



# SAFETY DATA SHEET

Revision Date 26/11/2018  
Date of the previous version 08/10/2018

Version 3.2  
EU EN

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1. Product identifier

<b>Product Name</b>	Nitric acid 60%
<b>Chemical Name</b>	Nitric acid
<b>CAS-No</b>	7697-37-2
<b>EC-No</b>	231-714-2
<b>REACH Registration Number</b>	01-2119487297-23-0027
<b>Formula</b>	HNO <sub>3</sub>

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

<b>Recommended Use</b>	Industrial use, Professional use. See annex for more detailed information.
<b>Uses advised against</b>	Consumer use.

### 1.3. Details of the supplier of the safety data sheet

OCI Nitrogen BV Mijnweg 1 P.O. Box 601 6160 AP Geleen, The Netherlands Tel: +31 (0) 46 7020111 www.ocinitrogen.com	OCI Nitrogen BV Mijnweg 1 P.O. Box 601 6160 AP Geleen, The Netherlands Tel: +31 (0) 46 7020111 www.ocinitrogen.com
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info.agro@ocinitrogen.com

### 1.4. Emergency telephone number

UK National Health Service (NHS) call 111 or, in life-threatening emergencies, call 999

WAL National Health Service (NHS) call 0845 46 47

IE National Poisons Information Centre  
+353 1 809 2566 or +353 1 837 9964 (only for healthcare professionals)

Manufacturer: Alert & Care Centre Chemelot (Geleen, The Netherlands)  
+31 46 4765555 (24/7)

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

#### Classification (1272/2008/EC)

Acute inhalation toxicity	Category 3 - H331
Skin corrosion/irritation	Category 1A - H314
Corrosive to metals	Category 1 - H290

For the full text of the H-Statements mentioned in this section, see Section 16.

**2.2 Label elements****Signal word**

Danger

**Hazard Statements**

H290 - May be corrosive to metals

H314 - Causes severe skin burns and eye damage

H331 - Toxic if inhaled

EUH071 - Corrosive to the respiratory tract

**Precautionary Statements**

P260 - Do not breathe dust/fume/gas/mist/vapours/spray

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting

P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower

P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

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 or doctor/physician

P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

**2.3 Other hazards**

None known.

**SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS****3.1 Substances**

Chemical Name	EC-No	CAS-No	Weight %	Classification (1272/2008/EC)	REACH Registration Number
Nitric acid	Present	7697-37-2	20-65	Ox. Liq 2 H272 Met. Corr. H290 Skin Corr. 1A H314 Acute Tox 3 H331	01-2119487297-23-00 27

Concentration Limits Oxid. Liquid 2  $\geq 99.0\%$ , Oxid. Liquid 3  $\geq 65.0\% < 99.0\%$ , Skin Corr. 1A  $\geq 20.0\%$ , Skin Corr. 1B  $\geq 5.0\% < 20.0\%$ , Acute Tox. 3  $> 26\% - \leq 100\%$ , Acute Tox. 4  $> 13\% - \leq 26\%$ .

For the full text of the H-Statements mentioned in this section, see Section 16.

**SECTION 4: FIRST AID MEASURES****4.1. Description of first aid measures****General advice**

Immediate medical attention is required. Remove from exposure, lie down. Do not breathe vapours, mist or gas. Do not get in eyes, on skin, or on clothing. Use first aid treatment according to the nature of the injury: Flush with plenty of water or Diphotherine.

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<b>Eye contact</b>	Get medical attention. Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes.
<b>Skin contact</b>	Get medical attention. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash contaminated clothing before reuse.
<b>Ingestion</b>	Get medical attention. Rinse mouth thoroughly with water. Give small quantities of water to drink. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. If victim is unconscious, monitor pulse, breathing and airway.
<b>Inhalation</b>	Get medical attention. Remove to fresh air and keep at rest in a position comfortable for breathing. If breathing is difficult, (trained personnel should) give oxygen. It may be dangerous to give mouth-to-mouth resuscitation. Move to fresh air in case of accidental inhalation of vapours or decomposition products: Symptoms may be delayed.
<b>Protection of first-aiders</b>	Use personal protective equipment. Avoid contact with skin, eyes and clothing.

