1 Identification

· Product identifier
  · Trade name: Custom Standard
  · Part number: ICUS-4928
  · 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.
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.

 Dangerous components:
 7697-37-2 nitric acid 1.98%

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.
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

<table>
<thead>
<tr>
<th>PAC-1:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid</td>
<td>0.16 ppm</td>
<td></td>
</tr>
<tr>
<td>10022-31-8 barium nitrate</td>
<td>2.9 mg/m³</td>
<td></td>
</tr>
<tr>
<td>7664-39-3 hydrogen fluoride</td>
<td>1.0 ppm</td>
<td></td>
</tr>
<tr>
<td>87-69-4 (+)-tartaric acid</td>
<td>1.6 mg/m³</td>
<td></td>
</tr>
<tr>
<td>13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>1.5 mg/m³</td>
<td></td>
</tr>
<tr>
<td>10196-18-6 zinc(II) nitrate hexahydrate</td>
<td>27 mg/m³</td>
<td></td>
</tr>
<tr>
<td>1313-27-5 molybdenum trioxide</td>
<td>2.5 mg/m³</td>
<td></td>
</tr>
<tr>
<td>7446-08-4 selenium dioxide</td>
<td>0.84 mg/m³</td>
<td></td>
</tr>
<tr>
<td>7803-55-6 ammonium trioxovanadate</td>
<td>0.01 mg/m³</td>
<td></td>
</tr>
<tr>
<td>10099-74-8 lead dinitrate</td>
<td>0.24 mg/m³</td>
<td></td>
</tr>
<tr>
<td>10026-22-9 cobalt (II) nitrate hexahydrate</td>
<td>0.3 mg/m³</td>
<td></td>
</tr>
<tr>
<td>7440-36-0 antimony</td>
<td>1.5 mg/m³</td>
<td></td>
</tr>
<tr>
<td>1327-53-3 diarsenic trioxide</td>
<td>0.27 mg/m³</td>
<td></td>
</tr>
<tr>
<td>10022-68-1 Nitric acid, cadmium salt, tetrahydrate</td>
<td>0.27 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-2:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid</td>
<td>24 ppm</td>
<td></td>
</tr>
<tr>
<td>10022-31-8 barium nitrate</td>
<td>350 mg/m³</td>
<td></td>
</tr>
<tr>
<td>7664-39-3 hydrogen fluoride</td>
<td>24 ppm</td>
<td></td>
</tr>
<tr>
<td>87-69-4 (+)-tartaric acid</td>
<td>17 mg/m³</td>
<td></td>
</tr>
<tr>
<td>13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>53 mg/m³</td>
<td></td>
</tr>
<tr>
<td>10196-18-6 zinc(II) nitrate hexahydrate</td>
<td>300 mg/m³</td>
<td></td>
</tr>
<tr>
<td>1313-27-5 molybdenum trioxide</td>
<td>43 mg/m³</td>
<td></td>
</tr>
<tr>
<td>7446-08-4 selenium dioxide</td>
<td>1.6 mg/m³</td>
<td></td>
</tr>
<tr>
<td>7803-55-6 ammonium trioxovanadate</td>
<td>0.11 mg/m³</td>
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</tr>
<tr>
<td>10099-74-8 lead dinitrate</td>
<td>180 mg/m³</td>
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</tr>
<tr>
<td>10026-22-9 cobalt (II) nitrate hexahydrate</td>
<td>23 mg/m³</td>
<td></td>
</tr>
<tr>
<td>7440-36-0 antimony</td>
<td>13 mg/m³</td>
<td></td>
</tr>
<tr>
<td>1327-53-3 diarsenic trioxide</td>
<td>3.0 mg/m³</td>
<td></td>
</tr>
<tr>
<td>10022-68-1 Nitric acid, cadmium salt, tetrahydrate</td>
<td>2.1 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-3:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid</td>
<td>92 ppm</td>
<td></td>
</tr>
<tr>
<td>10022-31-8 barium nitrate</td>
<td>2,100 mg/m³</td>
<td></td>
</tr>
<tr>
<td>7664-39-3 hydrogen fluoride</td>
<td>44 ppm</td>
<td></td>
</tr>
<tr>
<td>87-69-4 (+)-tartaric acid</td>
<td>100 mg/m³</td>
<td></td>
</tr>
<tr>
<td>13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>320 mg/m³</td>
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</tr>
<tr>
<td>10196-18-6 zinc(II) nitrate hexahydrate</td>
<td>1,800 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>
# Safety Data Sheet

