

This product is classified as Hazardous according to the criteria of Worksafe Australia

1. Identification

Product Name(s) Silver Testing Solutions

Product Code{s} TS-Ag

Recommended Use(s) Silver Testing

Digital Sciences
ABN 86 773 289 785

Manufacturer c/o Seaguard Chemicals Pty. Ltd.
6 / 130-132 Bayfield Rd. East,
Bayswater North, Victoria, Australia 3153
Mob: +61 419 500 1775

Business Hours: 8.30 am – 5.00pm, Monday to Friday

Emergency Contacts
8.30 am – 5.00pm Digital Sciences
Monday to Friday Mobile/Cell: +61 419 500 1775

Australia wide, 24 hours; 13 11 26, Poison Information

2. Hazards Identification

Classification of the Substance or Mixture:

Respiratory sensitization (Category 1)
Acute toxicity - Gases (Category 4)
Oxidizing liquids (Category 3)
Serious eye damage (Category 1)
Serious eye damage / Eye irritation (Category 1)
Skin corrosion / irritation (Category 1)
Skin sensitization (Category 1)
Specific target organ systemic toxicity (single exposure) (Category 3)
Germ cell mutagenicity (Category 1B)
Carcinogenicity (Category 1B)
Reproductive toxicity (Category 1B)
Acute aquatic toxicity (Category 3)
Chronic aquatic toxicity {Category 3}

Risk Phrases:

Symbol: O, C, T
R8: Contact with combustible material may cause fire.
R22: Harmful if swallowed
R23: Toxic by inhalation
R23|24|25: Toxic by inhalation, in contact with skin and if swallowed
R34: Causes burns.
R35: Causes severe burns.
R37: Irritating to respiratory system
R45: May cause cancer

R46: May cause heritable genetic damage
 R41: Risk of serious damage to eyes
 R42/43: May cause sensitisation by inhalation and skin contact.

Label Elements:

Trade Name: Gold Test Solution: 8K to 22K strength
 Signal Word: Danger



Hazard Statements:

H272: May intensify fire; oxidizer.
 H301: Toxic if swallowed
 H312: Harmful in contact with skin
 H314: Causes severe skin burns and eye damage.
 H317: May cause an allergic skin reaction
 H330: Fatal if inhaled
 H335+336: May cause respiratory irritation. May cause drowsiness or dizziness.
 H334: May cause an allergy or asthma symptoms or breathing difficulties if inhaled
 H340: May cause genetic defects
 H350: May cause cancer
 H360: May damage fertility or the unborn child
 H372: Causes damage to organs through prolonged or repeated exposure
 H400: Toxic to aquatic life
 H410: Very toxic to aquatic life with long-lasting effects

Precautionary Statements:

P201: Obtain special instructions before use.
 P202: Do not handle until all safety precautions have been read and understood.
 P220: Keep / Store away from clothing / combustible materials.
 P261: Avoid breathing dust / fume / gas / mist / vapours / spray.
 P272: Contaminated work clothing should not be allowed out of the workplace.
 P280: Wear protective gloves / protective clothing / eye protection / face protection.
 P284: Wear respiratory protection
 P302+P352: IF ON SKIN: Wash with plenty of soap and water.
 P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 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.
 P308+P313: IF exposed or concerned: Get medical advice/attention.
 P333+P313: If skin irritation or rash occurs: Get medical advice/attention.

3. Composition / Information on Ingredients

CAS Number: Not applicable to mixtures
 EC Number: Not applicable to mixtures
 Molecular Weight: Not applicable to mixtures

Ingredient	CAS Number	EC Number	Composition %	Hazardous	Chemical Characterisation
Nitric Acid	7697-37-2	231-595-7	20 - 50	Yes	Substance
Potassium Dichromate	7778-50-9	231-906-6	< 5	Yes	Substance
Water	7732-18-5	231-791-2	To 100	No	Mixture

4. First-Aid Measures

GENERAL INFORMATION

Immediate first aid treatment reduces the health effects of this substance. In all cases, immediately call a POISON CENTER or doctor / physician. **Caution:** Always consider any dangers within the vicinity of rendering aid. First aid personnel must be aware of own risk and protect themselves with all necessary personal protective equipment during the assistance of casualties.

Place unconscious person on the side in the recovery position and ensure breathing can take place. Never give anything by mouth to an unconscious person. If medical assistance is needed take as much detail as possible about the incident and hazardous materials involved with the casualty

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

In case of breathing is difficulty, qualified, trained personnel may administer oxygen. If patient needs resuscitation avoid mouth to mouth contact. **Warning:** It may be hazardous to the person providing artificial respiration when the inhaled material is toxic, infectious, or corrosive. A mechanical device e.g., a bag and mask can be used to provide artificial respiration.

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. Wash any contaminated clothing and/or shoes before reuse.

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

Acute: Symptoms/effects after inhalation may cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.