#### **4.2. Most important symptoms and effects, both acute and delayed**

<b>Main symptoms</b>	Causes severe skin burns and eye damage. Can burn mouth, throat, and stomach. Pain, blistering, Burning feeling and temporary redness.
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#### **4.3. Indication of any immediate medical attention and special treatment needed**

<b>Notes to physician</b>	Treat symptomatically. Symptoms may be delayed.
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## **SECTION 5: FIREFIGHTING MEASURES**

### **5.1. Extinguishing media**

<b>Suitable Extinguishing Media</b>	The product itself does not burn. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
<b>Unsuitable Extinguishing Media</b>	None known.

### **5.2. Special hazards arising from the substance or mixture**

<b>Special Hazard</b>	Heating of containers may cause pressure rise, with risk of bursting. Thermal decomposition can lead to release of irritating and toxic gases and vapours: Nitrogen oxides (NO <sub>x</sub> ), Contact with metals may evolve flammable hydrogen gas.
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### **5.3. Advice for firefighters**

<b>Fire fighting measures</b>	Evacuate non-essential personnel.
<b>Special protective equipment for fire-fighters</b>	Wear self-contained breathing apparatus and protective suit.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Evacuate non-essential personnel. Avoid contact with skin, eyes and clothing. Avoid breathing vapours or mists. Do not touch or walk through spilled material. In case of insufficient ventilation, wear suitable respiratory equipment.

### 6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas. Local authorities should be advised if significant spillages cannot be contained.

### 6.3 Methods and material for containment and cleaning up

The product should not be allowed to enter drains, water courses or the soil. The spilled material may be neutralized with sodium carbonate, sodium bicarbonate or calcium hydroxide. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

### 6.4. Reference to other sections

See sections 8 and 13.

## SECTION 7: HANDLING AND STORAGE

### 7.1 Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Avoid breathing vapours or mists. Contact lenses should not be worn when working with this product. Wash hands thoroughly after handling. Do not eat, drink and smoke in work areas; wash hands after use; remove contaminated clothing and protective equipment before entering eating areas. See annex for more detailed information.

### 7.2. Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Keep in properly labelled containers. Keep container tightly closed. Keep in a dry, cool and well-ventilated place Store locked up. Keep away from direct sunlight, Incompatible materials: Steel, Copper, Aluminium, Alkalis.

Packaging: corrosive resistant stainless steel, Glass, PVC, PTFE .

### 7.3. Specific end use(s)

<b>Exposure scenario</b>	See annex.
<b>Other information</b>	Not available.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control parameters

Chemical Name	European Union	The United Kingdom	France	Spain	Germany
Nitric acid	STEL: 1 ppm SETL: 2.6 mg/m <sup>3</sup>	STEL: 1 ppm SETL: 2.6 mg/m <sup>3</sup>	STEL: 1 ppm SETL: 2.6 mg/m <sup>3</sup>	VLA-EC: 1 ppm VLA-EC: 2.6 mg/m <sup>3</sup>	STEL: 1 ppm SETL: 2.6 mg/m <sup>3</sup>

Chemical Name	Italy	Portugal	Netherlands	Denmark	Poland
Nitric acid	STEL: 1 ppm SETL: 2.6 mg/m <sup>3</sup>	STEL: 4 ppm TWA: 2 ppm	STEL: 1.3 mg/m <sup>3</sup>	STEL: 5 mg/m <sup>3</sup> TWA: 10 mg/m <sup>3</sup>	STEL: 2.6 mg/m <sup>3</sup> TWA: 1.4 mg/m <sup>3</sup>

Chemical Name	Belgium	Sweden	Hungary	Finland	Czech Republic
Nitric acid	STEL: 2.6 mg/m <sup>3</sup>	STEL: 13 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	STEL: 2.6 mg/m <sup>3</sup>	TWA: 0.5 ppm TWA: 1.3 mg/m <sup>3</sup> STEL: 1 ppm STEL: 2.6 mg/m <sup>3</sup>	Ceiling: 2.5 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup>

**Biological Limit Values** Not established.

**Recommended monitoring procedures** No information available.

#### Derived No Effect Level (DNEL)

Chemical Name	Worker - inhalative, long-term - local	Worker - dermal, long-term - local	Worker - inhalative, short-term - local	Worker - dermal, short-term - local
Nitric acid	2.6 mg/m <sup>3</sup> (worker) 1.3 mg/m <sup>3</sup> (gen. population)			

**Predicted No Effect Concentration (PNEC)** No information available.

### 8.2. Exposure controls

**Appropriate engineering controls** Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location. Additional advice: Portable Diphoterine eyewashers. See annex for more detailed information.