acc. to OSHA HCS

Trade name: Custom Standard

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1313-27-5</td>
<td>molybdenum trioxide</td>
<td>260 mg/m³</td>
</tr>
<tr>
<td>7446-08-4</td>
<td>selenium dioxide</td>
<td>9.5 mg/m³</td>
</tr>
<tr>
<td>7803-55-6</td>
<td>ammonium trioxovanadate</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>10026-22-9</td>
<td>cobalt (II) nitrate hexahydrate</td>
<td>140 mg/m³</td>
</tr>
<tr>
<td>7440-36-0</td>
<td>antimony</td>
<td>80 mg/m³</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>diarsenic trioxide</td>
<td>9.1 mg/m³</td>
</tr>
<tr>
<td>10022-68-1</td>
<td>Nitric acid, cadmium salt, tetrahydrate</td>
<td>13 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**
  - **Components with limit values that require monitoring at the workplace:**
    - 7697-37-2 nitric acid
- **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 (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**
  - **Vapor density**
  - **Evaporation rate**
  - **Solubility in / Miscibility with**
    - Water: Not miscible or difficult to mix.
46.0.5

· Partition coefficient (n-octanol/water): Not determined.

· Viscosity:
  Dynamic at 20 °C (68 °F): 0.952 mPas
  Kinematic: Not determined.

· Solvent content:
  Water: 97.4 %
  VOC content:
  0.00 %
  0.0 g/l / 0.00 lb/gl

· Solids content:
  0.5 %

· 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 LC50/4 h 436 mg/L

  7697-37-2 nitric acid
  Inhalative LC50/4 h 67 mg/L (rat)

  7664-39-3 hydrogen fluoride
  Oral LD50 1,276 mg/kg (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)

  13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate
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.
  - 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

(Contd. on page 8)
### Trade name: Custom Standard

<table>
<thead>
<tr>
<th><strong>UN proper shipping name</strong></th>
<th>Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DOT</strong></td>
<td></td>
</tr>
<tr>
<td><strong>IMDG, IATA</strong></td>
<td>CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID)</td>
</tr>
</tbody>
</table>

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

| **Packing group**             | III                                                      |
| **DOT, IMDG, IATA**           |                                                          |

| **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 |

(Contd. on page 9)
## 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
    - 10022-31-8 barium nitrate
    - 7664-39-3 hydrogen fluoride
    - 13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate
    - 10031-43-3 cupric nitrate
    - 10196-18-6 zinc(II) nitrate hexahydrate
    - 1313-27-5 molybdenum trioxide
    - 7789-02-8 chromium (III) nitrate nonahydrate
    - 7446-08-4 selenium dioxide
    - 7803-55-6 ammonium trioxovanadate
    - 10099-74-8 lead dinitrate
    - 10026-22-9 cobalt (II) nitrate hexahydrate
    - 7440-36-0 antimony
    - 1327-53-3 diarsenic trioxide
    - 543-81-7 acetic acid beryllium salt
    - 10022-68-1 Nitric acid, cadmium salt, tetrahydrate
- **TSCA (Toxic Substances Control Act):**
  - 7697-37-2 nitric acid
  - 10022-31-8 barium nitrate
  - 7664-39-3 hydrogen fluoride
  - 87-69-4 (+)-tartaric acid
  - 1313-27-5 molybdenum trioxide
  - 7446-08-4 selenium dioxide
  - 7803-55-6 ammonium trioxovanadate
  - 10099-74-8 lead dinitrate
  - 7440-36-0 antimony
  - 1327-53-3 diarsenic trioxide
  - 7732-18-5 water
- **TSCA new (21st Century Act) (Substances not listed)**
- **Proposition 65**
  - **Chemicals known to cause cancer:**
    - 13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate
    - 10099-74-8 lead dinitrate
    - 1327-53-3 diarsenic trioxide
Trade name: Custom Standard

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>543-81-7</td>
<td>acetic acid beryllium salt</td>
</tr>
<tr>
<td>10022-68-1</td>
<td>Nitric acid, cadmium salt, tetrahydrate</td>
</tr>
</tbody>
</table>

- **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)**
<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>D, CBD(inh), NL(oral)</td>
</tr>
<tr>
<td>7446-08-4</td>
<td>selenium dioxide</td>
<td>D</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</td>
<td>B2</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>diarsenic trioxide</td>
<td>A</td>
</tr>
</tbody>
</table>

  **TLV (Threshold Limit Value established by ACGIH)**
<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>A4</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</td>
<td>A3</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>diarsenic trioxide</td>
<td>A1</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: 12/01/2017 / -
- 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