1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
ECO-SOL MAX2, ESL4-CY
ECO-SOL MAX2, ESL4-4CY

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

1.3. Details of the supplier of the safety data sheet

Manufacturer's name: Roland DG Corporation
Address: 1-6-4 Shinmiyakoda, Kita-ku, Hamamatsu-shi, Shizuoka-ken, 431-2103
JAPAN
Phone: +81-53-484-1224
Fax: +81-53-484-1226

E-mail Address:

Revised date: 30 August, 2017

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture
This product is classified as dangerous according to GHS.

Flammable liquids Category 4
Acute toxicity - oral Category 5
Eye damage/irritation Category 1
Skin corrosion/irritation Category 2
Toxic to reproduction Category 1B

2.2. GHS label elements, including precautionary statements

Pictogram

Signal word(s) Danger
Hazard statement(s)

Combustible liquid.
May be harmful if swallowed.
Causes skin irritation.
Causes serious eye damage.
May damage fertility or the unborn child

Precautionary statement(s)

Prevention
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
Wear protective gloves/protective clothing/eye protection/face protection.
Response
IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/attention.

2.3. Other hazards

Potential Health Effects:

Eyes: Causes severe eye injury which may persist for several days.
Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation: Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
Ingestion: May cause injury of mouth, throat, and stomach.
Chronic Health Hazards: Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity: None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)

3. Composition/information on ingredients

Chemical nature: mixture

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>EU registration No.</th>
<th>% By Weight</th>
<th>Classification EC No. 1272/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorant</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>1-5</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Proprietary organic materials</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>1-10</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>112-36-7</td>
<td>203-963-7</td>
<td>01-2119969946-13-0000</td>
<td>40-50</td>
<td>Skin Irrit. 2: H315</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>96-48-0</td>
<td>202-509-5</td>
<td>N/A for the moment</td>
<td>&lt;20</td>
<td>Acute Tox. 4: H302 Eye Dam. 1: H318 STOT SE 3: H336</td>
</tr>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>143-24-8</td>
<td>205-594-7</td>
<td>N/A for the moment</td>
<td>10-20</td>
<td>Repr. 1B: H360</td>
</tr>
<tr>
<td>Dialkylene glycol dialkyl ether</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>15-25</td>
<td>Not classified as hazardous</td>
</tr>
</tbody>
</table>

*C.B.I.: Confidential Business Information
*For the full text of the H-Statements mentioned in this Section, see Section 16.
4. First aid measures
4.1. Description of first aid measures
   Eyes: In case of contact, immediately flush eyes with plenty of water for several minutes. Hold eyelids open during flushing. Call a physician.
   Skin: In case of contact, immediately flush with plenty of water while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. If swelling or redness occurs, call a physician.
   Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
   Ingestion: If swallowed, DO NOT induce vomiting. Seek immediate medical advice.

4.2. Most important symptoms and effects, both acute and delayed
   Eyes: Causes severe eye injury which may persist for several days.
   Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
   Inhalation: Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
   Ingestion: May cause injury of mouth, throat, and stomach.

4.3. Indication of immediate medical attention and special treatment needed
   No information

5. Firefighting measures
5.1. Extinguishing media
   Suitable extinguishing media:
   Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.
   Unsuitable extinguishing media:
   Water, High-pressure water jet

5.2. Special hazards arising from the substance or mixture
   Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.
   Flash Point: 71 deg.C

5.3. Advice for firefighters
   Wear special chemical protective clothing and positive pressure self-contained breathing apparatus(SCBA). Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues. Applying direct water may be dangerous because fire may expand to surroundings.

6. Accidental release measures
6.1. Personal precautions, protective equipment and emergency procedures
   Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus and wear appropriate personal protective equipment.

6.2. Environmental precautions
   Wipe off spillage. Prevent liquid from entering sewers, waterways or low areas.
6.3. Methods and material for containment and cleaning up
   Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections
   Refer to “Section 8 Exposure controls/ personal protection” and “Section 13 Disposal consideration” as appropriate.

7. Handling and storage

7.1. Precautions for safe handling
   Avoid contact with eyes, skin and clothing. Use proper ventilation and no fire in work place. Put protection wear that has electrical conductivity in case of work. Keep out of reach of children and do not drink.

7.2. Conditions for safe storage, including any incompatibilities
   Keep containers tightly closed. Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with metals, amines, free radical initiators, oxidising agents.

7.3. Specific end use(s): Inkjet printing

8. Exposure controls/ personal protection

8.1. Control parameters
   Occupational Exposure Limits:
   EU: DNEL

<table>
<thead>
<tr>
<th>Components</th>
<th>Long term exposure</th>
<th>Short term exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>22mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>50.05mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>130mg/m³</td>
<td>958mg/m³</td>
</tr>
</tbody>
</table>

REACH Toxicological Information (Workers - Hazard via inhalation route)

8.2. Exposure controls:
   Appropriate engineering controls: Provide general and/or local exhaust ventilation.
   Respiratory protection: In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory protection equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with organic vapor cartridge. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
   Hand protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, use protective gloves. Recommended impervious gloves is butyl rubber glove.
   Eye protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear safety glasses or chemical splash goggles.
   Skin protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear protective clothing.
   Hygiene measures: Wash hands after handling. In case contact with clothing, wash before reuse. Do not eat, drink or smoke in handling or storage area.
   Environmental exposure control: Avoid release to the environment.
9. Physical and chemical properties
9.1. Information on basic physical and chemical properties
   Appearance: Cyan Liquid
   Odour: Slightly
   Odour threshold: No data available
   pH: Not applicable
   Melting point/freezing point: No data available
   Initial boiling point and boiling range: No data available
   Flash point: 71 deg.C
   Evaporation rate: No data available
   Flammability(solid,gas): Not applicable
   Upper/lower flammability or explosive limits: No data available
   Vapor pressure: No data available
   Vapor density: No data available
   Relative density: No data available
   Solubility(ies): Water solubility: Soluble
   Partition coefficient: n-octanol/water: No data available
   Auto-ignition temperature: No data available
   Decomposition temperature: No data available
   Viscosity: Less than 5 mPa·s at 20°C
   Explosive properties: Explosive limits: 0.3-16.0v/v% as γ-Butyrolactone
   Oxidizing properties: None
   Volatile organic compounds (VOC) content: 920 gram/liter (maximum value)

9.2. Other information: No information

10. Stability and reactivity
10.1. Reactivity: No reactivity under normal temperature
10.2. Chemical stability: Stable under normal temperature
10.3. Possibility of hazardous reactions: Not expected
10.4. Conditions to avoid: Elevated temperatures/heat, UV light, when not in use.
10.5. Incompatible materials: Avoid contact with acids, amines, free radical initiators, oxidizing agents.

11. Toxicological information
   *Based on toxicology data of chemically similar material
11.1. Information on toxicological effects
   Routes of Overexposure: Eye, skin, inhalation, and oral
   Acute toxicity:
   Oral LD50 >2500mg/kg(Rat)*
   Dermal LD50 >2000mg/kg(Rat)*
   Inhalant LC50 No data available
   Skin corrosion/irritation: Non-irritant (Rabbit, OECD404)*
   Serious eye damage/eye irritation: Non-irritant (Rabbit, OECD405)*
   Respiratory or skin sensitisation: Non-sensitizer (LLNA, OECD429)*
   Germ cell mutagenicity: Negative (by Ames Test)*
   Reproductive toxicity: Suspected of damaging fertility or the unborn child.(Tetraethylene glycol dimethyl ether and a similar chemical)
Carcinogenicity: None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)

STOT-single exposure: Overexposure of eye may be mildly irritating. Overexposure of skin may cause irritation and in some people swelling and redness. Inhalation may result in respiratory irritation and anesthesia. Ingestion may cause an upset stomach.

STOT-repeated exposure: No data available

Aspiration hazard: No data available

12. Ecological information
12.1. Toxicity: No data available
12.2. Persistence and degradability: No data available
12.3. Bioaccumulative potential: No data available
12.4. Mobility in soil: No data available
12.5. Results of PBT and vPvB assessment: Has not carried out PBT and vPvB assessment.
12.6. Other adverse effects: No data available

13. Disposal considerations
13.1. Waste treatment methods: This product is considered as a hazardous waste according to Directive 2008/98/EC. Treatment, storage, transportation and disposal must be in accordance with applicable federal, state/provincial, and local regulations. Do not flush to surface water or sanitary sewer system.

14. Transport information
14.1. UN Class/UN Number: ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.2. UN proper shipping name: ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.3. Transport hazard class(es): ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.4. Packing group: ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.5. Environmental hazards: ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.6. Special precautions for user: Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and IBC code: Not regulated

15. Regulatory information
EU Information: Chemical Safety Assessment according to (EC)1907/2006: This product has not carried out any Chemical Safety Assessment yet.

Australia Information: Hazardous statement: Classified as hazardous according to NOHSC criteria.

International Information: None of the ingredients in this ink is listed by IARC as a carcinogen.
16. Other information

List of relevant H-Statements:
H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H336 May cause drowsiness or dizziness.
H360 May damage fertility or the unborn child.

The information in this Safety Data Sheet (SDS) is believed to be correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. It is subject to revision as additional knowledge and experience is gained. Roland DG does not warrant the completeness or accuracy of the information contained herein.
Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
ECO-SOL MAX2, ESL4-MG
ECO-SOL MAX2, ESL4-4MG

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

1.3. Details of the supplier of the safety data sheet
Manufacture's name: Roland DG Corporation
Address: 1-6-4 Shinmiyakoda, Kita-ku, Hamamatsu-shi, Shizuoka-ken, 431-2103
JAPAN
Phone: + 81-53-484-1224
Fax: + 81-53-484-1226

E-mail Address: 
Revised date: 30 August, 2017

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture
This product is classified as dangerous according to GHS.
- Flammable liquids Category 4
- Acute toxicity - oral Category 5
- Eye damage/irritation Category 1
- Skin corrosion/irritation Category 2
- Toxic to reproduction Category 1B

2.2. GHS label elements, including precautionary statements
Pictogram

Signal word(s) Danger
Hazard statement(s)  Combustible liquid.
      May be harmful if swallowed.
      Causes skin irritation.
      Causes serious eye damage.
      May damage fertility or the unborn child

Precautionary statement(s)

Prevention  Do not handle until all safety precautions have been read and understood.
      Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
      Wear protective gloves/protective clothing/eye protection/face protection.

Response    IF ON SKIN: Wash with plenty of soap and water.
      IF IN EYES: Rinse cautiously with water for several minutes. Remove contact
      lenses, if present and easy to do. Continue rinsing.
      IF exposed or concerned: Get medical advice/attention.

2.3. Other hazards

Potential Health Effects:

Eyes:  Causes severe eye injury which may persist for several days.
Skin:  Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation:  Exposure to vapors (mist) may be harmful to the unborn child and at the risk of
      impaired fertility and irritate nose, throat/respiratory system.
Ingestion:  May cause injury of mouth, throat, and stomach.
Carcinogenicity:  None of the ingredients in this ink is listed by IARC as a carcinogen.  (1,2A and 2B)

3. Composition/information on ingredients

Chemical nature: mixture

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>EU registration No.</th>
<th>% By Weight</th>
<th>Classification EC No. 1272/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorant</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>1-5</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Proprietary organic materials</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>1-10</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>112-36-7</td>
<td>203-963-7</td>
<td>01-2119969946-13-0000</td>
<td>40-50</td>
<td>Skin Irrit. 2: H315</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>96-48-0</td>
<td>202-509-5</td>
<td>N/A for the moment</td>
<td>&lt;20</td>
<td>Acute Tox. 4: H302 Eye Dam. 1: H318 STOT SE 3: H336</td>
</tr>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>143-24-8</td>
<td>205-594-7</td>
<td>N/A for the moment</td>
<td>10-20</td>
<td>Repr. 1B: H360</td>
</tr>
<tr>
<td>Dialkylene glycol dialkyl ether</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>15-25</td>
<td>Not classified as hazardous</td>
</tr>
</tbody>
</table>

*C.B.I.: Confidential Business Information
*For the full text of the H-Statements mentioned in this Section, see Section 16.
4. First aid measures
4.1. Description of first aid measures
   Eyes: In case of contact, immediately flush eyes with plenty of water for several minutes. Hold eyelids open during flushing. Call a physician.
   Skin: In case of contact, immediately flush with plenty of water while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. If swelling or redness occurs, call a physician.
   Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
   Ingestion: If swallowed, DO NOT induce vomiting. Seek immediate medical advice.

