SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name: Tungsten Standard: 10000 µg/mL W in 5% HNO3, tr. HF [500ml bottle]

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

No further relevant information available.

Application of the substance / the mixture Reference material for laboratory use only

Manufacturer/Supplier:
Agilent Technologies Australia Pty Ltd
679 Springvale Road
Mulgrave
Victoria 3170, Australia

Further information obtainable from: e-mail: pdl-msds_author@agilent.com

1.4 Emergency telephone number: CHEMTREC®: +(61) - 290372994

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Flame over circle

Ox. Liq. 2 H272 May intensify fire; oxidiser.

Corrosion

Skin Corr. 1B H314 Causes severe skin burns and eye damage.

Eye Dam. 1 H318 Causes serious eye damage.

Acute Tox. 4 H302 Harmful if swallowed.

Acute Tox. 4 H312 Harmful in contact with skin.

Acute Tox. 4 H332 Harmful if inhaled.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC

C; Corrosive

R35: Causes severe burns.

Xn; Harmful

R20/21/22: Harmful by inhalation, in contact with skin and if swallowed.

Xi; Irritant

R41: Risk of serious damage to eyes.

O; Oxidising

(Contd. on page 2)
R8: Contact with combustible material may cause fire.

Information concerning particular hazards for human and environment:
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

Classification system:
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008
The product is classified and labelled according to the CLP regulation.

Hazard pictograms

| GHS03 | GHS05 | GHS07 |

- Signal word Danger

- Hazard-determining components of labelling:
  Nitric acid
  Hydrofluoric acid -

- Hazard statements
  H272 May intensify fire; oxidiser.
  H302+H312+H332 Harmful if swallowed, in contact with skin or if inhaled.
  H314 Causes severe skin burns and eye damage.

- Precautionary statements
  P221 Take any precaution to avoid mixing with combustibles.
  P280 Wear protective gloves/protective clothing/eye protection/face protection.
  P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
  P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P310 Immediately call a POISON CENTER/doctor.
  P405 Store locked up.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

- Information concerning particular hazards for human and environment:
  Safety phrases:
    26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
    36/37/39 Wear suitable protective clothing, gloves and eyewash protection.
    45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
    60 This material and its container must be disposed of as hazardous waste.

- Other hazards
  Results of PBT and vPvB assessment
    PBT: Not applicable.
    vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

- 3.2 Chemical characterisation: Mixtures
  Description:
  Aqueous solution.
Product name: Tungsten Standard: 10000 µg/mL W in 5% HNO3, tr. HF [500ml bottle]

Also contains substances at levels not considered to be hazardous.

<table>
<thead>
<tr>
<th>CAS: 7697-37-2</th>
<th>Nitric acid</th>
<th>&lt; 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>EINECS: 231-714-2</td>
<td>O R8</td>
<td></td>
</tr>
<tr>
<td>RTECS: QU5775000</td>
<td>Ox. Liq. 3, H272; Skin Corr. 1A, H314</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS: 7664-39-3</th>
<th>Hydrofluoric acid</th>
<th>&lt; 1.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>EINECS: 231-634-8</td>
<td>C R35</td>
<td></td>
</tr>
<tr>
<td>RTECS: MW 7875000</td>
<td>Acute Tox. 2, H300; Acute Tox. 1, H310; Acute Tox. 2, H330; Skin Corr. 1A, H314</td>
<td></td>
</tr>
</tbody>
</table>

- Additional information: For the wording of the listed risk phrases refer to section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General information:
Immediately remove any clothing soiled by the product. Symptoms of poisoning may occur even after several hours; therefore medical observation for at least 48 hours after the accident is recommended.

After inhalation:
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient in recovery position for transport.

After skin contact:
Immediately wash with water and soap and rinse thoroughly.

After eye contact:
Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing:
Rinse mouth. Do not induce vomiting.
Call for a doctor immediately.
Drink plenty of water and provide fresh air. Call for a doctor immediately.

4.2 Most important symptoms and effects, both acute and delayed
No further relevant information available.

4.3 Indication of any immediate medical attention and special treatment needed
No further relevant information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents:
CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

5.2 Special hazards arising from the substance or mixture
Formation of toxic gases is possible during heating or in case of fire.

5.3 Advice for firefighters

Protective equipment:
Mouth respiratory protective device.
Wear self-contained respiratory protective device.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.

6.2 Environmental precautions:
Dilate with plenty of water.
Do not allow to enter sewers/ surface or ground water.
Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 22.06.2015
Version number 2
Revision: 22.06.2015

Product name: Tungsten Standard: 10000 µg/mL W in 5% HNO3, tr. HF [500ml bottle]

6.3 Methods and material for containment and cleaning up:
- Use neutralising agent.
- Dispose of contaminated material as waste according to item 13.
- Ensure adequate ventilation.
- Absorb liquid components with liquid-binding material.
- DO NOT USE SAWDUST.

