Material Safety Data Sheet

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 3M(TM) Scotch-Weld(TM) EC-4419 Adhesive (1PB)
MANUFACTURER: 3M
DIVISION: Industrial Adhesives and Tapes Division
ADDRESS: 3M Center
St. Paul, MN  55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 11/20/2006
Supercedes Date: 11/28/2001
Document Group: 10-8584-4

Product Use:
Specific Use: Adhesive
Intended Use: Industrial use

SECTION 2: INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>C.A.S. No.</th>
<th>% by Wt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum Distillate</td>
<td>64741-84-0</td>
<td>15 - 40</td>
</tr>
<tr>
<td>Methyl Ethyl Ketone</td>
<td>78-93-3</td>
<td>10 - 30</td>
</tr>
<tr>
<td>2-Chloro-1,3-Butadiene Polymers and Copolymers</td>
<td>Trade Secret</td>
<td>10 - 30</td>
</tr>
<tr>
<td>p-tert-Butylphenol-Formaldehyde Resin</td>
<td>25085-50-1</td>
<td>5 - 10</td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>1 - 5</td>
</tr>
<tr>
<td>Magnesium Oxide</td>
<td>1309-48-4</td>
<td>1 - 5</td>
</tr>
<tr>
<td>Cellulose</td>
<td>9004-34-6</td>
<td>1 - 5</td>
</tr>
<tr>
<td>Antimony Trioxide</td>
<td>1309-64-4</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Odor, Color, Grade: Yellow, sweet/sharp odor.
General Physical Form: Liquid
Immediate health, physical, and environmental hazards: Closed containers exposed to heat from fire may build pressure and explode. Extremely flammable liquid and vapor. Vapors may travel long distances along the ground or floor to an ignition source and flash back. Contains a chemical or chemicals which can cause cancer. May cause target organ effects. Contains a
chemical or chemicals which can cause birth defects or other reproductive harm.

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:
Moderate Eye Irritation: Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Skin Contact:
Mild Skin Irritation: Signs/symptoms may include localized redness, swelling, and itching.

May be absorbed through skin and cause target organ effects.

Inhalation:
Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

May be absorbed following inhalation and cause target organ effects.

Ingestion:
Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

May be absorbed following ingestion and cause target organ effects.

Target Organ Effects:
Central Nervous System (CNS) Depression: Signs/symptoms may include headache, dizziness, drowsiness, incoordination, nausea, slowed reaction time, slurred speech, giddiness, and unconsciousness.

Prolonged or repeated exposure may cause:
   Cardiac Effects: Signs/symptoms may include irregular heartbeat (arrhythmia), changes in heart rate, damage to heart muscle, heart attack, and may be fatal.
   Liver Effects: Signs/symptoms may include loss of appetite, weight loss, fatigue, weakness, abdominal tenderness and jaundice.
   Central Neuropathy: Signs/symptoms may include irritability, memory impairment, personality changes, sleep disorders, and decreased ability to concentrate.
   Blood Effects: Signs/symptoms may include generalized weakness and fatigue, skin pallor, changes in blood clotting time, internal bleeding, and/or hemoglobinemia.
   Kidney/Bladder Effects: Signs/symptoms may include changes in urine production, abdominal or lower back pain, increased protein in urine, increased blood urea nitrogen (BUN), blood in urine, and painful urination.

Contains a chemical or chemicals which can cause birth defects or other reproductive harm.

Carcinogenicity:
Contains a chemical or chemicals which can cause cancer.
**SECTION 4: FIRST AID MEASURES**

### 4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

**Eye Contact:** Flush eyes with large amounts of water. If signs/symptoms persist, get medical attention.

**Skin Contact:** Wash affected area with soap and water. If signs/symptoms develop, get medical attention.

**Inhalation:** Remove person to fresh air. If signs/symptoms develop, get medical attention.

**If Swallowed:** Do not induce vomiting unless instructed to do so by medical personnel. Give victim two glasses of water. Never give anything by mouth to an unconscious person. Get medical attention.

**SECTION 5: FIRE FIGHTING MEASURES**

### 5.1 FLAMMABLE PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autoignition temperature</td>
<td>404 °C [Details: MEK]</td>
<td></td>
</tr>
<tr>
<td>Flash Point</td>
<td>-14.00 °F [Test Method: Closed Cup]</td>
<td></td>
</tr>
<tr>
<td>Flammable Limits - LEL</td>
<td>1.3 % volume</td>
<td></td>
</tr>
<tr>
<td>Flammable Limits - UEL</td>
<td>10.0 % volume</td>
<td></td>
</tr>
<tr>
<td>OSHA Flammability Classification:</td>
<td>Class IB Flammable Liquid</td>
<td></td>
</tr>
</tbody>
</table>

### 5.2 EXTINGUISHING MEDIA

Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide).

