## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier

Product name : JSR LUMILON LP-0101

Chemical description : Photosensitizers and resin solution.

Product code : 50910

Contains : 1-methoxy-2-propanol; ethyl-(S)-lactate

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use / Generic name : Photoresist

Main use category : Industrial use

### 1.3. Details of the supplier of the safety data sheet

JSR Micro Singapore Branch
60 Paya Lebar Road, Paya Lebar Square #07-18, Singapore 409051
TEL: +65 6775-0031

### 1.4. Emergency telephone number

Emergency number : Emergency phone number Belgium: +32-(0)70-245245

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

**Classification according to Regulation (EC) No. 1272/2008 [CLP]**

| | |
|---|---|
| Flam. Liq. 3 | H226 |
| Eye Dam. 1 | H318 |
| STOT SE 3 | H336 |
| STOT SE 3 | H335 |

Full text of classification categories and H statements : see section 16

**Adverse physicochemical, human health and environmental effects**

No supplementary major concern known. For more information, please see section 9 -> 12.

### 2.2. Label elements

**Labelling according to Regulation (EC) No. 1272/2008 [CLP]**

Hazard pictograms (CLP) :

GHS02 GHS05 GHS07

Signal word (CLP) : DANGER

Hazard statements (CLP) : H226 - Flammable liquid and vapour
H318 - Causes serious eye damage
H335 - May cause respiratory irritation
H336 - May cause drowsiness or dizziness

Precautionary statements (CLP) : P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P260 - Do not breathe dust, fume, gas, mist, vapours, spray
P280 - Wear protective gloves, protective clothing, eye protection, face protection
P305+P351+P313 - IF IN EYES: Rinse cautiously with water for several minutes. Get medical advice/attention
P312 - Call a POISON CENTER or doctor/physician if you feel unwell
P403+P235 - Store in a well-ventilated place. Keep cool

Extra phrases : Avoid: Light

Contains : 1-methoxy-2-propanol; ethyl-(S)-lactate

Unknown toxicity (CLP) : May contain <5% ingred. with unknown (environmental) toxicity

### 2.3. Other hazards

No additional information available

## SECTION 3: Composition/information on ingredients

### 3.2. Mixture

| Name | Product identifier | % | Classification according to Chemical Policy Singapore and CLASS regulation Malaysia 2013 |
|---|---|---|---|
| 1-methoxy-2-propanol | (CAS No) 107-98-2 | 50 - 55 | Flam. Liq. 3, H226<br>STOT SE 3, H336 |
| ethyl-(S)-lactate | (CAS No) 687-47-8 | 30 - 40 | Flam. Liq. 3, H226<br>Eye Dam. 1, H318<br>STOT SE 3, H335 |
| Photoactive compound | | < 2 | Flam. Sol. 1, H228<br>Pyr. Sol. 1, H250<br>Aquatic Chronic 4, H413 |
| 2-methoxypropanol<br>(Impurity) | (CAS No) 1589-47-5 | < 0,3 | Flam. Liq. 3, H226<br>Skin Irrit. 2, H315<br>Eye Dam. 1, H318<br>Repr. 1B, H360D<br>STOT SE 3, H335 |

Full text of H-statements: see section 16

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures general : Get medical advice/attention.

First-aid measures after inhalation : Allow victim to breathe fresh air. Allow the victim to rest. Obtain medical attention if breathing difficulty persists.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.

First-aid measures after eye contact : In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

First-aid measures after ingestion : If swallowed, immediately administer water (1/2 liter) only if victim is completely conscious/alert. Do not induce vomiting.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : More information in section: "Toxicology".

### 4.3. Indication of any immediate medical attention and special treatment needed

If medical advice is needed, have product container or label at hand.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Foam. Dry chemical. Carbon dioxide. Use extinguishing media appropriate for surrounding fire.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : This product is flammable. Heavier than air, vapours may travel long distances along ground, ignite and flash back to source. On exposure to high temperature, may decompose, releasing toxic/flammable vapours.

Reactivity : To our knowledge, the product does not present any particular risk, under normal conditions of use. (See section 7: Handling and Storage).

### 5.3. Advice for firefighters

Precautionary measures fire : Do not enter fire area without proper protective equipment, including respiratory protection. Pressure demand self-contained breathing apparatus should be provided to fire fighters in building or confined area where the material is stored.

Firefighting instructions : Avoid fire-fighting water to enter environment. Exercise caution when fighting any chemical fire. Water should be used to keep exposed containers cool.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : Supply fresh air. Equip cleanup crew with proper protection. No naked lights. No smoking. Use special care to avoid static electric charges.

