intensify fire; oxidizer.
H290 May be corrosive to metals.

		H314	Causes severe skin burns and eye damage.
		H331	Toxic if inhaled.
Supplemental Hazard Statements	:	EUH071	Corrosive to the respiratory tract.
Precautionary statements	:	**Prevention:**	
		P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
		P221	Take any precaution to avoid mixing with combustibles.
		P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
		P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
		Response:	
		P303 + P361 + P353 + P310	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a POISON CENTER/doctor.
		P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
		Storage:	
		P403 + P233	Store in a well-ventilated place. Keep container tightly closed.

Hazardous components which must be listed on the label:
nitric acid

Additional Labelling:
Acquisition, possession or use by the general public is restricted.

2.3 Other hazards

Results of PBT and vPvB assessment : This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT). This mixture contains no substance considered to be very persistent and very bioaccumulating (vPvB).

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : Concentrated aqueous solution

Hazardous components

Chemical name	CAS-No. EC-No. Registration number	Classification (REGULATION (EC) No 1272/2008)	Concentration (% w/w)
nitric acid	7697-37-2 231-714-2 01-2119487297-23-0000, 01-2119487297-23-0006, 01-2119487297-23-0026, 01-2119487297-23-XXXX	Ox. Liq. 3; H272 Skin Corr. 1A; H314 Met. Corr. 1; H290 Acute Tox. 3; H331	65 - < 70

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Remove from exposure.
Immediate medical attention is required.
First aider needs to protect himself.

If inhaled : Move to fresh air.
Keep patient warm and at rest.
If breathing is irregular or stopped, administer artificial respiration.
Mouth to mouth resuscitation may be dangerous.
Give oxygen if available.

In case of skin contact : Remove/Take off immediately all contaminated clothing.
Wash off immediately with plenty of water for at least 15 minutes.
Burns must be treated by a physician.
If skin irritation persists, call a physician.

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Seek medical advice immediately.
Symptoms may be delayed.

If swallowed	:	Do NOT induce vomiting. Do not give anything to drink. If swallowed, rinse mouth with water (only if the person is conscious). Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms	:	Inhalation: Respiratory irritation Pain Breathing difficulties Aspiration may cause pulmonary oedema and pneumonitis. Symptoms may be delayed. Skin contact: Causes severe burns. Eye contact: Causes serious eye damage.
Risks	:	Causes serious eye damage. Toxic if inhaled. Corrosive to the respiratory tract. Causes severe burns.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment	:	Risk of delayed pulmonary oedema. Keep under medical supervision for at least 48 hours.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Water spray Carbon dioxide (CO2) Alcohol-resistant foam
Unsuitable extinguishing media	:	Water in spread jet, dry chemicals or foam Do not smother with steam or sand.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting	:	Not combustible, but oxidizing May explode in contact with a powerful reducing agent. Reacts with common metals liberating hydrogen. Hazardous decomposition products formed under fire

conditions.
Nitrogen oxides (NOx)

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Personal protection through wearing a tightly closed chemical protection suit and a self-contained breathing apparatus.
Further information	:	Keep containers and surroundings cool with water spray. Use water spray to disperse vapours. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation.
Do not breathe vapours.
Avoid all contact with the product.
Personal protection through wearing a tightly closed chemical protection suit and a self-contained breathing apparatus.
Evacuate personnel to safe areas.
Suppress (knock down) vapours with water spray.

6.2 Environmental precautions

Prevent product from entering environment and drains.
Inform the responsible authorities in case of entry into waterways or drains.

6.3 Methods and material for containment and cleaning up

Prevent further leakage or spillage.
Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).
Large spills should be collected mechanically (remove by pumping) for disposal.

Dilute with plenty of water.
Neutralise with the following product(s):
soda ash
Calcium hydroxide

6.4 Reference to other sections

For personal protection see section 8.
For disposal considerations see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Ensure adequate ventilation.
Avoid inhalation, ingestion and contact with skin and eyes.
Use personal protective equipment.
Only add small quantities of acids and bases to water, never the opposite. Always use stirring.
Dilution and neutralization are highly exothermic reactions.

