1 Identification

- Product identifier
- Trade name: Custom Standard
- Part number: ICUS-3644
- 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

  ![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.

(Contd. on page 2)
Trade name: Custom Standard

- Classification system:
  - NFPA ratings (scale 0 - 4)
    - Health = 2
    - Fire = 0
    - Reactivity = 0
  - HMIS-ratings (scale 0 - 4)
    - Health = 2
    - Fire = 0
    - Reactivity = 0

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

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>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid</td>
<td>1.98%</td>
</tr>
</tbody>
</table>

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: Do not allow to enter sewers/ surface or ground water.
Trade name: Custom Standard

- **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:**
    | CAS Number | Chemical Name               | PAC 1 Limit |
    |------------|----------------------------|-------------|
    | 7697-37-2  | nitric acid                | 0.16 ppm    |
    | 7664-39-3  | hydrogen fluoride          | 1.0 ppm     |
    | 87-69-4    | (+)-tartaric acid          | 1.6 mg/m³   |
    | 7784-27-2  | aluminium nitrate          | 83 mg/m³    |
    | 10026-22-9 | cobalt (II) nitrate hexahydrate | 0.3 mg/m³ |
    | 13478-00-7 | Nitric acid, nickel(2+) salt, hexahydrate | 1.5 mg/m³ |
    | 3251-23-8  | copper dinitrate           | 8.9 mg/m³   |
    | 10196-18-6 | zinc(II) nitrate hexahydrate | 27 mg/m³  |
    | 1327-53-3  | diarsenic trioxide         | 0.27 mg/m³  |
    | 7446-08-4  | selenium dioxide           | 0.84 mg/m³  |
    | 1313-27-5  | molybdenum trioxide        | 2.3 mg/m³   |
    | 7761-88-8  | silver nitrate             | 0.047 mg/m³ |
    | 10022-68-1 | Nitric acid, cadmium salt, tetrahydrate | 0.27 mg/m³ |
    | 7440-36-0  | antimony                   | 1.5 mg/m³   |
    | 10102-45-1 | thallium nitrate           | 0.078 mg/m³ |
    | 10099-74-8 | lead dinitrate             | 0.24 mg/m³  |
    | 13520-83-7 | uranyl nitrate, hexahydrate | 1.3 mg/m³  |
    | 7803-55-6  | ammonium trioxovanadate    | 0.01 mg/m³  |

  - **PAC-2:**
    | CAS Number | Chemical Name               | PAC 2 Limit |
    |------------|----------------------------|-------------|
    | 7697-37-2  | nitric acid                | 24 ppm      |
    | 7664-39-3  | hydrogen fluoride          | 24 ppm      |
    | 87-69-4    | (+)-tartaric acid          | 17 mg/m³    |
    | 7784-27-2  | aluminium nitrate          | 920 mg/m³   |
    | 10026-22-9 | cobalt (II) nitrate hexahydrate | 23 mg/m³  |
    | 13478-00-7 | Nitric acid, nickel(2+) salt, hexahydrate | 53 mg/m³ |
    | 3251-23-8  | copper dinitrate           | 31 mg/m³    |
    | 10196-18-6 | zinc(II) nitrate hexahydrate | 300 mg/m³ |
    | 1327-53-3  | diarsenic trioxide         | 3.0 mg/m³   |
    | 7446-08-4  | selenium dioxide           | 1.6 mg/m³   |
    | 1313-27-5  | molybdenum trioxide        | 43 mg/m³    |
    | 7761-88-8  | silver nitrate             | 0.9 mg/m³   |
    | 10022-68-1 | Nitric acid, cadmium salt, tetrahydrate | 2.1 mg/m³ |
    | 7440-36-0  | antimony                   | 13 mg/m³    |
    | 10102-45-1 | thallium nitrate           | 4.3 mg/m³   |
    | 10099-74-8 | lead dinitrate             | 180 mg/m³   |
    | 13520-83-7 | uranyl nitrate, hexahydrate | 7 mg/m³    |

(Contd. on page 4)
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
· Components with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>7697-37-2 nitric acid</th>
<th>PEL Long-term value: 5 mg/m³, 2 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>REL Short-term value: 10 mg/m³, 4 ppm</td>
</tr>
<tr>
<td></td>
<td>Long-term value: 5 mg/m³, 2 ppm</td>
</tr>
<tr>
<td></td>
<td>TLV Short-term value: 10 mg/m³, 4 ppm</td>
</tr>
<tr>
<td></td>
<td>Long-term value: 5.2 mg/m³, 2 ppm</td>
</tr>
</tbody>
</table>
45.2.5

- **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:** Undetermined.
    - **Boiling point/Boiling range:** 100°C (°F)

  - **Flash point:** Not applicable.

