1 Identification

· Product identifier
  · Trade name: Custom Standard
· Part number: ICUS-7512
· 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
  GHS07
  Skin Irrit. 2 H315 Causes skin irritation.
  Eye Irrit. 2A H319 Causes serious eye irritation.

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

· Signal word Warning
· Hazard statements
  Causes skin irritation.
  Causes serious eye irritation.
· Precautionary statements
  Wash thoroughly after handling.
  Wear protective gloves / eye protection / face protection.
  If on skin: Wash with plenty of water.
  If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
  Continue rinsing.
  Specific treatment (see on this label).
  If skin irritation occurs: Get medical advice/attention.
  If eye irritation persists: Get medical advice/attention.
  Take off contaminated clothing and wash it before reuse.
4 First-aid measures

- **Description of first aid measures**
  - **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. If symptoms persist, consult a doctor.
  - **After swallowing:** If symptoms persist consult 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:** Not required.
- **Environmental precautions:** No special measures required.
Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

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

PAC-1:

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>0.16 ppm</td>
</tr>
<tr>
<td>87-69-4</td>
<td>(+)-tartaric acid</td>
<td>1.6 mg/m³</td>
</tr>
<tr>
<td>7784-27-2</td>
<td>aluminium nitrate</td>
<td>83 mg/m³</td>
</tr>
<tr>
<td>10196-18-6</td>
<td>zinc(II) nitrate hexahydrate</td>
<td>27 mg/m³</td>
</tr>
<tr>
<td>10377-66-9</td>
<td>manganese dinitrate</td>
<td>9.8 mg/m³</td>
</tr>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>2.9 mg/m³</td>
</tr>
<tr>
<td>1344-57-6</td>
<td>Uranium oxide (UO2)</td>
<td>0.68 mg/m³</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>diarsenic trioxide</td>
<td>0.27 mg/m³</td>
</tr>
<tr>
<td>13478-00-7</td>
<td>Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>1.5 mg/m³</td>
</tr>
<tr>
<td>7440-36-0</td>
<td>antimony</td>
<td>1.5 mg/m³</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</td>
<td>0.24 mg/m³</td>
</tr>
<tr>
<td>10022-68-1</td>
<td>Nitric acid, cadmium salt, tetrahydrate</td>
<td>0.27 mg/m³</td>
</tr>
<tr>
<td>10102-45-1</td>
<td>thallium nitrate</td>
<td>0.078 mg/m³</td>
</tr>
<tr>
<td>7761-88-8</td>
<td>silver nitrate</td>
<td>0.047 mg/m³</td>
</tr>
</tbody>
</table>

PAC-2:

<table>
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<th>Chemical Name</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>24 ppm</td>
</tr>
<tr>
<td>87-69-4</td>
<td>(+)-tartaric acid</td>
<td>17 mg/m³</td>
</tr>
<tr>
<td>7784-27-2</td>
<td>aluminium nitrate</td>
<td>920 mg/m³</td>
</tr>
<tr>
<td>10196-18-6</td>
<td>zinc(II) nitrate hexahydrate</td>
<td>300 mg/m³</td>
</tr>
<tr>
<td>10377-66-9</td>
<td>manganese dinitrate</td>
<td>16 mg/m³</td>
</tr>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>350 mg/m³</td>
</tr>
<tr>
<td>1344-57-6</td>
<td>Uranium oxide (UO2)</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>diarsenic trioxide</td>
<td>3.0 mg/m³</td>
</tr>
<tr>
<td>13478-00-7</td>
<td>Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>53 mg/m³</td>
</tr>
<tr>
<td>7440-36-0</td>
<td>antimony</td>
<td>13 mg/m³</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</td>
<td>180 mg/m³</td>
</tr>
<tr>
<td>10022-68-1</td>
<td>Nitric acid, cadmium salt, tetrahydrate</td>
<td>2.1 mg/m³</td>
</tr>
<tr>
<td>10102-45-1</td>
<td>thallium nitrate</td>
<td>4.3 mg/m³</td>
</tr>
<tr>
<td>7761-88-8</td>
<td>silver nitrate</td>
<td>0.9 mg/m³</td>
</tr>
</tbody>
</table>