Protective equipment : Wear suitable respiratory equipment.

Emergency procedures : Remove ignition sources.

### 6.2. Environmental precautions

Avoid release to the environment. Prevent entry to sewers and public waters.

### 6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it. Use suitable disposal containers.

### 6.4. Reference to other sections

No additional information available

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Precautions for safe handling : Both local exhaust and good general room ventilation must be provided not only to control exposure but also to prevent formation of flammable mixtures. Take precautionary measures against static discharge during blending and transfer operations. Close container tightly after use.

Hygiene measures : Avoid all unnecessary exposure. Handle in accordance with good industrial hygiene and safety procedures. Wear suitable protective clothing. Ensure prompt removal from eyes, skin and clothing. Do not eat, drink or smoke when using this product.

### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Maintain the storage temperature below 35°C. This storage temperature is intended to cover HSE-purposes and is valid within the period: shelflife + 3 months. For the technical application, see the specifications and the label. Store in a well-ventilated place. Keep container tightly closed. Keep away from heat, sparks, open flames. - No smoking.

Incompatible products : Store separately from oxidising agents and strongly alkaline and strongly acidic materials.

Storage temperature : 0 - 10 °C

Storage area : Store in a dry, cool area.

### 7.3. Specific end use(s)

No additional information available

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

**ethyl-(S)-lactate (687-47-8)**

| OEL | 15 min (mg/m³) | 15 min (ppm) | 8 h (mg/m³) | 8 h (ppm) |
|---|---|---|---|---|
| This chemical is not listed in the EU OEL list. | | | | |
| This chemical is not listed in the Singapore PEL list. | | | | |

**Photoactive compound**

| OEL | 15 min (mg/m³) | 15 min (ppm) | 8 h (mg/m³) | 8 h (ppm) |
|---|---|---|---|---|
| This chemical is not listed in the EU OEL list. | | | | |
| This chemical is not listed in the Singapore PEL list. | | | | |

**1-methoxy-2-propanol (107-98-2)**

| OEL | 15 min (mg/m³) | 15 min (ppm) | 8 h (mg/m³) | 8 h (ppm) |
|---|---|---|---|---|
| EU | 568 mg/m³ | 150 ppm | 375 mg/m³ | 100 ppm |
| Singapore | 553 mg/m³ | 150 ppm | 369 mg/m³ | 100 ppm |

**2-methoxypropanol (1589-47-5)**

| OEL | 15 min (mg/m³) | 15 min (ppm) | 8 h (mg/m³) | 8 h (ppm) |
|---|---|---|---|---|
| This chemical is not listed in the EU OEL list. | | | | |
| This chemical is not listed in the Singapore PEL list. | | | | |

### 8.2. Exposure controls

Appropriate engineering controls : Use explosion proof ventilation equipment. Laboratory samples should be handled in a fumehood. Local exhaust and general ventilation must be adequate to meet exposure standards.

Hand protection : Chemical resistant protective gloves (EN374). Suitable materials for splash contact, e.g nitril (0.1 mm). For prolonged, direct contact protective index 6, corresponding to > 480 minutes of permeation time, is recommended. Examples, subordinate to previous recommendation: nitrile rubber (0.4 mm), latex (0.5mm), butyl (0.7mm).Take new gloves when they are dirty.

Eye protection : Safety glasses. Wear eye-protectors conformed to EN166.

Skin and body protection : If skin contact or contamination of clothing is possible, protective clothing should be worn. Wear shoes conformed to EN345 type min S2.

Respiratory protection : Where exposure through inhalation may occur from use, approved respiratory protection equipment is recommended. Use a mask EN140/136 + thread fitting EN148-1 + filter EN14387 type A or mask EN405 with filter EN141 type A.

## SECTION 9: Physical and chemical properties

If no information is available on the mixture, please consult information on ingredients.

