Material Safety Data Sheet

MSDS 09461-0-001
Revision: C
Product code: Hydrogen Peroxide Solution
Issue date: 8/11/05

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Supplier:
Advanced Sterilization Products
33 Technology Drive
Irvine, CA 92618

Customer service telephone: 1-800-755-5900
Emergency telephone number: 1-877-208-6653 - 24 hrs
Product name: Hydrogen Peroxide Solution
Product code: ASPHYDPEROX

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROGEN PEROXIDE SOLUTION</td>
<td>7722-84-1</td>
<td>&gt;50</td>
<td>Not Determined</td>
<td>Not Determined</td>
<td>Not Determined</td>
<td>Not Determined</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Emergency overview:
Harmful by inhalation, in contact with skin and if swallowed.
Toxic: danger of very serious irreversible effects in contact with skin.
This product is not flammable, but it is an oxidizing material and can increase risk of fire or the intensity of a fire.
Contact with combustible material may cause fire.

Properties affecting health:
Harmful by inhalation, in contact with the eyes and skin, and if swallowed.

Principle routes of exposure:

- Oral: Harmful if swallowed.
- Eye contact: Severe irritant / corrosive to the eye.
- Skin contact: Severe irritant / corrosive to the skin.
- Ingestion: Harmful if swallowed. Severely irritating / corrosive to the gastrointestinal tract.
- Inhalation: Not a likely route of exposure. Inhalation of mist or vapors may be severely irritating to the nose, throat and lungs

Physico-chemical properties:
Hydrogen peroxide is an oxidizer

Hazard information:
- Target organ effects: Eyes, skin, lungs, respiratory system.
- Reproductive effects: This material is not reported to cause reproductive effects in humans
Mutagenic effects: This product is not known to produce mutagenic effects in humans
Sensitization: Non-sensitizing.

Carcinogenicity rating:

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS Number</th>
<th>J &amp; J:</th>
<th>NTP:</th>
<th>IARC:</th>
<th>California Proposition 65 List:</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROGEN PEROXIDE SOLUTION</td>
<td>7722-84-1</td>
<td>Not Determined</td>
<td>Not Determined</td>
<td>Listed.</td>
<td>Not Determined</td>
</tr>
</tbody>
</table>

Signs and symptoms: Irritating / corrosive to the eyes, skin, nose, throat and lungs.
Medical conditions aggravated by exposure: Dermatitis, respiratory irritation, eye and skin irritation.

4. FIRST AID MEASURES

Eye contact: In the case of contact with eyes, rinse immediately with plenty of water for 15 minutes and seek medical attention.
Ingestion: Do not induce vomiting. Call a physician or Poison Control Center immediately.
Inhalation: Move to fresh air immediately. If experiencing difficulty breathing, seek medical attention.
Skin contact: After contact with skin, wash immediately with plenty of water. Immediately remove contaminated clothing and shoes. Wash contaminated clothing before reuse. If skin irritation persists, contact a physician.
Protection of first-aiders: Wear chemical resistant gloves and eye protection.
Notes to physician: Treat symptoms and eliminate overexposure.

5. FIRE-FIGHTING MEASURES

Flash point (°F): >200
Flash point (°C): >93.4
Autoignition temperature: Non-combustible
Flammable limits in air - lower (%): Non-combustible
NFPA rating: Health: 3 flammability: 0 reactivity: 1 special: ox
HMIS rating: Health: 3 flammability: 0 physical hazard: 1

Fire fighting information:

Suitable extinguishing media: Preferably water or water fog. Carbon dioxide and dry chemical may also be used.
Extinguishing media which must not be used for safety reasons: None.
Specific methods: None.
Special protective equipment for firefighters: Wear self-contained breathing apparatus for fire fighting if necessary.
Hazardous combustion products: Product is non-combustible. On decomposition H2O2 releases oxygen which may intensify fire.
Explosivity: None.
Explosion limits:

Company: ADVANCED STERLIZATION PRODUCTS
Product code: ASPHYDPEROX
Product name: Hydrogen Peroxide Solution
CO# 12805-1
6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Responders should wear gloves, goggles and suitable body protection. Where there is a risk of product contact with shoes, chemical resistant shoe coverings are recommended.

Environmental precautions: Do not wash down sewers or waterways.
Do not allow material to contaminate ground water system.

Methods for cleaning up: Small spills can be cleaned up using a damp sponge or an inert absorbent. For large spills, clear the affected area. Place all spill residue and disposable clean-up materials in an appropriate container and seal for disposal. Keep away from combustible material.

7. HANDLING AND STORAGE

Handling:

Technical measures/precautions: Ensure adequate ventilation. If existing ventilation is not adequate, product should be used with a local exhaust hood, or in a ductless fume hood/portable ventilation system. Provide eye baths, washing facilities, and safety showers.

Safe handling advice: Wear appropriate personal protection, including chemical resistant gloves and clothing, and eye protection. Keep away from combustible material.