### 5.3 PROTECTION OF FIRE FIGHTERS

**Special Fire Fighting Procedures:** Water may not effectively extinguish fire; however, it should be used to keep fire-exposed containers and surfaces cool and prevent explosive rupture. Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

**Unusual Fire and Explosion Hazards:** Closed containers exposed to heat from fire may build pressure and explode. Extremely flammable liquid and vapor. Vapors may travel long distances along the ground or floor to an ignition source and flash back.

**Note:** See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

**SECTION 6: ACCIDENTAL RELEASE MEASURES**

**Accidental Release Measures:** Refer to other sections of this MSDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment. Call 3M-HELPS line (1-800-364-3577) for more information on handling and managing the spill. Evacuate unprotected and untrained personnel from hazard area. The spill should be cleaned up...
by qualified personnel. Remove all ignition sources such as flames, smoking materials, and electrical spark sources. Use only non-sparking tools. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Warning! A motor could be an ignition source and could cause flammable gases or vapors in the spill area to burn or explode. Contain spill. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water. Cover spill area with a fire-extinguishing foam. An aqueous film forming foam (AFFF) is recommended. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a toxic, corrosivity or flammability hazard. Collect as much of the spilled material as possible using non-sparking tools. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and MSDS. Collect the resulting residue containing solution. Seal the container. Dispose of collected material as soon as possible.

In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING
Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Contents may be under pressure, open carefully. Ground containers securely when transferring contents. Wear low static or properly grounded shoes. No smoking while handling this material. Avoid breathing of vapors, mists or spray. Avoid static discharge. Avoid eye contact with vapors, mists, or spray. Vapors may ignite explosively. May cause flash fire. Prevent build-up of vapors - open all windows and doors. Maintain vapor concentrations below recommended exposure limits. Use only with cross-ventilation. Without adequate ventilation, vapors may settle in low-lying areas. Keep away from heat, sparks, and open flame. Do not smoke or ignite matches, lighters, etc. Avoid contact with oxidizing agents.

7.2 STORAGE

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS
Use with appropriate local exhaust ventilation. Provide local exhaust ventilation at transfer points. Provide appropriate local exhaust ventilation on open containers. If exhaust ventilation is not available, use appropriate respiratory protection.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection
Avoid eye contact with vapors, mists, or spray.
The following eye protection(s) are recommended: Indirect Vented Goggles.

8.2.2 Skin Protection
Avoid skin contact.

Select and use gloves and/or protective clothing to prevent skin contact based on the results of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials. Gloves made from the following material(s) are recommended: Butyl Rubber, Polyethylene/Ethylene Vinyl Alcohol.

8.2.3 Respiratory Protection
Avoid breathing of vapors, mists or spray.
Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: Half facepiece or full face air-purifying respirator with organic vapor cartridges. Consult the current 3M Respiratory Selection Guide for additional information or call 1-800-243-4630 for 3M technical assistance.

8.2.4 Prevention of Swallowing
Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water.

8.3 EXPOSURE GUIDELINES

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Authority</th>
<th>Type</th>
<th>Limit</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimony compounds</td>
<td>ACGIH</td>
<td>TWA, as Sb</td>
<td>0.5 mg/m3</td>
<td>Table Z-1A</td>
</tr>
<tr>
<td>Antimony compounds</td>
<td>OSHA</td>
<td>TWA, as Sb</td>
<td>0.5 mg/m3</td>
<td>Table Z-1</td>
</tr>
<tr>
<td>Antimony Trioxide</td>
<td>ACGIH</td>
<td>TWA</td>
<td>10 mg/m3</td>
<td></td>
</tr>
<tr>
<td>Cellulose</td>
<td>OSHA</td>
<td>TWA, respirable</td>
<td>5 mg/m3</td>
<td>Table Z-1</td>
</tr>
<tr>
<td>Magnesium Oxide</td>
<td>ACGIH</td>
<td>TWA, as fume</td>
<td>10 mg/m3</td>
<td>Table A4</td>
</tr>
<tr>
<td>Magnesium Oxide</td>
<td>OSHA</td>
<td>TWA, as total dust</td>
<td>15 mg/m3</td>
<td>Table Z-1</td>
</tr>
<tr>
<td>Methyl Ethyl Ketone</td>
<td>ACGIH</td>
<td>TWA</td>
<td>200 ppm</td>
<td></td>
</tr>
<tr>
<td>Methyl Ethyl Ketone</td>
<td>ACGIH</td>
<td>STEL</td>
<td>300 ppm</td>
<td></td>
</tr>
<tr>
<td>Methyl Ethyl Ketone</td>
<td>OSHA</td>
<td>TWA</td>
<td>200 ppm</td>
<td>Table Z-1A</td>
</tr>
<tr>
<td>Methyl Ethyl Ketone</td>
<td>OSHA</td>
<td>STEL</td>
<td>300 ppm</td>
<td>Table Z-1A</td>
</tr>
<tr>
<td>Toluene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>50 ppm</td>
<td>Skin Notation*; Table A4</td>
</tr>
<tr>
<td>Toluene</td>
<td>CMRG</td>
<td>STEL</td>
<td>75 ppm</td>
<td>Skin Notation*</td>
</tr>
<tr>
<td>Toluene</td>
<td>OSHA</td>
<td>TWA, Vacated</td>
<td>100 ppm</td>
<td></td>
</tr>
<tr>
<td>Toluene</td>
<td>OSHA</td>
<td>STEL, Vacated</td>
<td>150 ppm</td>
<td></td>
</tr>
<tr>
<td>Toluene</td>
<td>OSHA</td>
<td>TWA</td>
<td>200 ppm</td>
<td>Table Z-2</td>
</tr>
<tr>
<td>Toluene</td>
<td>OSHA</td>
<td>CEIL</td>
<td>300 ppm</td>
<td>Table Z-2</td>
</tr>
</tbody>
</table>