6.4 Reference to other sections
- See Section 7 for information on safe handling.
- See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
- Ensure good ventilation/extraction at the workplace.
- Store in cool, dry place in tightly closed receptacles.
- Prevent formation of aerosols.
- Information about fire - and explosion protection: Protect from heat.

7.2 Conditions for safe storage, including any incompatibilities
- Storage:
  - Requirements to be met by storerooms and receptacles:
    - Store in a cool location.
    - Please refer to the manufacturer's certificate for specific storage and transport temperature conditions.
    - Keep container in a well-ventilated place. Keep away from sources of ignition and heat.
  - Information about storage in one common storage facility: Store away from foodstuffs.
  - Further information about storage conditions:
    - Keep container tightly sealed.
    - Protect from heat and direct sunlight.

7.3 Specific end use(s) No further relevant information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters
- Ingredients with limit values that require monitoring at the workplace:
  - 7697-37-2 Nitric acid
    - NES Short-term value: 10 mg/m³, 4 ppm
    - Long-term value: 5.2 mg/m³, 2 ppm
  - 7664-39-3 Hydrofluoric acid
    - NES Peak limitation: 2.6 mg/m³, 3 ppm

- Additional information: Lists used were valid at the time of SDS preparation.

8.2 Exposure controls
- Personal protective equipment:
  - General protective and hygienic measures:
    - Keep away from foodstuffs, beverages and feed.
    - Immediately remove all soiled and contaminated clothing
    - Wash hands before breaks and at the end of work.
    - Avoid contact with the eyes.
    - Avoid contact with the eyes and skin.

(Contd. on page 5)
Product name: Tungsten Standard: 10000 µg/mL W in 5% HNO₃, tr. HF [500ml bottle]

- **Respiratory protection:**
  In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
- **Protection of hands:**
  Chemical-resistant, impervious gloves with an approved standards should be worn at all times. The selection of the glove material is based on the penetration times, rates of diffusion and its degradation.

  **Protective gloves**

  - **Material of gloves**
    - PVC gloves
    - Neoprene gloves
  - **Penetration time of glove material**
    The protection time of the gloves can not be accurately estimated for mixtures consisting of several substances. Refer to and observe manufacturers break through times of the protective gloves.
- **Eye protection:**

### SECTION 9: Physical and chemical properties

- **9.1 Information on basic physical and chemical properties**
- **General Information**
  - **Appearance:**
    - Form: Liquid
    - Colour: Colourless
    - Odour: Odourless
    - Odour threshold: Not determined.
  - **pH-value at 20 °C:** < 1.5
  - **Change in condition**
    - Melting point/Melting range: Not determined.
    - Boiling point/Boiling range: 100 °C
  - **Flash point:** Not applicable.
  - **Flammability (solid, gaseous):** Not determined.
  - **Ignition temperature:**
    - Decomposition temperature: Not determined.
  - **Self-igniting:** Product is not selfigniting.
  - **Danger of explosion:**
    - Product is not explosive. However, formation of explosive air/vapour mixtures is possible.
  - **Explosion limits:**
    - Lower: Not determined.
    - Upper: Not determined.
  - **Vapour pressure at 20 °C:** 23 hPa

(Contd. from page 4)
Product name: Tungsten Standard: 10000 µg/mL W in 5% HNO3, tr. HF [500ml bottle]

- Density at 20 °C: 1.05842 g/cm³
- Relative density: Not determined.
- Vapour density: Not determined.
- Evaporation rate: Not determined.
- Solubility in / Miscibility with water: Fully miscible.
- Partition coefficient (n-octanol/water): Not determined.
- Viscosity:
  - Dynamic: Not determined.
  - Kinematic: Not determined.
- 9.2 Other information: No further relevant information available.

SECTION 10: Stability and reactivity

- 10.1 Reactivity: Stable under normal conditions.
- 10.2 Chemical stability: Stable under normal conditions.
- Thermal decomposition / conditions to be avoided:
  Formation of toxic gases is possible during heating or in case of fire.
- 10.3 Possibility of hazardous reactions: No dangerous reactions known.
- 10.4 Conditions to avoid: Heat.
- 10.5 Incompatible materials:
  - Bases.
  - Strong oxidizing agents.
- 10.6 Hazardous decomposition products:
  Formation of toxic gases is possible during heating or in case of fire.