### 9.1. Information on basic physical and chemical properties

| | | |
|---|---|---|
| Physical state | : | Liquid |
| Colour | : | Colourless to light yellow. |
| Odour | : | Ester-like. |
| pH | : | No data available |
| Flash point | : | 39 °C |
| Flammability (solid, gas) | : | Not applicable |
| Explosive limits | : | No data available |
| Vapour pressure | : | No data available |
| Relative density | : | 0,8 - 1,1 |
| Solubility | : | No data available |
| Log Pow | : | No data available |
| Viscosity, dynamic | : | 14 cP |

**ethyl-(S)-lactate(687-47-8)**

| | | |
|---|---|---|
| Physical state | : | Liquid |
| Odour | | Ester-like |
| pH | : | 4 (50 g/l; 20 °C) |
| Melting point | : | < -15 °C |
| Boiling point | : | 153 °C (1013 hPa) |
| Flash point | : | 55 °C |
| Relative evaporation rate (butylacetate=1) | : | 0,22 |
| Explosive limits (vol %) | : | 1,5 - 11,4 vol % |
| Vapour pressure | : | 2,2 hPa (20°C) |
| Relative vapour density | : | 4,07 |
| Relative density | : | 1,033 (20 °C) |
| Solubility in water | : | Miscible. |
| Log Pow | : | 0,31 (20 °C) |
| Auto-ignition temperature | : | 430 °C (1016-1024 hPa) |
| Viscosity, kinematic | : | 3,6 mm²/s (20 °C; OECD 114) |

**Photoactive compound**

| | | |
|---|---|---|
| Physical state | : | Solid |

**1-methoxy-2-propanol(107-98-2)**

| | | |
|---|---|---|
| Physical state | : | Liquid |
| Odour | | Ether-like |
| pH | : | 4 - 7 200 g/l, 20 °C |
| Melting point | : | -96 °C 1013,25 hPa |
| Boiling point | : | 120,17 °C 1013,25 hPa, OECD 103 |
| Flash point | : | 31,1 °C 1013 hPa |
| Relative evaporation rate (butylacetate=1) | : | 0,75 ASTM D3539 |
| Explosive limits (vol %) | : | 1,48 - 13,74 vol % 1013 hPa |
| Vapour pressure | : | 11,3 hPa 20°C |
| Relative vapour density | : | 3,11 |
| Relative density | : | 0,92 20 °C, ASTM D4052 |
| Solubility | : | soluble in most organic solvents<br>Soluble in<br>Benzene<br>Methanol<br>Glycerol |
| Solubility in water | : | > 1000 g/l 20 °C, EU A.6 |
| Auto-ignition temperature | : | 287 °C EU A.15 |
| Viscosity, dynamic | : | 1,9 mPa.s 20 °C |
| Oxidising properties | : | No oxidizing properties |

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

To our knowledge, the product does not present any particular risk, under normal conditions of use. (See section 7: Handling and Storage).

### 10.2. Chemical stability

To our knowledge, the product does not present any particular risk, under normal conditions of use.

### 10.3. Possibility of hazardous reactions

No additional information available

### 10.4. Conditions to avoid

Light. Heat. Flame.

### 10.5. Incompatible materials

Strong acids, strong bases.

### 10.6. Hazardous decomposition products

Smoke. Carbon dioxide. Carbon monoxide.

## SECTION 11: Toxicological information

If no information is available on the mixture, please consult information on ingredients.

### 11.1. Information on toxicological effects

| | | |
|---|---|---|
| Acute toxicity | : | Not classified |
| Skin corrosion/irritation | : | Not classified<br>May cause (slight) irritation |
| Serious eye damage/irritation | : | Causes serious eye damage. |
| Respiratory or skin sensitisation | : | Not classified |
| Germ cell mutagenicity | : | Not classified |
| Carcinogenicity | : | Not classified |
| Reproductive toxicity | : | Not classified |
| Specific target organ toxicity (single exposure) | : | May cause drowsiness or dizziness. May cause respiratory irritation.<br>May cause headache, nausea |
| Specific target organ toxicity (repeated exposure) | : | Not classified |
| Aspiration hazard | : | Not classified |

**ethyl-(S)-lactate (687-47-8)**

| | | |
|---|---|---|
| Acute toxicity | : | Not classified |
| LD50 oral rat | : | > 2000 mg/kg (OECD 401) |
| LD50 dermal rabbit | : | > 2000 mg/kg |
| LC50 inhalation rat (4 h) | : | > 5,4 mg/l (OECD 403) |
| Skin corrosion/irritation | : | Not classified<br>Not irritating to skin (OECD 404) |
| Serious eye damage/irritation | : | Causes serious eye damage. |
| Respiratory or skin sensitisation | : | Not classified<br>Local lymph node assay: negative |
| Germ cell mutagenicity | : | Not classified<br>Ames test: negative (OECD 471) Chromosome aberration: negative (OECD 473) In vitro mammalian cell gene mutation test: negative (OECD 476) (EU B.17) |
| Carcinogenicity | : | Not classified<br>IARC: not listed |
| Reproductive toxicity | : | Not classified<br>Based on available data, the classification criteria are not met |

