**Material Safety Data Sheet**

**IDENTITY (As Used on Label and List)**

PZT SOL-GEL SOLUTION (E-series)

**Section ‡T**

Manufacture's Name: Mitsubishi Materials Corporation

Emergency Telephone Number: 81-795-68-2320

Address (Number, Street, City, State And ZIP Code): 12-6 Technopark, Sanda, Hyogo, Japan

Telephone Number for Information: 81-795-68-2320

Date Prepared: January 31, 2002

Signature of Prepare (optional): Satoru Mori

**Section ‡U  - Hazardous Ingredients/Identity Information**

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS No.</th>
<th>WT%</th>
<th>OSHA TWA (mg/m³)</th>
<th>ACGIH TWA (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pb (oxide)</td>
<td>1317-36-8</td>
<td>0.5</td>
<td>35</td>
<td>0.1</td>
</tr>
<tr>
<td>Zr (oxide)</td>
<td>1314-23-4</td>
<td>0-18</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Ti (oxide)</td>
<td>13463-67-7</td>
<td>0-14</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1-Butanol</td>
<td>71-36-3</td>
<td>1</td>
<td>75</td>
<td>15</td>
</tr>
<tr>
<td>Propylene glycol</td>
<td>57-55-6</td>
<td>1</td>
<td>95</td>
<td>-</td>
</tr>
</tbody>
</table>

**Section ‡V  - Physical/Chemical characteristics**

- Boiling Point: 117°C (as 1-Butanol)
- Specific Gravity (H₂O = 1): 0.81 (as 1-Butanol)
- Vapor Pressure (Pa): 0.6kPa (at 20°C, as 1-Butanol)
- Melting Point: Not available
- Vapor Density (air = 1): 4.3 (as 1-Butanol)
- Evaporation Rate: Not available
- Solubility in Water: Soluble
- Appearance and Odor: Yellow liquid with slight odor

**Section ‡W  - Fire and Explosion Hazard Data**

- Flash Point: 29°C (as 1-Butanol)
- Flammable Limits: 1.4–11.2 vol% (as 1-Butanol)
- Extinguishing Media: Dry chemical, CO₂, foam
- Special Fire Fighting Procedures: Use self-contained breathing apparatus
- Unusual Fire and Explosion Hazards: Handle as a flammable liquid

**Section ‡X  - Reactivity Data**

- Stability: Stable
- Condition to Avoid: High temp.
- Incompatibility (Materials to Avoid): Ignition sources
Hazardous Decomposition or Byproducts:

- CO, PbO on combustion

Hazardous Polymerization:

- Will not occur

Condition to Avoid:

- Not applicable

Section ‡Y  - Health Hazard Data

Route(s) of Entry:

- Inhalation? Yes
- Skin? Yes
- Ingestion? Yes

Carcinogenicity:

- Unknown

NTP? Unknown

IARC Monographs? Unknown

OSHA Regulated? Unknown

Health Hazards (Acute and Chronic):

- Acute: Headache, dizziness, nausea, eye irritation
- Chronic: De-fatting of the skin

Signs and Symptoms of Exposure:

- Headache, dizziness, nausea, eye irritation

Medical Conditions Generally Aggravated by Exposure:

- Unknown

Emergency and First Aid Procedures

Inhalation:

- Remove to fresh air. Call a physician.

Eye:

- Immediately flush eyes with plenty of water. Call a doctor.

Skin:

- Wash with soap and water.

Section ‡Z  - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled:

- Remove all sources of ignition.

Waste Disposal Method:

- Contact local industrial waste disposal company for disposal.

Other Precautions:

- Avoid exposure to vapors.

Section ‡[  - Control Measures

Ventilation

Local Exhaust:

- Recommended

Mechanical (General):

- Desirable

Special:

- Not applicable

Other:

- Not applicable

Protective Gloves:

- Rubber

Eye Protection:

- Safety goggles

Other Protective Clothing or Equipment:

- Protective clothing to prevent all body contact

Work/Hygienic Practices:

- Wash thoroughly after handling

Section ‡\ - Additional Comments

UN Number: 1993 (Flammable Liquid)

While the information and recommendations set forth herein are believed to be accurate as of the date hereof, Mitsubishi Materials Corporation makes no warranty with respect hereto and disclaims all liability from reliance thereon.