

# Nitric Acid 26% < Concentration < 65%

## SAFETY DATA SHEET

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH) & 1272/2008 (CLP)

Revision 3, Aug 2017 (replaces Revision 2, May 2012)

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

#### 1.1 Product identifier

Product Name	Nitric Acid 26% < Conc < 65%
Alternative Name(s)	Aqua fortis, Azotic acid.
Chemical Formula	HNO <sub>3</sub> .
CAS No.	7697-37-2.
EINECS No.	231-714-2.
<b>UK REACH Registration No.</b>	<i>UK-01-9464807725-6-0001</i>
<b>EU REACH Registration No.</b>	01-2119487297-23-0020.

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

Identified use(s)	<p>Industrial distribution.</p> <p>Industrial USE to formulate chemical product mixtures.</p> <p>Industrial USE as chemical intermediate.</p> <p>Industrial USE as reactive agent/processing aid and for general chemical applications.</p> <p>Industrial USE for surface/article treatment.</p> <p>Industrial USE to manufacture specialist chemical/other products.</p> <p>Professional formulation of mixtures.</p> <p>Professional distribution.</p> <p>Professional USE as part of specialist chemicals/other products.</p> <p>Professional USE for surface/article treatment.</p> <p>Professional USE as reactive agent/processing aid and for general chemical applications.</p> <p>Professional USE as a laboratory/research chemical.</p>
Uses advised against	<p>Other non-specified industry.</p> <p>Any consumer use with concentration &gt;3%.</p>
Reason	<p>Due to lack of related experience or data, the supplier cannot approve this use.</p> <p>EC Regulation 98/2013 on Precursors of explosives forbids provision of Nitric Acid &gt;3% to consumer.</p>

#### 1.3 Details of the supplier of the Safety Data Sheet

Company Identification	CF Fertilisers UK Limited Ince, Chester CH2 4LB.
Telephone	+44 (0) 151 357 2777
Fax	+44 (0) 151 357 1755
E-mail	<a href="mailto:info@cffertilisers.co.uk">info@cffertilisers.co.uk</a>

#### 1.4 Emergency telephone number

Emergency Phone No.	+44 (0)1642 542824
E-mail	<a href="mailto:Liquids.sds@cffertilisers.co.uk">Liquids.sds@cffertilisers.co.uk</a>

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

Regulation (EC) No. 1272/2008 (CLP) Skin Corr. 1A; H314.  
AcuteTox. 3; H331  
Met. Corr. 1; H290.

### 2.2 Label elements

According to Regulation (EC) No. 1272/2008 (CLP).

Trade name Nitric Acid

#### Hazard Pictogram



GHS05

GHS06

#### Signal word(s)

Danger.

#### Hazard statement(s)

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

#### Precautionary statement(s):

Prevention

P260: Do not breathe dust/fume/gas/mist/vapours/spray.  
P271: Use only outdoors or in a well-ventilated area.  
P264: Wash hands thoroughly after handling.  
P234: Keep only in original container.  
P280: Wear protective gloves/protective clothing/eye protection/face protection.

#### Response

P301 + P330 + P331: IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.  
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P303 + P361 + P353: IF ON SKIN (or hair): Remove/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.  
P310: Immediately call a POISON CENTRE or doctor/physician.  
P363: Wash contaminated clothing before reuse.  
P390: Absorb spillage to prevent material damage.

#### Storage

P234: Keep only in original container.  
P403+P233: Store in a well-ventilated place. Keep container tightly closed.  
P404: Store in a closed container.  
P405: Store locked up.  
P406: Store in a corrosive resistant container (see Section 7).

#### Disposal

P501: Dispose of contents/container in accordance with local/regional/national /international regulations

#### Supplemental label elements

EUH071: Corrosive to the respiratory tract.

**EU Regulation (EC) No. 1907/2006 (REACH) Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles**  
**Special packaging requirements**

Not applicable.

Containers to be fitted with child-resistant fastenings

Not applicable.



Tactile warning of danger Not applicable.

### 2.3 Other hazards

Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII Not applicable.

Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII Not applicable.

Other hazards which do not result in classification Attacks many metals producing extremely flammable hydrogen gas which can form explosive mixtures with air.

### 2.4 Additional Information None.

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substances – Mono constituent substance.

Classification Regulation (EC) No. 1272/2008 (CLP)

Hazardous ingredient(s)	%W/W	CAS No.	EC No.	REACH Registration No.	Hazard statement(s)	Type
Nitric acid	26% < Conc < 65%	7697-37-2	231-714-2	01-2119487297-23-0020	Skin Corr. 1A; H314 Met. Corr. 1; H290 Oxidiser.2; H272 Acute Tox. 1, H330 EUH071.	[A]

Type: [A] – Constituent, [B] – Impurity, [C] – Stabilizing additive.

### 3.2 Additional Information

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

## SECTION 4: FIRST AID MEASURES



Speed is essential. Get medical attention immediately. First-aiders should be adequately protected (see Section 7). Remove patient from exposure. Guarantee that the eye flushing systems and safety showers are located close to the working place.