Advice on protection against fire and explosion : Keep away from combustible material. Keep away from heat and sources of ignition. May explode in contact with a powerful reducing agent. Reacts with common metals liberating hydrogen.

Hygiene measures : When using do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product. Do not wear contact lenses.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep in a cool, well-ventilated place. Store away from sources of heat, ignition and direct sunlight. Keep in an area equipped with acid resistant flooring.

Store in corrosive resistant stainless steel, aluminium, plastic or glass container with a resistant inner liner. plastics (e.g. PVC, PTFE)

Unsuitable materials for containers: Metals Carbon steel Polypropylene

7.3 Specific end use(s)

Specific use(s) : Consult the technical guidelines for the use of this substance/mixture.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
nitric acid	7697-37-2	STEL	1 ppm 2,6 mg/m3	2006/15/EC

Further information	Indicative

DNEL:

nitric acid	:	**End Use: Workers** Exposure routes: Inhalation Potential health effects: Acute, Local effects Value: 2,6 mg/m3 **End Use: Workers** Exposure routes: Inhalation Potential health effects: Long-term, Local effects Value: 2,6 mg/m3 **End Use: Consumer use** Exposure routes: Inhalation Potential health effects: Acute, Local effects Value: 1,3 mg/m3 **End Use: Consumer use** Exposure routes: Inhalation Potential health effects: Long-term, Local effects Value: 1,3 mg/m3

PNEC:

nitric acid	:	Not relevant

8.2 Exposure controls

Personal protective equipment

Eye protection	:	Wear goggles and if needed face-shield.
Hand protection		
Material	:	butyl-rubber
Break through time	:	300 min
Material	:	Fluorinated rubber
Break through time	:	> 480 min
Remarks	:	The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.
Skin and body protection	:	Chemical resistant protective suit Boots
Respiratory protection	:	Use the indicated respiratory protection if the occupational exposure limit is exceeded and/or in the case of dust or

aerosol formation.

Short term exposure:
Suitable mask (EN 149, EN 14387 or EN 1827)
Recommended Filter type:
Type B
Type E

Long term exposure:
Full face mask (e.g. EN 143, EN 14387 or EN 12083)
Self-contained breathing apparatus (EN 133)

Protective measures : Ensure that eyewash stations and safety showers are close to the workstation location.

Environmental exposure controls

General advice : Prevent product from entering environment and drains. Inform the responsible authorities in case of entry into waterways or drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	:	liquid
Colour	:	colourless, pale yellowish
Odour	:	pungent, suffocating
Odour Threshold	:	0,29 ppm
pH	:	1, 0,1 mol/lDissociation constant pKa = -1
Melting point	:	-38,0 °C (1013,0 hPa)
Boiling point	:	122 °C (1.013 hPa)
Flash point	:	Not applicable, (inorganic)
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	The product is not flammable.

Upper explosion limit	:	Not applicable
Lower explosion limit	:	Not applicable
Vapour pressure	:	9,4 hPa (20 °C)
Relative vapour density	:	2,2 (Air = 1.0)
Density	:	1,410 g/cm³ (20 °C)
Solubility(ies)		
Water solubility	:	> 500 g/l completely miscible (20 °C)
Auto-ignition temperature	:	does not ignite
Decomposition temperature	:	83 °C HNO3 100%
Viscosity		
Viscosity, dynamic	:	0,75 mPa.s (25 °C) HNO3 100%
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is classified as oxidizing with the category 3.

9.2 Other information

Molecular weight	:	63,01 g/mol

SECTION 10: Stability and reactivity

10.1 Reactivity

Stable under recommended storage conditions.

10.2 Chemical stability

The product is chemically stable.
In contact with light or organic matter may decompose to nitrogen oxides.

10.3 Possibility of hazardous reactions

Hazardous reactions : May react violently with:
Reducing agents
Combustible material
Bases
Chloride
Powdered metals

Reacts with common metals liberating hydrogen.
Exothermic reaction with water.

10.4 Conditions to avoid

Conditions to avoid : Direct sources of heat.