4.2. Most important symptoms and effects, both acute and delayed
   Eyes: Causes severe eye injury which may persist for several days.
   Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
   Inhalation: May cause injury of mouth, throat, and stomach.
   Ingestion: Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.

4.3. Indication of immediate medical attention and special treatment needed
   No information

5. Firefighting measures
5.1. Extinguishing media
   Suitable extinguishing media: Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.
   Unsuitable extinguishing media: Water, High-pressure water jet

5.2. Special hazards arising from the substance or mixture
   Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.
   Flash Point: 71 deg.C

5.3. Advice for firefighters
   Wear special chemical protective clothing and positive pressure self-contained breathing apparatus (SCBA). Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues. Applying direct water may be dangerous because fire may expand to surroundings.

6. Accidental release measures
General:
   Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill. Absorb spill with sand or earth then place in a chemical waste container.

6.1. Personal precautions, protective equipment and emergency procedures
   Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus and wear appropriate personal protective equipment.

6.2. Environmental precautions
   Wipe off spillage. Prevent liquid from entering sewers, waterways or low areas.
6.3. Methods and material for containment and cleaning up
Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections
Refer to “Section 8 Exposure controls/ personal protection” and “Section 13 Disposal consideration” as appropriate.

7. Handling and storage
7.1. Precautions for safe handling
Avoid contact with eyes, skin and clothing. Use proper ventilation and no fire in work place. Put protection wear that has electrical conductivity in case of work. Keep out of reach of children and do not drink.

7.2. Conditions for safe storage, including any incompatibilities
Keep containers tightly closed. Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with metals, amines, free radical initiators, oxidising agents.

7.3. Specific end use(s): Inkjet printing

8. Exposure controls/ personal protection
8.1. Control parameters
Occupational Exposure Limits:
EU: DNEL

<table>
<thead>
<tr>
<th>Components</th>
<th>Long term exposure</th>
<th>Short term exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>22mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>50.05mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>130mg/m³</td>
<td>958mg/m³</td>
</tr>
</tbody>
</table>

REACH Toxicological Information (Workers - Hazard via inhalation route)

8.2. Exposure controls:
**Appropriate engineering controls:** Provide general and/or local exhaust ventilation.

- **Respiratory protection:** In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory protection equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with organic vapor cartridge. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

- **Hand protection:** Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, use protective gloves. Recommended impervious gloves is butyl rubber glove.

- **Eye protection:** Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear safety glasses or chemical splash goggles.

- **Skin protection:** Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear protective clothing.

- **Hygiene measures:** Wash hands after handling. In case contact with clothing, wash before reuse. Do not eat, drink or smoke in handling or storage area.

- **Environmental exposure control:** Avoid release to the environment.
9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance: Magenta Liquid
Odour: Slightly
Odour threshold: No data available
pH: Not applicable
Melting point/freezing point: No data available
Initial boiling point and boiling range: No data available
Flash point: 71 deg.C
Evaporation rate: No data available
Flammability(solid, gas): Not applicable
Upper/lower flammability or explosive limits: No data available
Vapor pressure: No data available
Vapor density: No data available
Relative density: No data available
Solubility(ies): Water solubility: Soluble
Partition coefficient: n-octanol/water: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Viscosity: Less than 5 mPa·s at 20°C
Explosive properties: Explosive limits: 0.3-16.0 v/v% as γ-Butyrolactone
Oxidizing properties: None
Volatile organic compounds (VOC) content: 920 gram/liter (maximum value)

9.2. Other information: No information

10. Stability and reactivity

10.1. Reactivity: No reactivity under normal temperature
10.2. Chemical stability: Stable under normal temperature
10.3. Possibility of hazardous reactions: Not expected
10.4. Conditions to avoid: Elevated temperatures/heat, UV light, when not in use.
10.5. Incompatible materials: Avoid contact with acids, amines, free radical initiators, oxidizing agents.

11. Toxicological information

*Based on toxicology data of chemically similar material

11.1. Information on toxicological effects

Routes of Overexposure: Eye, skin, inhalation, and oral
Acute toxicity:
Oral LD50 >2500mg/kg(Rat)*
Dermal LD50 >2000mg/kg(Rat)*
Inhalant LC50 No data available

Skin corrosion/irritation: Non-irritant (Rabbit, OECD404)*
Serious eye damage/eye irritation: Non-irritant (Rabbit, OECD405)*
Respiratory or skin sensitisation: Non-sensitizer (LLNA, OECD429)*
Germ cell mutagenicity: Negative (by Ames Test)*
Reproductive toxicity: Suspected of damaging fertility or the unborn child. (Tetraethylene glycol dimethyl ether and a similar chemical)
Carcinogenicity: None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)

STOT-single exposure: Overexposure of eye may be mildly irritating.
Overexposure of skin may cause irritation and in some people swelling and redness.
Inhalation may result in respiratory irritation and anesthesia.
Ingestion may cause an upset stomach.

STOT-repeated exposure: No data available

Aspiration hazard: No data available

12. Ecological information
12.1. Toxicity: No data available
12.2. Persistence and degradability: No data available
12.3. Bioaccumulative potential: No data available
12.4. Mobility in soil: No data available
12.5. Results of PBT and vPvB assessment: Has not carried out PBT and vPvB assessment.
12.6. Other adverse effects: No data available

13. Disposal considerations
13.1. Waste treatment methods:
This product is considered as a hazardous waste according to Directive 2008/98/EC. Treatment, storage, transportation and disposal must be in accordance with applicable federal, state/provincial, and local regulations. Do not flush to surface water or sanitary sewer system.

14. Transport information
14.1. UN Class/UN Number:
   ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.2. UN proper shipping name:
   ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.3. Transport hazard class(es):
   ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.4. Packing group:
   ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.5. Environmental hazards:
   ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.6. Special precautions for user:
   Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and IBC code:
   Not regulated

15. Regulatory information
EU Information:
Chemical Safety Assessment according to (EC)1907/2006:
This product has not carried out any Chemical Safety Assessment yet.

International Information:
None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)
16. Other information

List of relevant H-Statements:

H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H336 May cause drowsiness or dizziness.
H360 May damage fertility or the unborn child.

The information in this Safety Data Sheet (SDS) is believed to be correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. It is subject to revision as additional knowledge and experience is gained. Roland DG does not warrant the completeness or accuracy of the information contained herein.
Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
- ECO-SOL MAX2, ESL4-YE
- ECO-SOL MAX2, ESL4-4YE

1.2. Relevant identified uses of the substance or mixture and uses advised against
- Inkjet Printing

1.3. Details of the supplier of the safety data sheet
- Manufacturer's name: Roland DG Corporation
- Address: 1-6-4 Shinmiyakoda, Kita-ku, Hamamatsu-shi, Shizuoka-ken, 431-2103 JAPAN
- Phone: + 81-53-484-1224
- Fax: + 81-53-484-1226

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture
- This product is classified as dangerous according to GHS.
  - Flammable liquids: Category 4
  - Acute toxicity - oral: Category 5
  - Eye damage/irritation: Category 1
  - Skin corrosion/irritation: Category 2
  - Toxic to reproduction: Category 1B

2.2. GHS label elements, including precautionary statements
- Pictogram
- Signal word(s): Danger
Hazard statement(s)  
Combustible liquid.
May be harmful if swallowed.
Causes skin irritation.
Causes serious eye damage.
May damage fertility or the unborn child

Precautionary statement(s)  
Prevention
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
Wear protective gloves/protective clothing/eye protection/face protection.

Response
IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/attention.

2.3. Other hazards  
Potential Health Effects:

Eyes: Causes severe eye injury which may persist for several days.
Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation: Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
Ingestion: May cause injury of mouth, throat, and stomach.
Chronic Health Hazards: Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity: None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)

3. Composition/information on ingredients  
Chemical nature: mixture

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>EU registration No.</th>
<th>% By Weight</th>
<th>Classification EC No. 1272/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorant</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>1-5</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Proprietary organic materials</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>1-10</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>112-36-7</td>
<td>203-963-7</td>
<td>01-2119969946 -13-0000</td>
<td>40-50</td>
<td>Skin Irrit. 2: H315</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>96-48-0</td>
<td>202-509-5</td>
<td>N/A for the moment</td>
<td>&lt;20</td>
<td>Acute Tox. 4: H302 Eye Dam. 1: H318 STOT SE 3: H336</td>
</tr>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>143-24-8</td>
<td>205-594-7</td>
<td>N/A for the moment</td>
<td>10-20</td>
<td>Repr. 1B: H360</td>
</tr>
<tr>
<td>Dialkylene glycol dialkyl ether</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>15-25</td>
<td>Not classified as hazardous</td>
</tr>
</tbody>
</table>

*C.B.I.: Confidential Business Information
*For the full text of the H-Statements mentioned in this Section, see Section 16.
4. First aid measures
4.1. Description of first aid measures
   Eyes: In case of contact, immediately flush eyes with plenty of water for several minutes. Hold eyelids open during flushing. Call a physician.
   Skin: In case of contact, immediately flush with plenty of water while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. If swelling or redness occurs, call a physician.
   Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
   Ingestion: If swallowed, DO NOT induce vomiting. Seek immediate medical advice.

4.2. Most important symptoms and effects, both acute and delayed
   Eyes: Causes severe eye injury which may persist for several days.
   Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
   Inhalation: Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
   Ingestion: May cause injury of mouth, throat, and stomach.

4.3. Indication of immediate medical attention and special treatment needed
   No information

5. Firefighting measures
5.1. Extinguishing media
   Suitable extinguishing media:
   Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.
   Unsuitable extinguishing media:
   Water, High-pressure water jet

5.2. Special hazards arising from the substance or mixture
   Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.
   Flash Point: 71 deg.C

5.3. Advice for firefighters
   Wear special chemical protective clothing and positive pressure self-contained breathing apparatus (SCBA). Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues. Applying direct water may be dangerous because fire may expand to surroundings.

6. Accidental release measures
   General:
   Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill. Absorb spill with sand or earth then place in a chemical waste container.

6.1. Personal precautions, protective equipment and emergency procedures
   Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus and wear appropriate personal protective equipment.

6.2. Environmental precautions
   Wipe off spillage. Prevent liquid from entering sewers, waterways or low areas.
6.3. Methods and material for containment and cleaning up
Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections
Refer to “Section 8 Exposure controls/ personal protection” and “Section 13 Disposal consideration” as appropriate.

7. Handling and storage
7.1. Precautions for safe handling
Avoid contact with eyes, skin and clothing. Use proper ventilation and no fire in work place. Put protection wear that has electrical conductivity in case of work. Keep out of reach of children and do not drink.

7.2. Conditions for safe storage, including any incompatibilities
Keep containers tightly closed. Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with metals, amines, free radical initiators, oxidising agents.