### 4.1 Description of first aid measures

Inhalation	If inhaled, remove to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Mouth to mouth resuscitation may be dangerous. Get medical attention immediately.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 30 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Chemical burns must be treated promptly by a physician.
Eye Contact	Immediately flush eyes with plenty of water for at least 30 minutes, keeping eyelids open. Check for and remove any contact lenses. Get medical attention immediately.
Ingestion	If large quantities of this material are swallowed, call a physician immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or

self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

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

**4.2.1 Potential acute health effects**

Inhalation	Toxic by inhalation. Corrosive to the respiratory tract. Causes burns. Vapor is strongly irritating to the respiratory system. Serious effects may be delayed following exposure. Fluid build-up in lungs may cause shortness of breath after severe exposure causing acute pulmonary oedema.
Skin Contact	Causes severe burns.
Eye Contact	Causes serious eye damage. Vapour is strongly irritating to the eyes.
Ingestion	May cause burns to mouth, throat and stomach.

**4.2.2 Over-exposure signs/symptoms**

	Adverse symptoms may include the following:
Inhalation	Respiratory tract irritation, coughing.
Skin Contact	Pain or irritation, redness, blistering may occur.
Eye Contact	Pain, watering, redness.
Ingestion	Stomach pains.

**4.3 Indication of immediate medical attention and special treatment needed**

Notes to physician	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Specific treatments	No specific treatment.

**SECTION 5: FIRE-FIGHTING MEASURES**

**5.1 Extinguishing Media**

Suitable Extinguishing Media	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable Extinguishing Media	DO NOT use chemical extinguisher or foam or attempt to smother the fire with steam or sand.

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

Hazards from the substance or mixture	O Reacts violently with water. Attacks many metals producing extremely flammable hydrogen gas which can form explosive mixtures with air. Acidic. Toxic if inhaled. In a fire, decomposition may produce toxic gases/fumes. In a fire or if heated, a pressure increase will occur and the container may burst.
Hazardous thermal decomposition products	Decomposition products may include the following materials: nitrogen oxides. Avoid breathing dusts, vapors or fumes from burning materials. In case of inhalation of decomposition products in a fire, symptoms may be delayed (see Section 4).

**5.3 Advice for fire-fighters**

Special precautions for fire-fighters	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. Risk of explosion. If large quantities are involved in a major fire, evacuate the area. No action shall be taken involving any personal risk or without suitable training. Use water spray to keep fire-exposed containers cool. Fight fire from protected location or maximum possible distance.
Special protective equipment for fire-fighters	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for

fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

Additional information

Not available.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

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

For non-emergency personnel

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator or SCBA when ventilation is inadequate. Put on appropriate personal protective equipment. Shut off all ignition sources in hazard area if safe to do so.

For emergency responders

If specialized clothing is required to deal with a release, take note of information in Section 8 on suitable materials. See 'non-emergency personnel' above.

### 6.2 Environmental precautions

Avoid contact/dispersal of spilt material and runoff with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

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

Small spillages

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Do not absorb in sawdust or other combustible material. It may lead to a fire risk when it dries out. Dispose of via a licensed waste disposal contractor.

Large spillages

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Do not absorb in sawdust or other combustible material. It may lead to a fire risk when it dries out. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product.

### 6.4 Reference to other sections

See Section 1 for emergency contact information.  
See Section 8 for appropriate PPE.  
See Section 13 for additional waste treatment information.

## SECTION 7: HANDLING AND STORAGE

### 7.1 Precautions for safe handling

Protective measures

Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator or SCBA when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from clothing, incompatible materials and combustible materials. Keep away from alkalis. Keep away from heat. Empty containers retain product residue and can be hazardous. Do not reuse container. Spillages should be cleaned up promptly to avoid damage to surrounding materials.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

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

**Recommendations**

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store in corrosive resistant container with a resistant inner liner. Store locked up. Separate from reducing agents and combustible materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Bund storage facilities to prevent soil and water pollution in the event of spillage.

**Seveso II Directive – reporting thresholds**

Danger criteria:

Category	Notification and MAPP threshold	Safety report threshold
H2: Acute Toxic Cat 3, inhalation exposure	50 te	200 te

**7.3 Specific end use(s)**

**Recommendations**

Store container tightly closed in well-ventilated place.

**Industrial sector specific solutions**

Not available.

**SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

**8.1 Control parameters**

**8.1.1 Occupational Exposure Limits**

**SUBSTANCE. Nitric acid**

**CAS No.7697-37-2**

Country	STEL (ppm)	STEL (mg/m <sup>3</sup> )	Other	Note
EU	1	2.6		EH40 WEL (2007-10-01) EU OEL (2006-02-01)

**8.1.2 Recommended monitoring procedures**

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Reference should be made to monitoring standards, such as the following:  
 European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy)  
 European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents)  
 European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents)

Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

**8.1.3 PNECs and DNELs**




SUBSTANCE.	Type	Exposure	Value (mg/m <sup>3</sup> )	Population	Effects
Nitric acid	DNEL	Short Term Inhalation	2.6	Workers	Local
		Long Term Inhalation	2.6		
	PNEC		Not applicable		

**8.2 Exposure controls**

**8.2.1 Appropriate engineering controls**

Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Guarantee that the eye flushing systems and safety showers are located close to the working place.