Storage:

Technical measures/storage conditions: Store away from incompatible materials.
Store in a well-ventilated location and in a temperature controlled area, at 15-30°C (59-86°F). The solution should be stored up right and in its original container until time of use to avoid any contamination. Store containers in a cool, dry location, away from direct sunlight, heat, spark flame or other sources of intense heat.

Incompatible products: Avoid excessive heat and contamination. Contamination may cause decomposition and generation of oxygen gas which could result in high pressures and possible rupture.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: Ensure adequate ventilation.

Eye protection: For routine use, wear approved chemical splash goggles. Where there is risk of product splashing into eyes, an independent face shield must be worn.

Hand protection: Wear chemical resistant gloves. Gloves should be changed frequently during use of product.

Skin and body protection Wear chemical resistant lab coat.

Respiratory protection: None normally required for routine use, unless sprays or mists are generated during use.

Other/general protection: None required.
9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>pH</td>
<td>&lt; 3</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>34.0</td>
</tr>
<tr>
<td>Boiling temperature (°F)</td>
<td>244</td>
</tr>
<tr>
<td>Boiling temperature (°C)</td>
<td>118</td>
</tr>
<tr>
<td>Melting point/range (°F)</td>
<td>-67.9</td>
</tr>
<tr>
<td>Melting point/range (°C)</td>
<td>-55.5</td>
</tr>
<tr>
<td>Freezing point/range (°F)</td>
<td>-67.9</td>
</tr>
<tr>
<td>Freezing point/range (°C)</td>
<td>-55.5</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.2361</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>14.8 mm Hg</td>
</tr>
<tr>
<td>Water solubility</td>
<td>Soluble</td>
</tr>
<tr>
<td>Viscosity</td>
<td>1.207</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water):</td>
<td>Not established</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical stability</td>
<td>Stable under recommended storage conditions.</td>
</tr>
<tr>
<td>Hazard polymerization</td>
<td>Hazardous polymerization does not occur.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Oxygen which supports combustion.</td>
</tr>
<tr>
<td>Materials to avoid</td>
<td>Reducing agents, wood, paper and other</td>
</tr>
<tr>
<td></td>
<td>combustibles, iron and other heavy metals,</td>
</tr>
<tr>
<td></td>
<td>copper, alloys and caustics.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>Excessive heat and contamination could cause</td>
</tr>
<tr>
<td></td>
<td>product to become unstable and decompose.</td>
</tr>
</tbody>
</table>

11. TOXICOLOGICAL INFORMATION

Acute toxicity

LD50 Dermal Rabbit (mg/kg): 6.5 g/kg at 70% hydrogen peroxide
LD50 Oral Rat (f) (mg/kg): 0.17 mg/L at 50% Hydrogen Peroxide

Local effects

<table>
<thead>
<tr>
<th>Route</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>Harmful by ingestion.</td>
</tr>
<tr>
<td>Eye</td>
<td>Severe irritant and corrosive to the eye when tested in animals.</td>
</tr>
<tr>
<td>Skin</td>
<td>Severe irritant and corrosive to the skin when tested in animals.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Inhalation of mist or vapors may be severely irritating to the nose, throat and lungs.</td>
</tr>
</tbody>
</table>

Chronic toxicity

<table>
<thead>
<tr>
<th>Route</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>No data available</td>
</tr>
<tr>
<td>Inhalation</td>
<td>No data available</td>
</tr>
<tr>
<td>Dermal</td>
<td>No data available</td>
</tr>
</tbody>
</table>

Subchronic toxicity

Company: ADVANCED STERILIZATION PRODUCTS
Product name: Hydrogen Peroxide Solution
Product code: ASPHYDPEROX
CO# 12805-1
Specific effects

Corrosive effects: Corrosive to eyes and skin.
Sensitization: Not a sensitizer.
Target organ effects: Eyes, skin, lungs, respiratory system.
Mutagenic effects: Hydrogen peroxide is not known to produce mutagenic effects in humans.
Reproductive effects: Not a reproductive effector.
Developmental effects: Not reported to cause teratogenic or embryotic effects in humans.
Carcinogenic effects: Hydrogen peroxide does not produce carcinogenic effects in humans.

General notes:

| 12. ECOLOGICAL INFORMATION |

Ecotoxicity

Ecotoxicity effects: Due to its corrosive and oxidizing properties, this solution can be harmful to plant and animal life if this product is released into the environment, especially if released in large quantities.

Aquatic toxicity effects: Due to its corrosive and oxidizing properties, this solution can adversely affect aquatic environments if large quantities are released into receiving water or the environment.

