* 1 Identification

- **Product identifier**
- **Trade name:** Reducing Reagent
- **Part number:** 850001
- **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: +1-800-424-9300
  Outside US: +1-703-527-3887

* 2 Hazard(s) identification

- **Classification of the substance or mixture**
  - GHS02 Flame
  - Flam. Liq. 3 H226 Flammable liquid and vapor.
  - GHS08 Health hazard
  - Repr. 1A H360 May damage fertility or the unborn child.
  - 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**
    - GHS02
    - GHS07
    - GHS08
- **Signal word** Danger
- **Hazard-determining components of labeling:**
  - bis(2-methoxyethyl) ether
- **Hazard statements**
  - Flammable liquid and vapor.
Trade name: Reducing Reagent

Causes skin irritation.
Causes serious eye irritation.
May damage fertility or the unborn child.

· Precautionary statements
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wash thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/attention.
Specific treatment (see on this label).
Take off contaminated clothing and wash it before reuse.
If skin irritation occurs: Get medical advice/attention.
If eye irritation persists: Get medical advice/attention.
In case of fire: Use for extinction: CO2, powder or water spray.
Store in a well-ventilated place. Keep cool.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· Classification system:
· NFPA ratings (scale 0 - 4)

<table>
<thead>
<tr>
<th></th>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

· HMIS-ratings (scale 0 - 4)

<table>
<thead>
<tr>
<th></th>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>*2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Fire</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reactivity</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

· Other hazards

3 Composition/information on ingredients

· Chemical characterization: Mixtures
· Description: Mixture of the substances listed below with nonhazardous additions.

· Dangerous components:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>111-96-6</td>
<td>bis(2-methoxyethyl) ether</td>
<td>99.0%</td>
</tr>
<tr>
<td>16940-66-2</td>
<td>sodium borohydride</td>
<td>1.0%</td>
</tr>
</tbody>
</table>
4 First-aid measures

- **Description of first aid measures**
  - **General information:** Immediately remove any clothing soiled by the product.
  - **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:**
  - CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

- **For safety reasons unsuitable extinguishing agents:** Water with full jet

- **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**
  - Wear protective equipment. Keep unprotected persons away.

- **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).
  - Dispose contaminated material as waste according to item 13.
  - Ensure adequate ventilation.

- **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>111-96-6</td>
<td>bis(2-methoxyethyl) ether</td>
<td>15 ppm</td>
</tr>
<tr>
<td>16940-66-2</td>
<td>sodium borohydrde</td>
<td>0.49 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-2:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>111-96-6</td>
<td>bis(2-methoxyethyl) ether</td>
<td>91 ppm</td>
</tr>
<tr>
<td>16940-66-2</td>
<td>sodium borohydrde</td>
<td>5.3 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-3:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>111-96-6</td>
<td>bis(2-methoxyethyl) ether</td>
<td>190 ppm</td>
</tr>
<tr>
<td>16940-66-2</td>
<td>sodium borohydrde</td>
<td>32 mg/m³</td>
</tr>
</tbody>
</table>
Trade name: Reducing Reagent

7 Handling and storage

- **Handling:**
- **Precautions for safe handling** Open and handle receptacle with care.
- **Information about protection against explosions and fires:**
  - Keep ignition sources away - Do not smoke.
  - Protect against electrostatic charges.
  - Keep respiratory protective device available.
- **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:**
  - The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **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.
      - Store protective clothing separately.
      - Avoid contact with the eyes and skin.
    - **Breathing equipment:** Not required.
    - **Protection of hands:**
      - **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.

(Contd. on page 5)
### 9 Physical and chemical properties

- **Information on basic physical and chemical properties**
- **General Information**
  - **Appearance:**
    - **Form:** Fluid
    - **Color:** According to product specification
  - **Odor:** Characteristic
  - **Odor threshold:** Not determined.
  - **pH-value:** Not determined.

- **Change in condition**
  - **Melting point/Melting range:** -68 °C (-90.4 °F)
  - **Boiling point/Boiling range:** 159.8 °C (319.6 °F)

- **Flash point:** 51 °C (123.8 °F)

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

- **Ignition temperature:** 190 °C (374 °F)

- **Decomposition temperature:** Not determined.

- **Auto igniting:** Product is not selfigniting.

- **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

- **Explosion limits:**
  - **Lower:** Not determined.
  - **Upper:** Not determined.

