MATERIAL SAFETY DATA SHEET

Revision Date: 11/05/2009                                  Conforms to 93/112/EC and ISO 11014-1

1. Chemical Product and Company Identification_________________________

<table>
<thead>
<tr>
<th>Product Name:</th>
<th>FlowLogic U</th>
<th>Product Number:</th>
<th>SG-BXX-05</th>
<th>SG-BXX-06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Names/Description:</td>
<td>Blend of scintillators in chiral phenylalkanes.</td>
<td>Contact Details</td>
<td>LabLogic Systems Limited</td>
<td>Tel. +44 (0) 114 2667267</td>
</tr>
<tr>
<td>Supplier</td>
<td>Paradigm House</td>
<td>3 Melbourne Avenue</td>
<td>Sheffield, South Yorkshire</td>
<td>S10 2QJ</td>
</tr>
<tr>
<td></td>
<td>LabLogic Systems Limited</td>
<td>Tel. +44 (0) 114 2667267</td>
<td>E-mail: <a href="mailto:solutions@lablogic.com">solutions@lablogic.com</a></td>
<td>Web: <a href="http://www.lablogic.com">www.lablogic.com</a></td>
</tr>
</tbody>
</table>

2. Composition/Information on Ingredients____________________________

<table>
<thead>
<tr>
<th>Component</th>
<th>% Comp.</th>
<th>CAS #</th>
<th>EINECS #</th>
<th>TLV (Units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenyl Xylyl Ethane (PXE)</td>
<td>50 - 70</td>
<td>6196-95-8</td>
<td>none established</td>
<td></td>
</tr>
<tr>
<td>Primary Alcohol Ethoxylate</td>
<td>5 - 10</td>
<td>68439-46-3</td>
<td>none established</td>
<td></td>
</tr>
<tr>
<td>Butoxy Ethanol</td>
<td>5 - 10</td>
<td>111-76-2</td>
<td>203-805-0</td>
<td>25 ppm (skin)</td>
</tr>
<tr>
<td>Linear alkyl phenyl ethoxylates</td>
<td>20 - 30</td>
<td>9016-45-9</td>
<td>none established</td>
<td></td>
</tr>
</tbody>
</table>

EEC LABEL SYMBOL AND CLASSIFICATION

R: 36/38
Irritating to eyes and skin.

S: 26-36
In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

3. Hazards Identification__________________________________________

Appearance and Odor

Nearly odorless, clear blue-violet fluorescent liquid.

EMERGENCY OVERVIEW - IMMEDIATE HAZARD

Phenyl Xylyl Ethane (PXE)
MAY BE IRRITATING TO THE SKIN, EYES, AND RESPIRATORY TRACT.
Primary Alcohol Ethoxylate
NO INFORMATION FOUND.
Butoxy Ethanol
CAUTION! SEVERELY IRRITATING TO THE EYES. IRRITATING TO THE SKIN, NOSE THROAT AND RESPIRATORY TRACT. TOXIC IF INHALED, INGESTED OR ABSORBED THROUGH SKIN.
EMERGENCY OVERVIEW - CHRONIC HAZARD WARNING:

Phenyl Xylyl Ethane (PXE)
NO CHRONIC HEALTH HAZARDS KNOWN
Primary Alcohol Ethoxylate
NO INFORMATION FOUND.
Butoxy Ethanol
NO INFORMATION FOUND.

Potential Health Effects

Inhalation
Phenyl Xylyl Ethane (PXE):
Breathing of the mists, vapors or fumes may irritate the nose, throat and lungs.
Primary Alcohol Ethoxylate:
Information not found.
Butoxy Ethanol:
Vapors may cause irritation to the nose, throat, and respiratory tract and are toxic if inhaled.

Ingestion
Phenyl Xylyl Ethane (PXE):
May cause irritation of the mouth, throat, and gastrointestinal tract. Exposure may also cause central nervous system symptoms.
Primary Alcohol Ethoxylate:
Moderately toxic by ingestion.
Butoxy Ethanol:
Moderately toxic if ingested.

Skin
Phenyl Xylyl Ethane (PXE):
May cause skin irritation.
Primary Alcohol Ethoxylate:
Severely irritating to the skin and moderately toxic if absorbed through the skin.
Butoxy Ethanol:
Product is mildly irritating to the skin and toxic if absorbed through the skin.

Eyes
Phenyl Xylyl Ethane (PXE):
Exposure to vapors, fumes or mists may cause irritation. Direct contact may cause irritation.
Primary Alcohol Ethoxylate:
Severely irritating to the eyes.
Butoxy Ethanol:
Causes severe eye irritation.

Signs and Symptoms of Overexposure

Inhalation
Phenyl Xylyl Ethane (PXE):
Sore throat, coughing, labored breathing, sneezing and burning sensation, depending on the concentration and duration of exposure. May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.
Primary Alcohol Ethoxylate:
Butoxy Ethanol:
Burning in nose and throat, coughing. Headache, dizziness, drowsiness, fatigue, nausea.
Ingestion
Phenyl Xylyl Ethane (PXE):
Salivation, pain, nausea, vomiting and diarrhea. Exposure may also cause central nervous system symptoms similar to those listed under Inhalation.
Primary Alcohol Ethoxylate:
Butoxy Ethanol:
Headache, dizziness, drowsiness, fatigue, nausea, vomiting.