7.3. Specific end use(s):
Inkjet printing

8. Exposure controls/ personal protection
8.1. Control parameters
Occupational Exposure Limits:
EU: DNEL

<table>
<thead>
<tr>
<th>components</th>
<th>Long term exposure</th>
<th>Short term exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrathylene glycol dimethyl ether</td>
<td>22mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>50.05mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>130mg/m³</td>
<td>958mg/m³</td>
</tr>
</tbody>
</table>

REACH Toxicological Information (Workers - Hazard via inhalation route)

8.2. Exposure controls:
Provide general and/or local exhaust ventilation.

Respiratory protection:
In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory protection equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with organic vapor cartridge. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Hand protection:
Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, use protective gloves. Recommended impervious gloves is butyl rubber glove.

Eye protection:
Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear safety glasses or chemical splash goggles.

Skin protection:
Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear protective clothing.

Hygiene measures:
Wash hands after handling. In case contact with clothing, wash before reuse. Do not eat, drink or smoke in handling or storage area.

Environmental exposure control:
Avoid release to the environment.
9. Physical and chemical properties
9.1. Information on basic physical and chemical properties

Appearance: Yellow Liquid
Odour: Slightly
Odour threshold: No data available
pH: Not applicable
Melting point/freezing point: No data available
Initial boiling point and boiling range: No data available
Flash point: 71 deg.C
Evaporation rate: No data available
Flammability(solid, gas): Not applicable
Upper/lower flammability or explosive limits: No data available
Vapor pressure: No data available
Vapor density: No data available
Relative density: No data available
Solubility(ies): Water solubility: Soluble
Partition coefficient: n-octanol/water: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Viscosity: Less than 5 mPa·s at 20°C
Explosive properties: Explosive limits: 0.3-16.0 v/v% as γ-Butyrolactone
Oxidizing properties: None

9.2. Other information: No information

10. Stability and reactivity
10.1. Reactivity: No reactivity under normal temperature
10.2. Chemical stability: Stable under normal temperature
10.3. Possibility of hazardous reactions: Not expected
10.4. Conditions to avoid: Elevated temperatures/heat, UV light, when not in use.
10.5. Incompatible materials: Avoid contact with acids, amines, free radical initiators, oxidizing agents.

11. Toxicological information
*Based on toxicology data of chemically similar material
11.1. Information on toxicological effects
Routes of Overexposure: Eye, skin, inhalation, and oral

Acute toxicity:
Oral LD50 >2500mg/kg (Rat)*
Dermal LD50 >2000mg/kg (Rat)*
Inhalant LC50 No data available

Skin corrosion/irritation: Non-irritant (Rabbit, OECD404)*
Serious eye damage/eye irritation: Non-irritant (Rabbit, OECD405)*
Respiratory or skin sensitisation: Non-sensitizer (LLNA, OECD429)*
Germ cell mutagenicity: Negative (by Ames Test)*
Reproductive toxicity: Suspected of damaging fertility or the unborn child. (Tetraethylene glycol dimethyl ether and a similar chemical)
Carcinogenicity: None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)
STOT-single exposure: Overexposure of eye may be mildly irritating. Overexposure of skin may cause irritation and in some people swelling and redness. Inhalation may result in respiratory irritation and anesthesia. Ingestion may cause an upset stomach.

STOT-repeated exposure: No data available
Aspiration hazard: No data available

12. Ecological information
12.1. Toxicity: No data available
12.2. Persistence and degradability: No data available
12.3. Bioaccumulative potential: No data available
12.4. Mobility in soil: No data available
12.5. Results of PBT and vPvB assessment: Has not carried out PBT and vPvB assessment.
12.6. Other adverse effects: No data available

13. Disposal considerations
13.1. Waste treatment methods: This product is considered as a hazardous waste according to Directive 2008/98/EC. Treatment, storage, transportation and disposal must be in accordance with applicable federal, state/provincial, and local regulations. Do not flush to surface water or sanitary sewer system.

14. Transport information
14.1. UN Class/UN Number:
   ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.2. UN proper shipping name:
   ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.3. Transport hazard class(es):
   ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.4. Packing group:
   ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.5. Environmental hazards:
   ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.6. Special precautions for user:
   Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and IBC code: Not regulated

15. Regulatory information
   EU Information:
   Chemical Safety Assessment according to (EC)1907/2006:
   This product has not carried out any Chemical Safety Assessment yet.

   Australia Information:
   Hazardous statement: Classified as hazardous according to NOHSC criteria.

   International Information:
   None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)
16. Other information

List of relevant H-Statements:

H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H336 May cause drowsiness or dizziness.
H360 May damage fertility or the unborn child.

The information in this Safety Data Sheet (SDS) is believed to be correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. It is subject to revision as additional knowledge and experience is gained. Roland DG does not warrant the completeness or accuracy of the information contained herein.
1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
ECO-SOL MAX2, ESL4-BK
ECO-SOL MAX2, ESL4-4BK

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

1.3. Details of the supplier of the safety data sheet
Manufacture's name: Roland DG Corporation
Address: 1-6-4 Shinmiyakoda, Kita-ku, Hamamatsu-shi, Shizuoka-ken, 431-2103
JAPAN
Phone: + 81-53-484-1224
Fax: + 81-53-484-1226

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture
This product is classified as dangerous according to GHS.
- Flammable liquids Category 4
- Acute toxicity - oral Category 5
- Eye damage/irritation Category 1
- Skin corrosion/irritation Category 2
- Toxic to reproduction Category 1B

2.2. GHS label elements, including precautionary statements
Pictogram

Signal word(s) Danger
Hazard statement(s)

Combustible liquid.
May be harmful if swallowed.
Causes skin irritation.
Causes serious eye damage.
May damage fertility or the unborn child.

Precautionary statement(s)

Prevention
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
Wear protective gloves/protective clothing/eye protection/face protection.

Response
IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/attention.

2.3. Other hazards

Potential Health Effects:

Eyes: Causes severe eye injury which may persist for several days.
Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation: Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
Ingestion: May cause injury of mouth, throat, and stomach.
Chronic Health Hazards: Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity: The product contains Carbon black.
IARC evaluated printing ink as a Group 3 (Not classifiable as to carcinogenicity to humans).

3. Composition/information on ingredients

Chemical nature: mixture

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>EU registration No.</th>
<th>% By Weight</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon black</td>
<td>1333-86-4</td>
<td>215-609-9</td>
<td>N/A for the moment</td>
<td>1-5</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Proprietary organic materials</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>1-10</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>112-36-7</td>
<td>203-963-7</td>
<td>01-211969946-13-0000</td>
<td>40-50</td>
<td>Skin Irrit. 2: H315</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>96-48-0</td>
<td>202-509-5</td>
<td>N/A for the moment</td>
<td>&lt;20</td>
<td>Acute Tox. 4: H302 Eye Dam. 1: H318 STOT SE 3: H336</td>
</tr>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>143-24-8</td>
<td>205-594-7</td>
<td>N/A for the moment</td>
<td>10-20</td>
<td>Repr. 1B: H360</td>
</tr>
<tr>
<td>Dialkylene glycol dialkyl ether</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>15-25</td>
<td>Not classified as hazardous</td>
</tr>
</tbody>
</table>

*C.B.I.: Confidential Business Information
*For the full text of the H-Statements mentioned in this Section, see Section 16.
4. First aid measures

4.1. Description of first aid measures

**Eyes:** In case of contact, immediately flush eyes with plenty of water for several minutes. Hold eyelids open during flushing. Call a physician.

**Skin:** In case of contact, immediately flush with plenty of water while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. If swelling or redness occurs, call a physician.

**Inhalation:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**Ingestion:** If swallowed, DO NOT induce vomiting. Seek immediate medical advice.

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

**Eyes:** Causes severe eye injury which may persist for several days.

**Skin:** Contact with skin may cause irritation, swelling or redness, allergic sensitization.

**Inhalation:** Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.

**Ingestion:** May cause injury of mouth, throat, and stomach.

4.3. Indication of immediate medical attention and special treatment needed

No information

5. Firefighting measures

5.1. Extinguishing media

**Suitable extinguishing media:**
- Dry chemical,
- Foam,
- Carbon dioxide,
- Dry sand,
- Loaded stream in spray.

**Unsuitable extinguishing media:**
- Water,
- High-pressure water jet

5.2. Special hazards arising from the substance or mixture

**Hazardous decomposition products:** Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.

**Flash Point:** 71 deg.C

5.3. Advice for firefighters

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus (SCBA). Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues. Applying direct water may be dangerous because fire may expand to surroundings.

6. Accidental release measures

**General:** Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill. Absorb spill with sand or earth then place in a chemical waste container.

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus and wear appropriate personal protective equipment.

6.2. Environmental precautions

Wipe off spillage. Prevent liquid from entering sewers, waterways or low areas.

6.3. Methods and material for containment and cleaning up

Sweep up material and dispose as waste following local regulations.
6.4. Reference to other sections
Refer to “Section 8 Exposure controls/ personal protection” and “Section 13 Disposal consideration” as appropriate.

7. Handling and storage
7.1. Precautions for safe handling
Avoid contact with eyes, skin and clothing. Use proper ventilation and no fire in work place. Put protection wear that has electrical conductivity in case of work. Keep out of reach of children and do not drink.

7.2. Conditions for safe storage, including any incompatibilities
Keep containers tightly closed. Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with metals, amines, free radical initiators, oxidising agents.

7.3. Specific end use(s): Inkjet printing

8. Exposure controls/ personal protection
8.1. Control parameters

<table>
<thead>
<tr>
<th>Occupational Exposure Limits:</th>
<th>EU: DNEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>components</td>
<td>Long term exposure</td>
</tr>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>22mg/m³</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>50.05mg/m³</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>130mg/m³</td>
</tr>
</tbody>
</table>

REACH Toxicological Information (Workers - Hazard via inhalation route)

<table>
<thead>
<tr>
<th>Australia: OELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>components</td>
</tr>
<tr>
<td>Carbon black</td>
</tr>
</tbody>
</table>

8.2. Exposure controls:
Appropriate engineering controls: Provide general and/or local exhaust ventilation.

Respiratory protection: In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory protection equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with organic vapor cartridge. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Hand protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, use protective gloves. Recommended impervious gloves is butyl rubber glove.

Eye protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear safety glasses or chemical splash goggles.

Skin protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear protective clothing.

Hygiene measures: Wash hands after handling. In case contact with clothing, wash before reuse. Do not eat, drink or smoke in handling or storage area.

Environmental exposure control: Avoid release to the environment.
9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

- **Appearance:** Black Liquid
- **Odour:** Slightly
- **Odour threshold:** No data available
- **pH:** Not applicable
- **Melting point/freezing point:** No data available
- **Initial boiling point and boiling range:** No data available
- **Flash point:** 71 deg.C
- **Evaporation rate:** No data available
- **Flammability(solid, gas):** Not applicable
- **Upper/lower flammability or explosive limits:** No data available
- **Vapor pressure:** No data available
- **Vapor density:** No data available
- **Relative density:** No data available
- **Solubility(ies):** Water solubility: Soluble
- **Partition coefficient: n-octanol/water:** No data available
- **Auto-ignition temperature:** No data available
- **Decomposition temperature:** No data available
- **Viscosity:** Less than 5 mPa·s at 20°C
- **Explosive properties:** Explosive limits: 0.3-16.0v/v% as γ-Butyrolactone
- **Oxidizing properties:** None
- **Volatile organic compounds (VOC) content:** 920 gram/liter (maximum value)

9.2. Other information: No information

10. Stability and reactivity

10.1. Reactivity: No reactivity under normal temperature
10.2. Chemical stability: Stable under normal temperature
10.3. Possibility of hazardous reactions: Not expected
10.4. Conditions to avoid: Elevated temperatures/heat, UV light, when not in use.
10.5. Incompatible materials: Avoid contact with acids, amines, free radical initiators, oxidizing agents.

