1 Identification

· Product identifier
· Trade name: Custom Standard
· Part number: ICUS-3385
· 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 = 1
    - Fire = 0
    - Reactivity = 0
  - HMIS-ratings (scale 0 - 4)
    - Health = 1
    - 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>
<tr>
<td>471-34-1 calcium carbonate</td>
<td>1.249%</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.
45.2.5

- **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>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid</td>
<td>0.16 ppm</td>
</tr>
<tr>
<td>471-34-1 calcium carbonate</td>
<td>45 mg/m³</td>
</tr>
<tr>
<td>13446-18-9 magnesium nitrate hexahydrate</td>
<td>16 mg/m³</td>
</tr>
<tr>
<td>7631-99-4 sodium nitrate, containing in the dry state more than 16,3 per cent by weight of nitrogen</td>
<td>4.1 mg/m³</td>
</tr>
<tr>
<td>16919-19-0 alkali fluorosilicates (NH₄)</td>
<td>12 mg/m³</td>
</tr>
<tr>
<td>7664-39-3 hydrogen fluoride</td>
<td>1.0 ppm</td>
</tr>
<tr>
<td>10043-35-3 boric acid</td>
<td>6 mg/m³</td>
</tr>
<tr>
<td>7722-76-1 ammonium dihydrogenorthophosphate</td>
<td>17 mg/m³</td>
</tr>
<tr>
<td>7757-79-1 potassium nitrate</td>
<td>9 mg/m³</td>
</tr>
<tr>
<td>10022-31-8 barium nitrate</td>
<td>2.9 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-2:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid</td>
<td>24 ppm</td>
</tr>
<tr>
<td>471-34-1 calcium carbonate</td>
<td>210 mg/m³</td>
</tr>
<tr>
<td>13446-18-9 magnesium nitrate hexahydrate</td>
<td>180 mg/m³</td>
</tr>
<tr>
<td>7631-99-4 sodium nitrate, containing in the dry state more than 16,3 per cent by weight of nitrogen</td>
<td>45 mg/m³</td>
</tr>
<tr>
<td>16919-19-0 alkali fluorosilicates (NH₄)</td>
<td>130 mg/m³</td>
</tr>
<tr>
<td>7664-39-3 hydrogen fluoride</td>
<td>24 ppm</td>
</tr>
<tr>
<td>10043-35-3 boric acid</td>
<td>23 mg/m³</td>
</tr>
<tr>
<td>7722-76-1 ammonium dihydrogenorthophosphate</td>
<td>190 mg/m³</td>
</tr>
<tr>
<td>7757-79-1 potassium nitrate</td>
<td>100 mg/m³</td>
</tr>
<tr>
<td>10022-31-8 barium nitrate</td>
<td>350 mg/m³</td>
</tr>
</tbody>
</table>

<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>471-34-1 calcium carbonate</td>
<td>1,300 mg/m³</td>
</tr>
<tr>
<td>13446-18-9 magnesium nitrate hexahydrate</td>
<td>1,100 mg/m³</td>
</tr>
<tr>
<td>7631-99-4 sodium nitrate, containing in the dry state more than 16,3 per cent by weight of nitrogen</td>
<td>270 mg/m³</td>
</tr>
<tr>
<td>16919-19-0 alkali fluorosilicates (NH₄)</td>
<td>780 mg/m³</td>
</tr>
<tr>
<td>7664-39-3 hydrogen fluoride</td>
<td>44 ppm</td>
</tr>
<tr>
<td>10043-35-3 boric acid</td>
<td>830 mg/m³</td>
</tr>
<tr>
<td>7722-76-1 ammonium dihydrogenorthophosphate</td>
<td>1,100 mg/m³</td>
</tr>
<tr>
<td>7757-79-1 potassium nitrate</td>
<td>600 mg/m³</td>
</tr>
<tr>
<td>10022-31-8 barium nitrate</td>
<td>2,100 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>Substance Code</th>
<th>Component</th>
<th>PEL Long-term</th>
<th>REL Short-term</th>
<th>TLV Short-term</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>Long-term value: 5 mg/m³, 2 ppm</td>
<td>Short-term value: 10 mg/m³, 4 ppm</td>
<td>Short-term value: 10 mg/m³, 4 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long-term value: 5 mg/m³, 2 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>471-34-1</td>
<td>calcium carbonate</td>
<td>Long-term value: 15* 5** mg/m³</td>
<td>Long-term value: 5 mg/m³, 2 ppm</td>
<td>Long-term value: 5.2 mg/m³, 2 ppm</td>
</tr>
</tbody>
</table>