#### Individual protection measures, such as personal protective equipment

**Eye protection**

**Hand Protection**

**Skin and body protection**

**Respiratory protection**

**Recommended Filter Type**

Tightly fitting safety goggles.

Protective gloves: (EN 374), Fluorinated rubber FKM, Viton®, 0,4mm >8h . Polychloroprene (CR) , Butyl rubber, Polyvinylchloride ( PVC ), 0,5mm >=2h. Unsuitable materials: Nitrile rubber, Natural Rubber.

Wear suitable protective clothing: Chemical resistant apron, Boots.

Wear respiratory protection: Wear a positive-pressure supplied-air respirator or Full face mask.

Filter ABEK NO P3 15

#### Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Do not eat, drink or smoke when using this product.

**Environmental Exposure Controls** The product should not be allowed to enter drains, water courses or the soil.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on basic physical and chemical properties

**Physical state @20°C**

**Appearance**

fluid

**Colour**

Colourless / Brown

**Odour**

Pungent

**Odour Threshold**

0.75 - 2.5 ppm

**pH**

< 1

**Melting/freezing point**

-35 to -18 °C

**Boiling point/boiling range**

104 - 122 °C

**Flash point**

Not applicable

**Evaporation rate**

No information available

**Flammability (solid, gas)**

Not flammable

**Flammability Limits in Air**

Not applicable

**Vapour pressure**

9.4-9.5 hPa, 55%-70% (@20 °C)

**Vapour density**

2.2 (air = 1)

**Relative density**

1.35 (water = 1)

**Solubility**

**Water solubility**

Soluble, ( Completely miscible )

**Partition Coefficient (n-octanol/water)**

No information available

**Autoignition temperature**

Not applicable

**Decomposition temperature**

>200 °C

**Viscosity, dynamic**

0.75 mPa.s (@ 25°C) 100%

**Oxidising properties**

See section 3.2

**Explosive properties**

No information available

### 9.2 Other information

**Other information**

No information available

## SECTION 10: STABILITY AND REACTIVITY

### 10.1. Reactivity

Corrosive to metals.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3 Possibility of hazardous reactions

The product reacts with metals with evolution of highly flammable hydrogen. Reacts with water: (exothermic reaction). Risk of explosion in confined areas and in contact with incompatible materials.

### 10.4. Conditions to avoid

Keep away from heat and sources of ignition.

### 10.5. Incompatible materials

Alkalis, Combustible materials, Organic materials, Alcohols, Organic solvents, Ketones, Aldehydes, Amines, Strong alkalis, Halogens, Polypropylene and Carbon steel. Contact with metals may evolve flammable hydrogen gas. May intensify fire; oxidizer.

### 10.6. Hazardous decomposition products

Hydrogen gas, Nitrogen oxides (NO<sub>x</sub>), Carbon oxides.

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information on toxicological effects

#### Acute toxicity

##### Ingestion

Causes burns of the upper digestive and respiratory tracts by strong corrosion.

##### Skin contact

Corrosive to skin. Corrosive to eyes.

##### Inhalation

Toxic if inhaled.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Nitric acid			> 2.65 mg/L ( Rat ) 4h

#### Skin corrosion/irritation

Corrosive to skin. Causes severe skin burns and eye damage.

#### Serious eye damage/irritation

Corrosive to eyes. Causes severe damage to eyes.

#### Respiratory or skin sensitisation

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

#### Germ cell mutagenicity

Not known to cause heritable genetic damage.

#### Carcinogenicity

Contains no ingredient listed as a carcinogen.

#### Reproductive toxicity

Not known to cause birth defects or have a deleterious effect on a developing fetus. Not known to adversely affect reproductive functions and organs.

#### STOT-single exposure

Corrosive to respiratory system.

#### STOT-repeated exposure

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

#### Aspiration hazard

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

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

Based on available data, the classification criteria are not met.  
May cause adverse effects in the aquatic environment due to changes in pH.

Chemical Name	Toxicity to algae	Toxicity to fish	Toxicity to microorganisms	Toxicity to daphnia and other aquatic invertebrates
Nitric acid		LC50: 72 mg/L 96 h Gambusia affinis		

### 12.2. Persistence and degradability

Readily biodegradable.

### 12.3. Bioaccumulative potential

Does not bioaccumulate.