PAC-3:

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>92 ppm</td>
</tr>
<tr>
<td>87-69-4</td>
<td>(+)-tartaric acid</td>
<td>100 mg/m³</td>
</tr>
<tr>
<td>7784-27-2</td>
<td>aluminium nitrate</td>
<td>5,500 mg/m³</td>
</tr>
<tr>
<td>10196-18-6</td>
<td>zinc(II) nitrate hexahydrate</td>
<td>1,800 mg/m³</td>
</tr>
<tr>
<td>10377-66-9</td>
<td>manganese dinitrate</td>
<td>96 mg/m³</td>
</tr>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>2,100 mg/m³</td>
</tr>
</tbody>
</table>

(Contd. of page 4)
Trade name: Custom Standard

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance Description</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1344-57-6</td>
<td>Uranium oxide (UO2)</td>
<td>30 mg/m³</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>diarsenic trioxide</td>
<td>9.1 mg/m³</td>
</tr>
<tr>
<td>13478-00-7</td>
<td>Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>320 mg/m³</td>
</tr>
<tr>
<td>7440-36-0</td>
<td>antimony</td>
<td>80 mg/m³</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</td>
<td>1,100 mg/m³</td>
</tr>
<tr>
<td>10022-68-1</td>
<td>Nitric acid, cadmium salt, tetrahydrate</td>
<td>13 mg/m³</td>
</tr>
<tr>
<td>10102-45-1</td>
<td>thallium nitrate</td>
<td>26 mg/m³</td>
</tr>
<tr>
<td>7761-88-8</td>
<td>silver nitrate</td>
<td>5.4 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.
  - Specific end use(s): No further relevant information available.

8 Exposure controls/personal protection

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

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance Description</th>
<th>Limit Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>PEL: 5 mg/m³, 2 ppm REL: 10 mg/m³, 4 ppm TLV: 10 mg/m³, 4 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 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: Colorless
    - Odor: Odorless
    - Odor threshold: Not determined.
  - **pH-value:**
    Not determined.

- **Change in condition**
  - Melting point/Melting range: 0 °C (32 °F)
  - Boiling point/Boiling range: 100 °C (212 °F)

- **Flash point:**
  Not applicable.

- **Flammability (solid, gaseous):**
  Not applicable.

- **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 (17.3 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.
Trade name: Custom Standard

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 3,384 mg/L (rat)
    - **7697-37-2 nitric acid**
      - Inhalative LC50/4 h 67 mg/L (rat)
  - **Primary irritant effect**:
    - **on the skin**: Irritant to skin and mucous membranes.
    - **on the eye**: Irritating effect.
  - **Sensitization**: No sensitizing effects known.
  - **Additional toxicological information**:
    - The product shows the following dangers according to internally approved calculation methods for preparations:
      - Irritant
  - **Carcinogenic categories**
    - **IARC (International Agency for Research on Cancer)**
      - 1327-53-3 diarsenic trioxide 1
      - 13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate 1
      - 10099-74-8 lead dinitrate 2A
      - 10022-68-1 Nitric acid, cadmium salt, tetrahydrate 1
      - 543-81-7 acetic acid beryllium salt 1
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.
  · **Additional ecological information:**
  · General notes: Generally not hazardous for water
  · **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**
  · DOT Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid)
  · IMDG, IATA CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID)
Trade name: Custom Standard

- Transport hazard class(es)
  - DOT
    - Class 8
    - Label 8
  - IMDG, IATA
    - Class 8
    - Label 8

- Packing group
  - DOT, IMDG, IATA III

- 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 A
  - 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: 5 L
      - On cargo aircraft only: 60 L
  - IMDG
    - Limited quantities (LQ) 5L
    - Excepted quantities (EQ) Code: E1
      - Maximum net quantity per inner packaging: 30 ml
      - Maximum net quantity per outer packaging: 1000 ml

- UN "Model Regulation":
  - UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID), 8, III

