1. Identification

Product Identifier: AQUA REGIA, DILUTE; MIXED ACID CONTAINING NITRIC ACID, HYDROCHLORIC ACID, AND WATER
Synonyms: None
Recommended Use of the Chemical and Restrictions On Use: Industrial Reagent
Manufacturer / Supplier: Puritan Products; 2290 Avenue A, Bethlehem, PA 18017 Phone: 610-866-4225
Emergency Phone Number: 24-Hour Chemtrec Emergency Telephone 800-424-9300

2. Hazard(s) Identification

Classification of the Substance or Mixture:
Acute toxicity - Gases (Category 4)
Oxidizing liquids (Category 3)
Serious eye damage (Category 1)
Skin corrosion / irritation (Category 1)
Serious eye damage / Eye irritation (Category 1)
Specific target organ systemic toxicity (single exposure) (Category 3)

Risk Phrases:
Symbol: O, C
R8: Contact with combustible material may cause fire.
R34: Causes burns.
R35: Causes severe burns.
R37: Irritating to respiratory system.

Label Elements:

Trade Name: AQUA REGIA, DILUTE
Signal Word: Danger
Hazard Statements:
H272: May intensify fire; oxidizer.
H314: Causes severe skin burns and eye damage.
H335+336: May cause respiratory irritation. May cause drowsiness or dizziness.

Precautionary Statements:
P220: Keep / Store away from clothing / combustible materials.
P261: Avoid breathing dust / fume / gas / mist / vapors / spray.
P280: Wear protective gloves / protective clothing / eye protection / face protection.
P305+351+338: 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.

3. Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS Number</th>
<th>EC Number</th>
<th>Percent</th>
<th>Hazardous</th>
<th>Chemical Characterization</th>
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<tr>
<td>Nitric Acid</td>
<td>7697-37-2</td>
<td>231-714-2</td>
<td>1 - 25%</td>
<td>Yes</td>
<td>Substance</td>
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<tr>
<td>Hydrochloric Acid</td>
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<td>231-595-7</td>
<td>1 - 25%</td>
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<td>Substance</td>
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<td>Water</td>
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<td>231-791-2</td>
<td>50 - 98%</td>
<td>No</td>
<td>Mixture</td>
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</table>

4. First-aid Measures

Immediate first aid treatment reduces the health effects of this substance. In all cases, immediately call a POISON CENTER or doctor / physician.

**Inhalation:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give Oxygen. Call a physician.

**Ingestion:** DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**Skin Contact:** In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Get medical attention immediately.

**Eye Contact:** Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire-fighting Measures

**Fire:** Not combustible, but concentrating the mixture may form a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Can react with metals to release flammable Hydrogen gas.

**Explosion:** Upon concentrating, may react explosively with combustible organic or readily oxidizable materials such as: alcohols, turpentine, charcoal, organic refuse, metal powder, Hydrogen Sulfide, etc. Reacts with most metals to release Hydrogen gas which can form explosive mixtures with air.

**Fire Extinguishing Media:** Water spray may be used to keep fire exposed containers cool. Do not get water inside container.

**Special Information:** If mixture is concentrated, may increase the flammability of combustible, organic and readily oxidizable materials. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.
6. Accidental Release Measures

**Personal Precautions, Protective Equipment and Emergency Procedures:** Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering.

**Environmental Precautions and Methods and Materials for Containment and Cleaning Up:** Contain and recover liquid when possible. Do not let product enter drains. Neutralize with alkaline material (soda ash, lime,) then absorb with an inert material (e. g., vermiculite, dry sand, earth,) and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

**Precautions for Safe Handling and Conditions for Safe Storage, Including Any Incompatibilities:** Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid.) Observe all warnings and precautions listed for the product.

8. Exposure Controls / Personal Protection

**Airborne Exposure Limits:**

For Nitric Acid:
- OSHA Permissible Exposure Limit (PEL): 2 ppm (TWA), 4 ppm (STEL)
- ACGIH Threshold Limit Value (TLV): 2 ppm (TWA); 4 ppm (STEL)

For Hydrochloric Acid:
- OSHA Permissible Exposure Limit (PEL): 5 ppm (Ceiling)
- ACGIH Threshold Limit Value (TLV): 2 ppm (Ceiling), A4 Not classifiable as a human carcinogen

**Ventilation System:** A system of local and / or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

**Personal Respirators (NIOSH Approved):** If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full face piece respirator, air-lined hood, or full face piece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). Nitric Acid is an oxidizer and should not come in contact with cartridges and canisters that contain oxidizable materials, such as activated charcoal. Canister-type respirators using sorbents are ineffective.

