NITRIC ACID 53%

REVISION DATE: 09/20/2022

1. - PRODUCT AND COMPANY IDENTIFICATION

Product name: NITRIC ACID 53%
Internal Code of product identification: 105.01.0
Company name: USIQUÍMICA DO BRASIL LTDA.
Address: Rua da Lagoa, 431 - Cumbica - Guarulhos - SP.
Company Phone: (11) 2481-3355 - PBX system.
Emergency phone: SUATRANS - COTEC - Environmental Emergency.
DDG (0800) 0111-767 - (0800) 7071-767 - 24 HOURS.
193 – Firefighters.

Main recommended uses for the substance: Metallurgy, paint stripper, surface treatment, laboratory reagents, rubbers, explosives, organic syntheses, photoengraving, electroplating, among others.

2. - HAZARD IDENTIFICATION

Classification of the substance or mixture (according to ABNT NBR 14.725-2):
Oxidizing and toxic - Category 1
Corrosion to metals - Category 1
Acute Toxicity - Oral - Category 4
Acute toxicity - skin - Category 4
Acute Toxicity - Inhalation - Category 4
Corrosive/ irritating to skin- Category 1C
Respiratory sensitizers - Category 1
Serious eye damage/eye irritation - Category 1
Skin Sensitization - Category 1
Aspiration hazard- Category 2
Hazard to the aquatic environment- Category 3
Chronic aquatic toxicity- Category 4

Appropriate elements of labeling:

LABEL ELEMENTS	DATA
Product identification and supplier emergency telephone number.	Technical name: Nitric acid 53% (HNO3) Technical name: Nitric acid 53% (36°Be) Emergency phone: SUATRANS - COTEC - Environmental Emergency. DDG (0800) 0111-767 - (0800) 7071-767 - 24 HOURS.
Chemical composition	HNO_3 minimum 53%
Hazard pictograms	
Warning words	**DANGER**
Danger phrases	Causes severe skin burns and serious eye damage. It can be fatal if swallowed and if it enters the airways. Toxic if ingested. May cause fire or explosion, powerful oxidizer. Harmful to aquatic life.
Caution Phrases	When handling, use respiratory protection with filter against acid gases and protection against accidental contact (pvc gloves and apron, face shield or pvc hood). Do not use in a place without adequate ventilation. Administer oxygen if breathing is difficult, or artificial respiration. Seek medical attention.

	In case of a spill, provide adequate ventilation to remove vapors. In case of skin contact, quickly remove contaminated clothing and shoes and wash the contaminated parts with plenty of water for at least 15 minutes. Quickly seek medical attention. In case of contact with eyes, immediately wash them with plenty of water, lifting the eyelids, do not rub the eyes. Quickly seek medical attention. Incompatible materials: Strong bases, metallic powders, carbide, hydrogen sulfide, turpentine and organic fuels. Store and handle in a ventilated environment, avoiding the concentration of vapors. This chemical, under certain conditions, when infiltrating the soil, contaminates the water table.
Other information	The Material Safety Data Sheet (MSDS) for this dangerous chemical product can be requested by calling (11) 3821-7000, or by e-mail: laboratorio@usiquimica.com.br

Other hazards which do not result in classification: No other hazards occur.

3. - COMPOSITION AND INFORMATION ON THE INGREDIENTS

Substance: NITRIC ACID 53%.
Common chemical name or generic name: NITRIC ACID.
Synonym: NITRIC ACID.
Chemical Abstract Service (CAS No): 7697-37-2
Chemical composition of the substance: Minimum 53% nitric acid.
There are no impurities that contribute to the danger.