96 HR LC50 Channel Catfish (mg/L): 37.4
96 HR LC50 Fathead Minnow (mg/L): 16.4
24 HR LC50 Daphnia Magna (mg/L): 7.7
48 HR LC50 Daphnia Pule (mg/L): 2.4
96 HR LC50 Freshwater Snail (mg/L): 17.7

Mobility: Unknown on product.
Persistence / degradability: Unknown on product.
Bioaccumulation: Unknown on product.
Degradation: Unknown on product.
General notes: Hydrogen peroxide in the aquatic environment is subject to various reduction or oxidation processes and decomposes into water and oxygen. Hydrogen Peroxide half life in freshwater ranged from 8 hours to 20 days, in air from 10-20 hours and in soils from minutes to hours depending upon microbiological activity and metal contaminants.

| 13. DISPOSAL CONSIDERATIONS |

Waste from residues / unused products: Waste disposal must be in accordance with appropriate US, Federal, State and International regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

Contaminated packaging: Triple rinse containers.

Methods for cleaning up: Small spills can be cleaned up using a damp sponge or an inert absorbent. For large spills, clear the affected area. Place all spill residue and disposable clean-up materials in an appropriate container and seal for disposal. Keep away from combustible material.
14. TRANSPORT INFORMATION

DOT:
- DOT UN-No: UN 2014
- DOT shipping name: Hydrogen peroxide, aqueous solutions
- Hazard class: 5.1 (Oxidizer)
- Subsidiary risk (hazard class): Class 8 Corrosive
- Packing group: II
- DOT reportable quantity (lbs): Not applicable.

IMO/IMDG:
- Hazard class: 5.1(Oxidizer) 8 (Corrosive)
- IMDG page: Chapter 2.5, Pages 54-56
- IMO-labels: 5.1 (Oxidizer) 8 (Corrosive)
- Proper shipping name: Hydrogen peroxide, aqueous solutions
- UN/Id No.: UN 2014

ADR/RID:
- Hazard class/packing group: No information
- Item: No information
- ADR/RID-labels: No information
- UN/Id No.: No information
- Proper shipping name: No information
- TREM-card: Not available

IATA/ICAO:
- Hazard class: 5.1, 8
- Packing group: FORBIDDEN FOR AIRFREIGHT
- Proper shipping name: Hydrogen peroxide, aqueous solutions
- ID/UN No.: UN 2014
- IATA - label: FORBIDDEN FOR AIRFREIGHT
- ERG #: 140

TDG (Canada):
- Status: No data is available on the product itself.
- Packing group: No data is available on the product itself.

15. REGULATORY INFORMATION

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS Number</th>
<th>Weight %</th>
<th>EPCRA (SARA Title III) Section 313 Toxic Chemical -</th>
<th>EPCRA (SARA Title III) Section 302 Extremely Hazardous Substance -</th>
<th>CERCLA Hazardous Substances:</th>
<th>RCRA status:</th>
</tr>
</thead>
<tbody>
<tr>
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<td>&gt;50</td>
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</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS Number</th>
<th>Weight %</th>
<th>ACGIH TLV (TWA - 8hr)</th>
<th>ACGIH TLV (STEL)</th>
<th>ACGIH TLV (Ceiling Limits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROGEN PEROXIDE SOLUTION</td>
<td>7722-84-1</td>
<td>&gt;50</td>
<td>1 ppm</td>
<td>ACGIH TLV (STEL)</td>
<td>ACGIH TLV (Ceiling Limits)</td>
</tr>
<tr>
<td>Components</td>
<td>CAS Number</td>
<td>Weight %</td>
<td>OSHA (TWA - 8hr)</td>
<td>OSHA (STEL)</td>
<td>OSHA (Ceiling Limits)</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------</td>
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<td>-----------------------</td>
</tr>
<tr>
<td>HYDROGEN PEROXIDE SOLUTION</td>
<td>7722-84-1</td>
<td>&gt;50</td>
<td>1.4 mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SARA (311, 312) hazard class:
- Immediate health: None
- Delayed health: None
- Fire: None
- Sudden Release of Pressure Hazard: None
- Reactivity: None

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS Number</th>
<th>Weight %</th>
<th>New Jersey RTK List</th>
<th>Pennsylvania RTK List</th>
<th>Massachusetts RTK List</th>
<th>Connecticut Hazardous Material List</th>
<th>Michigan Critical List</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROGEN PEROXIDE SOLUTION</td>
<td>7722-84-1</td>
<td>&gt;50</td>
<td>Listed.</td>
<td>Listed. Substance no. 1015</td>
<td>Listed.</td>
<td>Listed.</td>
<td></td>
</tr>
</tbody>
</table>

WHMIS:
- WHMIS trade secret: None
- WHMIS hazard class: C Oxidizing Materials
  D2B Toxic Materials
  E Corrosive Material

Notes:
1. SARA = Superfund Amendments and the Reauthorization Act.
2. CERCLA = Comprehensive Environmental Response, Compensations and Liability Act.
3. FIFRA = Federal Insecticide, Fungicide and Rodenticide Act
4. TSCA = Toxic Substance Control Act
5. WHMIS = Canadian Workplace Hazardous Materials Information System
6. This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

This data sheet contains changes from the previous version in section(s):
None

Additional advice: None

 Literary Reference: None

 MSDS format: North American Format - U.S. and Canada
This Material Safety Data Sheet was prepared in accordance with OSHA 29 CFR 1910.1200.

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