10.5 Incompatible materials

Materials to avoid : Combustible material
Organic materials
Reducing agents
Powdered metals
Alcohols
Chlorates
Carbon steel
Copper
Flammable liquids
Chromic acid

10.6 Hazardous decomposition products

Nitrogen oxides (NOx)

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Toxic if inhaled.

Components:

nitric acid:

Acute oral toxicity : Remarks: study scientifically unjustified (corrosive)

Acute inhalation toxicity : LC50 (Rat, male): 2,65 mg/l
Method: OECD Test Guideline 403

Acute dermal toxicity : Remarks: study scientifically unjustified (corrosive)

Skin corrosion/irritation

Causes severe burns.

Components:

nitric acid:
study scientifically unjustified

Serious eye damage/eye irritation

Causes serious eye damage.

Components:

nitric acid:
study scientifically unjustified
(corrosive)

Respiratory or skin sensitisation

Skin sensitisation: Not classified based on available information.
Respiratory sensitisation: Not classified based on available information.

Components:

nitric acid:
study scientifically unjustified
(corrosive)

Germ cell mutagenicity

Not classified based on available information.

Components:

nitric acid:

Genotoxicity in vitro	:	Test Type: Ames test Method: OECD Test Guideline 471 Result: negative
	:	Test Type: Chromosome aberration test in vitro Method: OECD Test Guideline 473 Result: negative Test substance: Sodium nitrate Remarks: Read-across (Analogy)
	:	Test Type: In vitro gene mutation study in mammalian cells Method: OECD Test Guideline 476 Result: negative Test substance: Potassium nitrate Remarks: Read-across (Analogy)
	:	Remarks: In vitro tests did not show mutagenic effects

Genotoxicity in vivo	:	Test Type: in vivo assay Species: Mouse (male) Application Route: Oral Method: No guideline followed Result: negative Test substance: Sodium nitrate Remarks: Read-across (Analogy)

Carcinogenicity

Not classified based on available information.

Components:

nitric acid:

Remarks: study scientifically unjustified

Reproductive toxicity

Not classified based on available information.

Components:

nitric acid:

Effects on fertility	:	Species: Rat Application Route: Ingestion General Toxicity - Parent: No observed adverse effect level: 1.500 mg/kg bw/day General Toxicity F1: No observed adverse effect level: 1.500 mg/kg bw/day Method: OECD Test Guideline 422 Remarks: Read-across (Analogy)
Effects on foetal development	:	Species: Rat Application Route: Ingestion General Toxicity Maternal: NOAEL: 1.500 mg/kg bw/day Teratogenicity: NOAEL: 1.500 mg/kg bw/day Method: OECD Test Guideline 422 Remarks: Read-across (Analogy)

STOT - single exposure

Corrosive to the respiratory tract.

STOT - repeated exposure

Not classified based on available information.

Components:

nitric acid:

Species: Rat
NOAEL: 1500 mg/kg/day
Application Route: Oral

Method: OECD Test Guideline 422
Test substance: Potassium nitrate
Remarks: Read-across (Analogy)

Species: Rat
NOAEC: > 2,15 ppm
Application Route: Inhalation
Method: OECD Test Guideline 413
Test substance: Nitrogen dioxide
Remarks: Read-across (Analogy)

Aspiration toxicity

Not classified based on available information.

Further information

Components:

nitric acid:
Remarks: Aspiration may cause pulmonary oedema and pneumonitis. Symptoms may be delayed.

SECTION 12: Ecological information

12.1 Toxicity

Components:

nitric acid:

Toxicity to fish	:	Median lethal pH (Lepomis macrochirus (Bluegill sunfish)): 3 - 3,5 Exposure time: 96 h Method: No guideline followed Remarks: Fresh water Median lethal pH (Oncorhynchus mykiss (rainbow trout)): ca. 3,7 Exposure time: 96 h Method: No guideline followed Remarks: Fresh water
Toxicity to daphnia and other aquatic invertebrates	:	Median lethal pH (Ceriodaphnia dubia (water flea)): 4,4 - 4,7 Exposure time: 48 h Method: US EPA Guideline Remarks: Fresh water
Toxicity to algae	:	NOEC (algae): 6,75 mmol/l Exposure time: 10 d