11. Toxicological information

*Based on toxicology data of chemically similar material

11.1. Information on toxicological effects

- **Routes of Overexposure:** Eye, skin, inhalation, and oral

- **Acute toxicity:**
  - Oral LD50: >2500mg/kg(Rat)*
  - Dermal LD50: >2000mg/kg(Rat)*
  - Inhalant LC50: No data available

- **Skin corrosion/irritation:** Non-irritant (Rabbit, OECD404)*
- **Serious eye damage/eye irritation:** Moderate irritant (Rabbit, OECD405)*
- **Respiratory or skin sensitisation:** Non-sensitizer (LLNA, OECD429)*
- **Germ cell mutagenicity:** Negative (by Ames Test)*
- **Reproductive toxicity:** Suspected of damaging fertility or the unborn child. (Tetraethylene glycol dimethyl ether and a similar chemical)
- **Carcinogenicity:** The product contains Carbon black.
  - IARC evaluated printing ink as a Group3(Not classifiable as to carcinogenicity to humans).
STOT-single exposure: Overexposure of eye may be mildly irritating. Overexposure of skin may cause irritation and in some people swelling and redness. Inhalation may result in respiratory irritation and anesthesia. Ingestion may cause an upset stomach.

STOT-repeated exposure: No data available

Aspiration hazard: No data available

12. Ecological information

12.1. Toxicity: No data available
12.2. Persistence and degradability: No data available
12.3. Bioaccumulative potential: No data available
12.4. Mobility in soil: No data available
12.5. Results of PBT and vPvB assessment: Has not carried out PBT and vPvB assessment.
12.6. Other adverse effects: No data available

13. Disposal considerations

13.1. Waste treatment methods:
This product is considered as a hazardous waste according to Directive 2008/98/EC. Treatment, storage, transportation and disposal must be in accordance with applicable federal, state/provincial, and local regulations. Do not flush to surface water or sanitary sewer system.

14. Transport information

14.1. UN Class/UN Number:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.2. UN proper shipping name:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.3. Transport hazard class(es):
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.4. Packing group:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.5. Environmental hazards:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.6. Special precautions for user:
Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and IBC code:
Not regulated

15. Regulatory information

EU Information:
Chemical Safety Assessment according to (EC)1907/2006:
This product has not carried out any Chemical Safety Assessment yet.

Australia Information:
Hazardous statement: Classified as hazardous according to NOHSC criteria.

International Information:
The product contains Carbon black.
IARC evaluated printing ink as a Group3(Not classifiable as to carcinogenicity to humans).
16. Other information

List of relevant H-Statements:

- H302 Harmful if swallowed.
- H315 Causes skin irritation.
- H318 Causes serious eye damage.
- H336 May cause drowsiness or dizziness.
- H360 May damage fertility or the unborn child.

The information in this Safety Data Sheet (SDS) is believed to be correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. It is subject to revision as additional knowledge and experience is gained. Roland DG does not warrant the completeness or accuracy of the information contained herein.
Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
ECO-SOL MAX2, ESL4-4LC

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

1.3. Details of the supplier of the safety data sheet
Manufacturer's name: Roland DG Corporation
Address: 1-6-4 Shinmiyakoda, Kita-ku, Hamamatsu-shi, Shizuoka-ken, 431-2103 JAPAN
Phone: + 81-53-484-1224
Fax: + 81-53-484-1226

E-mail Address: 
Revised date: 30 August, 2017

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture
This product is classified as dangerous according to GHS.
- Flammable liquids Category 4
- Acute toxicity - oral Category 5
- Eye damage/irritation Category 1
- Skin corrosion/irritation Category 2
- Toxic to reproduction Category 1B

2.2. GHS label elements, including precautionary statements
Pictogram

Signal word(s) Danger
Hazard statement(s)  Combustible liquid.
May be harmful if swallowed.
Causes skin irritation.
Causes serious eye damage.
May damage fertility or the unborn child

Precautionary statement(s)
Prevention  Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
Wear protective gloves/protective clothing/eye protection/face protection.
Response  IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/attention.

2.3. Other hazards
Potential Health Effects:
Eyes:  Causes severe eye injury which may persist for several days.
Skin:  Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation:  Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
Ingestion:  May cause injury of mouth, throat, and stomach.
Chronic Health Hazards:  Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity:  None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)

3. Composition/information on ingredients
Chemical nature: mixture

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>EU registration No.</th>
<th>% By Weight</th>
<th>Classification EC No. 1272/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorant</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>&lt;1</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Proprietary organic materials</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>1-10</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>112-36-7</td>
<td>203-963-7</td>
<td>01-2119969946-13-0000</td>
<td>40-50</td>
<td>Skin Irrit. 2: H315</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>96-48-0</td>
<td>202-509-5</td>
<td>N/A for the moment</td>
<td>&lt;20</td>
<td>Acute Tox. 4: H302 Eye Dam. 1: H318 STOT SE 3: H336</td>
</tr>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>143-24-8</td>
<td>205-594-7</td>
<td>N/A for the moment</td>
<td>10-20</td>
<td>Repr. 1B: H360</td>
</tr>
<tr>
<td>Dialkylene glycol dialkyl ether</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>15-25</td>
<td>Not classified as hazardous</td>
</tr>
</tbody>
</table>

*C.B.I.: Confidential Business Information
*For the full text of the H-Statements mentioned in this Section, see Section 16.
4. First aid measures
4.1. Description of first aid measures
   Eyes: In case of contact, immediately flush eyes with plenty of water for several minutes. Hold eyelids open during flushing. Call a physician.
   Skin: In case of contact, immediately flush with plenty of water while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. If swelling or redness occurs, call a physician.
   Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
   Ingestion: If swallowed, DO NOT induce vomiting. Seek immediate medical advice.

4.2. Most important symptoms and effects, both acute and delayed
   Eyes: Causes severe eye injury which may persist for several days.
   Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
   Inhalation: Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
   Ingestion: May cause injury of mouth, throat, and stomach.

4.3. Indication of immediate medical attention and special treatment needed
   No information

5. Firefighting measures
5.1. Extinguishing media
   Suitable extinguishing media:
   - Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.
   Unsuitable extinguishing media:
   - Water, High-pressure water jet

5.2. Special hazards arising from the substance or mixture
   Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.
   Flash Point: 71 deg.C

5.3. Advice for firefighters
   Wear special chemical protective clothing and positive pressure self-contained breathing apparatus (SCBA). Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues. Applying direct water may be dangerous because fire may expand to surroundings.

6. Accidental release measures
6.1. Personal precautions, protective equipment and emergency procedures
   Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus and wear appropriate personal protective equipment.

6.2. Environmental precautions
   Wipe off spillage. Prevent liquid from entering sewers, waterways or low areas.
6.3. Methods and material for containment and cleaning up
Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections
Refer to “Section 8 Exposure controls/ personal protection” and “Section 13 Disposal consideration” as appropriate.

7. Handling and storage
7.1. Precautions for safe handling
Avoid contact with eyes, skin and clothing. Use proper ventilation and no fire in work place. Put protection wear that has electrical conductivity in case of work. Keep out of reach of children and do not drink.

7.2. Conditions for safe storage, including any incompatibilities
Keep containers tightly closed. Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with metals, amines, free radical initiators, oxidising agents.

7.3. Specific end use(s):
Inkjet printing

8. Exposure controls/ personal protection
8.1. Control parameters
Occupational Exposure Limits:
EU: DNEL

<table>
<thead>
<tr>
<th>components</th>
<th>Long term exposure</th>
<th>Short term exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>22mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>50.05mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>130mg/m³</td>
<td>958mg/m³</td>
</tr>
</tbody>
</table>

REACH Toxicological Information (Workers - Hazard via inhalation route)

8.2. Exposure controls:
Appropriate engineering controls: Provide general and/or local exhaust ventilation.

Respiratory protection:
In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory protection equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with organic vapor cartridge. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Hand protection:
Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, use protective gloves. Recommended impervious gloves is butyl rubber glove.

Eye protection:
Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear safety glasses or chemical splash goggles.

Skin protection:
Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear protective clothing.

Hygiene measures:
Wash hands after handling. In case contact with clothing, wash before reuse. Do not eat, drink or smoke in handling or storage area.

Environmental exposure control:
Avoid release to the environment.
9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Solubility: Cyan Liquid
Odour: Slightly
Odour threshold: No data available
pH: Not applicable
Melting point/freezing point: No data available
Initial boiling point and boiling range: No data available
Flash point: 71 deg.C
Evaporation rate: No data available
Flammability(solid, gas): Not applicable
Upper/lower flammability or explosive limits: No data available
Vapor pressure: No data available
Vapor density: No data available
Relative density: No data available
Solubility(ies): Water solubility: Soluble
Partition coefficient: n-octanol/water: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Viscosity: Less than 5 mPa·s at 20°C
Explosive properties: Explosive limits: 0.3-16.0v/v% as γ-Butyrolactone
Oxidizing properties: None

9.2. Other information: No information

10. Stability and reactivity

10.1. Reactivity: No reactivity under normal temperature
10.2. Chemical stability: Stable under normal temperature
10.3. Possibility of hazardous reactions: Not expected
10.4. Conditions to avoid: Elevated temperatures/heat, UV light, when not in use.
10.5. Incompatible materials: Avoid contact with acids, amines, free radical initiators, oxidizing agents.

11. Toxicological information

*Based on toxicology data of chemically similar material

11.1. Information on toxicological effects

Routes of Overexposure: Eye, skin, inhalation, and oral
Acute toxicity:
- Oral LD50 >2500mg/kg(Rat)*
- Dermal LD50 >2000mg/kg(Rat)*
- Inhalant LC50 No data available

Skin corrosion/irritation: Non-irritant (Rabbit, OECD404)*
Serious eye damage/eye irritation: Non-irritant (Rabbit, OECD405)*
Respiratory or skin sensitisation: Non-sensitizer (LLNA, OECD429)*
Germ cell mutagenicity: Negative (by Ames Test)*
Reproductive toxicity: Suspected of damaging fertility or the unborn child. (Tetraethylene glycol dimethyl ether and a similar chemical)
Carcinogenicity: None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)

STOT-single exposure: Overexposure of eye may be mildly irritating. Overexposure of skin may cause irritation and in some people swelling and redness. Inhalation may result in respiratory irritation and anesthesia. Ingestion may cause an upset stomach.

STOT-repeated exposure: No data available
Aspiration hazard: No data available

12. Ecological information
12.1. Toxicity: No data available
12.2. Persistence and degradability: No data available
12.3. Bioaccumulative potential: No data available
12.4. Mobility in soil: No data available
12.5. Results of PBT and vPvB assessment: Has not carried out PBT and vPvB assessment.
12.6. Other adverse effects: No data available

13. Disposal considerations
13.1. Waste treatment methods:
This product is considered as a hazardous waste according to Directive 2008/98/EC. Treatment, storage, transportation and disposal must be in accordance with applicable federal, state/provincial, and local regulations. Do not flush to surface water or sanitary sewer system.

14. Transport information
14.1. UN Class/UN Number: Not regulated
14.2. UN proper shipping name: Not regulated
14.3. Transport hazard class(es): Not regulated
14.4. Packing group: Not regulated
14.5. Environmental hazards: Not regulated
14.6. Special precautions for user: Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and IBC code: Not regulated

15. Regulatory information
EU Information: Chemical Safety Assessment according to (EC)1907/2006: This product has not carried out any Chemical Safety Assessment yet.

Australia Information: Hazardous statement: Classified as hazardous according to NOHSC criteria.

International Information: None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)
16. Other information

List of relevant H-Statements:

- H302 Harmful if swallowed.
- H315 Causes skin irritation.
- H318 Causes serious eye damage.
- H336 May cause drowsiness or dizziness.
- H360 May damage fertility or the unborn child.