**8.2.2 Individual protection measures**

Hygiene measures	A washing facility or water for eye and skin cleaning purposes should be present.
Eye/face protection 	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. Recommended: face shield CEN: EN136. When combined with full face respiratory protection – EN 316 (for full face devices) or EN 402 (for self-contained breathing apparatus).
Skin protection (Hand protection/ Other) 	
Hand protection	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. > 8 hours (breakthrough time): Protective gloves should be worn under normal conditions of use. 4 - 8 hours (breakthrough time): Viton, neoprene
Body protection	Recommended: Protective clothing Personal protective equipment for the body should be selected based on the task being performed and the risks involved.
Other skin protection	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection 	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: acid gas filter (Type E)
Thermal hazards	Not applicable.
<b>8.2.3 Environmental Exposure Controls</b>	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Colourless to light yellow.
Odour (Vapours or fumes)	Pungent, acrid.
Odour Threshold (ppm)	0.29
pH (Value)	<1
Melting Point (°C)	-23°C (60%)
Boiling point/boiling range (°C):	118°C (60%)
Flash Point (°C)	Not determined
Evaporation rate	Not determined
Flammability (solid, gas)	Non-flammable.
Explosive limit ranges.	Not determined
Vapour Pressure	860 Pa @ 20°C (60%)
Vapour Density (Air=1)	Not determined.
Density (g/ml)	1.367 g/ml @ 20°C (60%)
Bulk Density (g/ml)	Not applicable.
Solubilities	Completely miscible with water.
Partition Coefficient (n-Octanol/water)	Not determined.
Auto Ignition Temperature (°C)	Not determined.
Decomposition Temperature (°C)	Not available.
Viscosity (mPa.s)	0.75 @ 25C

	Explosive properties	None.
	Oxidising properties	None
<b>9.2</b>	<b>Other information</b>	Met. Corr. 1; May be corrosive to metals. Not pyrophoric.

## SECTION 10: STABILITY AND REACTIVITY

<b>10.1</b>	<b>Reactivity</b>	May be corrosive to metals. Expert judgement.
<b>10.2</b>	<b>Chemical stability</b>	Stable under normal conditions.
<b>10.3</b>	<b>Possibility of hazardous reactions</b>	Hazardous reactions or instability may occur under certain conditions of storage or use.  Conditions may include the following: contact with combustible materials.  Reactions may include the following: risk of causing or intensifying fire.
<b>10.4</b>	<b>Conditions to avoid</b>	Reacts violently with water, especially when water is added to the product. Drying on clothing or other combustible materials may cause fire. Separate from acids, alkalis, reducing agents and combustibles. Avoid contact with organic materials.
	Remark	Avoid contact with combustible materials. Avoid contact with organic materials.
<b>10.5</b>	<b>Incompatible materials</b>	Attacks many metals producing extremely flammable hydrogen gas which can form explosive mixtures with air.  Reactive or incompatible with the following materials: alkalis, metals
	Remark	Corrosive to brass and galvanized metals. Reactive with copper, zinc, silver, magnesium. -Product may release nitrogen oxides (NO, NO <sub>2</sub> etc)
<b>10.6</b>	<b>Hazardous Decomposition Product(s)</b>	Emits highly corrosive fumes when heated to decomposition, nitrogen oxides (NO, NO <sub>2</sub> etc.)

## SECTION 11: TOXICOLOGICAL INFORMATION

<b>11.1</b>	<b>Information on toxicological effects</b>	
<b>11.1.1</b>	<b>Acute toxicity</b>	
	Inhalation	LC50 (rat) > 2.65 mg/l [4 hours] OECD Guideline 403. Reference – BASF SE (2015)
	Conclusion/summary	Toxic if inhaled. Corrosive to the respiratory system and digestive tract.
<b>11.1.2</b>	<b>Irritation/corrosion</b>	
	Conclusion/summary: Skin	Corrosive to skin on contact.
	Eyes	Corrosive to eyes.
	Respiratory	Corrosive to the respiratory system.
<b>11.1.3</b>	<b>Sensitization</b>	
	Conclusion/summary: Skin	Corrosive.
	Respiratory	Corrosive.
<b>11.1.4</b>	<b>Mutagenicity</b>	No mutagenic effect.
<b>11.1.5</b>	<b>Carcinogenicity</b>	No carcinogenic effect.
<b>11.1.6</b>	<b>Reproductive toxicity</b>	



Substance	Maternal Toxicity	Fertility	Development Toxin	Species	Dose	Exposure	Reference
Nitric acid	Negative	Negative	Negative	Rat	Oral: >1500 mg/kg OECD 422	28 days	IUCLID 5

Conclusion/summary: Not considered to be toxic to the reproductive system.

#### 11.1.7 Teratogenicity

Conclusion/summary: Animal evidence, data inconclusive.

Information on the likely route of exposure: No known significant effects or critical hazards.

#### 11.1.8 Potential acute health effects

Inhalation: Toxic if inhaled. Corrosive to the respiratory tract. Causes burns. Vapor is strongly irritating to the eyes and respiratory system. Serious effects may be delayed following exposure.

Ingestion: May cause burns to mouth, throat and stomach.

Skin contact: Causes severe burns.

Eye contact: Causes serious eye damage.

#### 11.1.9 Symptoms related to the physical, chemical and toxicological characteristics

Inhalation: Adverse symptoms may include the following:

Respiratory tract irritation, coughing.

Ingestion: Stomach pains.

Skin contact: Pain or irritation, redness, blistering may occur.

Eye contact: Pain, watering, redness.

#### 11.1.10 Delayed and immediate effects and also chronic effects from short and long term exposure

##### Short term exposure:

Potential immediate effects: Causes severe burns.

Potential delayed effects: Shortness of breath / breathing difficulty.

##### Long term exposure:

Potential immediate effects: Causes severe burns.

Potential delayed effects: Shortness of breath / breathing difficulty. Skin necrosis.