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

(Contd. of page 7)
### Section 313 (Specific toxic chemical listings):

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>Nitric acid</td>
</tr>
<tr>
<td>7784-27-2</td>
<td>Aluminium nitrate</td>
</tr>
<tr>
<td>10196-18-6</td>
<td>Zinc(II) nitrate hexahydrate</td>
</tr>
<tr>
<td>10377-66-9</td>
<td>Manganese dinitrate</td>
</tr>
<tr>
<td>10022-31-8</td>
<td>Barium nitrate</td>
</tr>
<tr>
<td>7789-02-8</td>
<td>Chromium (III) nitrate nonahydrate</td>
</tr>
<tr>
<td>10031-43-3</td>
<td>Cupric nitrate</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>Diarsenic trioxide</td>
</tr>
<tr>
<td>13478-00-7</td>
<td>Nitric acid, nickel(2+) salt, hexahydrate</td>
</tr>
<tr>
<td>7440-36-0</td>
<td>Antimony</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>Lead dinitrate</td>
</tr>
<tr>
<td>10022-68-1</td>
<td>Nitric acid, cadmium salt, tetrahydrate</td>
</tr>
<tr>
<td>10102-45-1</td>
<td>Thallium nitrate</td>
</tr>
<tr>
<td>543-81-7</td>
<td>Acetic acid beryllium salt</td>
</tr>
<tr>
<td>7761-88-8</td>
<td>Silver nitrate</td>
</tr>
</tbody>
</table>

### TSCA (Toxic Substances Control Act):

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>Nitric acid</td>
</tr>
<tr>
<td>87-69-4</td>
<td>(+)-Tartaric acid</td>
</tr>
<tr>
<td>10377-66-9</td>
<td>Manganese dinitrate</td>
</tr>
<tr>
<td>10022-31-8</td>
<td>Barium nitrate</td>
</tr>
<tr>
<td>1344-57-6</td>
<td>Uranium oxide (UO2)</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>Diarsenic trioxide</td>
</tr>
<tr>
<td>7440-36-0</td>
<td>Antimony</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>Lead dinitrate</td>
</tr>
<tr>
<td>10102-45-1</td>
<td>Thallium nitrate</td>
</tr>
<tr>
<td>7761-88-8</td>
<td>Silver nitrate</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
</tr>
</tbody>
</table>

### TSCA new (21st Century Act) (Substances not listed)

#### Proposition 65

- **Chemicals known to cause cancer:**
  - 1327-53-3 Diarsenic trioxide
  - 13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate
  - 10099-74-8 Lead dinitrate
  - 10022-68-1 Nitric acid, cadmium salt, tetrahydrate
  - 543-81-7 Acetic acid beryllium salt

- **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: Custom Standard

- Carcinogenic categories

- EPA (Environmental Protection Agency)

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>Carcinogenic Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>10377-66-9</td>
<td>manganese dinitrate</td>
<td>D</td>
</tr>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>D, CBD(inh), NL(oral)</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>diarsenic trioxide</td>
<td>A</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</td>
<td>B2</td>
</tr>
<tr>
<td>10102-45-1</td>
<td>thallium nitrate</td>
<td>II</td>
</tr>
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</table>

- TLV (Threshold Limit Value established by ACGIH)

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>TLV Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>A4</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>diarsenic trioxide</td>
<td>A1</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</td>
<td>A3</td>
</tr>
</tbody>
</table>

- 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

GHS07

- Signal word Warning

- Hazard statements

Causes skin irritation.
Causes serious eye irritation.

- Precautionary statements

Wash thoroughly after handling.
Wear protective gloves / eye protection / face protection.
If on skin: Wash with plenty of water.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
Continue rinsing.
Specific treatment (see on this label).
If skin irritation occurs: Get medical advice/attention.
If eye irritation persists: Get medical advice/attention.
Take off contaminated clothing and wash it before reuse.

- 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 12/04/2017 / -

- 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
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
Trade name: Custom Standard

- 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 Irrit. 2: Skin corrosion/irritation – Category 2
- Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A