4. - FIRST AID MEASURES

Inhalation: Remove casualty to uncontaminated, ventilated area and administer oxygen, if available. Apply resuscitation maneuvers in case of cardiorespiratory arrest. Quickly seek medical attention.
Skin contact: Quickly remove contaminated clothing and shoes and wash the affected parts with plenty of running water for at least 15 minutes. Don't scrub the spot. Quickly seek medical attention.
Eye contact: Immediate service is essential. The first 10 seconds are critical to avoiding blindness. Washing eyes with running water for 15 minutes, lifting eyelids to allow maximum removal of product. After these cares, refer immediately to the ophthalmologist.
Ingestion: Never give anything by mouth to unconscious or convulsive people. The conscious injured person can drink water or milk. Due to the strong corrosive power of nitric acid, vomiting is contraindicated. If vomiting occurs spontaneously, the victim should be laid on their side to prevent pulmonary aspiration. Quickly seek medical attention.
Actions to be avoided: Do not induce vomiting. Do not administer liquids to torporous, unconscious or convulsive patients.
Brief description of the main symptoms and effects: Nitric acid is very corrosive to the skin, eyes, digestive tract and respiratory tract.
Protection of the first aid provider: Use the indicated personal protection equipment. Access to people in contaminated areas should only be allowed if they are wearing specific clothing and adequate respiratory protection, with filters for acidic gases (or combined), self-contained mask or with air intake.
Notes to the physician: In the inhalation of vapors containing nitrogen oxide, pulmonary edema may occur later, which requires prolonged medical observation in a hospital environment. Aspiration can occur during ingestion and/or vomiting, it is life-threatening. Gastric lavages should be performed by an experienced professional, considering the risk of gastrointestinal perforation and the induction of vomiting by passing the nasogastric tube and introducing liquid for its performance. Assess kidney function.

5. - FIREFIGHTING MEASURES

Suitable extinguishing measures: The product is not combustible. When involved in fire, use appropriate extinguishing media to fight it, depending on the fuel involved in the fire.
Inappropriate extinguishing measures: The product is not combustible. When involved in fire, do not use inappropriate means of extinguishing, depending on the fuel involved in the fire.
Specific hazards: Nitric acid is not combustible, but an oxidizer, which can cause fire when in contact with other fuels or organic materials. It reacts with most metals to release hydrogen gas, which can form explosive mixtures with air.
Special Methods: Avoid the to application of excess water, as there may be contamination of water courses.
Fire fighter Protection: Use personal protective equipment, especially respiratory protection. In case of fire there is the possibility of decomposition with the release of irritating toxic gases. Wear self-contained or blown air mask, and acid-resistant PVC clothing.

6. - CONTROL MEASURES FOR SPILLING OR LEAKING

Personal precautions:
Removal of ignition sources: Nitric acid is not combustible. As it is oxidizing, avoid contact with other fuels or organic materials.
Prevention of inhalation and contact with skin, mucous membranes and eyes: Use personal protective equipment appropriate. Access by people to contaminated areas should only be allowed if they are wearing specific clothing and adequate respiratory protection, with filters for acidic gases (or combined) or self-contained or air-induction masks.
Precautions to the environment: It can contaminate watercourses, making them unfit for any purpose. High concentrations in the air endanger human and animal life. Storage sites must have containment dikes. Isolate and evacuate area in case of leakage and/or spillage. Try to block the leak, contain the spilled liquid or transfer the product. Keep the wind blowing your back during emergency care. Access by people to contaminated areas should only be allowed if they are wearing specific clothing and adequate respiratory protection, with filters for acidic gases (or combined) or self-contained or air-induction masks.
Cleaning methods: Use personal protective equipment and isolate the area. Remove all organics and fuel and provide adequate ventilation for gas dispersion
Recovery: Try to contain the spilled product with a sand dam or earth. If possible, transfer the product. Never use organic material to contain spillage.
Neutralization: Heat release results.
Disposal: Try to reuse the product, if possible, or neutralize the residue before taking it to the proper final disposal.
Prevention of secondary hazards: Review directions contained in the previous fields.