#### 11.1.11 Potential chronic health effects

Substance	Result	Species	Dose	Exposure	Reference
Nitric acid	Sub-acute NOEL Oral	Rat	Oral: >1500 mg/kg OECD 422	28 days	IUCLID 5
	Sub-chronic NOAEC Inhalation		Inhalation: 4.11 mg/m <sup>3</sup>	90 days	IUCLID 5

Conclusion/summary: Data inconclusive.

General: No known significant effects or critical hazards.

Carcinogenicity: No known significant effects or critical hazards.

Mutagenicity	No known significant effects or critical hazards.
Teratogenicity	No known significant effects or critical hazards.
Developmental effects	No known significant effects or critical hazards.
Fertility effects	No known significant effects or critical hazards.

#### 11.1.12 Toxokinetics

Absorption	Rapidly absorbed.
Metabolism	The chemical and its metabolites are fully excreted and do not accumulate within the body.
Elimination	This product shows a low bioaccumulation potential.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1 Toxicity

Test material	Method	Species	Results
nitric acid (CAS 7697-37-2)	Acute, freshwater fish, 96h (pH is regularly adjusted)	Lepomis macrochirus (bluegill sunfish)	median lethal pH (96 h): 3 — 3.5 pH (meas. (TWA))
nitric acid (CAS 7697-37-2)	Acute, freshwater fish, 7day (pH is regularly adjusted)	Salmo gairdneri (new name: Oncorhynchus mykiss) (rainbow trout)	<b>LT50 (median lethal time of exposure)(7 d):</b> <ul style="list-style-type: none"> <li>ca. 200 min at pH 3.0</li> <li>ca. 1000 min at pH 3.3</li> <li>&gt;3200 &lt; 10000 min at pH 3.7</li> </ul> <b>median lethal pH:</b> <ul style="list-style-type: none"> <li>(96 h): ca. 3.7 pH</li> <li>(7 d): ca. 4 pH</li> </ul>
Similar Substance [sodium nitrate (CAS 7631-99-4)]	Acute, freshwater fish and marine, 96h	Salmo sp.	LC50 (96 h): 4400 - 6000 mg NO <sub>3</sub> - per liter (nominal)
Similar Substance [sodium nitrate (CAS 7631-99-4)]	Acute, freshwater fish, 96h	Lepomis macrochirus	LC50 (96h): 12000 mg/L (nominal)
Similar Substance [sodium nitrate (CAS 7631-99-4)]	Acute, freshwater fish, 96h (ASTM E729-26)	Topeka shiner (Notropis topeka)	LC50 (96h): 1559 mg/L NO <sub>3</sub> -N LC50 (96h): 1354 mg/L NO <sub>3</sub> -N
Similar Substance [sodium nitrate (CAS 7631-99-4)]	Acute, freshwater fish, 96h	Gambusia affinis	LC50 (96h): 6650 mg/L
nitric acid (CAS 7697-37-2)	Acute, freshwater invertebrate, 48h	Ceriodaphnia dubia	LC50 (48 h): 4.4 pH standard units LC50 (pH range tested: 3.2-8.0) (48 h): 4.7 pH
Similar Substance [sodium nitrate (CAS 7631-99-4)]	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)	Daphnia magna	EC50 (24 h): 8609 mg/L based on: mobility
Similar Substance [Potassium nitrate (CAS 7757-79-1)]	Acute, freshwater invertebrate, 48h	Daphnia magna	EC50 (48 h): 490 mg/L

Conclusion/Summary: The product is not expected to harm the environment when used properly according to directions.

<b>12.2 Persistence and degradability</b>	Due to its high solubility in water, nitric acid will be dissociated into its ions (H <sup>+</sup> and NO <sub>3</sub> <sup>-</sup> ) and in water the H <sup>+</sup> ions will form H <sub>3</sub> O <sup>+</sup> ions. Biodegradation is not applicable to inorganics
<b>12.3 Bioaccumulative potential</b>	Bioaccumulation is not relevant for such highly soluble and dissociating substances.

Substance	LogPow	BCF	Potential	Reference
Nitric acid	Not applicable	-	low	

Conclusion/Summary: The product is not expected to bioaccumulate through food chains in the environment.

<b>12.4</b>	<b>Mobility in soil</b>	Soil/water partition coefficient: Not available  Mobility: Not available.
<b>12.5</b>	<b>Results of PBT and vPvB assessment</b>	Not applicable to inorganic substances.
<b>12.6</b>	<b>Other adverse effects</b>	The main characteristic of the nitric acid that drives its toxicity is embedded in the fact it is a strong) acid that dissociates in water into its respective ions H <sup>+</sup> and NO <sub>3</sub> <sup>-</sup> and will affect the environment and its organisms by decreasing the pH. The increasing nitrate concentration is judged to have a minor effect on aquatic organisms compared to the effect of pH. The EU limit value of 50 mg NO <sub>3</sub> <sup>-</sup> /L (0.8 mmol NO <sub>3</sub> <sup>-</sup> /L) for water corresponds to a pH of 3.1 when all nitrate comes from nitric acid.

## SECTION 13: DISPOSAL CONSIDERATIONS

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

### 13.1 Waste treatment methods

#### 13.1.1 Product

Methods of disposal

The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Hazardous waste

Yes.

**European waste catalogue (EWC)**

Waste code: 06 01 05\*

Waste designation: Nitric acid and nitrous acid.

#### 13.1.2 Packaging

Methods of disposal

The generation of waste should be avoided or minimized wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions


This material and its container must be disposed of in a safe way.

Care should be taken when handling emptied containers that have not been cleaned or rinsed out.