The information in this Safety Data Sheet (SDS) is believed to be correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. It is subject to revision as additional knowledge and experience is gained. Roland DG does not warrant the completeness or accuracy of the information contained herein.
1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
ECO-SOL MAX2, ESL4-4LM

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

1.3. Details of the supplier of the safety data sheet
Manufacture's name: Roland DG Corporation
Address: 1-6-4 Shinmiyakoda, Kita-ku, Hamamatsu-shi, Shizuoka-ken, 431-2103
JAPAN
Phone: + 81-53-484-1224
Fax: + 81-53-484-1226

2. Hazard identification

2.1. Classification of the substance or mixture
This product is classified as dangerous according to GHS.
- Flammable liquids Category 4
- Acute toxicity - oral Category 5
- Eye damage/irritation Category 1
- Skin corrosion/irritation Category 2
- Toxic to reproduction Category 1B

2.2. GHS label elements, including precautionary statements
Pictogram

Signal word(s) Danger
Hazard statement(s)  Combustible liquid.  
May be harmful if swallowed.  
Causes skin irritation.  
Causes serious eye damage.  
May damage fertility or the unborn child

Precautionary statement(s)
Prevention  Do not handle until all safety precautions have been read and understood.  
Keep away from heat/sparks/open flames/hot surfaces. — No smoking.  
Wear protective gloves/protective clothing/eye protection/face protection.
Response IF ON SKIN: Wash with plenty of soap and water.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
IF exposed or concerned: Get medical advice/attention.

2.3. Other hazards
Potential Health Effects:

Eyes: Causes severe eye injury which may persist for several days.
Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation: Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
Ingestion: May cause injury of mouth, throat, and stomach.
Chronic Health Hazards: Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity: None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)

3. Composition/information on ingredients
Chemical nature: mixture

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>EU registration No.</th>
<th>% By Weight</th>
<th>Classification EC No. 1272/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorant</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>&lt;1</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Proprietary organic materials</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>5-15</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>112-36-7</td>
<td>203-963-7</td>
<td>01-2119969946-13-0000</td>
<td>40-50</td>
<td>Skin Irrit. 2: H315</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>96-48-0</td>
<td>202-509-5</td>
<td>N/A for the moment</td>
<td>&lt;20</td>
<td>Acute Tox. 4: H302 Eye Dam. 1: H318 STOT SE 3: H336</td>
</tr>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>143-24-8</td>
<td>205-594-7</td>
<td>N/A for the moment</td>
<td>10-20</td>
<td>Repr. 1B: H360</td>
</tr>
<tr>
<td>Dialkylene glycol dialkyl ether</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>15-25</td>
<td>Not classified as hazardous</td>
</tr>
</tbody>
</table>

*C.B.I.: Confidential Business Information
*For the full text of the H-Statements mentioned in this Section, see Section 16.
4. First aid measures

4.1. Description of first aid measures

- **Eyes:** In case of contact, immediately flush eyes with plenty of water for several minutes. Hold eyelids open during flushing. Call a physician.

- **Skin:** In case of contact, immediately flush with plenty of water while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. If swelling or redness occurs, call a physician.

- **Inhalation:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

- **Ingestion:** If swallowed, DO NOT induce vomiting. Seek immediate medical advice.

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

- **Eyes:** Causes severe eye injury which may persist for several days.

- **Skin:** Contact with skin may cause irritation, swelling or redness, allergic sensitization.

- **Inhalation:** Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.

- **Ingestion:** May cause injury of mouth, throat, and stomach.

4.3. Indication of immediate medical attention and special treatment needed

No information

5. Firefighting measures

5.1. Extinguishing media

- **Suitable extinguishing media:**
  - Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.

- **Unsuitable extinguishing media:**
  - Water, High-pressure water jet

5.2. Special hazards arising from the substance or mixture

- **Hazardous decomposition products:** Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.

- **Flash Point:** 71 deg.C

5.3. Advice for firefighters

- Wear special chemical protective clothing and positive pressure self-contained breathing apparatus (SCBA). Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues. Applying direct water may be dangerous because fire may expand to surroundings.

6. Accidental release measures

General:

- Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill. Absorb spill with sand or earth then place in a chemical waste container.

6.1. Personal precautions, protective equipment and emergency procedures

- Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus and wear appropriate personal protective equipment.

6.2. Environmental precautions

- Wipe off spillage. Prevent liquid from entering sewers, waterways or low areas.
6.3. Methods and material for containment and cleaning up
   Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections
   Refer to “Section 8 Exposure controls/ personal protection” and “Section 13 Disposal consideration” as appropriate.

7. Handling and storage
7.1. Precautions for safe handling
   Avoid contact with eyes, skin and clothing. Use proper ventilation and no fire in work place. Put protection wear that has electrical conductivity in case of work. Keep out of reach of children and do not drink.

7.2. Conditions for safe storage, including any incompatibilities
   Keep containers tightly closed. Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with metals, amines, free radical initiators, oxidising agents.

7.3. Specific end use(s):
   Inkjet printing

8. Exposure controls/ personal protection
8.1. Control parameters
   Occupational Exposure Limits:
   EU: DNEL

<table>
<thead>
<tr>
<th>components</th>
<th>Long term exposure</th>
<th>Short term exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>22mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>50.05mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>130mg/m³</td>
<td>958mg/m³</td>
</tr>
</tbody>
</table>

   REACH Toxicological Information (Workers - Hazard via inhalation route)

8.2. Exposure controls:
   Provide general and/or local exhaust ventilation.

   Respiratory protection:
   In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory protection equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with organic vapor cartridge. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

   Hand protection:
   Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, use protective gloves. Recommended impervious gloves is butyl rubber glove.

   Eye protection:
   Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear safety glasses or chemical splash goggles.

   Skin protection:
   Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear protective clothing.

   Hygiene measures:
   Wash hands after handling. In case contact with clothing, wash before reuse. Do not eat, drink or smoke in handling or storage area.

   Environmental exposure control:
   Avoid release to the environment.
9. Physical and chemical properties
9.1. Information on basic physical and chemical properties

Appearance: Magenta Liquid
Odour: Slightly
Odour threshold: No data available
pH: Not applicable
Melting point/freezing point: No data available
Initial boiling point and boiling range: No data available
Flash point: 71 deg.C
Evaporation rate: No data available
Flammability(solid, gas): Not applicable
Upper/lower flammability or explosive limits: No data available
Vapor pressure: No data available
Vapor density: No data available
Relative density: No data available
Solubility(ies): Water solubility: Soluble
Partition coefficient: n-octanol/water: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Viscosity: Less than 5 mPa·s at 20°C
Explosive properties: Explosive limits: 0.3-16.0v/v% as γ-Butyrolactone
Oxidizing properties: None

9.2. Other information: No information

10. Stability and reactivity
10.1. Reactivity: No reactivity under normal temperature
10.2. Chemical stability: Stable under normal temperature
10.3. Possibility of hazardous reactions: Not expected
10.4. Conditions to avoid: Elevated temperatures/heat, UV light, when not in use.
10.5. Incompatible materials: Avoid contact with acids, amines, free radical initiators, oxidizing agents.

11. Toxicological information

*Based on toxicology data of chemically similar material

11.1. Information on toxicological effects
Routes of Overexposure: Eye, skin, inhalation, and oral

Acute toxicity:
Oral LD50 >2500mg/kg(Rat)*
Dermal LD50 >2000mg/kg(Rat)*
Inhalant LC50 No data available

Skin corrosion/irritation: Non-irritant (Rabbit, OECD404)*
Serious eye damage/eye irritation: Non-irritant (Rabbit, OECD405)*
Respiratory or skin sensitisation: Non-sensitizer (LLNA, OECD429)*
Germ cell mutagenicity: Negative (by Ames Test)*
Reproductive toxicity: Suspected of damaging fertility or the unborn child.(Tetraethylene glycol dimethyl ether and a similar chemical)

Carcinogenicity: None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)
STOT-single exposure: Overexposure of eye may be mildly irritating. Overexposure of skin may cause irritation and in some people swelling and redness. Inhalation may result in respiratory irritation and anesthesia. Ingestion may cause an upset stomach.

STOT-repeated exposure: No data available
Aspiration hazard: No data available

12. Ecological information
12.1. Toxicity: No data available
12.2. Persistence and degradability: No data available
12.3. Bioaccumulative potential: No data available
12.4. Mobility in soil: No data available
12.5. Results of PBT and vPvB assessment: Has not carried out PBT and vPvB assessment.
12.6. Other adverse effects: No data available

13. Disposal considerations
13.1. Waste treatment methods:
This product is considered as a hazardous waste according to Directive 2008/98/EC. Treatment, storage, transportation and disposal must be in accordance with applicable federal, state/provincial, and local regulations. Do not flush to surface water or sanitary sewer system.

14. Transport information
14.1. UN Class/UN Number:
ADR/ADG/DOT, IMDG, or IATA: Not regulated
14.2. UN proper shipping name:
ADR/ADG/DOT, IMDG, or IATA: Not regulated
14.3. Transport hazard class(es):
ADR/ADG/DOT, IMDG, or IATA: Not regulated
14.4. Packing group:
ADR/ADG/DOT, IMDG, or IATA: Not regulated
14.5. Environmental hazards:
ADR/ADG/DOT, IMDG, or IATA: Not regulated
14.6. Special precautions for user:
Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and IBC code:
Not regulated

15. Regulatory information
EU Information:
Chemical Safety Assessment according to (EC) 1907/2006:
This product has not carried out any Chemical Safety Assessment yet.

Australia Information:
Hazardous statement: Classified as hazardous according to NOHSC criteria.

International Information:
None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)
16. Other information

List of relevant H-Statements:

H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H336 May cause drowsiness or dizziness.
H360 May damage fertility or the unborn child.

The information in this Safety Data Sheet (SDS) is believed to be correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. It is subject to revision as additional knowledge and experience is gained. Roland DG does not warrant the completeness or accuracy of the information contained herein.
Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
ECO-SOL MAX2, ESL4-4LK

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

1.3. Details of the supplier of the safety data sheet
Manufacture's name: Roland DG Corporation
Address: 1-6-4 Shinmiyakoda, Kita-ku, Hamamatsu-shi, Shizuoka-ken, 431-2103
JAPAN
Phone: + 81-53-484-1224
Fax: + 81-53-484-1226

E-mail Address:
Revised date: 30 August, 2017

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture
This product is classified as dangerous according to GHS.
- Flammable liquids Category 4
- Acute toxicity - oral Category 5
- Eye damage/irritation Category 1
- Skin corrosion/irritation Category 2
- Toxic to reproduction Category 1B

2.2. GHS label elements, including precautionary statements
Pictogram

Signal word(s) Danger
Hazard statement(s)  
Combustible liquid.  
May be harmful if swallowed.  
Causes skin irritation.  
Causes serious eye damage.  
May damage fertility or the unborn child

Precautionary statement(s)  
Prevention  
Do not handle until all safety precautions have been read and understood.  
Keep away from heat/sparks/open flames/hot surfaces. — No smoking.  
Wear protective gloves/protective clothing/eye protection/face protection.  
Response  
IF ON SKIN: Wash with plenty of soap and water.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
IF exposed or concerned: Get medical advice/attention.

2.3. Other hazards  
Potential Health Effects:  
Eyes: Causes severe eye injury which may persist for several days.  
Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.  
Inhalation: Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.  
Ingestion: May cause injury of mouth, throat, and stomach.  
Chronic Health Hazards: Repeated skin contact may cause a persistent irritation or dermatitis.  
Carcinogenicity: The product contains Carbon black.  
IARC evaluated printing ink as a Group3(Not classifiable as to carcinogenicity to humans).