7. - HANDLING AND STORAGE

Handling
Technical measures Prevent physical damage to tanks, piping and valves. Isolate them from incompatible substances.
Prevention of worker's exposure: Submit the entire system to periodic maintenance control. Keep staff permanently trained.
Prevention of fire and explosion: Nitric acid is non-combustible but can cause fire when in contact with other fuels or organic materials. It reacts with most metals to release hydrogen gas, which can form explosive mixtures with air.
Precautions for safe handling: To reduce the possibility of a health risk, ensure sufficient ventilation or the existence of exhaust in the room to control the ambient concentration at low levels. Always use personal protective equipment: specific clothing and adequate respiratory protection, with filters for acidic gases (or combined) or self-contained or air-induction masks.
Orientation for safe handling: Avoid contact with incompatible materials and environmental contaminations as mentioned in the previous fields. Avoid exposing the product to heat and incompatible materials. Its reactions with compounds such as alcohols, amines, ammonia, aldehydes, hydrazine's, acetic anhydride, ketones, flammable substances, alkali metals, sulfuric acid, hydrocarbons, can be exothermic and explosive.

Storage
Appropriate technical measures:
Storage conditions: Follow the equipment manufacturer's guidance.

Appropriate: Always use specified material compatible with 53% nitric acid.
Trucks and Storage Tanks:
Sheets: stainless steel ASTM A-240 TP 304 L.
Flanges: stainless steel ASTM A-182 F 304 L.
Tubes: stainless steel ASTM A-312 TP 304 L.
Connections: stainless steel ASTM A-403 WP 304 L.
Valves: Stainless steel ASTM A-351CF3.
Screw: Stainless steel ASTM A 193 gr B8.
Nut: ASTM stainless steel A 194 gr B8.
To avoid: Avoid light and heat, avoid contact with organic or incompatible material. See previous information.
Risk signaling: Signposts indicating **CORROSIVE**.
Incompatible product and materials: See previous information.
Safe materials for packaging:
Recommendations: Always use specified material compatible with 53% nitric acid (example: stainless steel, Teflon).
Unsuitable: Do not use packaging made with material incompatible with 53% nitric acid (example: organic material or wood). For this concentration, aluminum is also not a recommended material for packaging.

8. - EXPOSURE CONTROLS AND PERSONAL PROTECTION

Measures of engineering control: Provide mechanical ventilation and direct exhaust system to the outside environment. These measures help to reduce exposure to the product. It is recommended to make emergency showers and eye washes available in the work area. Engineering control measures are most effective in reducing product exposure.
Parameters of specific control:
Occupational exposure limits:
TLV-TWA - 2 ppm (~ 5mg/m3) (ACGIH).
TLV-STEL-4 ppm (~10mg/m3) (ACGIH).
Brazilian: not defined by NR-15 of Ordinance 3214/78 of the Ministry of Labor and Employment
Biological indicators: See table I of NR 7 of Ordinance 3214/78 of the Ministry of Labor and Employment (www.mte.gov.br)
Recommended monitoring procedures : Subject exposed individuals to periodic tests of respiratory function; periodic medical examination should emphasize the possibility of bronchial hyperreactivity occurring in long-term exposures.
Personal Protective Equipment:
Respiratory protection: Wear respiratory protection if the concentration in the environment is above the action limit or half the tolerance limit. Panorama mask with filter against acid gases or multipurpose (combined) as long as recommended according to the concentration determined in the environment. For large leaks and/or spills, use a self-contained mask (or air intake). **Attention:** masks with mechanical filters do not protect workers exposed to oxygen deficient atmosphere.
Hand protection: Wear acid resistant gloves.
Eye protection: Wear chemical safety glasses and/or face shield.
Protection of the skin and body: Wear acid resistant PVC clothing.
Hygiene measures: Keep workplaces within hygiene standards. Never eat, drink or smoke in the work area. Practice good personal hygiene especially before eating, drinking and smoking. Separate contaminated tools and clothing, ensuring that they are effectively washed before reuse.

9. - PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Liquid.
Color: Colorless.
Odor: Characteristic asphyxiating odor.
pH: < 1 - Strongly acidic.
Specific temperatures:
Boiling point: 117 °C.
Boiling temperature range: Not applicable.
Distillation range : Not applicable.

Melting point: Not determined.
Decomposition temperature: Not determined.
Flash point: Not applicable.
Auto-ignition temperature: Not applicable.
Upper/lower explosive limits: Not applicable.
Vapor pressure: 6.7 - 7.9 mm Hg to 20 °C (55% - 50% HNO3).
Vapor Density: Not determined.
Density: 1.33 g/cm3 at 20 °C
Solubility: Soluble in water (heat release).
Partition coefficient octanol / water: Not determined.
Evaporation rate: Not determined.
Further information: In addition to the fact that the product is corrosive, its oxidizing effect must not be forgotten.

10. -STABILITY AND REACTIVITY

Specific conditions:
Instability: Nitric acid breaks down in air, in contact with light and organic substances. Dangerous reactions: Its reactions with compounds such as alcohols, amines, aldehydes, hydrazine's, acetic anhydride, ketones, flammable substances, alkali metals, sulfuric acid, hydrocarbons, can be exothermic and explosive. Nitric acid can react violently with organic fuels and strong bases, oxidize materials such as wood and particulate metals. It is corrosive to papers and clothing, reacts with water releasing heat and toxic fumes.
Conditions to avoid: Avoid contact with combustible and organic materials as it can cause fire. In contact with some metals it can release hydrogen.
Materials or incompatible substances: May react violently with organic fuels and strong bases, oxidize materials such as wood and particulate metals. It is corrosive to papers and clothing, reacts with water releasing heat and toxic fumes.
Need to add additives and inhibitors: Not applicable.
Hazardous decomposition products Under the action of fire, it can decompose, releasing toxic nitrous gases (NOx).

11. -TOXICOLOGICAL INFORMATION

Information according to the different routes of exposure:
Acute toxicity: The inhalation of nitric acid vapors initially produces irritation of the upper airways, causing sneezing, coughing, chest pain, respiratory distress, salivation and dizziness, which may progress to pulmonary edema and death.
Local effects: Nitric acid is very corrosive to the skin, eyes, digestive tract and respiratory tract.
Sensitization: Avoid contact with product. Always use personal protective equipment.
Inhalation: Inhalation of nitric acid vapors produces irritation of the upper airways, causing sneezing, coughing, chest pain, difficulty breathing, salivation and dizziness, which may progress to pulmonary edema and death.
Eye contact: Eye contact causes yellowish discoloration and severe burns, which can lead to loss of vision.
Skin contact: In contact with the skin, it can cause from moderate irritation to serious injuries, depending on the concentration and time of action.
Ingestion: When swallowed, yellowish scabs appear on the lips, tongue and roof of the mouth. Digestive tube necrosis, with gastric perforation, may progress to asphyxia due to glottic edema, convulsions and coma.
Burns: Burning the skin produces yellow-brown, painful patches that may be accompanied by blistering or necrotic lesions that progressively deepen.
Chronic toxicity: Repeated exposure to concentrations above the tolerance limits for occupational exposure may determine respiratory functional disorders.
Toxicologically synergistic effects: Smoking, in the development of chronic bronchitis.
Specific effects: It has no carcinogenic effect, according to the International Agency for Research on Cancer - IARC. Nitric acid is toxic and very corrosive to the skin, eyes, digestive tract and respiratory tract. Nitric acid fumes and vapors can form a mixture of nitrogen oxides when reacting with metallic materials or organic compounds. Nitrogen oxides resulting from these chemical reactions, particularly nitrogen dioxide (NO2), when aspirated in higher concentrations, cause breathing difficulties, pneumonitis, acute lung edema, loss of consciousness, and can lead to death.

Lethal Dose: IDLH: 25 ppm.

