1. PRODUCT AND COMPANY IDENTIFICATION

Product Name Hydrogen peroxide, 50-70 wt% solution in water
Cat No. H341-500
Synonyms Carbamide Peroxide; Hydrogen Dioxide; Peroxide
Recommended Use Laboratory chemicals

Company Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

2. HAZARDS IDENTIFICATION

DANGER! Emergency Telephone Number
Oxidizer: Contact with combustible/organic material may cause fire. Causes burns by all exposure routes. Harmful by inhalation and if swallowed. May cause pulmonary edema. Corrosive to metals.

Appearance Colorless Physical State Liquid Odor slight

Target Organs Eyes, Skin, Central nervous system (CNS), Respiratory system

Potential Health Effects

Acute Effects
Principle Routes of Exposure

Eyes Causes burns.
Skin Causes burns. May be harmful in contact with skin.
Inhalation Causes burns. Harmful by inhalation. May cause pulmonary edema.
Ingestion Toxic if swallowed. May be fatal if swallowed. Causes burns. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Chronic Effects None known

See Section 11 for additional Toxicological information.

Aggravated Medical Conditions Skin disorders. Respiratory disorders.
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Haz/Non-haz</th>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Water</td>
<td>7732-18-5</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Hydrogen peroxide</td>
<td>7722-84-1</td>
<td>50</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

**Eye Contact**
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

**Skin Contact**
Immediate medical attention is required. Wash off immediately with plenty of water for at least 15 minutes.

**Inhalation**
Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Immediate medical attention is required.

**Ingestion**
Do not induce vomiting. Call a physician or Poison Control Center immediately.

**Notes to Physician**
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

**Flash Point**
No information available.

**Method**
No information available.

**Autoignition Temperature**
No information available.

**Explosion Limits**
Upper 100%
Lower 40%

**Suitable Extinguishing Media**
Flooding quantities of water. Cool closed containers exposed to fire with water spray.

**Unsuitable Extinguishing Media**
No information available.

**Hazardous Combustion Products**
No information available.

**Sensitivity to mechanical impact**
No information available.

**Sensitivity to static discharge**
No information available.

**Specific Hazards Arising from the Chemical**
Non-combustible. Burning produces obnoxious and toxic fumes. Containers may explode when heated. May form explosive peroxides. Oxidizer: Contact with combustible/organic material may cause fire.

**Protective Equipment and Precautions for Firefighters**
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
<th>Physical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>OX</td>
</tr>
</tbody>
</table>

6. ACCIDENTAL RELEASE MEASURES
6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Use personal protective equipment. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Do not get in eyes, on skin, or on clothing.

Environmental Precautions
Should not be released into the environment

Methods for Containment and Clean Up
Provide adequate ventilation. Soak up with inert absorbent material. Sweep up or vacuum up spillage and collect in suitable container for disposal. Keep away from clothing and other combustible materials. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system.

7. HANDLING AND STORAGE

Handling
Use only under a chemical fume hood. Wear personal protective equipment. Keep away from clothing and other combustible materials. Do not get in eyes, on skin, or on clothing. Avoid breathing vapors or mists. Do not ingest. Contents may develop pressure upon prolonged storage. Keep containers dry and tightly closed to avoid moisture absorption and contamination. Protect from light.

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store near combustible materials. Keep away from direct sunlight. Keep refrigerated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Measures
Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Use explosion-proof electrical/ventilating/lighting/equipment.

Exposure Guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen peroxide</td>
<td>TWA: 1 ppm</td>
<td>(Vacated) TWA: 1 ppm</td>
<td>IDLH: 75 ppm</td>
</tr>
<tr>
<td></td>
<td>(Vacated) TWA: 1.4 mg/m³</td>
<td>TWA: 1 ppm</td>
<td>TWA: 1 ppm</td>
</tr>
<tr>
<td></td>
<td>TWA: 1.4 mg/m³</td>
<td>TWA: 1 ppm</td>
<td>TWA: 1.4 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Quebec</th>
<th>Mexico OEL (TWA)</th>
<th>Ontario TWAEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen peroxide</td>
<td>TWA: 1 ppm</td>
<td>TWA: 1 ppm</td>
<td>TWA: 1 ppm</td>
</tr>
<tr>
<td></td>
<td>TWA: 1.4 mg/m³</td>
<td>TWA: 1.5 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STEL: 2 ppm</td>
<td>STEL: 3 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

NIOSH IDLH: Immediately Dangerous to Life or Health

Personal Protective Equipment

Eye/face Protection
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166

Skin and body protection
Wear appropriate protective gloves and clothing to prevent skin exposure

Respiratory Protection
Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

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>Appearance</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>slight</td>
</tr>
</tbody>
</table>
9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor Threshold</td>
<td>No information available.</td>
</tr>
<tr>
<td>pH</td>
<td>1.4 (30 % Solution)</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>2.4 kPa @ 30 °C</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>1.10</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No information available.</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>114°C / 237.2°F@ 760 mmHg</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>-52°C / -61.6°F</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>&gt; 125°C</td>
</tr>
<tr>
<td>Flash Point</td>
<td>No information available.</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>No information available.</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.200</td>
</tr>
<tr>
<td>Solubility</td>
<td>No information available.</td>
</tr>
<tr>
<td>log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>34</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>H2O2</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Stability
Light sensitive.