**ethyl-(S)-lactate (687-47-8)**

| | | |
|---|---|---|
| Specific target organ toxicity (single exposure) | : | May cause respiratory irritation. |
| Specific target organ toxicity (repeated exposure) | : | Not classified |
| Aspiration hazard | : | Not classified |

**Photoactive compound**

| | | |
|---|---|---|
| Acute toxicity | : | Not classified |
| Skin corrosion/irritation | : | Not classified |
| Serious eye damage/irritation | : | Not classified |
| Respiratory or skin sensitisation | : | Not classified |
| Germ cell mutagenicity | : | Not classified |
| Carcinogenicity | : | Not classified |
| Reproductive toxicity | : | Not classified |
| Specific target organ toxicity (single exposure) | : | Not classified |
| Specific target organ toxicity (repeated exposure) | : | Not classified |
| Aspiration hazard | : | Not classified |

**1-methoxy-2-propanol (107-98-2)**

| | | |
|---|---|---|
| Acute toxicity | : | Not classified |
| LD50 oral rat | : | 4016 mg/kg (EU B.1) |
| LD50 dermal rat | : | > 2000 mg/kg EU B.3 |
| LC50 inhalation rat (4 h) | : | > 26,29 mg/l OECD 403 |
| Skin corrosion/irritation | : | Not classified<br>Not irritating to skin (EU B.4) |
| Serious eye damage/irritation | : | Not classified<br>Not irritating to eyes (EU B.5) |
| Respiratory or skin sensitisation | : | Not classified<br>Guinea pig maximisation test: negative (EU B.6) |
| Germ cell mutagenicity | : | Not classified<br>Ames test: negative (OECD 471) Chromosome aberration: negative (OECD 473) In vitro mammalian cell gene mutation test: negative (OECD 476) |
| Carcinogenicity | : | Not classified<br>No evidence of carcinogenic effects in experiments (OECD 453) IARC: not listed |
| Reproductive toxicity | : | Not classified<br>Based on available data, the classification criteria are not met (OECD 414) (OECD 416) |
| Specific target organ toxicity (single exposure) | : | May cause drowsiness or dizziness. |
| Specific target organ toxicity (repeated exposure) | : | Not classified<br>Based on available data, the classification criteria are not met (OECD 413) (OECD 407) (OECD 410) |
| Aspiration hazard | : | Not classified |

**2-methoxypropanol (1589-47-5)**

| | | |
|---|---|---|
| Acute toxicity | : | Not classified |
| Skin corrosion/irritation | : | Causes skin irritation. |
| Serious eye damage/irritation | : | Causes serious eye damage. |
| Respiratory or skin sensitisation | : | Not classified |

**2-methoxypropanol (1589-47-5)**

| | | |
|---|---|---|
| Germ cell mutagenicity | : | Not classified |
| Carcinogenicity | : | Not classified |
| Reproductive toxicity | : | May damage the unborn child. |
| Specific target organ toxicity (single exposure) | : | May cause respiratory irritation. |
| Specific target organ toxicity (repeated exposure) | : | Not classified |
| Aspiration hazard | : | Not classified |

## SECTION 12: Ecological information

### 12.1. Toxicity

**ethyl-(S)-lactate (687-47-8)**

| | | |
|---|---|---|
| LC50 fish (96 h) | : | 320 mg/l (Danio rerio; OECD 203) |
| EC50 crustacea (48 h) | : | 683 mg/l (Daphnia magna; OECD 202) |
| ErC50 algae or other aquatic plants (72-96 h) | : | 3500 mg/l (Pseudokirchnerella subcapitata; OECD 201) |
| Water hazard class (WGK) | : | 1 |

**1-methoxy-2-propanol (107-98-2)**

| | | |
|---|---|---|
| LC50 fish (96 h) | : | 20800 mg/l Pimephales promelas, ASTM E729-80 |
| EC50 crustacea (48 h) | : | 23300 mg/l Daphnia magna |
| EC50 microorganisms | : | > 1000 mg/l activated sludge, 3 h, OECD 209 |
| ErC50 algae or other aquatic plants (72-96 h) | : | > 1000 mg/l Pseudokirchnerella subcapitata |
| Water hazard class (WGK) | : | 1 |

