1 Identification

· Product identifier
  · Trade name: Tune-E25 CCT Solution
  · Part number: 1600637
  · Application of the substance / the mixture: Laboratory chemicals

· Details of the supplier of the safety data sheet
  · Manufacturer/Supplier:
    ULTRA Scientific, Inc.
    250 Smith Street
    North Kingstown, RI 02852
    USA

· Information department:
  Telephone: (401) 294-9400
  Fax: (401) 295-2300
  E-mail: regulatory@ultrasci.com

· Emergency telephone number:
  US: (800) 424-9300
  Outside US: (703) 527-3887

2 Hazard(s) identification

· Classification of the substance or mixture

  GHS05 Corrosion

  Skin Corr. 1B H314 Causes severe skin burns and eye damage.
  Eye Dam. 1  H318 Causes serious eye damage.

· Label elements
  · GHS label elements: The product is classified and labeled according to the Globally Harmonized System (GHS).
  · Hazard pictograms

  GHS05

· Signal word: Danger

· Hazard-determining components of labeling:
  nitric acid

· Hazard statements
  Causes severe skin burns and eye damage.

· Precautionary statements
  Do not breathe dusts or mists.
  Wash thoroughly after handling.
  Wear protective gloves/protective clothing/eye protection/face protection.
  If swallowed: Rinse mouth. Do NOT induce vomiting.
  If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  IF INHALED: Remove person to fresh air and keep comfortable for breathing.
  If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
  Continue rinsing.
  Immediately call a POISON CENTER/doctor.

(Contd. on page 2)
3 Composition/information on ingredients

- Chemical characterization: Mixtures
- Description: Mixture of the substances listed below with nonhazardous additions.

<table>
<thead>
<tr>
<th>Dangerous components:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid 5.0%</td>
</tr>
</tbody>
</table>

4 First-aid measures

- Description of first aid measures
  - General information: Immediately remove any clothing soiled by the product.
  - After inhalation: In case of unconsciousness place patient stably in side position for transportation.
  - 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: Drink copious amounts of water and provide fresh air. Immediately call a doctor.
  - Information for doctor:
    - Most important symptoms and effects, both acute and delayed: No further relevant information available.
    - Indication of any immediate medical attention and special treatment needed: No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
  - Suitable extinguishing agents: Use fire fighting measures that suit the environment.
  - Special hazards arising from the substance or mixture: No further relevant information available.
  - Advice for firefighters
  - Protective equipment: No special measures required.
6 Accidental release measures

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

- **Environmental precautions:** Do not allow to enter sewers/surface or ground water.

- **Methods and material for containment and cleaning up:**
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  Use neutralizing agent.
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.

- **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.

- **Protective Action Criteria for Chemicals**

<table>
<thead>
<tr>
<th>PAC-1</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid</td>
<td>0.16 ppm</td>
</tr>
<tr>
<td>7446-08-4 selenium dioxide</td>
<td>0.84 mg/m³</td>
</tr>
<tr>
<td>1312-43-2 diindium trioxide</td>
<td>0.36 mg/m³</td>
</tr>
<tr>
<td>10099-74-8 lead dinitrate</td>
<td>0.24 mg/m³</td>
</tr>
<tr>
<td>7803-55-6 ammonium trioxovanadate</td>
<td>0.01 mg/m³</td>
</tr>
<tr>
<td>1327-53-3 diarsenic trioxide</td>
<td>0.27 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-2</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid</td>
<td>24 ppm</td>
</tr>
<tr>
<td>7446-08-4 selenium dioxide</td>
<td>1.6 mg/m³</td>
</tr>
<tr>
<td>1312-43-2 diindium trioxide</td>
<td>4.8 mg/m³</td>
</tr>
<tr>
<td>10099-74-8 lead dinitrate</td>
<td>180 mg/m³</td>
</tr>
<tr>
<td>7803-55-6 ammonium trioxovanadate</td>
<td>0.11 mg/m³</td>
</tr>
<tr>
<td>1327-53-3 diarsenic trioxide</td>
<td>3.0 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-3</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid</td>
<td>92 ppm</td>
</tr>
<tr>
<td>7446-08-4 selenium dioxide</td>
<td>9.5 mg/m³</td>
</tr>
<tr>
<td>1312-43-2 diindium trioxide</td>
<td>29 mg/m³</td>
</tr>
<tr>
<td>10099-74-8 lead dinitrate</td>
<td>1,100 mg/m³</td>
</tr>
<tr>
<td>7803-55-6 ammonium trioxovanadate</td>
<td>80 mg/m³</td>
</tr>
<tr>
<td>1327-53-3 diarsenic trioxide</td>
<td>9.1 mg/m³</td>
</tr>
</tbody>
</table>

7 Handling and storage

- **Handling:**
  - **Precautions for safe handling** No special precautions are necessary if used correctly.
  - **Information about protection against explosions and fires:** No special measures required.