Chemical Name	Log P <sub>ow</sub>	Bioconcentration factor (BCF)
Nitric acid	-2.3	

### 12.4. Mobility in soil

No information available.

### 12.5. Results of PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT). This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

### 12.6. Other adverse effects

May cause adverse effects in the aquatic environment due to changes in pH.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

#### **Waste from residues / unused products**

Dispose of in accordance with local regulations.

#### **Contaminated packaging**

Empty containers should be taken to an approved waste handling site for recycling or disposal.



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**SECTION 14: TRANSPORT INFORMATION**

According to: ADR, RID, ADN, IMDG, IATA/ICAO.

**14.1. UN number**

UN 2031

**14.2. UN proper shipping name**

NITRIC ACID

**14.3. Transport hazard class(es)**

8

**14.4. Packing group**

II

**14.5 Environmental hazards**

Not applicable.

**14.6 Special precautions for user**

See transport regulations for UN number specific special precautions.  
Inland waterway transport (ADN). PP 81: Shelf life. Plastic container.

**14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code**

See section 17, IBC Code.

## SECTION 15: REGULATORY INFORMATION

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

#### Restrictions on use

Regulation (EU) No 98/2013: Acquisition, possession or use by the general public is restricted.  
 Dangerous substance category per Seveso Directive (2012/18/EU): H2 Quantity 1: 50t, Quantity 2: 200t.

#### Europe

Component	Rotterdam Convention on Prior Inform Consent (PIC)	EU - Ozone Depleting Substances Regulations (2037/2000/EC)	EU - Explosives Precursors Marketing and Use (98/2013/EC)
Nitric acid 7697-37-2 ( 20-65 )	Not listed	Not listed	3 %w/w limit value 3 - 10 %w/w limit value

#### National regulatory information

Component	WGK Classification (VwVwS)
Nitric acid 7697-37-2 ( 20-65 )	Reg. no. 414, hazard class 1 - slightly hazardous to water (except fuming)

#### Other Regulations

REGULATION (EC) No 2003/2003 relating to fertilisers.

#### International legislation/requirements

No information available.

### 15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance. See annex for more detailed information.

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**SECTION 16: OTHER INFORMATION**

<b>Full text of H-Statements referred to under sections 2 and 3</b>	H272 - May intensify fire; oxidizer H290 - May be corrosive to metals H314 - Causes severe skin burns and eye damage H331 - Toxic if inhaled EUH071 - Corrosive to the respiratory tract
<b>Revision Note</b>	Personal Protective Equipment.
<b>Training Advice</b>	Workers must be trained in the proper use and handling of this product as required under applicable regulations.
<b>Abbreviations and acronyms</b>	STOT: Specific Target Organ Toxicity PBT: Persistent, Bioaccumulative, Toxic vPvB: very Persistent and very Bioaccumulating ADR: Accord européen relatif au transport international des marchandises Dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road) EC: European Commission RID: Règlement concernant le transport international ferroviaire des marchandises dangereuses (Regulations for the International Transport of Dangerous Goods by Rail) ADN: Accord européen relatif au transport international des marchandises Dangereuses par voies de Navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways) ICAO: International Civil Aviation Organization REACH: Registration, Evaluation, Authorisation and Restriction of Chemical substances ES: Exposure Scenario DNEL: Derived No Effect Level PNEC: Predicted No Effect Concentration IARC: International Agency for Research on Cancer
<b>SDS No.</b>	OC00019 /OCE1

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

## 1. EXPOSURE SCENARIO

**Exposure scenario** 1  
**Title** Manufacturing

**Use descriptor**

**Process categories**

PROC1 - Use in closed process, no likelihood of exposure  
 PROC2 - Use in closed, continuous process with occasional controlled exposure (e.g. sampling)  
 PROC3 - Use in closed batch process (synthesis or formulation); Industrial setting  
 PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises  
 PROC8a - Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non dedicated facilities  
 PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities  
 PROC9 - Transfer of substance or mixture into small containers (dedicated filling line, including weighing)  
 PROC15 - Use as laboratory reagent

**Environmental release categories** ERC1 - Manufacture of substances

## 2. CONDITIONS OF USE AFFECTING EXPOSURE

**Product characteristics**  
**Physical state @20°C** Liquid, Aqueous solution.  
**Concentration of substance in product** 60%.