Empty containers or liners may retain some product residues.

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## SECTION 14: TRANSPORT INFORMATION

	ADR / RID	ADN	IMDG	IATA
14.1	<b>UN number</b>	2031		
14.2	<b>Proper shipping name</b>	NITRIC ACID		
14.3	<b>Transport hazard class</b>	8		
				
14.4	<b>Packing group</b>	II		
14.5	<b>Environmental hazards</b>	No.		
14.6	<b>Additional information</b>			

Hazard identification number	80	-	-	-
Limited quantity	-	-	-	-
Tunnel Code	(E)	-	-	-
Danger Code	-	N3	-	-
IMDG Code Segregation Group	-	-	SG01	-
Emergency Schedules	-	-	F-A, S-Q	-
	<b>ADR / RID</b>	<b>ADN</b>	<b>IMDG</b>	<b>IATA</b>
Marine pollutant	-	-	-	No
Special precautions for user	-	-	-	-
Emergency schedules	-	-	-	-
Passenger & cargo aircraft quantity limitation	-	-	-	-
Packaging instructions	-	-	-	-
Cargo aircraft quantity limitation	-	-	-	-

Remark: Re ADN: N3. The product is only regulated as an environmentally hazardous substance when transported in tank vessels.

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

Proper shipping name Nitric acid (less than 65%)

Ship type 2

Pollution category Y

14.8 IMSBC Not applicable.

## SECTION 15: REGULATORY INFORMATION

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

#### 15.1.1 EU Regulation (EC) No. 1907/2006 (REACH)

Registered Substance REACH Registration number: 01-2119487297-23-0020.

Annex XIV - List of substances subject to authorization. Not listed

Substances of very high concern. Not listed

#### 15.1.2 Seveso Directive

Danger criteria: Category:  
H2: Acute Toxic Category 3, inhalation exposure.

#### 15.1.3 Other regulations

Council Directive 94/33/EC of 22 June 1994 on the protection of young people at work.

EU Directive 92/85/EEC, Employment restrictions concerning pregnant and lactating mothers.

REGULATION (EU) No 98/2013: Acquisition, possession or use by the general public is restricted.

EU - Explosives Precursors Marketing and Use (98/2013) - Limit Values of Restricted Explosives Precursors: 3% w/w limit value

EU - Explosives Precursors Marketing and Use (98/2013) - Substances Subject to Registration: 3-10% w/w limit value

EU - Occupational Diseases (Recommendation C(2003)3297) - European Schedule of Occupational Diseases - Substances and Agents: 109.01

#### 15.1.4 National regulations

To our knowledge no other country or state specific regulations are applicable.

15.2 Chemical Safety Assessment Complete.

## SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements, marked in italics: 1-16

Additional change information:

## LEGEND

bw	Body weight
LTEL	Long Term Exposure Limit
STEL	Short Term Exposure Limit
DNEL	Derived No Effect Level
PNEC	Predicted No Effect Concentration
PBT	PBT: Persistent, Bioaccumulative and Toxic
vPVB	very Persistent and very Bioaccumulative
WEL	Workplace Exposure Limit (UK HSE EH40)
NOAEL	No Observable Adverse Effect Level
NOAEC	No Observable Adverse Effect Concentration
Ox. Liq. 3	Oxidising liquid Category 3
Skin Corr. 1A	Skin corrosion/irritation Category 2
Met. Corr. 1	Substance or mixture corrosive to metals Category 1
Acute Tox. 3	Acute Toxicity Category 3
Acute Tox. 1	Acute Toxicity Category 1
EUH statement	CLP specific hazard statement.

## Key literature references and sources for data

EU REACH, IUCLID5, Nitric Acid CSR.

National Institute for Occupational Safety and Health, U.S. Dept. of Health, Education, and Welfare, Reports and Memoranda Registry of Toxic Effects of Chemical Substances.

IHS, 4777 Levy Street, St Laurent, Quebec HAR 2P9, Canada.Regulation (EC) No 1272/2008 Annex VI.

## Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Ox. Liq. 3, H272	Calculation method.
Met. Corr.1, H290	Expert judgement.
Skin Corr./Irrit.1, H314	On basis of test data.
Acute Tox. 3, H331	On basis of test data.
Acute Tox. 1, H330	On basis of test data.

## Full text of classifications [CLP/GHS]

**Met. Corr. 1, H290:** CORROSIVE TO METALS - Category 1  
**Ox. Liq. 3, H272:** OXIDIZING LIQUIDS - Category 3  
**Skin Corr./Irrit. 1A, H314:** SKIN CORROSION/IRRITATION - Category 1A  
**Acute Tox. 3, H331:** TOXIC IF INHALED -Category 3  
**Acute Tox. 1, H330:** FATAL IF INHALED -Category 1

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## ANNEX TO THE EXTENDED SAFETY DATA SHEET: EXPOSURE SCENARIO(S): Revised August 2017.