**Skin Protection:** Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

**Eye Protection:** Use chemical safety goggles and / or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

**Appearance:** Clear, colorless solution

**Odor:** Pungent odor

**Odor Threshold:** Not determined

**pH:** < 1

**% Volatiles by volume @ 21C (70F):** 100 (as water and acid)

**Melting Point:** No information found

**Boiling Point / Boiling Range:** No information found

**Flash Point:** Not applicable

**Evaporation Rate (BuAC=1):** No information found
Flammability: Not applicable
Upper / Lower Flammability or Explosive Limits: Not applicable
Vapor Pressure (mm Hg): No information found
Vapor Density (Air=1): No information found
Relative Density: No information found
Solubility: Infinitely soluble
Partition Coefficient: n-octanol / water: No data available
Auto-ignition Temperature: No data available
Decomposition Temperature: No data available
Viscosity: No information found

10. Stability and Reactivity

Reactivity and / or Chemical Stability: Stable under ordinary conditions of use and storage. Containers may burst when heated.

Possibility of Hazardous Reactions and Conditions to Avoid: Light, heat and incompatibles.

Incompatible Materials: If mixture is concentrated may become a dangerous oxidizing agent, solutions containing Nitric Acid are incompatible with most substances, especially strong bases, metallic powders, carbides, Hydrogen Sulfide, turpentine, and combustible organics.

Hazardous Decomposition Products: If mixture is concentrated may become a dangerous oxidizing agent, solutions containing Nitric Acid are incompatible with most substances, especially strong bases, metallic powders, carbides, Hydrogen Sulfide, turpentine, and combustible organics.

11. Toxicological Information

Emergency Overview: POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.

Potential Health Effects:

Nitric Acid is extremely hazardous; it is corrosive, reactive, an oxidizer, and a poison. Hydrochloric Acid is a corrosive.

Inhalation: Corrosive! Inhalation of vapors can cause breathing difficulties and lead to pneumonia and pulmonary edema, which may be fatal. Other symptoms may include coughing, choking, and irritation of the nose, throat, and respiratory tract.

Ingestion: Corrosive! Swallowing Nitric Acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract.

Skin Contact: Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and stain skin a yellow or yellow-brown color.

Eye Contact: Corrosive! Vapors are irritating and may cause severe damage to the eyes. Contact may cause severe burns and permanent eye damage.

Chronic Exposure: Long-term exposure to concentrated vapors may cause erosion of teeth and lung damage. Long-term exposures seldom occur due to the corrosive properties of the acid.

Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders, eye disease, or cardiopulmonary diseases may be more susceptible to the effects of this substance.

Specific Target Organ Toxicity - Single Exposure (Globally Harmonized System:) The substance or mixture is classified as specific target organ toxicant, single exposure, Category 3 with respiratory tract irritation.

Specific Target Organ Toxicity - Repeated Exposure (Globally Harmonized System:) No data available.
Numerical Measures of Toxicity: Cancer Lists: NTP Carcinogen

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<tr>
<td>Hydrogen Chloride (7647-01-0)</td>
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<td>Water (7732-18-5)</td>
<td>No</td>
<td>No</td>
<td>None</td>
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Acute Toxicity:
For Nitric Acid:  
Oral (human) LDLo: 430 mg/kg; Inhalation,(rat) LC50: 67 ppm (NO2)/4H; Investigated as a mutagen, reproductive effector.
For Hydrochloric Acid:  
Inhalation (rat) LC50: 3124 ppm/1H; Oral rabbit LD50: 900 mg/kg; Investigated as a Tumorigen, mutagen, reproductive effector.

12. Ecological Information

Ecotoxicity: This material may be toxic to aquatic life.  
LC50 Shrimp: 100-300 ppm / 48 h / salt water; LC100 trout: 10 mg/l / 24 h; TLm mosquito fish: 282 ppm / 96 h

Persistence and Degradability: When released into the soil, this material is not expected to biodegrade and may leach into groundwater.

Bioaccumulative Potential: No further relevant information available.

Mobility in Soil: No data available.

Other adverse effects: US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

UN Number: UN3264
UN Proper Shipping Name: Corrosive Liquid, Acidic, Inorganic, n.o.s. (Nitric Acid and Hydrochloric Acid)
Packing Group: II

DOT IMDG IATA

Land Transport ADR/RID and GGVS/GGVE (Cross Border / Domestic)
Transport Hazard Class(es): 8

Maritime Transport IMDG/GGVSea
Transport Hazard Class(es): 8
Marine Pollutant: No

Air Transport ICAO-TI and IATA-DGR
Transport Hazard Class(es): 8

AQUA REGIA, DILUTE
Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code

Special Precautions for User: No additional information

15. Regulatory Information

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Chemical Inventory Status – Part 2

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Federal, State & International Regulations - Part 1

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Federal, State & International Regulations - Part 2

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</table>

Chemical Weapons Convention: No
SARA 311/312: Acute: Yes  Chronic: Yes  Fire: No  Pressure: No
Reactivity: No  Mixture / Liquid

16. Other Information

Effective Date: 04/01/15 – Changed GHS02 symbol GHS03
Replaces Revision: 01/01/13 – GHS Compliant, 04/26/12 – Initial Release

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