**Frequency and duration of use** ≤ 8 hours/day.

**Contributing scenarios**

**Control of environmental exposure**

Environmental Release Category	ERC1 - Manufacture of substances
Product characteristics	Liquid
Frequency and duration of use	≤ 8 hours/day
Control of environmental exposure	Not required

**Control of worker exposure**

Process category	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
Product characteristics	Liquid
Frequency and duration of use	≤ 8 hours/day
Technical conditions and measures at process level (source) to prevent release	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

	<p>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). 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.</p>
Conditions and Measures Related to Personal Protection, Hygiene, and Health Evaluation	<p>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.</p>

### 3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE

#### Environment Exposure Estimation

Environment Exposure Estimation	Not determined Quantitative exposure and risk assessment not available
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#### Health Exposure Estimation

Health Exposure Estimation	Not determined Quantitative exposure and risk assessment not available
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### 4. GUIDANCE TO DOWNSTREAM USER FOR EVALUATING EMPLOYEE WHETHER HE WORKS INSIDE THE BOUNDARIES SET BY THE ES

#### Environmental exposure

As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed.

#### Control of worker exposure

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.

#### Guidance to check compliance with the exposure scenario

If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. For scaling see ECETOC TRA, ART, STOFFENMANAGER, EUSES.

## Exposure scenario 2 Formulation [mixing] of preparations and/or re-packaging

## 1. EXPOSURE SCENARIO

<b>Exposure scenario Title</b>	<b>2 Formulation [mixing] of preparations and/or re-packaging</b>
<b>Use descriptor</b>	
<b>Product category</b>	PC12 - Fertilisers PC14 - Metal surface treatment products, including galvanic and electroplating products PC15 - Non-metal-surface treatment products PC35 - Washing and cleaning products (including solvent based products)
<b>Process categories</b>	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure (e.g. sampling) PROC3 - Use in closed batch process (synthesis or formulation); Industrial setting PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact) PROC8a - Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC15 - Use as laboratory reagent
<b>Environmental release categories</b>	ERC2 - Formulation of mixtures

## 2. CONDITIONS OF USE AFFECTING EXPOSURE

<b>Product characteristics</b>	
<b>Physical state @20°C</b>	Liquid, Aqueous solution.
<b>Concentration of substance in product</b>	60%.

**Frequency and duration of use** ≤ 8 hours/day.

**Contributing scenarios****Control of environmental exposure**

Environmental Release Category	ERC2 - Formulation of mixtures
Product characteristics	Liquid
Frequency and duration of use	≤ 8 hours/day
Control of environmental exposure	Not required

**Control of worker exposure**

Process category	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 mixtures and articles (multi-stage 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
Product characteristics	Liquid
Frequency and duration of use	≤ 8 hours/day
Technical conditions and measures at process level (source) to prevent release	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

**Exposure scenario 2 Formulation [mixing] of preparations and/or re-packaging**

	<p>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.</p> <p>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.</p> <p>Suitable material: The recommended material for tanks, vessels and accessories is low carbon austenitic stainless steel.</p> <p>Unsuitable materials: Do not use any metal, carbon steel or polypropylene.</p> <p>Ventilation conditions in the working area: Use only outdoors or in a well-ventilated area (approximately 5 air changes per hour).</p> <p>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.</p> <p>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.</p> <p>Gas monitoring: Use stationary and/or portable NOx monitors in the working place.</p>
Conditions and Measures Related to Personal Protection, Hygiene, and Health Evaluation	<p>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.</p> <p>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.</p> <p>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.</p> <p>When aerosols/mists of nitric acid can be formed, wear a suitable acid resistant chemical safety suit with a supplied air respirator/helmet/suit.</p> <p>Suitable material: butyl/fluorinated rubber.</p>

### 3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE

#### Environment Exposure Estimation

Environment Exposure Estimation	Not determined Quantitative exposure and risk assessment not available
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#### Health Exposure Estimation

Health Exposure Estimation	Not determined Quantitative exposure and risk assessment not available
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### 4. GUIDANCE TO DOWNSTREAM USER FOR EVALUATING EMPLOYEE WHETHER HE WORKS INSIDE THE BOUNDARIES SET BY THE ES

#### Environmental exposure

As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed.

#### Control of worker exposure

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.

#### Guidance to check compliance with the exposure scenario

If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. For scaling see ECETOC TRA, ART, STOFFENMANAGER, EUSES.