  - **Flammability (solid, gaseous):** Not applicable.
### 4.5.2.5

- 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 at 20°C (68 °F): 0.952 mPas
  - Kinematic: Not determined.
- Solvent content:  
  - Water: 97.8 %
  - 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)
      - Oral LD50: 1,276,000 mg/kg (rat)
      - Dermal LD50: 5,000 mg/kg
      - Inhalative LD50: 436 mg/L
Trade name: Custom Standard

<table>
<thead>
<tr>
<th>Substance ID</th>
<th>Substance Name</th>
<th>Inhalative LC50/4 h</th>
<th>Oral LD50</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>67 mg/L (rat)</td>
<td>1,276 mg/kg (rat)</td>
</tr>
<tr>
<td>7664-39-3</td>
<td>hydrogen fluoride</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **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)**
    - 10026-22-9 cobalt (II) nitrate hexahydrate 2B
    - 13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate 1
    - 1327-53-3 diarsenic trioxide 1
    - 7446-08-4 selenium dioxide 3
    - 10022-68-1 Nitric acid, cadmium salt, tetrahydrate 1
    - 10099-74-8 lead dinitrate 2A
    - 543-81-7 acetic acid beryllium salt 1
  - **NTP (National Toxicology Program)**
    - 13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate K
    - 1327-53-3 diarsenic trioxide K
    - 10022-68-1 Nitric acid, cadmium salt, tetrahydrate K
    - 10099-74-8 lead dinitrate R
    - 543-81-7 acetic acid beryllium salt 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.
  - **Additional ecological information:**
  - **General notes:**
    Water hazard class 1 (Self-assessment): slightly hazardous for water
    Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
  - **Results of PBT and vPvB assessment**
    - **PBT:** Not applicable.
    - **vPvB:** Not applicable.
Safety Data Sheet
acc. to OSHA HCS

Printing date 10/19/2017 Version Number 1 Reviewed on 10/19/2017

Trade name: Custom Standard

· 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)

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

  · IMDG, IATA
    · Class 8 Corrosive substances
    · 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.

(Contd. on page 9)
### 45.2.5 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
    - 7664-39-3 hydrogen fluoride
    - 1327-53-3 diarsenic trioxide

  - **Section 313 (Specific toxic chemical listings):**
    - 7697-37-2 nitric acid
    - 7664-39-3 hydrogen fluoride
    - 7784-27-2 aluminium nitrate
    - 7789-02-8 chromium (III) nitrate nonahydrate
    - 10026-22-9 cobalt (II) nitrate hexahydrate
    - 13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate
    - 3251-23-8 copper dinitrate
    - 10196-18-6 zinc(II) nitrate hexahydrate
    - 1327-53-3 diarsenic trioxide
    - 7446-08-4 selenium dioxide
    - 1313-27-5 molybdenum trioxide
    - 7761-88-8 silver nitrate
    - 10022-68-1 Nitric acid, cadmium salt, tetrahydrate
    - 7440-36-0 antimony
    - 10102-45-1 thallium nitrate
    - 10099-74-8 lead dinitrate
    - 7803-55-6 ammonium trioxovanadate
    - 543-81-7 acetic acid beryllium salt

- **TSCA (Toxic Substances Control Act):**
  - 7697-37-2 nitric acid
  - 7664-39-3 hydrogen fluoride
  - 87-69-4 (+)-tartaric acid
Trade name: Custom Standard

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>3251-23-8</td>
<td>copper dinitrate</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>diarsenic trioxide</td>
</tr>
<tr>
<td>7446-08-4</td>
<td>selenium dioxide</td>
</tr>
<tr>
<td>1313-27-5</td>
<td>molybdenum trioxide</td>
</tr>
<tr>
<td>7761-88-8</td>
<td>silver nitrate</td>
</tr>
<tr>
<td>7440-36-0</td>
<td>antimony</td>
</tr>
<tr>
<td>10102-45-1</td>
<td>thallium nitrate</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</td>
</tr>
<tr>
<td>7803-55-6</td>
<td>ammonium trioxovanadate</td>
</tr>
<tr>
<td>16962-40-6</td>
<td>ammonium hexafluorotitanate</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>water</td>
</tr>
</tbody>
</table>

**Proposition 65**

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

**Carcinogenic categories**

- **EPA (Environmental Protection Agency)**
  - 1327-53-3 diarsenic trioxide A
  - 7446-08-4 selenium dioxide D
  - 10102-45-1 thallium nitrate II
  - 10099-74-8 lead dinitrate B2

- **TLV (Threshold Limit Value established by ACGIH)**
  - 1327-53-3 diarsenic trioxide A1
  - 10099-74-8 lead dinitrate A3
  - 13520-83-7 uranyl nitrate, hexahydrate A1

- **NIOSH-Ca (National Institute for Occupational Safety and Health)**
  - 13520-83-7 uranyl nitrate, hexahydrate

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

**Hazard pictograms**

- GHS07

(Contd. on page 11)
45.2.5  ·  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  10/19/2017 / -
·  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
  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