Test Type: Growth inhibition
Test substance: Potassium nitrate
Remarks: Marine water
Read-across (Analogy)

Toxicity to bacteria : EC50 : > 1.000 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition of activated sludge
Test substance: Sodium nitrate
Method: OECD Test Guideline 209
Remarks: Read-across (Analogy)

Toxicity to fish (Chronic toxicity) : NOEC: 268 mg nitrate/l
Exposure time: 30 d
Test substance: Sodium nitrate
Remarks: Read-across (Analogy)

NOEC: 157 mg nitrate/l
Exposure time: 32 d
Species: fathead minnow (Pimephales promelas)
Test substance: Sodium nitrate
Remarks: Read-across (Analogy)

Ecotoxicology Assessment
Acute aquatic toxicity : Toxic effects caused by pH.

12.2 Persistence and degradability

Components:

nitric acid:

Biodegradability : Remarks: study scientifically unjustified (inorganic)

Impact on Sewage Treatment : Not relevant

12.3 Bioaccumulative potential

Components:

nitric acid:

Bioaccumulation : Remarks: Does not accumulate in organisms. (inorganic)

Partition coefficient: n-octanol/water : log Pow: -0,21
Remarks: concentration 70 %

12.4 Mobility in soil

Components:

nitric acid:

Mobility	:	Medium: Water Remarks: completely soluble
	:	Medium: Soil Remarks: Not expected to adsorb on soil.

12.5 Results of PBT and vPvB assessment

Product:

Assessment	:	This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT).. This mixture contains no substance considered to be very persistent and very bioaccumulating (vPvB)..

Components:

nitric acid:

Assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT).. This substance is not considered to be very persistent and very bioaccumulating (vPvB)..

12.6 Other adverse effects

Product:

Components:

nitric acid:

Additional ecological information	:	Remarks: No information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	Dispose of in accordance with local regulations. Solutions with low pH-value must be neutralized before discharge. pH should be in the range of 6 - 9. Neutralise with the following product(s): soda ash

Calcium hydroxide

European waste code:
06 01 05 (nitric acid and nitrous acid)

Contaminated packaging : Empty remaining contents.
Dispose of contents/ container to an approved waste disposal plant.

SECTION 14: Transport information

14.1 UN number

ADR : UN 2031

IMDG : UN 2031

14.2 UN proper shipping name

ADR : NITRIC ACID, OTHER THAN RED FUMING, WITH AT LEAST 65%, BUT NOT MORE THAN 70% NITRIC ACID

IMDG : NITRIC ACID, OTHER THAN RED FUMING, WITH AT LEAST 65%, BUT NOT MORE THAN 70% NITRIC ACID

14.3 Transport hazard class(es)

ADR : 8

IMDG : 8

Subsidiary hazard class : 5.1

14.4 Packing group

ADR
Packing group : II
Hazard Identification Number : 85
Labels : 8 (5.1)
Tunnel restriction code : (E)

IMDG
Packing group : II
EmS Code : F-A, S-Q

14.5 Environmental hazards

ADR
Environmentally hazardous : no

IMDG
Marine pollutant : no

14.6 Special precautions for user

Remarks : No specific instructions needed.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Ship type : 2
Pollution category : Y

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

Category		Quantity 1	Quantity 2
H2	ACUTE TOXIC	50 t	200 t
P8	OXIDIZING LIQUIDS AND SOLIDS	50 t	200 t

Other regulations : Regulation (EU) No 98/2013 of the European Parliament and of the Council of 15 January 2013 on the marketing and use of explosives precursors:
Annex I
Acquisition, possession or use by the general public is restricted.

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this mixture.

SECTION 16: Other information

Full text of H-Statements

H272 : May intensify fire; oxidizer.
H290 : May be corrosive to metals.
H314 : Causes severe skin burns and eye damage.
H331 : Toxic if inhaled.