## 1. EXPOSURE SCENARIO

<b>Exposure scenario Title</b>	<b>3 Industrial use, Use as an intermediate.</b>
<b>Use descriptor</b>	
<b>Sector of use</b>	SU8 - Manufacture of bulk, large scale chemicals (including petroleum products) SU9 - Manufacture of fine chemicals SU0 - Other
<b>Product category</b>	PC19 - Intermediates
<b>Process categories</b>	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure (e.g. sampling) PROC3 - Use in closed batch process (synthesis or formulation); Industrial setting PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact) PROC8a - Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC15 - Use as laboratory reagent
<b>Environmental release categories</b>	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

## 2. CONDITIONS OF USE AFFECTING EXPOSURE

<b>Product characteristics</b>	
<b>Physical state @20°C</b>	Liquid, Aqueous solution.
<b>Concentration of substance in product</b>	60%.
<b>Frequency and duration of use</b>	≤ 8 hours/day.
<b>Contributing scenarios</b>	

<b>Control of environmental exposure</b>	
Environmental Release Category	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Product characteristics	Liquid
Frequency and duration of use	≤ 8 hours/day
Control of environmental exposure	Not required

<b>Control of worker exposure</b>	
Process category	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 mixtures and articles (multi-stage 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
Product characteristics	Liquid
Frequency and duration of use	≤ 8 hours/day
Technical conditions and measures at	Containment: Under standard operating conditions the substance is rigorously contained by



**Exposure scenario 3 Industrial use, Use as an intermediate.**

process level (source) to prevent release	<p>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.</p> <p>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.</p> <p>Suitable material: The recommended material for tanks, vessels and accessories is low carbon austenitic stainless steel.</p> <p>Unsuitable materials: Do not use any metal, carbon steel or polypropylene.</p> <p>Ventilation conditions in the working area: Use only outdoors or in a well-ventilated area (approximately 5 air changes per hour).</p> <p>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.</p> <p>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.</p> <p>Gas monitoring: Use stationary and/or portable NOx monitors in the working place.</p>
Conditions and Measures Related to Personal Protection, Hygiene, and Health Evaluation	<p>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.</p> <p>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.</p> <p>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.</p> <p>When aerosols/mists of nitric acid can be formed, wear a suitable acid resistant chemical safety suit with a supplied air respirator/helmet/suit.</p> <p>Suitable material: butyl/fluorinated rubber.</p>

### 3. EXPOSURE ESTIMATION AND REFERENCE TO ITS SOURCE

#### Environment Exposure Estimation

Environment Exposure Estimation	Not determined Quantitative exposure and risk assessment not available
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#### Health Exposure Estimation

Health Exposure Estimation	Not determined Quantitative exposure and risk assessment not available
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### 4. GUIDANCE TO DOWNSTREAM USER FOR EVALUATING EMPLOYEE WHETHER HE WORKS INSIDE THE BOUNDARIES SET BY THE ES

#### Environmental exposure

As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed.

#### Control of worker exposure

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.

#### Guidance to check compliance with the exposure scenario

If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. For scaling see ECETOC TRA, ART, STOFFENMANAGER, EUSES.

## 1. EXPOSURE SCENARIO

<b>Exposure scenario Title</b>	<b>4 Industrial use, Industrial cleaning.</b>
<b>Use descriptor</b>	
<b>Sector of use</b>	SU2a - Mining, (without offshore industries) SU4 - Manufacture of food products SU6a - Manufacture of wood and wood products SU8 - Manufacture of bulk, large scale chemicals (including petroleum products) SU9 - Manufacture of fine chemicals SU10 - Formulation [mixing] of preparations and/or re-packaging SU12 - Manufacture of plastics products, including compounding and conversion SU14 - Manufacture of basic metals, including alloys SU15 - Manufacture of fabricated metal products, except machinery and equipment SU16 - Manufacture of computer, electronic and optical products, electrical equipment SU19 - Building and construction work SU23 - Recycling
<b>Product category</b>	PC0 - Other Products PC14 - Metal surface treatment products, including galvanic and electroplating products PC15 - Non-metal-surface treatment products PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents, other unspecified PC35 - Washing and cleaning products (including solvent based products) PC37 - Water treatment chemicals
<b>Process categories</b>	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure (e.g. sampling) PROC3 - Use in closed batch process (synthesis or formulation); Industrial setting PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact) PROC7 - Industrial spraying PROC8a - Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or mixture 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
<b>Environmental release categories</b>	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles ERC6b - Industrial use of reactive processing aids