- **Conditions for safe storage, including any incompatibilities**

- **Storage:**
  - **Requirements to be met by storerooms and receptacles:** No special requirements.
  - **Information about storage in one common storage facility:** Not required.
  - **Further information about storage conditions:** Keep receptacle tightly sealed.
8 Exposure controls/personal protection

- Additional information about design of technical systems: No further data; see item 7.

- Control parameters
  - Components with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>Component</th>
<th>Long-term value</th>
<th>Short-term value</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid</td>
<td>5 mg/m³, 2 ppm</td>
<td>10 mg/m³, 4 ppm</td>
</tr>
<tr>
<td></td>
<td>Long-term value</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 mg/m³, 2 ppm</td>
<td></td>
</tr>
<tr>
<td>REL</td>
<td>Short-term value</td>
<td>10 mg/m³, 4 ppm</td>
</tr>
<tr>
<td>TLV</td>
<td>Short-term value</td>
<td>10 mg/m³, 4 ppm</td>
</tr>
<tr>
<td></td>
<td>Long-term value</td>
<td>5.2 mg/m³, 2 ppm</td>
</tr>
</tbody>
</table>

- Additional information: The lists that were valid during the creation were used as basis.

- 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.
  - Breathing equipment: Not required.
  - Protection of hands:
    - Protective gloves
      - The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
      - Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
      - Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
  - Material of gloves
    - The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
  - Penetration time of glove material
    - The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
  - Eye protection:
    - Tightly sealed goggles


### 9 Physical and chemical properties

- **Information on basic physical and chemical properties**
  - **General Information**
    - **Appearance:**
      - **Form:** Fluid
      - **Color:** According to product specification
    - **Odor:** Characteristic
    - **Odor threshold:** Not determined.
  - **pH-value:** Not determined.
  - **Change in condition**
    - **Melting point/Melting range:** Undetermined.
    - **Boiling point/Boiling range:** 83°C (°F)
  - **Flash point:** Not applicable.
  - **Flammability (solid, gaseous):** Not applicable.
  - **Ignition temperature:**
    - **Decomposition temperature:** Not determined.
  - **Auto igniting:** Product is not selfigniting.
  - **Danger of explosion:** Product does not present an explosion hazard.
    - **Explosion limits:**
      - **Lower:** Not determined.
      - **Upper:** Not determined.
  - **Vapor pressure at 20°C (68 °F):** 23 hPa (mm Hg)
  - **Density:** Not determined.
  - **Relative density**
    - Not determined.
  - **Vapor density**
    - Not determined.
  - **Evaporation rate**
    - Not determined.
  - **Solubility in / Miscibility with**
    - **Water:** Not miscible or difficult to mix.
  - **Partition coefficient (n-octanol/water):** Not determined.
  - **Viscosity**
    - **Dynamic:** Not determined.
    - **Kinematic:** Not determined.
  - **Solvent content:**
    - **Water:** 95.0 %
    - **VOC content:** 0.00 %
    - 0.0 g/l / 0.00 lb/gl
  - **Solids content:** 0.0 %
  - **Other information**
    - No further relevant information available.

### 10 Stability and reactivity

- **Reactivity** No further relevant information available.
## Chemical stability
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

### 11 Toxicological information

#### Information on toxicological effects

- **Acute toxicity:**
  - **LD/LC50 values that are relevant for classification:**
    - **ATE (Acute Toxicity Estimate)**
      - Inhalative LC50/4 h 1,340 mg/L (rat)
    - **7697-37-2 nitric acid**
      - Inhalative LC50/4 h 67 mg/L (rat)
  - **Primary irritant effect:**
    - **on the skin:** Caustic effect on skin and mucous membranes.
    - **on the eye:** Strong caustic effect. Strong irritant with the danger of severe eye injury.
    - **Sensitization:** No sensitizing effects known.
  - **Additional toxicological information:**
    - The product shows the following dangers according to internally approved calculation methods for preparations:
      - Corrosive
      - Irritant
    - Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

#### Carcinogenic categories

- **IARC (International Agency for Research on Cancer)**
  - 7446-08-4 selenium dioxide
    - 3
  - 10099-74-8 lead dinitrate
    - 2A
  - 1327-53-3 diarsenic trioxide
    - 1
- **NTP (National Toxicology Program)**
  - 10099-74-8 lead dinitrate
    - R
  - 1327-53-3 diarsenic trioxide
    - K
- **OSHA-Ca (Occupational Safety & Health Administration)**
  - None of the ingredients is listed.