Chronic: Long-term exposure to concentrated vapours may cause erosion of teeth and lung damage. Long-term exposures seldom occur due to the corrosive properties of the acid. May cause genetic defects. May cause cancer. May damage fertility or the unborn child.

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

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. Use fire-extinguishing media appropriate for surrounding materials. 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 case of fire, toxic and corrosive gases including oxides of nitrogen and chromium can be formed. 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.

Specific Hazards: 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! Avoid unauthorised discharge to the environment. Large spillages or uncontrolled discharge to water systems must be alerted to the Environmental Protection Agency or other regulatory body. If spillages to land cannot be treated safely or if contamination will occur the Environment Agency must be alerted immediately. If the mixture has entered a foul drain or sewage system in significant amounts to cause a hazard, then the local water treatment company must be informed.

Large Spillages: Dam and absorb spillages with sand, earth or other inert, non-combustible material. Collect spillage in containers, seal securely and deliver for disposal according to local regulations. Flush area clean with lots of water. Be aware of potential for surfaces to become slippery. Containers with collected spillage must be properly labelled with correct contents and hazard symbol. Wash thoroughly after dealing with a spillage.

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 (vapours, 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 Potassium Dichromate:

ACGIH ACGIH TWA (mg/m³) 0.05 mg/m³ as Cr

OSHA OSHA PEL (TWA) (mg/m³) 0.005 mg/m³ as Cr(VI)

IDLH US IDLH (mg/m³) 15 mg/m³ as Cr(VI)

NIOSH NIOSH REL (TWA) (mg/m³) 0.001 mg/m³ as Cr

Personal protective equipment: Gas mask. Gloves. Safety glasses.



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: Orange to amber coloured solution

Odour: Pungent odour, acrid, corrosive

Odour Threshold: Not determined

pH: < 1

% Volatiles by volume @ 21C (70F): > 95 (as water and acid)

Melting Point: No information found

Boiling Point I 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. Contains hexavalent chromium.

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. Potassium Dichromate is an oxidiser, toxic and carcinogenic.

Inhalation: Corrosive! Inhalation of vapours can cause breathing difficulties and lead to pneumonia and pulmonary oedema, 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, oesophagus and gastrointestinal tract. Potassium dichromate is toxic by ingestion.

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

Eye Contact: Corrosive! Vapours 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 vapours 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

Ingredient	Known	Anticipated	IARC Category
Nitric Acid (7697-37-2)	No	No	None
Potassium Dichromate (7778-50-9)	Yes	Yes	1
Water (7732-18-5)	No	No	None

Component	Toxicity				
	LC50	Inhaled	Rat	217 ppm	4 Hr.
Nitric Acid	LC50	Inhaled	Rat	67 ppm (NO2)	4 Hr.
	LDLo	Oral	Human	430 mg/Kg	
Potassium Dichromate	LD50	Oral	Rat	25 mg/Kg	
	1D5	Oral	Rat	130 mg/Kg	
	LC50	Skin	Rabbit	14 mg/Kg	
	1D50	Dermal	Rabbit	1150 mg/Kg	
	1C50	Inhalation	Rat	0.09 mg/L	4 Hr.
	LDL	Oral	Man	143 Mg/Kg	
	LDL	Oral	Child	26 Mg/Kg	

Acute Toxicity:

Nitric Acid: Investigated as a mutagen, reproductive effector.

Potassium Dichromate:

Toxicologically Synergistic Products: No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation: Causes burns by all exposure routes

Sensitization: May cause sensitization by skin contact

Carcinogenicity: Carcinogen (IARC Group 1)

Mutagenic Effects: May cause heritable genetic damage

Reproductive Effects: May impair fertility.

Developmental Effects: Component substance is listed on California Proposition 65 as a developmental hazard.

Teratogenicity: May cause harm to the unborn child.

Germ cell mutagenicity: May cause genetic defects.

STOT I single exposure: Respiratory system

STOT I repeated exposure: Respiratory system Liver Kidney Blood

Aspiration hazard: as for Nitric Acid

Symptoms / effects, both acute and delayed: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or oesophagus should be investigated: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, light-headedness, chest pain, muscle pain or flushing: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

Endocrine Disruptor Information: No information available

Other Adverse Effects: The toxicological properties have not been fully investigated.

12. Ecological Information

ECOTOXICITY: The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Component	Toxicity			
<i>Nitric Acid</i>	LC50	Shrimp	100-300 ppm	4 Hr. salt water
	LC100	Trout	10 mg/L	24 Hr.
	TLm	Mosquito Fish	282 ppm	96 Hr.
<i>Potassium Dichromate</i>	LDC0	Striped Bass	75 mg/L	96 Hr.
	LC50	Daphnia	1.5 mg/L	24 Hr.
	LC50	Flathead Minnow	17.3 mg/L	11 Hr.

BODS and COD: No data available.

Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise. Chromium probably occurs as the insoluble (CrIII) oxide (Cr₂O₃.nH₂O) in the soil, as the organic matter in the soil is expected to reduce any soluble chromate to insoluble chromic oxide (Cr₂O₃). Chromium in the soil can be transported to the atmosphere by way of aerosol formation. Chromium is also transported from the soil through runoff and leaching of water. Most of the chromium in surface waters may be present in particulate form as sediment. Some of the particulate chromium

would remain as suspended matter and ultimately be deposited in the sediments. Chromium present usually as Cr(III) in the soil and is characterized by its lack of mobility, except in cases where Cr(VI) is involved. Chromium (VI) of natural origin is rarely found.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic. Dangerous to aquatic life in high concentrations.

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

Bio-accumulative Potential: No further relevant information available.

Mobility in Soil: No data available.

Other adverse effects: EPA require reporting spills and releases to soil, water and air in excess of reportable quantities. Report any such pills to your local council, government or the EPA in your local jurisdiction if unable to contain, isolate / neutralise / decontaminate and remove the spill safely.

13. Disposal Considerations

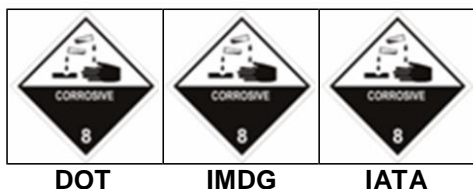
Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. 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

D.O.T. CLASSIFICATION

UN NUMBER	UN2031	LABELCODES	Corrosive
PROPER SHIPPING NAME	NITRICACID	REPORTABLE QUANTITY	1000 LBS
HAZARD CLASS	8	EMERGENCY RESPONSE NUMBER	157
PACKING GROUP	PGII	MARINE POLLUTANT	No

HMIS	National Fire Protection Association		
Health Hazard	4	Health	4
Fire Hazard	0	Flammability	0
Reactivity	2	Reactivity	2
Personal Protection		Specific hazard	Oxidizer



15. Regulatory Information

TSCA	CAS No.	SecSIb)	SecSI d)	Sec	Sec 12(b)
Chemical Name		Inventory	Health & Safety	Chemical Test Rules	Export Notification
Nitric Acid	7697-37-2	Yes	Yes		Yes



Safety Data Sheet

Gold Test Solution, Platinum Test Solution

Controlled Document: DS_TS-Ag-SDS V1.3.Docx Rev 1.3 Release Date: 25-Jan-21

Potassium Dichromate	7778-50-9	Yes	Yes	Y	Yes		
Reportable Quantities	CAS No.	EPCRATPQ	EPCRARQ	CERCLARQ	TRI	RCRA	RMPTQ
Chemical Name		Sec.302	Sec.304	Sec.103	Sec.313	Code	Sec.112r
Nitric acid	7697-37-2	1,000	1,000	1,000	Y		
Potassium Dichromate	7778-50-9			10	Y		

SARA	Sec313	Sec311 & 312 Hazards					Sec.3o2
ChemicalName	Acute	Chronic	Flammable	Pressure	Reactive	Extremely HazardousSubstance	
Nitric acid	Yes	Yes	Yes	No	Yes	Yes	
PotassiumDichromate	Yes	Yes	Yes	No	Yes	Yes	

INTERNATIONAL REGULATIONS

The components of this product are listed on the chemical inventories of the following countries

Chemical Name	Australia	Canada	Europe	Japan	Korea	UK
Nitric Acid	Yes	Yes	Yes	Yes	Yes	Yes
Potassium Dichromate	Yes	Yes	Yes	Yes	Yes	Yes

DSCL(EEC)	CODE	DEFINITION
Nitric Acid	R8	Contact with combustible material may cause fire.
	R35	Causes severe burns.
	R37	Irritating to respiratory system.
Potassium Dichromate	R21	Harmful in contact with skin.
	R25	Toxic if swallowed.
	R41	Risk of serious damage to eyes.
	R43	May cause sensitization by skin contact.
	R46	May cause heritable genetic damage.
	R49	May cause cancer by inhalation.
	R50	Very toxic to aquatic organisms.
R53	May cause long-term adverse effects in the aquatic	

16. Other Information

Effective Date: 25-01-2021 – V 1.3 Initial Release

Replaces Revision: n/a

Prepared / Revised By: R. Engelhardt

Source Information	Chemical	CasNo.	Revision Date
Mallinckrodt Baker, Inc.	Nitric Acid	7697-37-2	2/15/2008
Science Laboratory	Nitric Acid	7697-37-2	11/1/2008
CEPP	Nitric Acid	7697-37-2	3/5/2009
OSHA	Nitric Acid	7697-37-2	3/5/2009
EMD Chemicals Inc	Nitric Acid	7697-37-2	3/27/2003
Mallinckrodt Baker, Inc.	Potassium Dichromate	7778-50-9	6/9/2005
Science Laboratory	Potassium Dichromate	7778-50-9	11/1/2008

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