Conditions to Avoid

Incompatible Materials
Acids, Strong oxidizing agents, Alcohols, alkaline, Ammonia, Organic materials, Sulfides, Cyanides, lead oxides, lead, Acetone, Acid anhydrides, Metals, copper, Reducing agents, Powdered metals

Hazardous Decomposition Products
Hydrogen, oxygen

Hazardous Polymerization
Hazardous polymerization does not occur.

Hazardous Reactions
None under normal processing.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product Information
No acute toxicity information is available for this product

Component Information

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral Oral (LD50 Oral)</th>
<th>LD50 Dermal (LD50 Dermal)</th>
<th>LC50 Inhalation (LC50 Inhalation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen peroxide</td>
<td>801 mg/kg ( Rat )</td>
<td>2000 mg/kg ( Rabbit )</td>
<td>2 mg/L ( Rat ) 4 h</td>
</tr>
</tbody>
</table>

Irritation
Causes burns by all exposure routes

Toxicologically Synergistic Products
No information available.

Chronic Toxicity
No information available.

Carcinogenicity
The table below indicates whether each agency has listed any ingredient as a carcinogen.
Sensitization  No information available.
Mutagenic Effects  No information available.
Reproductive Effects  No information available.
Developmental Effects  No information available.
Teratogenicity  No information available.
Other Adverse Effects  See actual entry in RTECS for complete information.
Endocrine Disruptor Information  No information available

### 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

<table>
<thead>
<tr>
<th>Component</th>
<th>Freshwater Algae</th>
<th>Freshwater Fish</th>
<th>Microtox</th>
<th>Water Flea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen peroxide</td>
<td>EC50 2.5 mg/L/72h</td>
<td>LC50: 16.4 mg/L/96h (P. promelas)</td>
<td>Not listed</td>
<td>EC50 7.7 mg/L/24h</td>
</tr>
</tbody>
</table>

Persistence and Degradability  Expected to be biodegradable.
Bioaccumulation/ Accumulation  No information available
Mobility

### 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Methods**  Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification

### 14. TRANSPORT INFORMATION

**DOT**

<table>
<thead>
<tr>
<th></th>
<th>UN-No</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN-No</td>
<td>UN2014</td>
</tr>
<tr>
<td>Proper Shipping Name</td>
<td>HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS</td>
</tr>
<tr>
<td>Hazard Class</td>
<td>5.1</td>
</tr>
<tr>
<td>Subsidiary Hazard Class</td>
<td>8</td>
</tr>
<tr>
<td>Packing Group</td>
<td>II</td>
</tr>
</tbody>
</table>

**TDG**

<table>
<thead>
<tr>
<th></th>
<th>UN-No</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN-No</td>
<td>UN2014</td>
</tr>
</tbody>
</table>
14. TRANSPORT INFORMATION

Proper Shipping Name: HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS
Hazard Class: 5.1
Subsidiary Hazard Class: 8
Packing Group: II

IATA
UN-No: UN2014
Proper Shipping Name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION
Hazard Class: 5.1
Subsidiary Hazard Class: 8
Packing Group: II

IMDG/IMO
UN-No: UN2014
Proper Shipping Name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION
Hazard Class: 5.1
Subsidiary Hazard Class: 8
Packing Group: II

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Component</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>NLP</th>
<th>PICCS</th>
<th>ENCS</th>
<th>AICS</th>
<th>CHINA</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>231-791-2</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Hydrogen peroxide</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>231-765-0</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313
Not applicable

SARA 311/312 Hazardous Categorization
Acute Health Hazard: Yes
Chronic Health Hazard: No
Fire Hazard: No
Sudden Release of Pressure Hazard: No
Reactive Hazard: Yes

Clean Water Act
Not applicable

<table>
<thead>
<tr>
<th>Component</th>
<th>CWA - Hazardous Substances</th>
<th>CWA - Reportable Quantities</th>
<th>CWA - Toxic Pollutants</th>
<th>CWA - Priority Pollutants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>-</td>
<td>1 LB</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Clean Air Act
Not applicable

OSHA

<table>
<thead>
<tr>
<th>Component</th>
<th>Specifically Regulated Chemicals</th>
<th>Highly Hazardous Chemicals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen peroxide</td>
<td>-</td>
<td>TQ: 7500 lb</td>
</tr>
</tbody>
</table>

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

<table>
<thead>
<tr>
<th>Component</th>
<th>Hazardous Substances RQs</th>
<th>CERCLA EHS RQs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen peroxide</td>
<td>-</td>
<td>1000 lb</td>
</tr>
</tbody>
</table>

California Proposition 65
This product does not contain any Proposition 65 chemicals.

State Right-to-Know

<table>
<thead>
<tr>
<th>Component</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen peroxide</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
</tr>
</tbody>
</table>

U.S. Department of Transportation
Reportable Quantity (RQ): N
DOT Marine Pollutant: N
DOT Severe Marine Pollutant: N

U.S. Department of Homeland Security
This product contains the following DHS chemicals:

<table>
<thead>
<tr>
<th>Component</th>
<th>DHS Chemical Facility Anti-Terrorism Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen peroxide</td>
<td>2000 lb STQ (concentration of at least 30%)</td>
</tr>
</tbody>
</table>

Other International Regulations

Mexico - Grade
No information available

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.
16. OTHER INFORMATION

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date
03-Dec-2010

Print Date
29-May-2013

Revision Summary
"***", and red text indicates revision

Disclaimer
The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of MSDS