Full text of other abbreviations

Acute Tox. : Acute toxicity
Met. Corr. : Corrosive to metals
Ox. Liq. : Oxidizing liquids
Skin Corr. : Skin corrosion

Further information

Training advice : Provide adequate information, instruction and training for operators., Regular trainings of all employees which are

		involved in the transport of dangerous goods (according to chapter 1.3 ADR).
Other information	:	Issued according to Regulation (EC) No 1907/2006, Annex II, and its amendments.
Issuer	:	Borealis, Group Product Stewardship / Mikaela Eriksson.
Sources of key data used to compile the Safety Data Sheet	:	Chemical Safety Report, Nitric acid. FARM REACH Consortium, 2016 International Chemical Safety Card, Concentrated Nitric Acid (70%), 2006 (http://www.cdc.gov/niosh/ipcsneng/neng0183.html)

Disclaimer

To the best of our knowledge, the information contained herein is accurate and reliable as of the date of publication; however we do not assume any liability whatsoever for the accuracy and completeness of such information.

Borealis makes no warranties which extend beyond the description contained herein. Nothing herein shall constitute any warranty of merchantability or fitness for a particular purpose.

It is the customer's responsibility to inspect and test our products in order to satisfy itself as to the suitability of the products for the customer's particular purpose. The customer is responsible for the appropriate, safe and legal use, processing and handling of our products.

No liability can be accepted in respect of the use of Borealis' products in conjunction with other materials. The information contained herein relates exclusively to our products when not used in conjunction with any third party materials.

Identified uses:

Use: Manufacture, Concentration < 70 %

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental Release Categories	:	**ERC1:** Manufacture of substances

Use: Formulation & (re)packing of substances and mixtures, Concentration < 70 %

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small

		containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental Release Categories	:	**ERC2:** Formulation of preparations

Use: Use as an intermediate, Concentration < 70 %

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental Release Categories	:	**ERC6a:** Industrial use resulting in manufacture of another substance (use of intermediates)

Use: Reactive processing aid, Use in cleaning agents, ion exchange processes, Industrial use of metal treatment products, Surface treatment, Use in water treatment agents, Concentration < 70 %

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises

		PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC7:** Industrial spraying **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC10:** Roller application or brushing **PROC13:** Treatment of articles by dipping and pouring **PROC15:** Use as laboratory reagent
Environmental Release Categories	:	**ERC4, ERC6b:** Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of reactive processing aids

Use: Concentration < 70 %, Wide dispersive outdoor use of reactive substances in open systems, Use in cleaning agents, pH adjustment

Main User Groups	:	**SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	:	**SU1:** Agriculture, forestry, fishery
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC10:** Roller application or brushing **PROC11:** Non industrial spraying **PROC13:** Treatment of articles by dipping and pouring **PROC15:** Use as laboratory reagent **PROC19:** Hand-mixing with intimate contact and only PPE

		available
Environmental Release Categories	:	**ERC8b, ERC8e:** Wide dispersive indoor use of reactive substances in open systems, Wide dispersive outdoor use of reactive substances in open systems

Use: Consumer

Main User Groups	:	**SU 21:** Consumer uses: Private households (= general public = consumers)
Chemical product category	:	**PC3:** Air care products **PC12:** Fertilizers **PC31:** Polishes and wax blends **PC35:** Washing and cleaning products (including solvent based products)
Environmental Release Categories	:	**ERC8b, ERC8e:** Wide dispersive indoor use of reactive substances in open systems, Wide dispersive outdoor use of reactive substances in open systems

1. Short title of Exposure Scenario: Manufacture, Concentration < 70 %

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental Release Categories	:	**ERC1:** Manufacture of substances

2.1 Contributing scenario controlling environmental exposure for: ERC1: Manufacture of substances

Remarks	:	Exposure assessment and risk characterization are not required for environment.