3. Composition/information on ingredients  
Chemical nature: mixture

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>EU registration No.</th>
<th>% By Weight</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon black</td>
<td>1333-86-4</td>
<td>215-609-9</td>
<td>N/A for the moment</td>
<td>&lt;1</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Proprietary organic materials</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>1-10</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>112-36-7</td>
<td>203-963-7</td>
<td>01-211969946-13-0000</td>
<td>40-50</td>
<td>Skin Irrit. 2: H315</td>
</tr>
</tbody>
</table>
| γ-butyrolactone             | 96-48-0 | 202-509-5   | N/A for the moment  | <20         | Acute Tox. 4: H302  
|                             |         |             |                     |             | Eye Dam. 1: H318  
|                             |         |             |                     |             | STOT SE 3: H336  
| Tetraethylene glycol dimethyl ether | 143-24-8 | 205-594-7 | N/A for the moment  | 10-20       | Repr. 1B: H360  
| Dialkylene glycol dialkyl ether | C.B.I. | C.B.I. | N/A for the moment  | 15-25       | Not classified as hazardous |

*C.B.I.: Confidential Business Information  
*For the full text of the H-Statements mentioned in this Section, see Section 16.
4. First aid measures

4.1. Description of first aid measures

Eyes: In case of contact, immediately flush eyes with plenty of water for several minutes. Hold eyelids open during flushing. Call a physician.

Skin: In case of contact, immediately flush with plenty of water while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. If swelling or redness occurs, call a physician.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion: If swallowed, DO NOT induce vomiting. Seek immediate medical advice.

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

Eyes: Causes severe eye injury which may persist for several days.

Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.

Inhalation: Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.

Ingestion: May cause injury of mouth, throat, and stomach.

4.3. Indication of immediate medical attention and special treatment needed

No information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:
- Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.

Unsuitable extinguishing media:
- Water, High-pressure water jet

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.

Flash Point: 71 deg.C

5.3. Advice for firefighters

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus (SCBA). Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues. Applying direct water may be dangerous because fire may expand to surroundings.

6. Accidental release measures

General:

Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill. Absorb spill with sand or earth then place in a chemical waste container.

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus and wear appropriate personal protective equipment.

6.2. Environmental precautions

Wipe off spillage. Prevent liquid from entering sewers, waterways or low areas.
6.3. Methods and material for containment and cleaning up
   Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections
   Refer to “Section 8 Exposure controls/ personal protection” and “Section 13 Disposal consideration” as appropriate.

7. Handling and storage
7.1. Precautions for safe handling
   Avoid contact with eyes, skin and clothing. Use proper ventilation and no fire in work place. Put protection wear that has electrical conductivity in case of work. Keep out of reach of children and do not drink.

7.2. Conditions for safe storage, including any incompatibilities
   Keep containers tightly closed. Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with metals, amines, free radical initiators, oxidising agents.

7.3. Specific end use(s): Inkjet printing

8. Exposure controls/ personal protection
8.1. Control parameters
   Occupational Exposure Limits:
   EU: DNEL
<table>
<thead>
<tr>
<th>components</th>
<th>Long term exposure</th>
<th>Short term exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>22mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>50.05mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>130mg/m³</td>
<td>958mg/m³</td>
</tr>
</tbody>
</table>
   REACH Toxicological Information (Workers - Hazard via inhalation route)

   Australia: OELs
<table>
<thead>
<tr>
<th>components</th>
<th>TWA</th>
<th>STEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon black</td>
<td>3mg/m³</td>
<td>-</td>
</tr>
</tbody>
</table>

8.2. Exposure controls:
   Appropriate engineering controls: Provide general and/or local exhaust ventilation.

   Respiratory protection: In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory protection equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with organic vapor cartridge. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

   Hand protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, use protective gloves. Recommended impervious gloves is butyl rubber glove.

   Eye protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear safety glasses or chemical splash goggles.

   Skin protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear protective clothing.
9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Black Liquid</td>
</tr>
<tr>
<td>Odour</td>
<td>Slightly</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>71 deg.C</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability(solid,gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td>Water solubility: Soluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Less than 5 mPa·s at 20°C</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Explosive limits: 0.3-16.0v/v% as γ-Butyrolactone</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>None</td>
</tr>
<tr>
<td>Volatile organic compounds (VOC) content</td>
<td>920 gram/liter (maximum value)</td>
</tr>
</tbody>
</table>

9.2. Other information: No information

10. Stability and reactivity

10.1. Reactivity: No reactivity under normal temperature

10.2. Chemical stability: Stable under normal temperature

10.3. Possibility of hazardous reactions: Not expected

10.4. Conditions to avoid: Elevated temperatures/heat, UV light, when not in use.

10.5. Incompatible materials: Avoid contact with acids, amines, free radical initiators, oxidizing agents.


11. Toxicological information

*Based on toxicology data of chemically similar material

11.1. Information on toxicological effects

Routes of Overexposure: Eye, skin, inhalation, and oral

Acute toxicity:

- Oral LD50: >2500mg/kg(Rat)*
- Dermal LD50: >2000mg/kg(Rat)*
- Inhalant LC50: No data available

Skin corrosion/irritation: Non-irritant (Rabbit, OECD404)*

Serious eye damage/eye irritation: Moderate irritant (Rabbit, OECD405)*

Respiratory or skin sensitisation: Non-sensitizer (LLNA, OECD429)*

Germ cell mutagenicity: Negative (by Ames Test)*
Reproductive toxicity: No data available
Suspected of damaging fertility or the unborn child. (Tetraethylene glycol dimethyl ether and a similar chemical)

Carcinogenicity: The product contains Carbon black.
IARC evaluated printing ink as a Group 3 (Not classifiable as to carcinogenicity to humans).

STOT-single exposure: Overexposure of eye may be mildly irritating.
Overexposure of skin may cause irritation and in some people swelling and redness.
Inhalation may result in respiratory irritation and anesthesia.
Ingestion may cause an upset stomach.

STOT-repeated exposure: No data available

Aspiration hazard: No data available

12. Ecological information
12.1. Toxicity: No data available
12.2. Persistence and degradability: No data available
12.3. Bioaccumulative potential: No data available
12.4. Mobility in soil: No data available
12.5. Results of PBT and vPvB assessment: Has not carried out PBT and vPvB assessment.
12.6. Other adverse effects: No data available

13. Disposal considerations
13.1. Waste treatment methods:
This product is considered as a hazardous waste according to Directive 2008/98/EC.
Treatment, storage, transportation and disposal must be in accordance with applicable federal, state/provincial, and local regulations. Do not flush to surface water or sanitary sewer system.

14. Transport information
14.1. UN Class/UN Number: Not regulated
ADR/ADG/DOT, IMDG, or IATA:
14.2. UN proper shipping name: Not regulated
ADR/ADG/DOT, IMDG, or IATA:
14.3. Transport hazard class(es): Not regulated
ADR/ADG/DOT, IMDG, or IATA:
14.4. Packing group: Not regulated
ADR/ADG/DOT, IMDG, or IATA:
14.5. Environmental hazards: Not regulated
ADR/ADG/DOT, IMDG, or IATA:
14.6. Special precautions for user: Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and IBC code: Not regulated

15. Regulatory information
EU Information:
Chemical Safety Assessment according to (EC) 1907/2006:
This product has not carried out any Chemical Safety Assessment yet.

Australia Information:
Hazardous statement: Classified as hazardous according to NOHSC criteria.

International Information:
The product contains Carbon black.
IARC evaluated printing ink as a Group 3 (Not classifiable as to carcinogenicity to humans).
16. Other information

List of relevant H-Statements:

  H302 Harmful if swallowed.
  H315 Causes skin irritation.
  H318 Causes serious eye damage.
  H336 May cause drowsiness or dizziness.
  H360 May damage fertility or the unborn child.

The information in this Safety Data Sheet (SDS) is believed to be correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. It is subject to revision as additional knowledge and experience is gained. Roland DG does not warrant the completeness or accuracy of the information contained herein.
1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
ECO-SOL MAX2, ESL4-WH

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

1.3. Details of the supplier of the safety data sheet
Manufacture's name: Roland DG Corporation
Address: 1-6-4 Shinmiyakoda, Kita-ku, Hamamatsu-shi, Shizuoka-ken, 431-2103
JAPAN
Phone: + 81-53-484-1224
Fax: + 81-53-484-1226

E-mail Address:
Revised date: 30 August, 2017

1.4. Emergency telephone:

2. Hazard identification
2.1. Classification of the substance or mixture
This product is classified as dangerous according to GHS.
Flammable liquids Category 4
Skin corrosion/irritation Category 2

2.2. GHS label elements, including precautionary statements
Pictogram

Signal word(s) Warning
Hazard statement(s) Combustible liquid.
Causes skin irritation.
Precautionary statement(s)

Prevention
Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
Wear protective gloves/protective clothing/eye protection/face protection.

Response
IF ON SKIN: Wash with plenty of soap and water.
If skin irritation occurs: Get medical advice/attention.
Take off contaminated clothing.

Storage
Store in a well-ventilated place. Keep cool.

2.3. Other hazards
Potential Health Effects:

Eyes: Contact with eye may be mildly irritating.
Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation: Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
Ingestion: May cause injury of mouth, throat, and stomach.
Chronic Health Hazards: Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity: The product contains Titanium dioxide.
IARC evaluated printing ink as a Group3(Not classifiable as to carcinogenicity to humans).

3. Composition/information on ingredients

Chemical nature: mixture

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>EU registration No.</th>
<th>% By Weight</th>
<th>Classification EC No. 1272/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium dioxide</td>
<td>13463-67-7</td>
<td>236-675-5</td>
<td>N/A for the moment</td>
<td>10-20</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Proprietary organic materials</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>5-15</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>112-36-7</td>
<td>203-963-7</td>
<td>01-2119969946-13-0000</td>
<td>50-60</td>
<td>Skin Irrit. 2: H315</td>
</tr>
<tr>
<td>Dialkylene glycol dialkyl ether</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>about 20</td>
<td>Not classified as hazardous</td>
</tr>
</tbody>
</table>

*C.B.I.: Confidential Business Information
*For the full text of the H-Statements mentioned in this Section, see Section 16.

4. First aid measures

4.1. Description of first aid measures

Eyes: In case of contact, immediately flush eyes with plenty of water for several minutes. Hold eyelids open during flushing. Call a physician.
Skin: In case of contact, immediately flush with plenty of water while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. If swelling or redness occurs, call a physician.
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion: If swallowed, DO NOT induce vomiting. Seek immediate medical advice.
4.2. Most important symptoms and effects, both acute and delayed

**Eyes:** Causes severe eye injury which may persist for several days.

**Skin:** Contact with skin may cause irritation, swelling or redness, allergic sensitization.

**Inhalation:** Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.

**Ingestion:** May cause injury of mouth, throat, and stomach.

4.3. Indication of immediate medical attention and special treatment needed

No information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:
- Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.

Unsuitable extinguishing media:
- Water, High-pressure water jet

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.

Flash Point: 71 deg.C

5.3. Advice for firefighters

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus (SCBA). Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues. Applying direct water may be dangerous because fire may expand to surroundings.

6. Accidental release measures

General:

- Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill. Absorb spill with sand or earth then place in a chemical waste container.

6.1. Personal precautions, protective equipment and emergency procedures

- Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus and wear appropriate personal protective equipment.

6.2. Environmental precautions

- Wipe off spillage. Prevent liquid from entering sewers, waterways or low areas.

6.3. Methods and material for containment and cleaning up

- Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections

- Refer to “Section 8 Exposure controls/personal protection” and “Section 13 Disposal consideration” as appropriate.

7. Handling and storage

7.1. Precautions for safe handling

- Avoid contact with eyes, skin and clothing. Use proper ventilation and no fire in work place. Put protection wear that has electrical conductivity in case of work. Keep out of reach of children and do not drink.