SECTION 11: Toxicological information

- 11.1 Information on toxicological effects
- Acute toxicity:
  - LD/LC50 values relevant for classification:
    | 7697-37-2 Nitric acid |
    | Oral LD0 430 mg/kg (Human) |
    | Inhalative LC50 130 mg/l (rat) |
    | 7664-39-3 Hydrofluoric acid - |
    | Oral LD50 1276 mg/kg (rat) |
- Primary irritant effect:
  - on the skin: Strong caustic effect on skin and mucous membranes.
  - on the eye:
    - Strong caustic effect.
    - Strong irritant with the danger of severe eye injury.
  - Sensitisation: No sensitising effects known.
- Additional toxicological information:
  The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:
  - Harmful
  - Corrosive
  - Irritant

(Contd. on page 7)
Product name: Tungsten Standard: 10000 µg/mL W in 5% HNO₃, tr. HF [500ml bottle]

Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity:

7697-37-2 Nitric acid

LC50/48 180 mg/l (crustacean)

12.2 Persistence and degradability No further relevant information available.

12.3 Bioaccumulative potential No further relevant information available.

12.4 Mobility in soil No further relevant information available.

Additional ecological information:

General notes:
Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water

Do not allow undiluted product to reach ground water, water course or sewage system.

Must not reach sewage water or drainage ditch undiluted or unneutralised.

Rinse off of bigger amounts into drains or the aquatic environment may lead to decreased pH-values. A low pH-value harms aquatic organisms. In the dilution of the use-level the pH-value is considerably increased, so that after the use of the product the aqueous waste, emptied into drains, is only low water-dangerous.

12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6 Other adverse effects No further relevant information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Recommendation

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

European waste catalogue

Waste disposal key numbers from EWC have to be assigned depending on origin and processing.

Uncleaned packaging:

Recommendation: Dispose of in accordance with national regulations.

Recommended cleansing agents: Water, if necessary together with cleansing agents.

SECTION 14: Transport information

14.1 UN-Number

ADG, IMDG, IATA UN3264

ADG 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID, HYDROFLUORIC ACID)

IMDG, IATA CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID, HYDROFLUORIC ACID)
Product name: Tungsten Standard: 10000 µg/mL W in 5% HNO3, tr. HF [500ml bottle]

<table>
<thead>
<tr>
<th>14.3 Transport hazard class(es)</th>
<th>ADG, IMDG, IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>8 Corrosive substances.</td>
</tr>
<tr>
<td>Label</td>
<td>8</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>14.4 Packing group</th>
<th>ADG, IMDG, IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>II</td>
</tr>
</tbody>
</table>

| 14.5 Environmental hazards:     |                     |
| Marine pollutant:               | No                |

| 14.6 Special precautions for user | Warning: Corrosive substances. |
| Danger code (Kemler):            | 80                |
| EMS Number:                      | F-A,S-B           |
| Segregation groups               | Acids             |

| 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable. |
| Transport/Additional information: |                     |
| ADG                              |                     |
| Excepted quantities (EQ):        | E2                |
| Limited quantities (LQ):         | 1L                 |
| Transport category               | 2                  |
| Tunnel restriction code          | E                  |

| UN "Model Regulation":          | UN3264, CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID, HYDROFLUORIC ACID), 8, II |

SECTION 15: Regulatory information

| 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture |
| Philippines Inventory of Chemicals and Chemical Substances |
| 7697-37-2 Nitric acid |
| 7664-39-3 Hydrofluoric acid - Purified water |

| Australian Inventory of Chemical Substances |
| All ingredients are listed. |

| Standard for the Uniform Scheduling of Medicines and Poisons |
| 7697-37-2 Nitric acid | S5, S6 |
| 7664-39-3 Hydrofluoric acid - | S5, S6, S7 |

| 15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out. |
| (Contd. on page 9) |
SECTION 16: Other information

The information contained in this document is based on Agilent’s state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

- **Relevant phrases**
  - H272 May intensify fire; oxidiser.
  - H300 Fatal if swallowed.
  - H310 Fatal in contact with skin.
  - H314 Causes severe skin burns and eye damage.
  - H330 Fatal if inhaled.
  - R26/27/28 Very toxic by inhalation, in contact with skin and if swallowed.
  - R35 Causes severe burns.
  - R8 Contact with combustible material may cause fire.

- **Abbreviations and acronyms:**
  - ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  - IMDG: International Maritime Code for Dangerous Goods
  - IATA: International Air Transport Association
  - GHS: Globally Harmonised System of Classification and Labelling of Chemicals
  - EINECS: European Inventory of Existing Commercial Chemical Substances
  - ELINCS: European List of Notified Chemical Substances
  - CAS: Chemical Abstracts Service (division of the American Chemical Society)
  - LC50: Lethal concentration, 50 percent
  - LD50: Lethal dose, 50 percent
  - Ox. Liq. 2: Oxidising Liquids, Hazard Category 2
  - Ox. Liq. 3: Oxidising Liquids, Hazard Category 3
  - Acute Tox. 2: Acute toxicity, Hazard Category 2
  - Acute Tox. 4: Acute toxicity, Hazard Category 4
  - Acute Tox. 1: Acute toxicity, Hazard Category 1
  - Skin Corr. 1A: Skin corrosion/irritation, Hazard Category 1A
  - Skin Corr. 1B: Skin corrosion/irritation, Hazard Category 1B
  - Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1

- **Sources**