### Identification of the substance or mixture

Product definition	Mono-constituent substance
Product name	Nitric Acid 26% < Conc < 65%

## 1. ES 1: Manufacture

### 1.1 Title Section

*Manufacture - Manufacturing of the substance <70% (continuous and batch synthesis), including handling, storage and quality control*

Environment	
1: <i>Manufacturing of the substance &lt;70% (continuous and batch synthesis), including handling, storage and quality control</i>	ERC1
Worker	
2: Use in closed process, no likelihood of exposure	PROC 1
3: Use in closed, continuous process with occasional controlled exposure (e.g. sampling)	PROC 2
4: Mixing or blending in batch processes; Closed systems	PROC 3
5: Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
6: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities	PROC 8a
7: Transfer of substance or mixture (charging/discharging) at dedicated facilities	PROC 8b
8: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC 9
9: Use as laboratory reagent Use as laboratory reagent	PROC 15

### 1.2 Conditions of use affecting exposure

#### 1.2.1 Control of environmental exposure: *Manufacture of substance in closed and open systems (ERC 1)*

Neutralisation is normally necessary before waste water is discharged into water treatment plants. Exposure assessment and risk characterisation are not conducted because Nitric Acid is not classified for environmental hazard.

#### 1.2.2 Control of worker exposure: All worker activities combined

Product (Article) characteristics
<ul style="list-style-type: none"> <li>Percentage (w/w) of substance in mixture/article: &lt; 70%</li> <li>Physical form of the used product: Liquid (aqueous solution)</li> </ul>
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> <li>Duration of activities in the working area: ≤ 8 hours/day (all worker activities combined)</li> <li>Amount used: Not relevant</li> </ul>
Technical and organisational conditions and measures
<ul style="list-style-type: none"> <li><b>Containment:</b> 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.</li> <li><b>Organisational measures:</b> 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.</li> <li><b>Suitable material:</b> The recommended material for tanks, vessels and accessories is low carbon austenitic stainless steel.</li> <li><b>Unsuitable materials:</b> Do not use any metal, carbon steel or polypropylene</li> </ul>

- 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 NO<sub>x</sub> monitors in the working place, monitoring normal NO<sub>x</sub> levels at well below 2.6 mg/m<sup>3</sup>

**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

1.3 Exposure estimation and reference to its source

**Risks for workers**

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

1.3.1 Conclusion on risk characterisation

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

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

1.4.1 Environment

Exposure assessment and risk characterisation are not needed because Nitric Acid is not classified for environmental hazard.

1.4.2 Health

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. For scaling, see the MEASE tool,

<http://www.ebrc.de/mease.html>.

*DNEL inhalation*: 2.6 mg/m<sup>3</sup> (workers); 1.3 mg/m<sup>3</sup> (general population)



## 2. ES 2: Formulation or re-packing

### 2.1 Title Section

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

Environment	
1: Formulation of mixtures using Nitric acid < 70%	ERC2
Worker	
2: Use in closed process, no likelihood of exposure	PROC 1
3: Use in closed, continuous process with occasional controlled exposure (e.g. sampling)	PROC 2
4: Mixing or blending in batch processes; Closed systems	PROC 3
5: Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
6: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)	PROC 5
7: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities	PROC 8a
8: Transfer of substance or mixture (charging/discharging) at dedicated facilities	PROC 8b
9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC 9
10: Use as laboratory reagent Use as laboratory reagent	PROC 15

### 2.2 Conditions of use affecting exposure

#### 2.2.1 Control of environmental exposure: *Formulation into mixture (ERC 2)*

Neutralisation is normally necessary before waste water is discharged into water treatment plants. Exposure assessment and risk characterisation are not conducted because Nitric Acid is not classified for environmental hazard.

#### 2.2.2 Control of worker exposure: All worker activities combined

Product (Article) characteristics
<ul style="list-style-type: none"> <li>Percentage (w/w) of substance in mixture/article: &lt; 70%</li> <li>Physical form of the used product: Liquid (aqueous solution)</li> </ul>
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> <li>Duration of activities in the working area: ≤ 8 hours/day (all worker activities combined)</li> <li>Amount used: Not relevant</li> </ul>
Technical and organisational conditions and measures
<ul style="list-style-type: none"> <li><u>Containment</u>: 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.</li> <li><u>Organisational measures</u>: 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.</li> <li><u>Suitable material</u>: The recommended material for tanks, vessels and accessories is low carbon austenitic stainless steel.</li> </ul>

- Unsuitable materials: Do not use any metal, carbon steel or polypropylene
- Ventilation conditions in the working area: Use only outdoors or in a well-ventilated area (approximately 5 air changes per hour)
- Local exhaust ventilation: Use indoor local exhaust ventilation when vapour/mist/spray of nitric acid could be present in the air within the breathing zone of a worker.
- Storage conditions: Store in a well-ventilated place (preferably outside). In an area equipped with acid resistant flooring. Protect from sunlight. Keep containers tightly closed. Keep away from combustible materials, heat, hot surfaces, sparks, open flames and other ignition sources.
- Gas monitoring: Use stationary and/or portable NOx monitors in the working place, monitoring normal NOx levels at well below 2.6 mg/m<sup>3</sup>

#### 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

### 2.3 Exposure estimation and reference to its source

#### Risks for workers

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

#### 2.3.1 Conclusion on risk characterisation

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

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

#### 2.4.1 Environment

Exposure assessment and risk characterisation are not needed because Nitric Acid is not classified for environmental

hazard.

#### 2.4.2 Health

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. For scaling, see the MEASE tool, <http://www.ebrc.de/mease.html>.

