1 Identification

- Product identifier
  - Trade name: Custom Standard
  - Part number: ICUS-3457-50
  - 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.
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 Value |
    |------------|-------------------------------------|-----------|
    | 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 |
    | 10022-31-8 | barium nitrate                      | 2.9 mg/m³ |
    | 10042-76-9 | strontium nitrate                   | 5.7 mg/m³ |
    | 10043-35-3 | boric acid                          | 6 mg/m³   |
    | 7782-61-8  | iron (III) nitrate nonahydrate      | 22 mg/m³  |
    | 7784-27-2  | aluminium nitrate                   | 83 mg/m³  |
    | 13478-00-7 | Nitric acid, nickel(2+) salt, hexahydrate | 1.5 mg/m³ |
    | 10377-66-9 | manganese dinitrate                 | 9.8 mg/m³ |
    | 3251-23-8  | copper dinitrate                    | 8.9 mg/m³ |
    | 7440-36-0  | antimony                            | 1.5 mg/m³ |
    | 10196-18-6 | zinc(II) nitrate hexahydrate        | 27 mg/m³  |
    | 7789-09-5  | ammonium dichromate                 | 0.37 mg/m³|
    | 7446-08-4  | selenium dioxide                    | 0.84 mg/m³|
    | 10099-74-8 | lead dinitrate                      | 0.24 mg/m³|
    | 10022-68-1 | Nitric acid, cadmium salt, tetrahydrate | 0.27 mg/m³|

  · **PAC-2:**

    | CAS Number | Chemical Name                        | PAC Value |
    |------------|-------------------------------------|-----------|
    | 7697-37-2  | nitric acid                         | 24 ppm    |
    | 7664-39-3  | hydrogen fluoride                   | 24 ppm    |
    | 87-69-4    | (+)-tartaric acid                   | 17 mg/m³  |
    | 10022-31-8 | barium nitrate                      | 350 mg/m³ |
    | 10042-76-9 | strontium nitrate                   | 62 mg/m³  |
    | 10043-35-3 | boric acid                          | 23 mg/m³  |
    | 7782-61-8  | iron (III) nitrate nonahydrate      | 110 mg/m³ |
    | 7784-27-2  | aluminium nitrate                   | 920 mg/m³ |
    | 13478-00-7 | Nitric acid, nickel(2+) salt, hexahydrate | 53 mg/m³  |
    | 10377-66-9 | manganese dinitrate                 | 16 mg/m³  |
    | 3251-23-8  | copper dinitrate                    | 31 mg/m³  |
    | 7440-36-0  | antimony                            | 13 mg/m³  |
    | 10196-18-6 | zinc(II) nitrate hexahydrate        | 300 mg/m³ |
    | 7789-09-5  | ammonium dichromate                 | 6.3 mg/m³ |
    | 7446-08-4  | selenium dioxide                    | 1.6 mg/m³ |
    | 10099-74-8 | lead dinitrate                      | 180 mg/m³ |
    | 10022-68-1 | Nitric acid, cadmium salt, tetrahydrate | 2.1 mg/m³ |
Trade name: Custom Standard

<table>
<thead>
<tr>
<th>PAC-3:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid</td>
<td>92 ppm</td>
</tr>
<tr>
<td>7664-39-3 hydrogen fluoride</td>
<td>44 ppm</td>
</tr>
<tr>
<td>87-69-4 (+)-tartaric acid</td>
<td>100 mg/m³</td>
</tr>
<tr>
<td>10022-31-8 barium nitrate</td>
<td>2,100 mg/m³</td>
</tr>
<tr>
<td>10042-76-9 strontium nitrate</td>
<td>370 mg/m³</td>
</tr>
<tr>
<td>10043-35-3 boric acid</td>
<td>830 mg/m³</td>
</tr>
<tr>
<td>7782-61-8 iron (III) nitrate nonahydrate</td>
<td>640 mg/m³</td>
</tr>
<tr>
<td>7784-27-2 aluminium nitrate</td>
<td>5,500 mg/m³</td>
</tr>
<tr>
<td>13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>320 mg/m³</td>
</tr>
<tr>
<td>10377-66-9 manganese dinitrate</td>
<td>96 mg/m³</td>
</tr>
<tr>
<td>3251-23-8 copper dinitrate</td>
<td>190 mg/m³</td>
</tr>
<tr>
<td>7440-36-0 antimony</td>
<td>80 mg/m³</td>
</tr>
<tr>
<td>10196-18-6 zinc(II) nitrate hexahydrate</td>
<td>1,800 mg/m³</td>
</tr>
<tr>
<td>7789-09-5 ammonium dichromate</td>
<td>38 mg/m³</td>
</tr>
<tr>
<td>7446-08-4 selenium dioxide</td>
<td>9.5 mg/m³</td>
</tr>
<tr>
<td>10099-74-8 lead dinitrate</td>
<td>1,100 mg/m³</td>
</tr>
<tr>
<td>10022-68-1 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:

<table>
<thead>
<tr>
<th>PAC-3:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid</td>
<td></td>
</tr>
<tr>
<td>PEL Long-term value: 5 mg/m³, 2 ppm</td>
<td></td>
</tr>
<tr>
<td>REL Short-term value: 10 mg/m³, 4 ppm</td>
<td></td>
</tr>
<tr>
<td>Long-term value: 5 mg/m³, 2 ppm</td>
<td></td>
</tr>
<tr>
<td>TLV Short-term value: 10 mg/m³, 4 ppm</td>
<td></td>
</tr>
<tr>
<td>Long-term value: 5.2 mg/m³, 2 ppm</td>
<td></td>
</tr>
</tbody>
</table>
· Additional information: The lists that were valid during the creation were used as basis.
Trade name: Custom Standard

- **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.
  - **Ignition temperature:**
    - Decomposition temperature: Not determined.
Trade name: Custom Standard

45.2.5

- **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:** Not determined.
- **Density:**
  - 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: 97.5 %
  - VOC content: 0.00 %
  - 0.0 g/l / 0.00 lb/gl
- **Solids content:** 0.4 %
- **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         |
Trade name: Custom Standard

### 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**

<table>
<thead>
<tr>
<th>IARC (International Agency for Research on Cancer)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>1</td>
</tr>
<tr>
<td>7789-09-5 ammonium dichromate</td>
<td>1</td>
</tr>
<tr>
<td>7446-08-4 selenium dioxide</td>
<td>3</td>
</tr>
<tr>
<td>10099-74-8 lead dinitrate</td>
<td>2A</td>
</tr>
<tr>
<td>10022-68-1 Nitric acid, cadmium salt, tetrahydrate</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NTP (National Toxicology Program)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>K</td>
</tr>
<tr>
<td>7789-09-5 ammonium dichromate</td>
<td>K</td>
</tr>
<tr>
<td>10099-74-8 lead dinitrate</td>
<td>R</td>
</tr>
<tr>
<td>10022-68-1 Nitric acid, cadmium salt, tetrahydrate</td>
<td>K</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OSHA-Ca (Occupational Safety &amp; Health Administration)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>None of the ingredients is listed.</td>
<td></td>
</tr>
</tbody>
</table>

### 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

- UN proper shipping name
  - DOT
  - IMDG, IATA
    Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid)
    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.
### 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

- **Section 313 (Specific toxic chemical listings):**
  - 7697-37-2 nitric acid
  - 7664-39-3 hydrogen fluoride
  - 10022-31-8 barium nitrate
  - 10042-76-9 strontium nitrate
  - 7782-61-8 iron (III) nitrate nonahydrate
  - 7784-27-2 aluminium nitrate
  - 13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate
  - 10377-66-9 manganese dinitrate
  - 3251-23-8 copper dinitrate
  - 7440-36-0 antimony
  - 10196-18-6 zinc(II) nitrate hexahydrate
  - 7789-09-5 ammonium dichromate
  - 7446-08-4 selenium dioxide
  - 10099-74-8 lead dinitrate
  - 10022-68-1 Nitric acid, cadmium salt, tetrahydrate

- **TSCA (Toxic Substances Control Act):**
  - 7697-37-2 nitric acid
  - 7664-39-3 hydrogen fluoride
  - 87-69-4 (+)-tartaric acid
  - 10022-31-8 barium nitrate
  - 10042-76-9 strontium nitrate
  - 10043-35-3 boric acid
  - 10377-66-9 manganese dinitrate
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>7440-36-0</td>
<td>antimony</td>
</tr>
<tr>
<td>7789-09-5</td>
<td>ammonium dichromate</td>
</tr>
<tr>
<td>7446-08-4</td>
<td>selenium dioxide</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</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
    - 7789-09-5  ammonium dichromate
    - 10099-74-8  lead dinitrate
    - 10022-68-1  Nitric acid, cadmium salt, tetrahydrate
  - **Chemicals known to cause reproductive toxicity for females:**
    - 7789-09-5  ammonium dichromate
  - **Chemicals known to cause reproductive toxicity for males:**
    - 7789-09-5  ammonium dichromate
  - **Chemicals known to cause developmental toxicity:**
    - 7789-09-5  ammonium dichromate
  - **Carcinogenic categories**
    - **EPA (Environmental Protection Agency)**
      - 10022-31-8  barium nitrate  D, CBD(inh), NL(oral)
      - 10043-35-3  boric acid  I (oral)
      - 10377-66-9  manganese dinitrate  D
      - 7789-09-5  ammonium dichromate  A(inh), D(oral), K/L(inh), CBD(oral)
      - 7446-08-4  selenium dioxide  D
      - 10099-74-8  lead dinitrate  B2
  - **TLV (Threshold Limit Value established by ACGIH)**
    - 10022-31-8  barium nitrate  A4
    - 10043-35-3  boric acid  A4
    - 7789-09-5  ammonium dichromate  A1
    - 10099-74-8  lead dinitrate  A3
  - **NIOSH-Ca (National Institute for Occupational Safety and Health)**
    - 7789-09-5  ammonium dichromate

- **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.


**Trade name: Custom Standard**

- **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** 09/06/2017 / -

- **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)
  - 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