7.2. Conditions for safe storage, including any incompatibilities

- Keep containers tightly closed. Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with metals, amines, free radical initiators, oxidising agents.

7.3. Specific end use(s):

- Inkjet printing
8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:
Australia: OELs

<table>
<thead>
<tr>
<th>Components</th>
<th>TWA</th>
<th>STEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium dioxide</td>
<td>10mg/m³</td>
<td>-</td>
</tr>
</tbody>
</table>

8.2. Exposure controls:

Appropriate engineering controls: Provide general and/or local exhaust ventilation.

Respiratory protection: In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory protection equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with organic vapor cartridge. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Hand protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, use protective gloves. Recommended impervious gloves is butyl rubber glove.

Eye protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear safety glasses or chemical splash goggles.

Skin protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear protective clothing.

Hygiene measures: Wash hands after handling. In case contact with clothing, wash before reuse. Do not eat, drink or smoke in handling or storage area.

Environmental exposure control: Avoid release to the environment.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance: White Liquid
Odour: Slightly
Odour threshold: No data available
pH: Not applicable
Melting point/freezing point: No data available
Initial boiling point and boiling range: No data available
Flash point: 71 deg.C
Evaporation rate: No data available
Flammability(solid,gas): Not applicable
Upper/lower flammability or explosive limits:
Vapor pressure: No data available
Vapor density: No data available
Relative density: No data available
Solubility(ies): Water solubility: Soluble
Partition coefficient: n-octanol/water: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Viscosity: Less than 5 mPa·s at 20°C
Explosive properties: Explosive limits: 0.3-16.0v/v% as γ-Butyrolactone
Oxidizing properties: None
Volatile organic compounds (VOC) content: 800 gram/liter (maximum value)
9.2. Other information: No information

10. Stability and reactivity
10.1. Reactivity: No reactivity under normal temperature
10.2. Chemical stability: Stable under normal temperature
10.3. Possibility of hazardous reactions: Not expected
10.4. Conditions to avoid: Elevated temperatures/heat, UV light, when not in use.
10.5. Incompatible materials: Avoid contact with acids, amines, free radical initiators, oxidizing agents.

11. Toxicological information
*Based on toxicology data of chemically similar material
11.1. Information on toxicological effects
Routes of Overexposure: Eye, skin, inhalation, and oral
Acute toxicity:
   Oral LD50 >2500mg/kg(Rat)*
   Dermal LD50 >2000mg/kg(Rat)*
   Inhalant LC50 No data available
Skin corrosion/irritation: Non-irritant (Rabbit, OECD404)*
Serious eye damage/eye irritation: Non-irritant (Rabbit, OECD405)*
Respiratory or skin sensitisation: Non-sensitizer (LLNA, OECD429)*
Germ cell mutagenicity: Negative (by Ames Test)*
Reproductive toxicity: No data available
Carcinogenicity: The product contains Titanium dioxide.
   IARC evaluated printing ink as a Group3(Not classifiable as to carcinogenicity to humans).
STOT-single exposure: Overexposure of eye may be mildly irritating.
   Overexposure of skin may cause irritation and in some people swelling and redness.
   Inhalation may result in respiratory irritation and anesthesia.
   Ingestion may cause an upset stomach.
STOT-repeated exposure: No data available
Aspiration hazard: No data available

12. Ecological information
12.1. Toxicity: No data available
12.2. Persistence and degradability: No data available
12.3. Bioaccumulative potential: No data available
12.4. Mobility in soil: No data available
12.5. Results of PBT and vPvB assessment: Has not carried out PBT and vPvB assessment.
12.6. Other adverse effects: No data available
13. Disposal considerations
13.1. Waste treatment methods:
This product is considered as a hazardous waste according to Directive 2008/98/EC.
Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Do not flush to surface water or sanitary sewer system.

14. Transport information
14.1. UN Class/UN Number:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.2. UN proper shipping name:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.3. Transport hazard class(es):
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.4. Packing group:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.5. Environmental hazards:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.6. Special precautions for user:
Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and IBC code:
Not regulated

15. Regulatory information
EU Information:
Chemical Safety Assessment according to (EC)1907/2006:
This product has not carried out any Chemical Safety Assessment yet.

Australia Information:
Hazardous statement: Classified as hazardous according to NOHSC criteria. One of the substance in this product is being introduced under a Low Volume Chemical Permit granted under section 21U(2) of the Industrial Chemicals (Notification and Assessment) Act 1989.

International Information:
The product contains Titanium dioxide.
IARC evaluated printing ink as a Group3(Not classifiable as to carcinogenicity to humans).

16. Other information
List of relevant H-Statements:
H315 Causes skin irritation.

The information in this Safety Data Sheet (SDS) is believed to be correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. It is subject to revision as additional knowledge and experience is gained. Roland DG does not warrant the completeness or accuracy of the information contained herein.
Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
ECO-SOL MAX2, ESL4-MT

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

1.3. Details of the supplier of the safety data sheet
Manufacture's name: Roland DG Corporation
Address: 1-6-4 Shinmiyakoda, Kita-ku, Hamamatsu-shi, Shizuoka-ken, 431-2103
JAPAN
Phone: +81-53-484-1224
Fax: +81-53-484-1226

E-mail Address:
Revised date: 30 August, 2017

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture
This product is classified as dangerous according to GHS.
  Flammable liquids Category 4
  Acute toxicity - oral Category 5
  Eye damage/irritation Category 1
  Skin corrosion/irritation Category 2
  Toxic to reproduction Category 1B

2.2. GHS label elements, including precautionary statements
Pictogram

Signal word(s) Danger
Hazard statement(s)  
- Combustible liquid.
- May be harmful if swallowed.
- Causes skin irritation.
- Causes serious eye damage.
- May damage fertility or the unborn child

Precautionary statement(s)  
**Prevention**  
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
Wear protective gloves/protective clothing/eye protection/face protection.

**Response**  
IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/attention.

2.3. Other hazards  
**Potential Health Effects:**
- **Eyes:** Causes severe eye injury which may persist for several days.
- **Skin:** Contact with skin may cause irritation, swelling or redness, allergic sensitization.
- **Inhalation:** Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
- **Ingestion:** May cause injury of mouth, throat, and stomach.
- **Chronic Health Hazards:** Repeated skin contact may cause a persistent irritation or dermatitis.
- **Carcinogenicity:** None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)

3. Composition/information on ingredients  
**Chemical nature:** mixture

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>EU registration No.</th>
<th>% By Weight</th>
<th>Classification EC No. 1272/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorants</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>1-5</td>
<td>Not classified as hazardous</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>112-36-7</td>
<td>203-963-7</td>
<td>01-2119969946-13-0000</td>
<td>70-80</td>
<td>Skin Irrit. 2: H315</td>
</tr>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>143-24-8</td>
<td>205-594-7</td>
<td>N/A for the moment</td>
<td>10-20</td>
<td>Repr. 1B: H360</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>96-48-0</td>
<td>202-509-5</td>
<td>N/A for the moment</td>
<td>about 10</td>
<td>Acute Tox. 4: H302                   Eye Dam. 1: H318 STOT SE 3: H336</td>
</tr>
<tr>
<td>Proprietary organic materials</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>1-5</td>
<td>Not classified as hazardous</td>
</tr>
</tbody>
</table>

*C.B.I.: Confidential Business Information
*For the full text of the H-Statements mentioned in this Section, see Section 16.
4. First aid measures

4.1. Description of first aid measures

**Eyes:** In case of contact, immediately flush eyes with plenty of water for several minutes. Hold eyelids open during flushing. Call a physician.

**Skin:** In case of contact, immediately flush with plenty of water while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. If swelling or redness occurs, call a physician.

**Inhalation:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**Ingestion:** If swallowed, DO NOT induce vomiting. Seek immediate medical advice.

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

**Eyes:** Causes severe eye injury which may persist for several days.

**Skin:** Contact with skin may cause irritation, swelling or redness, allergic sensitization.

**Inhalation:** Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.

**Ingestion:** May cause injury of mouth, throat, and stomach.

4.3. Indication of immediate medical attention and special treatment needed

No information

5. Firefighting measures

5.1. Extinguishing media

**Suitable extinguishing media:**
- Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.

**Unsuitable extinguishing media:**
- Water, High-pressure water jet

5.2. Special hazards arising from the substance or mixture

**Hazardous decomposition products:** Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.

**Flash Point:** 71 deg.C

5.3. Advice for firefighters

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus (SCBA). Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues. Applying direct water may be dangerous because fire may expand to surroundings.
6. Accidental release measures
General:
Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill. Absorb spill with sand or earth then place in a chemical waste container.

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus and wear appropriate personal protective equipment.

6.2. Environmental precautions
Wipe off spillage. Prevent liquid from entering sewers, waterways or low areas.

6.3. Methods and material for containment and cleaning up
Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections
Refer to “Section 8 Exposure controls/ personal protection” and “Section 13 Disposal consideration” as appropriate.

7. Handling and storage
7.1. Precautions for safe handling
Avoid contact with eyes, skin and clothing. Use proper ventilation and no fire in work place. Put protection wear that has electrical conductivity in case of work. Keep out of reach of children and do not drink.

7.2. Conditions for safe storage, including any incompatibilities
Keep containers tightly closed. Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with metals, amines, free radical initiators, oxidising agents.

7.3. Specific end use(s):
Inkjet printing

8. Exposure controls/ personal protection
8.1. Control parameters
Occupational Exposure Limits:
EU: DNEL
<table>
<thead>
<tr>
<th>components</th>
<th>Long term exposure</th>
<th>Short term exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraethylene glycol dimethyl ether</td>
<td>22mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>50.05mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>130mg/m³</td>
<td>958mg/m³</td>
</tr>
</tbody>
</table>

REACH Toxicological Information (Workers - Hazard via inhalation route)

8.2. Exposure controls:
Appropriate engineering controls: Provide general and/or local exhaust ventilation.

Respiratory protection:
In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory protection equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with organic vapor cartridge. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Hand protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, use protective gloves. Recommended impervious gloves is butyl rubber glove.

Eye protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear safety glasses or chemical splash goggles.

Skin protection: Not required under suitable use as setting the ink on the printer. However, in case of direct contact to the ink, wear protective clothing.

Hygiene measures: Wash hands after handling. In case contact with clothing, wash before reuse. Do not eat, drink or smoke in handling or storage area.

Environmental exposure control: Avoid release to the environment.

9. Physical and chemical properties
9.1. Information on basic physical and chemical properties
Appearance: Sliver Liquid
Odour: Slight
Odour threshold: No data available
pH: Not applicable
Melting point/freezing point: No data available
Initial boiling point and boiling range: No data available
Flash point: 71 deg.C
Evaporation rate: No data available
Flammability(solid,gas): Not applicable
Upper/lower flammability or explosive limits: No data available
Vapor pressure: No data available
Vapor density: No data available
Relative density: No data available
Solubility(ies): Water solubility: Soluble
Partition coefficient: n-octanol/water: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Viscosity: Less than 5 mPa·s at 20°C
Explosive properties: Explosive limits: 0.3-16.0v/v% as γ-Butyrolactone
Oxidizing properties: None
Volatile organic compounds (VOC) content: 930 gram/liter (maximum value)

9.2. Other information: No information

10. Stability and reactivity
10.1. Reactivity: No reactivity under normal temperature
10.2. Chemical stability: Stable under normal temperature
10.3. Possibility of hazardous reactions: Not expected
10.4. Conditions to avoid: Elevated temperatures/heat, UV light, when not in use.
10.5. Incompatible materials: Avoid contact with acids, amines, free radical initiators, oxidizing agents.
11. Toxicological information

*Based on toxicology data of chemically similar material

11.1. Information on toxicological effects

Routes of Overexposure: Eye, skin, inhalation, and oral

Acute toxicity:
- Oral LD50 $>2500\text{mg/kg (Rat)}$
- Dermal LD50 $>2000\text{mg/kg (Rat)}$
- Inhalant LC50 No data available

Skin corrosion/irritation: Non-irritant (Rabbit, OECD404)

Serious eye damage/eye irritation: Non-irritant (Rabbit, OECD405)

Respiratory or skin sensitisation: Non-sensitizer (LLNA, OECD429)

Germ cell mutagenicity: Negative (by Ames Test)

Reproductive toxicity: Suspected of damaging fertility or the unborn child. (Tetraethylene glycol dimethyl ether and a similar chemical)

Carcinogenicity: None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)

STOT-single exposure: Overexposure of eye may be mildly irritating. Overexposure of skin may cause irritation and in some people swelling and redness. Inhalation may result in respiratory irritation and anesthesia. Ingestion may cause an upset stomach.