*DNEL inhalation*: 2.6 mg/m<sup>3</sup> (workers); 1.3 mg/m<sup>3</sup> (general population)

### 3. ES 3: Use at industrial sites as intermediate

#### 3.1 Title Section

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

Environment	
1: Use of Nitric acid < 70% at industrial site as intermediate	ERC6a
Worker	
2: Use in closed process, no likelihood of exposure	PROC 1
3: Use in closed, continuous process with occasional controlled exposure (e.g. sampling)	PROC 2
4: Mixing or blending in batch processes; Closed systems	PROC 3
5: Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
6: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)	PROC 5
7: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities	PROC 8a
8: Transfer of substance or mixture (charging/discharging) at dedicated facilities	PROC 8b
9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC 9
10: Use as laboratory reagent Use as laboratory reagent	PROC 15

#### 3.2 Conditions of use affecting exposure

##### 3.2.1 Control of environmental exposure: *Use of Nitric acid < 70% at industrial site as intermediate (ERC 6a)*

Neutralisation is normally necessary before waste water is discharged into water treatment plants. Exposure assessment and risk characterisation are not conducted because Nitric Acid is not classified for environmental hazard.

##### 3.2.2 Control of worker exposure: All worker activities combined

Product (Article) characteristics
<ul style="list-style-type: none"> <li>Percentage (w/w) of substance in mixture/article: &lt; 70%</li> <li>Physical form of the used product: Liquid (aqueous solution)</li> </ul>
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> <li>Duration of activities in the working area: ≤ 8 hours/day (all worker activities combined)</li> <li>Amount used: Not relevant</li> </ul>
Technical and organisational conditions and measures
<ul style="list-style-type: none"> <li><b>Containment:</b> 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.</li> <li><b>Organisational measures:</b> 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.</li> <li><b>Suitable material:</b> The recommended material for tanks, vessels and accessories is low carbon austenitic stainless steel.</li> <li><b>Unsuitable materials:</b> Do not use any metal, carbon steel or polypropylene</li> </ul>

- 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 NO<sub>x</sub> monitors in the working place, monitoring normal NO<sub>x</sub> levels at well below 2.6 mg/m<sup>3</sup>

**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

3.3 Exposure estimation and reference to its source

**Risks for workers**

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

3.3.1 Conclusion on risk characterisation

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

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

3.4.1 Environment

Exposure assessment and risk characterisation are not needed because Nitric Acid is not classified for environmental hazard.

3.4.2 Health

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. For scaling, see the MEASE tool, <http://www.ebrc.de/mease.html>.

*DNEL inhalation*: 2.6 mg/m<sup>3</sup> (workers); 1.3 mg/m<sup>3</sup> (general population)

#### 4. ES 4: Use at industrial sites as reactive processing aid

##### 4.1 Title Section

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

Environment	
1: Use of Nitric acid < 70% at industrial site as reactive processing aid (Cleaning agent, pH regulator, waste gas treatment, ion exchange resins regeneration, metal treatment, plastic treatment, surface treatment product, water treatment)	ERC4
2: Use of Nitric acid < 70% at industrial site as reactive processing aid (Cleaning agent, pH regulator, waste gas treatment, ion exchange resins regeneration, metal treatment, plastic treatment, surface treatment product, water treatment)	ERC6a
Worker	
3: Use in closed process, no likelihood of exposure	PROC 1
4: Use in closed, continuous process with occasional controlled exposure (e.g. sampling)	PROC 2
5: Mixing or blending in batch processes; Closed systems	PROC 3
6: Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
7: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)	PROC 5
8: Industrial spraying	PROC 7
9: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities	PROC 8a
10: Transfer of substance or mixture (charging/discharging) at dedicated facilities	PROC 8b
11: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC 9
12: Roller application or brushing	PROC 10
13: Treatment of articles by dipping and pouring	PROC 13
14: Use as laboratory reagent Use as laboratory reagent	PROC 15

##### 4.2 Conditions of use affecting exposure

4.2.1 Control of environmental exposure: *Use of Nitric acid < 70% at industrial site as reactive processing aid (Cleaning agent, pH regulator, waste gas treatment, ion exchange resins regeneration, metal treatment, plastic treatment, surface treatment product, water treatment) (ERC 4; ERC 6b)*

Neutralisation is normally necessary before waste water is discharged into water treatment plants. Exposure assessment and risk characterisation are not conducted because Nitric Acid is not classified for environmental hazard.

4.2.2 Control of worker exposure: All worker activities combined

Product (Article) characteristics
<ul style="list-style-type: none"> <li>Percentage (w/w) of substance in mixture/article: &lt; 70%</li> <li>Physical form of the used product: Liquid (aqueous solution)</li> </ul>
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> <li>Duration of activities in the working area: ≤ 8 hours/day (all worker activities combined)</li> <li>Amount used: Not relevant</li> </ul>
Technical and organisational conditions and measures
<ul style="list-style-type: none"> <li><u>Containment</u>: Under standard operating conditions the substance is rigorously contained by</li> </ul>

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

- **Organisational measures:** Minimise the number of staff in the working area. Minimise manual activities. Train employees how to safely handle the substance, incl. how to use personal protection equipment. Regularly clean up the working area. Have supervision in place to regularly check that the conditions of use are followed by the workers. Ensure that all equipment is well maintained. Ascertain that personal protection equipment is available and used according to the instructions. Ensure that eyewash stations and safety showers are available in the working area.
- **Suitable material:** The recommended material for tanks, vessels and accessories is low carbon austenitic stainless steel.
- **Unsuitable materials:** Do not use any metal, carbon steel or polypropylene
- **Ventilation conditions in the working area:** Use only outdoors or in a well-ventilated area (approximately 5 air changes per hour)
- **Local exhaust ventilation:** Use indoor local exhaust ventilation when vapour/mist/spray of nitric acid could be present in the air within the breathing zone of a worker.
- **Storage conditions:** Store in a well-ventilated place (preferably outside). In an area equipped with acid resistant flooring. Protect from sunlight. Keep containers tightly closed. Keep away from combustible materials, heat, hot surfaces, sparks, open flames and other ignition sources.
- **Gas monitoring:** Use stationary and/or portable NOx monitors in the working place, monitoring normal NOx levels at well below 2.6 mg/m<sup>3</sup>

**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

4.3 Exposure estimation and reference to its source

**Risks for workers**

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



Route of exposure and type of effects	Risk quantification
Eye, local	Qualitative (see below)

#### 4.3.1 Conclusion on risk characterisation

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

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

##### 4.4.1 Environment

Exposure assessment and risk characterisation are not needed because Nitric Acid is not classified for environmental hazard.