12. - ECOLOGICAL INFORMATION

- Environmental effects, behaviors and impacts of the product:
Mobility: The product is an energetic oxidizer.
Persistence/ degradability: The released product tends to form NOx.
Bioaccumulation: It contaminates the soil, requiring a neutralization and restoration work.
Expected behavior: Rapid dissipation of the gas cloud.
Environmental impact: Due to the corrosive nature of nitric acid, animals exposed to this product may suffer tissue damage and death, depending on the environmental concentration. Plants contaminated with the product may be adversely affected or destroyed.
Ecotoxicity: Nitric acid is water soluble and even at low concentrations it is harmful to aquatic life. Harmful effect due to pH change.

13. - CONSIDERATIONS ON FINAL DISPOSAL

Recommended methods for final disposal:
The treatment and disposal of product residues must be done in a suitable environment, by people trained in the use of special equipment and the recommended PPE's to avoid contact with the product, its vapors or mists. Leaks must be contained and collected for later disposal after neutralization.
Product:
Ensure all Federal, State and local agencies receive proper notice of spills and disposal methods. CONAMA Resolution 005/1993, Law No. 12,305, as of August 2, 2010 (National Solid Waste Policy). Neutralize slowly and carefully with lime if possible.
Product waste:
Consult environmental regulatory agencies for advice on acceptable regulatory practices. Come in contact with relevant local authorities. It can be incinerated when in compliance with local regulations. Or dispose of in an approved chemical waste landfill.
Used Package:
Empty containers must be drained and covered before handling and transport operations. If the package is not properly washed and decontaminated, it is considered to contain the product.

14. - TRANSPORT INFORMATION

National and International Regulations
Land:
Resolution No. 5947/2021 of the Brazilian National Land Transport Agency (ANTT), Approves the Complementary Instructions to the Regulation of Land Transport of Dangerous Goods and its amendments.
UN number: 2031.
Appropriate name for shipment: NITRIC ACID, except smoldering red, with more than 70% nitric acid.
Risk class: 8 (corrosive).
Risk number: 80.
Packing group: II

Waterway:
DPC – Directorate of Ports and Coasts (Transport in Brazilian waters) Maritime Authority Regulations (NORMAM) NORMAM 01/DPC: Vessels Used in Open-seas Navigation
UN number: 2031.
Appropriate name for shipment: NITRIC ACID, except smoldering red, with more than 70% nitric acid.
Risk class: 8 (corrosive).
Risk number: 80.
Packing group: II

- Air Transport:
ANAC - National Civil Aviation Agency - Resolution No. 129 as of January 8, 2009
RBAC N°175 - (BRAZILIAN CIVIL AVIATION REGULATION) - TRANSPORTATION OF DANGEROUS ITEMS IN CIVIL AIRCRAFT

IS No. 175-001 - SUPPLEMENTARY INSTRUCTION - IS
ICAO - "International Civil Aviation Organization" - Doc 9284-NA/905 IATA - "International Air Transport Association"
Dangerous Goods Regulation (DGR)
UN number: 2031.
Appropriate name for shipment: NITRIC ACID, except smoldering red, with more than 70% nitric acid.
Risk class: 8 (corrosive).
Risk number: 80.
Packing group: II

15. - REGULATORY INFORMATION

Specific regulations for the chemical product:
Federal Decree No. 2,657, as of July 3, 1998;
Standard ABNT-NBR 14725:2014;
Ordinance No. 229, as of May 24, 2011 – Changes Regulatory Standard No. 26.

16. - OTHER INFORMATION

The information on this sheet corresponds to the current state of our knowledge and experience of the product and is not exhaustive. It applies to the product under the conditions specified, unless otherwise stated. In case of combinations or mixtures, make sure that no new danger can appear. This information does not, in any case, exempt the user of the product from complying with all legislative, regulatory and administrative texts relating to the product, safety, hygiene and protection of human and environmental health.
Bibliographical References:

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