MATERIAL SAFETY DATA SHEET – LID3354S

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Electrorheological fluid
Product Number: LID 3354S
Product Type: Adaptive fluid

This electrorheological fluid may be used for experimental and evaluation purposes only.

2. COMPOSITION, INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS No.</th>
<th>% by wt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicone oil</td>
<td>63-148-62-9</td>
<td>62</td>
</tr>
<tr>
<td>*Lithium salt of resorcinol/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formalin</td>
<td>Proprietary</td>
<td>38</td>
</tr>
</tbody>
</table>

*Information on ingredients:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resorcinol</td>
<td>108-46-3</td>
</tr>
<tr>
<td>Lithium Hydroxide LiOH, hydrated form</td>
<td>1310-66-3</td>
</tr>
<tr>
<td>Formalin</td>
<td>50-00-0</td>
</tr>
</tbody>
</table>

Ingredients that have exposure limits

<table>
<thead>
<tr>
<th>Exposure limits (TWA) Ingredients</th>
<th>ACGIH (TLV)</th>
<th>OSHA (PEL)</th>
<th>OTHER</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Exposure limits (STEL) Ingredients</th>
<th>ACGIH (TLV)</th>
<th>OSHA (PEL)</th>
</tr>
</thead>
</table>

3. HAZARDS IDENTIFICATION

Toxicity: May cause mild eye irritation
When heated to temperatures above 300°F (150°C) in the presence of air, this product can form formaldehyde vapors. Formaldehyde is a potential cancer hazard and a known skin and respiratory sensitizer. Vapors irritate eyes, nose and throat. Safe handling conditions may be maintained by keeping vapor concentration below the OSHA permissible limit for formaldehyde.

Primary route of entry: None known

Signs and symptoms of exposure: Irritation of the eyes
3. HAZARDS IDENTIFICATION (CONT.)

Existing Conditions
aggravated by exposure  None known

Ingredients

<table>
<thead>
<tr>
<th>Literature referenced</th>
<th>Carcinogen</th>
<th>Target Organ and Other Health effects</th>
<th>NTP</th>
<th>IARC</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicone oil</td>
<td>No data</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Lithium salt of resorcinol/</td>
<td>No data</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Formalin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Ingestion
Do not induce vomiting. Keep individual calm.
Obtain medical attention

Inhalation:  Does not apply

Skin contact:  Wash thoroughly with soap and water

Eye Contact:  Flush eyes with directed stream of water for at least 15 minutes.

5. FIRE FIGHTING MEASURES

Flash Point: More than 200°F
Recommended Method: Closed cup

Extinguishing Agents  Carbon dioxide, foam, dry chemical
Wear NIOSH/MSHA approved positive pressure self-contained breathing apparatus.

Hazardous Products formed by Fire or Thermal Decomp None.
Unusual Fire or Explosion Hazards: None

Explosive Limits:
(% by volume in air) Lower Not available
(% by volume in air) Upper Not available

6. ACCIDENTAL RELIEF MEASURES

Steps to be taken in case of spill or leak  Soak up with an inert absorbent. Store in partly filled, closed container until disposal.
7. HANDLING AND STORAGE.

Safe Storage: Store below 100°F
Shelf Life: At least 3 years at 70°F
Handling: Avoid prolonged skin contact. Keep away from eyes.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Eyes: Safety glasses or goggles
Skin: Rubber or plastic gloves
Ventilation: Does not apply

See Section 2 for Exposure Limits

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Brown liquid
Odor: Mild
Boiling Point: More than 300°F
pH: Does not apply
Solubility in Water: Insoluble
Volatile Organic Compound (EPA Method 24): Not available
Vapor Pressure: Not available
Vapor Density: Not available
Evaporation Rate: (Ether = 1) Not available.

10. STABILITY AND REACTIVITY

Stability: Stable
Hazardous Polymerization: Will not occur
Incompatibility: Oxidizing agents, aluminum, magnesium, sodium potassium, and amines.

Hazardous Decomposition Products (non-thermal): None

11. TOXICOLOGICAL INFORMATION

See Section 3
12. ECOLOGICAL INFORMATION

No data available

13. DISPOSAL CONSIDERATIONS

Recommended methods of disposal: Incinerate following EPA and local regulations
EPA Hazardous Waste Number NII - Not a RCRA Hazardous Waste Material

14. TRANSPORT INFORMATION

DOT (49 CFR 172)
Domestic Ground Transport
Proper Shipping Name: Unrestricted
Hazard Class or Division: Unrestricted
Identification Number: None
Marine Pollutant: None
IATA
Proper Shipping Name: Unrestricted
Class or Division: Unrestricted
UN or ID Number: None

15. REGULATORY INFORMATION

CA Proposition 65 No California Proposition 65 chemicals are known to be present

16. OTHER INFORMATION

Estimated NFPA(R) Code:
Health Hazard 0
Fire Hazard 0
Reactivity Hazard 0
Specific Hazard: Does not apply

Estimated HMIS(R) Code:
Health Hazard 0
Flammability Hazard 0
Reactivity Hazards 0
Personal Protection See Section 8

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HMIS is a registered trademark of the National Paint and Coatings Assn.

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