*total dust **respirable fraction

- 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
### 9 Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Information on basic physical and chemical properties</strong></td>
<td></td>
</tr>
<tr>
<td><strong>General Information</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Appearance:</strong></td>
<td></td>
</tr>
<tr>
<td>Form</td>
<td>Fluid</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not determined</td>
</tr>
<tr>
<td>pH-value</td>
<td>Not determined</td>
</tr>
<tr>
<td>Change in condition</td>
<td></td>
</tr>
<tr>
<td>Melting point/Melting range</td>
<td>Undetermined</td>
</tr>
<tr>
<td>Boiling point/Boiling range</td>
<td>100°C (°F)</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (solid, gaseous)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td></td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not determined</td>
</tr>
<tr>
<td>Auto igniting</td>
<td>Product is not selfigniting.</td>
</tr>
<tr>
<td>Danger of explosion</td>
<td>Product does not present an explosion hazard.</td>
</tr>
<tr>
<td>Explosion limits</td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>Not determined</td>
</tr>
<tr>
<td>Upper</td>
<td>Not determined</td>
</tr>
<tr>
<td>Vapor pressure at 20°C (68 °F):</td>
<td>23 hPa (mm Hg)</td>
</tr>
<tr>
<td>Density at 20°C (68 °F):</td>
<td>1.04238 g/cm³ (lbs/gal)</td>
</tr>
<tr>
<td>Relative density</td>
<td>Not determined</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not determined</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not determined</td>
</tr>
<tr>
<td>Solubility in / Miscibility with Water</td>
<td>Not miscible or difficult to mix.</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water)</td>
<td>Not determined</td>
</tr>
</tbody>
</table>
Trade name: Custom Standard

- Viscosity:
  - Dynamic at 20°C (68 °F): 0.952 mPas
  - 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) | Oral  | Dermal | Inhalative |
    |-------------------------------|-------|--------|------------|
    | LD50                          | 66,360 mg/kg (rat) | 4,918 mg/kg | 380 mg/L |
    
    7697-37-2 nitric acid
    - Inhalative LC50 67 mg/L (rat)

    471-34-1 calcium carbonate
    - Oral LD50 6,450 mg/kg (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)
  - 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.
    - **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)
- **Transport hazard class(es)**
  - **DOT**
    - **Class** 8 Corrosive substances
Trade name: Custom Standard

| · 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                                                                             |
| 13446-18-9 magnesium nitrate hexahydrate                                                          |
| 7664-39-3 hydrogen fluoride                                                                         |
| 7757-79-1 potassium nitrate                                                                         |
| 10022-31-8 barium nitrate                                                                           |
Trade name: Custom Standard

- **TSCA (Toxic Substances Control Act):**
  - 7697-37-2 nitric acid
  - 471-34-1 calcium carbonate
  - 7631-99-4 sodium nitrate, containing in the dry statement more than 16.3 per cent by weight of nitrogen
  - 16919-19-0 alkali fluorosilicates (NH4)
  - 7664-39-3 hydrogen fluoride
  - 10043-35-3 boric acid
  - 7722-76-1 ammonium dihydrogenorthophosphate
  - 7757-79-1 potassium nitrate
  - 10022-31-8 barium nitrate
  - 7732-18-5 water

- **Proposition 65**
  - **Chemicals known to cause cancer:** None of the ingredients is listed.
  - **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:** None of the ingredients is listed.

- **Carcinogenic categories**
  - **EPA (Environmental Protection Agency)**
    - 10043-35-3 boric acid I (oral)
    - 10022-31-8 barium nitrate D, CBD (inh), NL (oral)
  - **TLV (Threshold Limit Value established by ACGIH)**
    - 10043-35-3 boric acid A4
    - 10022-31-8 barium nitrate A4
  - **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.

(Contd. on page 10)
Trade name: Custom Standard

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 08/14/2017 / -

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