2.2 Contributing scenario controlling worker exposure for: General measures PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent

Product characteristics

Chemical name	Concentration [%]
nitric acid	< 70

Physical Form (at time of use) : Aqueous solution

Frequency and duration of use

Frequency of use : 8 hours/day

Technical conditions and measures

Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions. Automate activity where possible. Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

Organisational measures to prevent /limit releases, dispersion and exposure

Handle in accordance with good industrial hygiene and safety practice., Ensure operatives are trained to minimise exposures., Minimise number of staff exposed., Clean equipment and the work area every day.

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

Wear protective gloves/ protective clothing/ eye protection/ face protection., For personal protection see section 8.

3. Exposure estimation and reference to its source

Remarks:	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The safety data sheet at hand provides the user with risk management measures and operational conditions which enables him to work safely with the substance / mixture. If other risk management measures / operational conditions are adopted, the user has to ensure, that the risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario: Formulation & (re)packing of substances and mixtures, Concentration < 70 %

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental Release Categories	:	**ERC2:** Formulation of preparations

2.1 Contributing scenario controlling environmental exposure for: ERC2: Formulation of preparations

Remarks	:	Exposure assessment and risk characterization are not required for environment.

2.2 Contributing scenario controlling worker exposure for: General measures PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact), Transfer of substance or preparation (charging/ discharging)

from/ to vessels/ large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent

Product characteristics

Chemical name	Concentration [%]
nitric acid	< 70

Physical Form (at time of use) : Aqueous solution

Frequency and duration of use

Frequency of use : 8 hours/day

Technical conditions and measures

Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions. Automate activity where possible. Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

Organisational measures to prevent /limit releases, dispersion and exposure

Handle in accordance with good industrial hygiene and safety practice., Ensure operatives are trained to minimise exposures., Minimise number of staff exposed., Clean equipment and the work area every day.

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

Wear protective gloves/ protective clothing/ eye protection/ face protection., For personal protection see section 8.

3. Exposure estimation and reference to its source

Remarks:	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The safety data sheet at hand provides the user with risk management measures and operational conditions which enables him to work safely with the substance / mixture. If other risk management measures / operational conditions are adopted, the user has to ensure, that the risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario: Use as an intermediate, Concentration < 70 %

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental Release Categories	:	**ERC6a:** Industrial use resulting in manufacture of another substance (use of intermediates)

2.1 Contributing scenario controlling environmental exposure for: ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

Remarks	:	Exposure assessment and risk characterization are not required for environment.

2.2 Contributing scenario controlling worker exposure for: General measures PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact), Transfer of substance or preparation (charging/ discharging)

from/ to vessels/ large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent

Product characteristics

Chemical name	Concentration [%]
nitric acid	< 70

Physical Form (at time of use) : Aqueous solution

Frequency and duration of use

Frequency of use : 8 hours/day

Technical conditions and measures

Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions. Automate activity where possible. Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

Organisational measures to prevent /limit releases, dispersion and exposure

Handle in accordance with good industrial hygiene and safety practice., Ensure operatives are trained to minimise exposures., Minimise number of staff exposed., Clean equipment and the work area every day.

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

Wear protective gloves/ protective clothing/ eye protection/ face protection., For personal protection see section 8.

3. Exposure estimation and reference to its source

Remarks:	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The safety data sheet at hand provides the user with risk management measures and operational conditions which enables him to work safely with the substance / mixture. If other risk management measures / operational conditions are adopted, the user has to ensure, that the risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario: Reactive processing aid, Use in cleaning agents, ion exchange processes, Industrial use of metal treatment products, Surface treatment, Use in water treatment agents, Concentration < 70 %

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC7:** Industrial spraying **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC10:** Roller application or brushing **PROC13:** Treatment of articles by dipping and pouring **PROC15:** Use as laboratory reagent
Environmental Release Categories	:	**ERC4, ERC6b:** Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of reactive processing aids

2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC6b: Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of reactive processing aids

Remarks	:	Exposure assessment and risk characterization are not required for environment.