### 12 Ecological information

- **Toxicity**
  - **Aquatic toxicity:** No further relevant information available.
  - **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
General notes:
Water hazard class 2 (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Must not reach bodies of water or drainage ditch undiluted or unneutralized.
Danger to drinking water if even small quantities leak into the ground.

Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

Other adverse effects
No further relevant information available.

13 Disposal considerations
Waste treatment methods
Recommendation:
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information
UN-Number
DOT, IMDG, IATA UN3264

UN proper shipping name
Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid)
DOT, IMDG, IATA CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID)

Transport hazard class(es)
DOT
Class 8 Corrosive substances
Label 8

IMDG, IATA
Class 8 Corrosive substances
Label 8

Packing group
DOT, IMDG, IATA II

Environmental hazards:
Not applicable.

Special precautions for user
Warning: Corrosive substances
| · Danger code (Kemler):   | 80 |
| · EMS Number:             | F-A,S-B |
| · Segregation groups:     | Acids |
| · Stowage Category:       | B |
| · Stowage Code:           | SW2 Clear of living quarters. |
| · Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable. |
| · Transport/Additional information: | |
| · DOT                      | |
| · Quantity limitations     | On passenger aircraft/rail: 1 L On cargo aircraft only: 30 L |
| · IMDG                     | |
| · Limited quantities (LQ)  | 1L |
| · Excepted quantities (EQ) | Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml |
| · UN "Model Regulation":  | UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID), 8, II |

### 15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
  - Sara
  - Section 355 (extremely hazardous substances):
    - 7697-37-2 nitric acid
    - 1327-53-3 diarsenic trioxide
  - Section 313 (Specific toxic chemical listings):
    - 7697-37-2 nitric acid
    - 7446-08-4 selenium dioxide
    - 10099-74-8 lead dinitrate
    - 7803-55-6 ammonium trioxovanadate
    - 1327-53-3 diarsenic trioxide
  - TSCA (Toxic Substances Control Act):
    - All ingredients are listed.
  - Proposition 65
    - Chemicals known to cause cancer:
      - 10099-74-8 lead dinitrate
      - 1327-53-3 diarsenic trioxide
    - Chemicals known to cause reproductive toxicity for females:
      - None of the ingredients is listed.
    - Chemicals known to cause reproductive toxicity for males:
      - None of the ingredients is listed.
    - Chemicals known to cause developmental toxicity:
      - 1327-53-3 diarsenic trioxide
Trade name: Tune-E25 CCT Solution

- Carcinogenic categories
  - EPA (Environmental Protection Agency)
    - 7446-08-4 selenium dioxide D
    - 10099-74-8 lead dinitrate B2
    - 1327-53-3 diarsenic trioxide A
  - TLV (Threshold Limit Value established by ACGIH)
    - 10099-74-8 lead dinitrate A3
    - 1327-53-3 diarsenic trioxide A1
  - NIOSH-Ca (National Institute for Occupational Safety and Health)
    - None of the ingredients is listed.

- GHS label elements
  - The product is classified and labeled according to the Globally Harmonized System (GHS).

- Hazard pictograms
  - GHS05

- Signal word
  - Danger

- Hazard-determining components of labeling:
  - nitric acid

- Hazard statements
  - Causes severe skin burns and eye damage.

- Precautionary statements
  - Do not breathe dusts or mists.
  - Wash thoroughly after handling.
  - Wear protective gloves/protective clothing/eye protection/face protection.
  - If swallowed: Rinse mouth. Do NOT induce vomiting.
  - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
  - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  - Immediately call a POISON CENTER/doctor.
  - Specific treatment (see on this label).
  - Wash contaminated clothing before reuse.
  - Store locked up.
  - Dispose of contents/container in accordance with local/regional/national/international regulations.

- Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- Date of preparation / last revision 09/22/2017 / -

- 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
  - DOT: US Department of Transportation
  - IATA: International Air Transport Association
  - ACGIH: American Conference of Governmental Industrial Hygienists
Trade name: Tune-E25 CCT Solution

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)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Skin Corr. 1B: Skin corrosion/irritation – Category 1B
Eye Dam. 1: Serious eye damage/eye irritation – Category 1