S/P BRAND ISOPROPYL ALCOHOL
MATERIAL SAFETY DATA SHEET

STEPHENS SCIENTIFIC
107 RIVERDALE ROAD
RIVERDALE, NEW JERSEY 07457
(201) 831-9800

CHEMTREC ASSISTANCE: (800) 424-9300

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I. SUBSTANCE IDENTIFICATION

TRADE NAMES/SYNONYMS: S/P Brand Isopropyl Alcohol, C4307, C4307-5

NFPA RATINGS (SCALE 0-4): HEALTH = 1  FIRE = 3  REACTIVITY = 0

II. HAZARDOUS COMPONENTS

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS-NUMBER</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl alcohol</td>
<td>67-63-0</td>
<td>99+</td>
</tr>
</tbody>
</table>

EXPOSURE LIMITS: OSHA PEL: 400 ppm  ACGIH TLV: 400 ppm  OTHER LIMITS RECOMMENDED:

III. PHYSICAL AND CHEMICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOILING POINT</td>
<td>82° C (180° F)</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY</td>
<td>H₂O = 1 (at 25° C) 0.79</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>-85° C (-125° F)</td>
</tr>
<tr>
<td>VAPOR PRESSURE</td>
<td>33 @ 20° C (68° F)</td>
</tr>
<tr>
<td>EVAPORATION RATE</td>
<td>(BUTYL ACETATE = 1): 2.83</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Infinite in water</td>
</tr>
<tr>
<td>APPEARANCE AND ODOR</td>
<td>Clear, colorless liquid. Rubbing alcohol.</td>
</tr>
</tbody>
</table>

IV. FIRE AND EXPLOSION HAZARD DATA

FIRE AND EXPLOSIVE HAZARD: Flammable liquid. Above flashpoint, vapor-air mixtures are explosive within flammable limits noted below. Contact with strong oxidizers may cause fire or explosion.

FLASH POINT (METHOD USED): 12° C (53° F)  FLAMMABLE LIMITS:  LEL: 2.0  UEL: 12.0

EXTinguISHING MEDIA: Water spray, dry chemical, alcohol foam, or carbon dioxide. Water spray may be used to keep fire exposed containers cool.

SPECIAL FIRE FIGHTING PROCEDURES: in the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Water may be used to flush spills away from exposures and to dilute spills to non-flammable mixtures. Vapors can flow along surfaces to distant ignition source and flash back.

V. REACTIVITY DATA

STABILITY: Stable under ordinary conditions of use and storage. Heat and sunlight can contribute to instability.

INCOMPATIBILITY (MATERIALS TO AVOID): Heat, flame, strong oxidizers, acetaldehyde, chlorine, ethylene oxide, hydrogen-palladium combination, hydrogen peroxide-sulfuric acid combination, potassium tert-butoxide, hypochlorous acid, isocyanates, nitroform, phosgene, oleum and perchloric acid.

CONDITIONS TO AVOID: Keep away from heat, sparks and flame.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Toxic gases and vapors such as carbon monoxide may be released in a fire involving isopropyl alcohol.

HAZARDOUS POLYMERIZATION: Will not occur.

S/P Brand Isopropyl Alcohol, C4307, C4307-5 - Revision March 1992
VI. TOXICITY

CARCINOGEN STATUS: NTP?: IARC MONOGRAPH?: OSHA REGULATED?: Yes

OSHA REGULATION 29 CFR 1910.1000 REQUIRES THE FOLLOWING PERMISSIBLE EXPOSURE LIMITS:

<table>
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<tr>
<th></th>
<th>TWA</th>
<th>STEL</th>
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<tbody>
<tr>
<td>isopropyl alcohol</td>
<td>400 ppm</td>
<td>500 ppm</td>
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ACGIH RECOMMENDS THE FOLLOWING THRESHOLD LIMIT VALUES:

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VII. HEALTH EFFECTS AND FIRST AID

INHALATION: May cause irritation of the nose and throat.

ACUTE EXPOSURE: Exposure to high concentrations has a narcotic effect, producing symptoms of drowsiness, headache, staggering, unconsciousness and possibly death.