2.2 Contributing scenario controlling worker exposure for: General measures

PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact), Industrial spraying, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Roller application or brushing, Treatment of articles by dipping and pouring, Use as laboratory reagent

Product characteristics

Chemical name	Concentration [%]
nitric acid	< 70

Physical Form (at time of use) : Aqueous solution

Frequency and duration of use

Frequency of use : 8 hours/day

Technical conditions and measures

Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions. Automate activity where possible. Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

Organisational measures to prevent /limit releases, dispersion and exposure

Handle in accordance with good industrial hygiene and safety practice., Ensure operatives are trained to minimise exposures., Minimise number of staff exposed., Clean equipment and the work area every day.

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

Wear protective gloves/ protective clothing/ eye protection/ face protection., For personal protection see section 8.

3. Exposure estimation and reference to its source

Remarks:	Predicted exposures are not expected to exceed the applicable consumer

	reference values when the operational conditions/risk management measures given in section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The safety data sheet at hand provides the user with risk management measures and operational conditions which enables him to work safely with the substance / mixture. If other risk management measures / operational conditions are adopted, the user has to ensure, that the risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario: Concentration < 70 %, Wide dispersive outdoor use of reactive substances in open systems, Use in cleaning agents, pH adjustment

Main User Groups	:	**SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	:	**SU1:** Agriculture, forestry, fishery
Process categories	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC10:** Roller application or brushing **PROC11:** Non industrial spraying **PROC13:** Treatment of articles by dipping and pouring **PROC15:** Use as laboratory reagent **PROC19:** Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	:	**ERC8b, ERC8e:** Wide dispersive indoor use of reactive substances in open systems, Wide dispersive outdoor use of reactive substances in open systems

2.1 Contributing scenario controlling environmental exposure for: ERC8b, ERC8e: Wide dispersive indoor use of reactive substances in open systems, Wide dispersive outdoor use of reactive substances in open systems

Remarks	:	Exposure assessment and risk characterization are not required for environment.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	Solutions with low pH-value must be neutralized before

discharge., pH should be in the range of 6 - 9.

2.2 Contributing scenario controlling worker exposure for: General measures PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC15, PROC19: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact), Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Roller application or brushing, Non industrial spraying, Treatment of articles by dipping and pouring, Use as laboratory reagent, Hand-mixing with intimate contact and only PPE available

Product characteristics

Chemical name	Concentration [%]
nitric acid	< 70

Physical Form (at time of use) : Aqueous solution

Frequency and duration of use

Frequency of use : 8 hours/day

Technical conditions and measures

Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions. Automate activity where possible. Provide a good standard of controlled ventilation (5 to 10 air changes per hour).

Organisational measures to prevent /limit releases, dispersion and exposure

Handle in accordance with good industrial hygiene and safety practice., Ensure operatives are trained to minimise exposures., Minimise number of staff exposed., Clean equipment and the work area every day.

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

Wear protective gloves/ protective clothing/ eye protection/ face protection., For personal protection see section 8.

3. Exposure estimation and reference to its source

Remarks:	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

The safety data sheet at hand provides the user with risk management measures and operational conditions which enables him to work safely with the substance / mixture. If other risk management measures / operational conditions are adopted, the user has to ensure, that the risks are managed to at least equivalent levels.

1. Short title of Exposure Scenario: Consumer

Main User Groups	:	**SU 21:** Consumer uses: Private households (= general public = consumers)
Chemical product category	:	**PC3:** Air care products **PC12:** Fertilizers **PC31:** Polishes and wax blends **PC35:** Washing and cleaning products (including solvent based products)
Environmental Release Categories	:	**ERC8b, ERC8e:** Wide dispersive indoor use of reactive substances in open systems, Wide dispersive outdoor use of reactive substances in open systems

2.1 Contributing scenario controlling environmental exposure for: ERC8b, ERC8e: Wide dispersive indoor use of reactive substances in open systems, Wide dispersive outdoor use of reactive substances in open systems

Remarks	:	Exposure assessment and risk characterization are not required for environment.

2.2 Contributing scenario controlling consumer exposure for: PC3, PC12, PC31, PC35: Air care products, Fertilizers, Polishes and wax blends, Washing and cleaning products (including solvent based products)

Remarks	:	not required

Chemical name	Concentration [%]
nitric acid	< 3

3. Exposure estimation and reference to its source

Remarks:	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Not applicable