## 2. CONDITIONS OF USE AFFECTING EXPOSURE

**Product characteristics**  
**Physical state @20°C** Liquid, Aqueous solution.  
**Concentration of substance in product** 60%

**Frequency and duration of use** ≤ 8 hours/day.

**Contributing scenarios**

**Control of environmental exposure**

Environmental Release Category	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
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	ERC6b - Industrial use of reactive processing aids
Product characteristics	Liquid
Frequency and duration of use	≤ 8 hours/day
Control of environmental exposure	Not required

<b>Control of worker exposure</b>	
Process category	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 mixtures and articles (multi-stage 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
Product characteristics	Liquid
Frequency and duration of use	≤ 8 hours/day
Technical conditions and measures at process level (source) to prevent release	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.
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

<b>Environment Exposure Estimation</b>	
Environment Exposure Estimation	Not determined Quantitative exposure and risk assessment not available

<b>Health Exposure Estimation</b>	
Health Exposure Estimation	Not available Quantitative exposure and risk assessment not available

### 4. GUIDANCE TO DOWNSTREAM USER FOR EVALUATING EMPLOYEE WHETHER HE

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## WORKS INSIDE THE BOUNDARIES SET BY THE ES

### **Environmental exposure**

As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed.

### **Control of worker exposure**

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.

### **Guidance to check compliance with the exposure scenario**

If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. For scaling see ECETOC TRA, ART, STOFFENMANAGER, EUSES.

## 1. EXPOSURE SCENARIO

<b>Exposure scenario Title</b>	<b>5 Professional use, Professional cleaning.</b>
<b>Use descriptor</b>	
<b>Sector of use</b>	SU1 - Agriculture, forestry, fishery SU2a - Mining, (without offshore industries) SU4 - Manufacture of food products SU6a - Manufacture of wood and wood products SU12 - Manufacture of plastics products, including compounding and conversion SU14 - Manufacture of basic metals, including alloys SU15 - Manufacture of fabricated metal products, except machinery and equipment SU16 - Manufacture of computer, electronic and optical products, electrical equipment SU19 - Building and construction work SU23 - Recycling
<b>Product category</b>	PC12 - Fertilisers PC14 - Metal surface treatment products, including galvanic and electroplating products PC15 - Non-metal-surface treatment products PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents, other unspecified PC35 - Washing and cleaning products (including solvent based products)
<b>Process categories</b>	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure (e.g. sampling) PROC3 - Use in closed batch process (synthesis or formulation); Industrial setting PROC5 - Mixing or blending in batch processes for formulation of mixtures and articles (multi-stage and/or significant contact) PROC8a - Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or mixture 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
<b>Environmental release categories</b>	ERC8b - Wide dispersive indoor use of reactive substances in open systems ERC8e - Wide dispersive outdoor use of reactive substances in open systems

## 2. CONDITIONS OF USE AFFECTING EXPOSURE

**Product characteristics**  
**Physical state @20°C** Liquid, Aqueous solution.  
**Concentration of substance in product** 60%.

**Frequency and duration of use** ≤ 8 hours/day.

**Contributing scenarios**

**Control of environmental exposure**

Environmental Release Category	ERC8b - Wide dispersive indoor use of reactive substances in open systems ERC8e - Wide dispersive outdoor use of reactive substances in open systems
Product characteristics	Liquid
Frequency and duration of use	≤ 8 hours/day
Control of environmental exposure	Not required

<b>Control of worker exposure</b>	
Process category	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 mixtures and articles (multi-stage 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
Product characteristics	Liquid
Frequency and duration of use	≤ 8 hours/day
Technical conditions and measures at process level (source) to prevent release	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.
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

#### Environment Exposure Estimation

Environment Exposure Estimation | Not determined Quantitative exposure and risk assessment not available

#### Health Exposure Estimation

Health Exposure Estimation | Not determined Quantitative exposure and risk assessment not available

### 4. GUIDANCE TO DOWNSTREAM USER FOR EVALUATING EMPLOYEE WHETHER HE WORKS INSIDE THE BOUNDARIES SET BY THE ES

#### Environmental exposure

**Exposure scenario 5 Professional use, Professional cleaning.**

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As no environmental hazard was identified no environmental-related exposure assessment and risk characterisation was performed.

**Control of worker exposure**

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.

**Guidance to check compliance with the exposure scenario**

If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. For scaling see ECETOC TRA, ART, STOFFENMANAGER, EUSES.