**2-methoxypropanol (1589-47-5)**

| | | |
|---|---|---|
| Water hazard class (WGK) | : | 1 |

### 12.2. Persistence and degradability

**ethyl-(S)-lactate (687-47-8)**

| | | |
|---|---|---|
| Persistence and degradability | : | Not readily biodegradable. (EU C.5). (EU C.6). |

**1-methoxy-2-propanol (107-98-2)**

| | | |
|---|---|---|
| Persistence and degradability | : | Readily biodegradable. (OECD 301E). |

### 12.3. Bioaccumulative potential

**ethyl-(S)-lactate (687-47-8)**

| | | |
|---|---|---|
| Log Pow | : | 0,31 (20 °C) |

**1-methoxy-2-propanol (107-98-2)**

| | | |
|---|---|---|
| Bioaccumulative potential | : | Low bioaccumulation potential. |

### 12.4. Mobility in soil

**ethyl-(S)-lactate (687-47-8)**

| | | |
|---|---|---|
| Surface tension | : | 70,5 mN/m (1 g/l; 20 °C) |
| Log Koc | : | < 1,32 (EU C.19; OECD 121) |

**1-methoxy-2-propanol (107-98-2)**

| | | |
|---|---|---|
| Surface tension | : | 70,7 mN/m 1 g/l, 20 °C, OECD 115 |
| Log Koc | : | 0,76 |
| Ecology - soil | : | Very mobile in soil. |

### 12.5. Results of PBT and vPvB assessment

**ethyl-(S)-lactate (687-47-8)**

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

### 12.6. Other adverse effects

No additional information available

## SECTION 13: Disposal considerations

**13.1. Waste treatment methods**

Waste disposal recommendations : Avoid release to the environment. Dispose in a safe manner in accordance with local/national regulations.

## SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

**14.1. UN number** : 1866

**14.2. UN proper shipping name** : RESIN SOLUTION

**14.3. Transport hazard class(es)** : 3

**Hazard labels** :


**14.4. Packing group** : III

**14.5. Environmental hazards**

No additional information available

**14.6. Special precautions for user**

**Overland transport:**

Orange plates :


Tunnel restriction code (ADR) : D/E

**14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

No additional information available

## SECTION 15: Regulatory information

**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**

**15.1.1. EU-Regulations**

Contains no REACH Annex XIV substances

**15.1.2. National regulations**

Water hazard class (WGK) : If no information is available on the mixture, please consult information on ingredients.

Other information, restriction and prohibition regulations : Ensure all national/local regulations are observed.

**15.2. Chemical safety assessment**

No Chemical Safety Assessment has been carried out.

## SECTION 16: Other information

**Classification**

Available information on the ingredients and/or on the mixture is used for the purpose of classification of the mixture. Classifying the mixture is done in accordance with Chemical Policy Singapore (SS 586 : 2014) and CLASS regulation Malaysia 2013 on classification, labelling and packaging of substances and mixtures.

**Full text of R-, H- and EUH-statements**

Aquatic Chronic 4 Hazardous to the aquatic environment — Chronic Hazard, Category 4

| | |
|---|---|
| Eye Dam. 1 | Serious eye damage/eye irritation, Category 1 |
| Flam. Liq. 3 | Flammable liquids, Category 3 |
| Flam. Sol. 1 | Flammable solids, Category 1 |
| Pyr. Sol. 1 | Pyorphoric Solids, Category 1 |
| Repr. 1B | Reproductive toxicity, Category 1B |
| Skin Irrit. 2 | Skin corrosion/irritation, Category 2 |
| STOT SE 3 | Specific target organ toxicity — Single exposure, Category 3, Narcosis |
| STOT SE 3 | Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation |
| H226 | Flammable liquid and vapour |
| H228 | Flammable solid |
| H250 | Catches fire spontaneously if exposed to air |
| H315 | Causes skin irritation |
| H318 | Causes serious eye damage |
| H335 | May cause respiratory irritation |
| H336 | May cause drowsiness or dizziness |
| H360D | May damage the unborn child |
| H413 | May cause long lasting harmful effects to aquatic life |
| | Avoid: Light. |

The contents and format of this SDS are in accordance with Chemical Policy Singapore (SS 586 : 2014) and CLASS regulation Malaysia 2013.

DISCLAIMER OF LIABILITY. The information in this safety datasheet is based on our current best knowledge. This sheet describes our product in relation to safety requirements and takes into account a normal handling, storage, use or disposal of the product. It is not meant to guarantee specific determined qualities of the product. It was prepared and is to be used only for this product. If the product is used as a component in another product, the information contained in this data sheet may not be applicable.