##### 4.4.2 Health

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. For scaling, see the MEASE tool, <http://www.ebrc.de/mease.html>.

*DNEL inhalation:* 2.6 mg/m<sup>3</sup> (workers); 1.3 mg/m<sup>3</sup> (general population)

## 5. ES 5: Widespread use by professional workers

### 5.1 Title Section

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

Environment	
1: Use of Nitric acid < 70% at industrial site as reactive processing aid (Cleaning agent, pH regulator, waste gas treatment, ion exchange resins regeneration, metal treatment, plastic treatment, surface treatment product, water treatment)	ERC8b
2: Use of Nitric acid < 70% at industrial site as reactive processing aid (Cleaning agent, pH regulator, waste gas treatment, ion exchange resins regeneration, metal treatment, plastic treatment, surface treatment product, water treatment)	ERC8e
Worker	
3: Use in closed process, no likelihood of exposure	PROC 1
4: Use in closed, continuous process with occasional controlled exposure (e.g. sampling)	PROC 2
5: Mixing or blending in batch processes; Closed systems	PROC 3
6: Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact)	PROC 5
7: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities	PROC 8a
8: Transfer of substance or mixture (charging/discharging) at dedicated facilities	PROC 8b
9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC 9
10: Roller application or brushing	PROC 10
11: Non industrial spraying	PROC 11
12: Treatment of articles by dipping and pouring	PROC 13
13: Use as laboratory reagent Use as laboratory reagent	PROC 15
14: Production of preparations* or articles by tableting, compression, extrusion, pelletisation	PROC 19

### 5.2 Conditions of use affecting exposure

#### 5.2.1 Control of environmental exposure: *Use of Nitric acid < 70% by professional worker (outdoor and indoor of reactive substances in open systems as cleaning agent, pH regulator, metal treatment) (ERC 8b; ERC 8e)*

Neutralisation is normally necessary before waste water is discharged into water treatment plants. Exposure assessment and risk characterisation are not conducted because Nitric Acid is not classified for environmental hazard.

#### 5.2.2 Control of worker exposure: All worker activities combined

Product (Article) characteristics
<ul style="list-style-type: none"> <li>Percentage (w/w) of substance in mixture/article: &lt; 70%</li> <li>Physical form of the used product: Liquid (aqueous solution)</li> </ul>
Amount used (or contained in articles), frequency and duration of use/exposure
<ul style="list-style-type: none"> <li>Duration of activities in the working area: ≤ 8 hours/day (all worker activities combined)</li> <li>Amount used: Not relevant</li> </ul>
Technical and organisational conditions and measures
<ul style="list-style-type: none"> <li><u>Containment</u>: 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</li> </ul>

contained, a worker is not exposed to the substance as the use takes place in a fume hood or as the worker wears personal protective equipment and uses local exhaust ventilation. Formation of aerosols/mists/splashes is prevented.

- **Organisational measures:** Minimise the number of staff in the working area. Minimise manual activities. Train employees how to safely handle the substance, incl. how to use personal protection equipment. Regularly clean up the working area. Have supervision in place to regularly check that the conditions of use are followed by the workers. Ensure that all equipment is well maintained. Ascertain that personal protection equipment is available and used according to the instructions. Ensure that eyewash stations and safety showers are available in the working area.
- **Suitable material:** The recommended material for tanks, vessels and accessories is low carbon austenitic stainless steel.
- **Unsuitable materials:** Do not use any metal, carbon steel or polypropylene
- **Ventilation conditions in the working area:** Use only outdoors or in a well-ventilated area (approximately 5 air changes per hour)
- **Local exhaust ventilation:** Use indoor local exhaust ventilation when vapour/mist/spray of nitric acid could be present in the air within the breathing zone of a worker.
- **Storage conditions:** Store in a well-ventilated place (preferably outside). In an area equipped with acid resistant flooring. Protect from sunlight. Keep containers tightly closed. Keep away from combustible materials, heat, hot surfaces, sparks, open flames and other ignition sources.
- **Gas monitoring:** Use stationary and/or portable NOx monitors in the working place, monitoring normal NOx levels at well below 2.6 mg/m<sup>3</sup>

**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

5.3 Exposure estimation and reference to its source

**Risks for workers**

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

#### 5.3.1 Conclusion on risk characterisation

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

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

##### 5.4.1 Environment

Exposure assessment and risk characterisation are not needed because Nitric Acid is not classified for environmental hazard.

##### 5.4.2 Health

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. For scaling, see the MEASE tool, <http://www.ebrc.de/mease.html>.

*DNEL inhalation:* 2.6 mg/m<sup>3</sup> (workers); 1.3 mg/m<sup>3</sup> (general population)