STOT-repeated exposure: No data available

Aspiration hazard: No data available

12. Ecological information

12.1. Toxicity: No data available

12.2. Persistence and degradability: No data available

12.3. Bioaccumulative potential: No data available

12.4. Mobility in soil: No data available

12.5. Results of PBT and vPvB assessment: Has not carried out PBT and vPvB assessment.

12.6. Other adverse effects: No data available

13. Disposal considerations

13.1. Waste treatment methods:

This product is considered as a hazardous waste according to Directive 2008/98/EC. Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Do not flush to surface water or sanitary sewer system.
14. Transport information

14.1. UN Class/UN Number:
ADR/ADG/DOT, IMDG, or IATA : Not regulated

14.2. UN proper shipping name:
ADR/ADG/DOT, IMDG, or IATA : Not regulated

14.3. Transport hazard class(es):
ADR/ADG/DOT, IMDG, or IATA : Not regulated

14.4. Packing group:
ADR/ADG/DOT, IMDG, or IATA : Not regulated

14.5. Environmental hazards:
ADR/ADG/DOT, IMDG, or IATA : Not regulated

14.6. Special precautions for user:
Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and IBC code:
Not regulated

15. Regulatory information

EU Information:
Chemical Safety Assessment according to (EC)1907/2006:
This product has not carried out any Chemical Safety Assessment yet.

Australia Information:
Hazardous statement: Classified as hazardous according to NOHSC criteria.

International Information:
None of the ingredients in this ink is listed by IARC as a carcinogen.

16. Other information

List of relevant H-Statements:
H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H336 May cause drowsiness or dizziness.
H360 May damage fertility or the unborn child.

The information in this Safety Data Sheet (SDS) is believed to be correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. It is subject to revision as additional knowledge and experience is gained. Roland DG does not warrant the completeness or accuracy of the information contained herein.
Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
CLEANING LIQUID FOR ECO-SOL INK, ESL4-CL

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

1.3. Details of the supplier of the safety data sheet
Manufacture's name: Roland DG Corporation
Address: 1-6-4 Shinmiyakoda, Kita-ku, Hamamatsu-shi, Shizuoka-ken, 431-2103
JAPAN
Phone: + 81-53-484-1224
Fax: + 81-53-484-1226

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture
This product is classified as dangerous according to GHS.
Flammable liquids Category 4
Acute toxicity - oral Category 5
Eye damage/irritation Category 1
Skin corrosion/irritation Category 2

2.2. GHS label elements, including precautionary statements
Pictogram

Signal word(s) Danger
Hazard statement(s) Combustible liquid.
May be harmful if swallowed.
Causes skin irritation.
Causes serious eye damage.
Precautionary statement(s)

Prevention
Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
Wear protective gloves/protective clothing/eye protection/face protection.

Response
IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/attention.
Take off contaminated clothing.

2.3. Other hazards
Potential Health Effects:

Eyes: Causes severe eye injury which may persist for several days.

Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.

Inhalation: Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.

Ingestion: May cause injury of mouth, throat, and stomach.

Chronic Health Hazards: Repeated skin contact may cause a persistent irritation or dermatitis.

Carcinogenicity: None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)

3. Composition/information on ingredients

Chemical nature: mixture

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>EU registration No.</th>
<th>% By Weight</th>
<th>Classification EC No. 1272/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>112-36-7</td>
<td>203-963-7</td>
<td>01-2119969946-13-0000</td>
<td>70-80</td>
<td>Skin Irrit. 2: H315</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>96-48-0</td>
<td>202-509-5</td>
<td>N/A for the moment</td>
<td>&lt;20</td>
<td>Acute Tox. 4: H302 Eye Dam. 1: H318 STOT SE 3: H336</td>
</tr>
<tr>
<td>Dialkylene glycol dialkyl ether</td>
<td>C.B.I.</td>
<td>C.B.I.</td>
<td>N/A for the moment</td>
<td>5-15</td>
<td>Not classified as hazardous</td>
</tr>
</tbody>
</table>

*C.B.I.: Confidential Business Information

*For the full text of the H-Statements mentioned in this Section, see Section 16.

4. First aid measures

4.1. Description of first aid measures

Eyes: In case of contact, immediately flush eyes with plenty of water for several minutes. Hold eyelids open during flushing. Call a physician.

Skin: In case of contact, immediately flush with plenty of water while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. If swelling or redness occurs, call a physician.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion: If swallowed, DO NOT induce vomiting. Seek immediate medical advice.
4.2. Most important symptoms and effects, both acute and delayed

   Eyes: Causes severe eye injury which may persist for several days.
   Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
   Inhalation: Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
   Ingestion: May cause injury of mouth, throat, and stomach.

4.3. Indication of immediate medical attention and special treatment needed
No information

5. Firefighting measures
5.1. Extinguishing media
   Suitable extinguishing media:
      Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.
   Unsuitable extinguishing media:
      Water, High-pressure water jet

5.2. Special hazards arising from the substance or mixture
   Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.
   Flash Point: 71 deg.C

5.3. Advice for firefighters
   Wear special chemical protective clothing and positive pressure self-contained breathing apparatus(SCBA). Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues. Applying direct water may be dangerous because fire may expand to surroundings.

6. Accidental release measures
General:
   Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill. Absorb spill with sand or earth then place in a chemical waste container.

6.1. Personal precautions, protective equipment and emergency procedures
   Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus and wear appropriate personal protective equipment.

6.2. Environmental precautions
   Dike spill. Prevent liquid from entering sewers, waterways or low areas.

6.3. Methods and material for containment and cleaning up
   Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections
   Refer to “Section 8 Exposure controls/ personal protection” and “Section 13 Disposal consideration” as appropriate.

7. Handling and storage
7.1. Precautions for safe handling
   Avoid contact with eyes, skin and clothing. Use proper ventilation and no fire in work place. Put protection wear that has electrical conductivity in case of work. Keep out of reach of children and do not drink.
7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed. Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with metals, amines, free radical initiators, oxidising agents.

7.3. Specific end use(s):

Cleaning liquid

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:
EU: DNEL

<table>
<thead>
<tr>
<th>components</th>
<th>Long term exposure</th>
<th>Short term exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylene glycol diethyl ether</td>
<td>50.05mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>γ-butyrolactone</td>
<td>130mg/m³</td>
<td>958mg/m³</td>
</tr>
</tbody>
</table>

REACH Toxicological Information (Workers - Hazard via inhalation route)

8.2. Exposure controls:

Provide general and/or local exhaust ventilation.

Respiratory protection: In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory protection equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with organic vapor cartridge. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Hand protection: Not required under suitable use as setting the cleaning liquid on the printer. However, in case of direct contact to the cleaning liquid, use protective gloves. Recommended impervious gloves is butyl rubber glove.

Eye protection: Not required under suitable use as setting the cleaning liquid on the printer. However, in case of direct contact to the cleaning liquid, wear safety glasses or chemical splash goggles.

Skin protection: Not required under suitable use as setting the cleaning liquid on the printer. However, in case of direct contact to the cleaning liquid, wear protective clothing.

Hygiene measures: Wash hands after handling. In case contact with clothing, wash before reuse. Do not eat, drink or smoke in handling or storage area.

Environmental exposure control: Avoid release to the environment.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Solubility: Clear Liquid
Odour: Slightly
Odour threshold: No data available
pH: Not applicable
Melting point/freezing point: No data available
Initial boiling point and boiling range: No data available
Flash point: 71 deg.C
Evaporation rate: No data available
Flammability(solid, gas): Not applicable
Upper/lower flammability or explosive limits: No data available
Vapor pressure: No data available
Vapor density: No data available
Relative density: No data available
**Solubility(ies):** Water solubility: Soluble
Partition coefficient: n-octanol/water: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Viscosity: Less than 5 mPa·s at 20°C
Explosive properties: Explosive limits: 0.3-16.0v/v% as γ-Butyrolactone
Oxidizing properties: None
**Volatile organic compounds (VOC) content:** 940 gram/liter (maximum value)

9.2. Other information: No information

10. Stability and reactivity
10.1. Reactivity: No reactivity under normal temperature
10.2. Chemical stability: Stable under normal temperature
10.3. Possibility of hazardous reactions: Not expected
10.4. Conditions to avoid: Elevated temperatures/heat, UV light, when not in use.
10.5. Incompatible materials: Avoid contact with acids, amines, free radical initiators, oxidizing agents.

11. Toxicological information
   *Based on toxicology data of chemically similar material
11.1. Information on toxicological effects
   **Routes of Overexposure:** Eye, skin, inhalation, and oral
   **Acute toxicity:**
   Oral LD50 >2500mg/kg(Rat)*
   Dermal LD50 >2000mg/kg(Rat)*
   Inhalant LC50 No data available
   **Skin corrosion/irritation:** Non-irritant (Rabbit, OECD404)*
   **Serious eye damage/eye irritation:** Non-irritant (Rabbit, OECD405)*
   **Respiratory or skin sensitisation:** Non-sensitizer (LLNA, OECD429)*
   **Germ cell mutagenicity:** Negative (by Ames Test)*
   **Reproductive toxicity:** No data available
   **Carcinogenicity:** None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)
   **STOT-single exposure:** Overexposure of eye may be mildly irritating.
   Overexposure of skin may cause irritation and in some people swelling and redness.
   Inhalation may result in respiratory irritation and anesthesia.
   Ingestion may cause an upset stomach.
   **STOT-repeated exposure:** No data available
   **Aspiration hazard:** No data available

12. Ecological information
12.1. Toxicity: No data available
12.2. Persistence and degradability: No data available
12.3. Bioaccumulative potential: No data available
12.4. Mobility in soil: No data available
12.5. Results of PBT and vPvB assessment: Has not carried out PBT and vPvB assessment.
12.6. Other adverse effects: No data available
13. Disposal considerations
13.1. Waste treatment methods:
This product is considered as a hazardous waste according to Directive 2008/98/EC. Treatment, storage, transportation and disposal must be in accordance with applicable federal, state/provincial, and local regulations. Do not flush to surface water or sanitary sewer system.

14. Transport information
14.1. UN Class/UN Number:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.2. UN proper shipping name:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.3. Transport hazard class(es):
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.4. Packing group:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.5. Environmental hazards:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.6. Special precautions for user:
Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and IBC code:
Not regulated

15. Regulatory information
EU Information:
Chemical Safety Assessment according to (EC)1907/2006:
This product has not carried out any Chemical Safety Assessment yet.

Australia Information:
Hazardous statement: Classified as hazardous according to NOHSC criteria.

International Information:
None of the ingredients in this ink is listed by IARC as a carcinogen. (1,2A and 2B)

16. Other information
List of relevant H-Statements:
H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H336 May cause drowsiness or dizziness.

The information in this Safety Data Sheet (SDS) is believed to be correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. It is subject to revision as additional knowledge and experience is gained. Roland DG does not warrant the completeness or accuracy of the information contained herein.