Skin
Phenyl Xylyl Ethane (PXE):
Drying, reddening, itching, and cracking. Repeated or prolonged contact with large amounts of this material may result in absorption through the skin to produce toxic effects.
Primary Alcohol Ethoxylate:
Butoxy Ethanol:
Redness, pain and itching.

Eyes
Phenyl Xylyl Ethane (PXE):
Redness, tearing, and blurred vision.
Primary Alcohol Ethoxylate:
Butoxy Ethanol:
Redness, tearing, and pain.

Carcinogenicity
Phenyl Xylyl Ethane (PXE):
Not listed by NTP or IARC as a known or possible carcinogen.
Primary Alcohol Ethoxylate:
No information available.
Butoxy Ethanol:
Not listed as a known or anticipated carcinogen by NTP or IARC.

Mutagenicity
Phenyl Xylyl Ethane (PXE):
No information available.
Primary Alcohol Ethoxylate:
No information available.
Butoxy Ethanol:
No information found.

Reproductive Toxicity
Phenyl Xylyl Ethane (PXE):
No information available.
Primary Alcohol Ethoxylate:
No information available.
Butoxy Ethanol:
Inhalation exposure of pregnant rabbits caused some lethality to the dam and fetus at 200 ppm, but there were no effects at 100 ppm and below. Inhalation exposure to pregnant rats caused irritancy to the dams and related fetotoxicity at 200 and 100 ppm, but there were no effects at 50 ppm and below.
### Teratogenic Effects

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenyl Xylyl Ethane (PXE):</td>
<td>No information</td>
</tr>
<tr>
<td>Primary Alcohol Ethoxylate:</td>
<td>No information available.</td>
</tr>
<tr>
<td>Butoxy Ethanol:</td>
<td>Has not been shown to cause birth defects.</td>
</tr>
</tbody>
</table>

### Routes of Entry

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Phenyl Xylyl Ethane (PXE):</td>
<td>Ingestion, inhalation, skin contact.</td>
</tr>
<tr>
<td>Primary Alcohol Ethoxylate:</td>
<td>Inhalation, ingestion, skin contact.</td>
</tr>
<tr>
<td>Butoxy Ethanol:</td>
<td>Inhalation, ingestion, skin contact.</td>
</tr>
</tbody>
</table>

### Target Organ Statement

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Phenyl Xylyl Ethane (PXE):</td>
<td>No information available.</td>
</tr>
<tr>
<td>Primary Alcohol Ethoxylate:</td>
<td>No information available.</td>
</tr>
<tr>
<td>Butoxy Ethanol:</td>
<td>Preexisting skin, eye, and lung disorders may be aggravated by exposure.</td>
</tr>
</tbody>
</table>

### 4. First Aid Measures

#### Inhalation
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

#### Ingestion
DO NOT INDUCE VOMITING. If swallowed and the person is conscious, immediately give large amounts of water. Get medical attention.

#### Skin
Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

#### Eyes
Immediately flush eyes with plenty of water for at least fifteen minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

### 5. Fire Fighting Measures

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>91 C</td>
</tr>
<tr>
<td>Flash Point Method</td>
<td>PMCC*</td>
</tr>
<tr>
<td>Flammable Limits</td>
<td>ND</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>&gt; 707 F</td>
</tr>
</tbody>
</table>

* Flash point value determined by Pensky-Martin Closed Cup method (PMCC). Upon request, alternate Tagliabue Closed Cup data (TCC) has been provided in some instances to local regulatory agencies.
Extinguishing media
Water spray, dry chemical, alcohol-resistant foam, or carbon dioxide.

Protective Equipment
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.

Hazardous Combustion Products
Thermal decomposition products may include carbon monoxide, carbon dioxide, and hydrocarbons.

Unusual Fire and Explosion Hazards
Emits toxic fumes under fire conditions.

NFPA Codes: Health 1  Flammability 1  Reactivity 0

6. Accidental Release Measures

Steps to be taken in case material is released or spilled
Eliminate source of ignition. Ventilate area. Cover with absorbent material (soda ash) to confine spill and sweep or shovel into container. Close container tightly. Avoid breathing vapors.

Waste Disposal Method
Disposal must be made in accordance with applicable federal, state, and local regulations.

Personal Precautions
Wear appropriate protective equipment as specified in section 8.

7. Handling and Storage

Handling
Avoid contact and inhalation. Do not get in eyes, on skin, on clothing. Wash thoroughly after handling. Transfer methods should avoid static sparks. Do not eat, drink, or smoke in areas of use or storage.

Storage
Keep in a tightly closed container, stored in a cooled, dry, ventilated area away from sources of heat or ignition. Protect from physical damage.