- **Vapor pressure at 20 °C (68 °F):** 2.7 hPa (2 mm Hg)

- **Density at 20 °C (68 °F):** 0.93757 g/cm³ (7.82402 lbs/gal)

- **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):** 1.88 mPas
  - **Kinematic:** Not determined.

- **Solvent content:**
  - **Organic solvents:** 99.0 %

(Contd. on page 6)
### Trade name: Reducing Reagent

<table>
<thead>
<tr>
<th>VOC content:</th>
<th>99.00 %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>928.2 g/l / 7.75 lb/gl</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solids content:</th>
<th>0.0 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>· Other information</td>
<td>No further relevant information available.</td>
</tr>
</tbody>
</table>

### 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**

<table>
<thead>
<tr>
<th>ATE (Acute Toxicity Estimate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
</tr>
<tr>
<td>Dermal</td>
</tr>
</tbody>
</table>

111-96-6 bis(2-methoxyethyl) ether

| Oral  | LD50  | 5,400 mg/kg (rat) |

16940-66-2 sodium borohydride

| Oral  | LD50  | 162 mg/kg (rat) |
| Dermal | LD50  | 4,000 mg/kg (rabbit) |

- **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.
  - **NTP (National Toxicology Program)** None of the ingredients is listed.
  - **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.
- 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 packaging:
- Recommendation: Disposal must be made according to official regulations.

14 Transport information

- UN-Number
- DOT, IMDG, IATA UN3272
- UN proper shipping name
- DOT Esters, n.o.s. (bis(2-methoxyethyl) ether)
- IMDG, IATA ESTERS, N.O.S. (bis(2-methoxyethyl) ether)
- Transport hazard class(es)
- DOT
  - Class 3 Flammable liquids
  - Label 3
- IMDG, IATA
  - Class 3 Flammable liquids
  - Label 3
| Trade name: Reducing Reagent |

- **Packing group**
  - DOT, IMDG, IATA: III  
- **Environmental hazards:** Not applicable.
- **Special precautions for user** Warning: Flammable liquids
- **Danger code (Kemler):** 30
- **EMS Number:** F-E,S-D
- **Stowage Category** A
- **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: 30 L  
    - On cargo aircraft only: 30 L
  - **IMDG**  
    - Limited quantities (LQ): 10 L  
    - 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 3272 ESTERS, N.O.S. (BIS(2-METHOXYETHYL) ETHER), 3, III

---

### 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Sara**
  - **Section 355 (extremely hazardous substances):** None of the ingredients is listed.
  - **Section 313 (Specific toxic chemical listings):** 111-96-6 bis(2-methoxyethyl) ether
- **TSCA (Toxic Substances Control Act):** All ingredients are listed.
- **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.
Trade name: Reducing Reagent

- **Carcinogenic categories**

  - **EPA (Environmental Protection Agency)**
    16940-66-2 sodium borohydride I (oral)

  - **TLV (Threshold Limit Value established by ACGIH)**
    None of the ingredients is listed.

  - **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**

  - GHS02
  - GHS07
  - GHS08

- **Signal word** Danger

- **Hazard-determining components of labeling:**
  bis(2-methoxyethyl) ether

- **Hazard statements**
  Flammable liquid and vapor.
  Causes skin irritation.
  Causes serious eye irritation.
  May damage fertility or the unborn child.

- **Precautionary statements**
  Obtain special instructions before use.
  Do not handle until all safety precautions have been read and understood.
  Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  Keep container tightly closed.
  Ground/bond container and receiving equipment.
  Use explosion-proof electrical/ventilating/lighting/equipment.
  Use only non-sparking tools.
  Take precautionary measures against static discharge.
  Wash thoroughly after handling.
  Wear protective gloves/protective clothing/eye protection/face protection.
  If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
  Continue rinsing.
  IF exposed or concerned: Get medical advice/attention.
  Specific treatment (see on this label).
  Take off contaminated clothing and wash it before reuse.
  If skin irritation occurs: Get medical advice/attention.
  If eye irritation persists: Get medical advice/attention.
  In case of fire: Use for extinguition: CO2, powder or water spray.
  Store in a well-ventilated place. Keep cool.
  Store locked up.
  Dispose of contents/container in accordance with local/regional/national/international regulations.

- **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**: 05/02/2018 / 3
- **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
  - Flam. Liq. 3: Flammable liquids – Category 3
  - Skin Irrit. 2: Skin corrosion/irritation – Category 2
  - Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
  - Repr. 1A: Reproductive toxicity – Category 1A
- * Data compared to the previous version altered.