FIRST AID: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT: Has a defatting action of the skin that can cause irritation. May cause irritation with a stinging effect and burning sensation.

CHRONIC EXPOSURE: Prolonged contact with skin may cause mild irritation, drying, cracking, or contact dermatitis may develop.

FIRST AID: Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists.

EYE CONTACT: Vapors may irritate the eyes.

ACUTE EXPOSURE: Splashes may cause severe irritation, possible corneal burns and eye damage.

FIRST AID: Wash eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

INGESTION:

ACUTE EXPOSURE: May cause drowsiness, unconsciousness, and death. Gastrointestinal pain, cramps, nausea, vomiting, and diarrhea may also result. The single lethal dose for a human adult = about 250 ml (SAX Sixth Edition).

FIRST AID: Give water to drink. Induce vomiting if medical help is not immediately available. Never give anything by mouth to an unconscious person. Get medical attention immediately.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

VIII. PRECAUTIONS FOR SAFE HANDLING AND USE

SPILL AND LEAK PROCEDURES: Remove all sources of ignition. Ventilate area of leak or spill. Clean-up personnel require protective clothing and respiratory protection from vapors. Small spills may be absorbed on paper towels and evaporated in a fume hood. Allow enough time for fumes to clear hood, then ignite paper in a suitable location away from combustible materials. Contain and recover fluid for reclamation when possible.

WASTE DISPOSAL METHOD: Larger spills and lot sizes can be collected as hazardous waste and atomized in a suitable RCRA approved combustion chamber, or absorbed with vermiculite, dry sand, earth or similar material for disposal as hazardous waste in a RCRA approved facility.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Keep away from heat, sparks and flame. Keep container closed. Use with adequate ventilation. Avoid breathing vapor. Wash thoroughly after handling. Avoid contact with eyes, skin and clothing.

OTHER PRECAUTIONS: Warning! Flammable liquid. Harmful if swallowed or inhaled. Affects central nervous system. Causes irritation.
V. PROTECTIVE EQUIPMENT

VENTILATION: A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation: A Manual of Recommended Practices", most recent edition, for details.

RESPIRATOR: If the TLV is exceeded a full facepiece chemical cartridge respirator may be worn, in general, up to the maximum use concentration specified by the respirator supplier. Alternatively, a supplied air full facepiece respirator or airlined hood may be worn.

CLOTHING: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls to prevent skin contact.

EYE PROTECTION: Use chemical safety goggles and/or a full face shield where splashing is possible. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

WORK/HYGIENIC PRACTICES: Wash thoroughly after handling. Avoid contact with eyes, skin and clothing.

X. STORAGE AND SPECIAL INFORMATION

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from oxidizing materials. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment.

XI. REGULATORY STATUS

HAZARD CATEGORIES FOR SARA SECTION 311/312 REPORTING

<table>
<thead>
<tr>
<th></th>
<th>Acute:</th>
<th>Chronic:</th>
<th>Pressure:</th>
<th>Reactive:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

COMPONENTS

<table>
<thead>
<tr>
<th>SARA Sect. 302 RO</th>
<th>SARA Sect. 313 Name List</th>
<th>CERCLA Sect. 103 RO</th>
<th>RCRA Sec.613.33</th>
</tr>
</thead>
<tbody>
<tr>
<td>RO</td>
<td>TPO</td>
<td>Chemical Category</td>
<td></td>
</tr>
<tr>
<td>Isopropyl alcohol</td>
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SARA Section 302 RO: Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.
SARA Section 302 TPO: Threshold Planning Quantity of Extremely Hazardous Substance. An asterisk (*) following a Threshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity = 10,000 lbs.
SARA Section 313 Chemicals: Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.
CERCLA Section 103: Comprehensive Environmental Response, Compensation and Liability Act (Superfund). Releases to air, land or water of these hazardous substances which exceed the Reportable Quantity (RO) must be reported to the National Response Center, (800-424-8802); Listed at 40 CFR 302.4