Storage Temperature
Room Temperature

Disposal
Observe all national, state, and local regulations regarding disposal.
8. Exposure Controls/Personal Protection

### Airborne Exposure Limits

| Component: Phenyl Xylyl Ethane (PXE) | ACGIH Threshold Limit Value (TLV): none established |
| Component: Primary Alcohol Ethoxylate | ACGIH Threshold Limit Value (TLV): none established |
| Component: Butoxy Ethanol | ACGIH Threshold Limit Value (TLV): 25 ppm (skin) |

### Engineering Controls

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.

### Respiratory Protection

For conditions of use where exposure to the substance is apparent, consult an industrial hygienist. For emergencies, or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator.

### Eye Protection

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

### Skin Protection

Wear protective gloves and clean body covering clothing.

### Other Control Measures

N.A.

9. Physical Properties

| Boiling point | 575 - 605 F |
| Melting point | N.A. |
| Vapor pressure (mmHg) | < 0.1 |
| Vapor density (Air = 1) | Not determinable |
| % volatile by volume | 100% |
| Evaporation Rate Solubility in water | Not measureable Slightly soluble. |
| pH | N.A. |
| Specific gravity (H2O = 1) | 0.91 |
| Specific gravity (H2O = 1) | 0.91 |
10. Stability and Reactivity

**Stability**

Stable under ordinary conditions of use and storage.

**Conditions to Avoid**

Heat, sources of ignition.

**Hazardous Decomposition Products**

Combustion may produce toxic oxides of carbon and reactive hydrocarbons.

**Hazardous Polymerization**

Will not occur

**Incompatibles**

Phenyl Xylyl Ethane (PXE):
Oxidizing agents.

Primary Alcohol Ethoxylate:
Strong oxidizing agents. Aluminum surfaces at temperatures above 120 degrees.

Butoxy Ethanol:
Strong oxidizing agents. Strong bases and salts of strong bases at elevated temperatures. Aluminum surfaces.

Linear alkyl phenyl ethoxylates:
Oxidizing agents.

11. Toxicological Information

**Product LD50 Values**

<table>
<thead>
<tr>
<th></th>
<th>Oral Rat LD50 (mg/kg):</th>
<th>Dermal Rabbit LD50 (mg/kg):</th>
</tr>
</thead>
<tbody>
<tr>
<td>FlowLogic U</td>
<td>No Data</td>
<td>No Data</td>
</tr>
<tr>
<td>FlowLogic U</td>
<td>No Data</td>
<td>No Data</td>
</tr>
</tbody>
</table>

**Component Cancer List Status**

<table>
<thead>
<tr>
<th></th>
<th>NTP Carcinogen</th>
<th>IARC Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenyl Xylyl Ethane (PXE)</td>
<td>No, No</td>
<td>None, None</td>
</tr>
<tr>
<td>Primary Alcohol Ethoxylate</td>
<td>No, No</td>
<td>None, None</td>
</tr>
<tr>
<td>Butoxy Ethanol</td>
<td>No, No</td>
<td>None, None</td>
</tr>
<tr>
<td>Linear alkyl phenyl ethoxylates</td>
<td>No, No</td>
<td>None, None</td>
</tr>
</tbody>
</table>

12. Ecological Information

**Phenyl Xylyl Ethane (PXE)**

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA is is the responsibility of the user to determine, at the time of disposal, whether the product meets the criteria for hazardous waste.

**Primary Alcohol Ethoxylate**

If this product becomes waste, it would not be a hazardous waste by RCRA criteria. Place in an appropriate disposal facility in compliance with local regulations.
**Butoxy Ethanol**

No information available.

**Linear alkyl phenyl ethoxylates**

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA is is the responsibility of the user to determine, at the time of disposal, whether the product meets the criteria for hazardous waste.

### 13. Disposal Considerations

Observe all national, state, and local regulations regarding disposal.

### 14. Transport Information

**D.O.T.**

Proper Shipping Name: Not regulated.
Hazard Class: N.A.
UN Number: N.A.
Packing Group: N.A.

**I.A.T.A.**

Proper Shipping Name: Not regulated.
Hazard Class: N.A.
UN Number: N.A.
Packing Group: N.A.

**I.M.O.**

Proper Shipping Name: Not regulated.
Hazard Class: N.A.
UN Number: N.A.
Packing Group: N.A.

### 15. Regulatory Information

**United States**

**TSCA Regulatory Statement**

All intentional ingredients are listed on the TSCA Inventory.

**SARA 311/312 Hazard Categories**

<table>
<thead>
<tr>
<th>Component</th>
<th>Fire</th>
<th>Pressure</th>
<th>Reactivity</th>
<th>Acute</th>
<th>Chronic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenyl Xylyl Ethane (PXE)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Primary Alcohol Ethoxylate</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Butoxy Ethanol</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Linear alkyl phenyl ethoxylates</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
Europe

EEC Regulatory
All intentional ingredients are listed on the European EINECS Inventory.

EEC LABEL SYMBOL AND CLASSIFICATION

R: 36/38
Irritating to eyes and skin.

S: 26-36
In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

16. Other Information

NFPA Codes:  Health 1  Flammability 1  Reactivity 0

MANUFACTURER DISCLAIMER: The information given herein is offered in good faith as accurate, but without guarantee. Conditions of the use and suitability of the product for particular uses are beyond our control. All risks of use of the product are therefore assumed by the user. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.