* Substance(s) refer to the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly, by direct contact with the substance. Vehicles can alter skin absorption.

VAC Vacated PEL: Vacated Permissible Exposure Limits [PEL] are enforced as the OSHA PEL in some states. Check with your local regulatory agency.

SOURCE OF EXPOSURE LIMIT DATA:
ACGIH: American Conference of Governmental Industrial Hygienists
CMRG: Chemical Manufacturer Recommended Guideline
OSHA: Occupational Safety and Health Administration
AIHA: American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

- Odor, Color, Grade: Yellow, sweet/sharp odor.
- General Physical Form: Liquid
- Autoignition temperature: 404 ºC [Details: MEK]
- Flash Point: -14.00 ºF [Test Method: Closed Cup]
- Flammable Limits - LEL: 1.3 % volume
- Flammable Limits - UEL: 10.0 % volume
- Boiling point: >=80 ºC [Details: MEK]
- Density: 0.88 g/ml
- Vapor Density: 2.41 [Ref Std: AIR=1]
- Vapor Pressure: <=91 mmHg [@ 77 ºF]
Specific Gravity: 0.88 [Ref Std: WATER=1]

pH: Not Applicable

Melting point: Not Applicable

Solubility in Water: Slight (less than 10%)

Evaporation rate: 2.5 [Ref Std: ETHER=1]

Volatile Organic Compounds: 539 g/l [Test Method: calculated SCAQMD rule 443.1]

Percent volatile: 60 - 70 % weight

VOC Less H2O & Exempt Solvents: 539 g/l [Test Method: calculated SCAQMD rule 443.1]

Viscosity: 11000 - 14000 centipoise [@ 73.4 °F]

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable.

Materials and Conditions to Avoid: Heat; Sparks and/or flames

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

<table>
<thead>
<tr>
<th>Substance</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldehydes</td>
<td>During Combustion</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>During Combustion</td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>During Combustion</td>
</tr>
<tr>
<td>Oxides of Antimony</td>
<td>During Combustion</td>
</tr>
</tbody>
</table>

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Not determined.

CHEMICAL FATE INFORMATION

Not determined.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Incinerate in a permitted hazardous waste incinerator. As a disposal alternative, dispose of waste product in a permitted hazardous waste facility.
EPA Hazardous Waste Number (RCRA): D001 (Ignitable), D035 (Methyl ethyl ketone)

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14: TRANSPORT INFORMATION

ID Number(s):

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS
Contact 3M for more information.

311/312 Hazard Categories:
Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - Yes

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>C.A.S. No</th>
<th>% by Wt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>1 - 5</td>
</tr>
<tr>
<td>Methyl Ethyl Ketone</td>
<td>78-93-3</td>
<td>10 - 30</td>
</tr>
<tr>
<td>Antimony Trioxide (ANTIMONY COMPOUNDS)</td>
<td>1309-64-4</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

STATE REGULATIONS
Contact 3M for more information.

CALIFORNIA PROPOSITION 65

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>C.A.S. No.</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimony Trioxide</td>
<td>1309-64-4</td>
<td><strong>Carcinogen</strong></td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>*Developmental Toxin</td>
</tr>
</tbody>
</table>

* WARNING: contains a chemical or chemicals which can cause birth defects or other reproductive harm.
** WARNING: contains a chemical which can cause cancer.

CHEMICAL INVENTORIES
The components of this product are in compliance with the chemical notification requirements of TSCA.
Contact 3M for more information.

INTERNATIONAL REGULATIONS
Contact 3M for more information.

WHMIS: Hazardous

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification
Health: 2  Flammability: 3  Reactivity: 0  Special Hazards: None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

No revision information is available.

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