

Material Safety Data Sheet

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

1.1. Product identifier

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

E-mail Address:

Date Prepared: 27 September, 2012

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is not classified as hazardous according to Directive 1999/45/EC.

2.2. Label elements

The product does not need to be labelled in accordance with Directive 1999/45/EC.

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.

Inhalation: Exposure to vapors (mist) will cause respiratory irritation and anesthesia.

Ingestion: May cause upset stomach.

Chronic Health Hazards: None Known.

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

| Composition | CAS No. | EC No. | EU registration No. | % By Weight | Classification EC No. 1272/2008 | Classification 67/548/EEC |
|-------------------------------------|-----------|-----------|---------------------|-------------|---------------------------------|-----------------------------|
| Carbon black | 1333-86-4 | 215-609-9 | N/A for the moment | 1-5 | Not classified as hazardous | Not classified as hazardous |
| Proprietary organic materials | C.B.I. | C.B.I. | N/A for the moment | 5-15 | Not classified as hazardous | Not classified as hazardous |
| Diethylene glycol diethyl ether | 112-36-7 | 203-963-7 | N/A for the moment | <50 | Not classified as hazardous | Not classified as hazardous |
| γ -butyrolactone | 96-48-0 | 202-509-5 | N/A for the moment | <20 | Not classified as hazardous | Not classified as hazardous |
| Tetraethylene glycol dimethyl ether | 143-24-8 | 205-594-7 | N/A for the moment | 10-20 | Not classified as hazardous | Not classified as hazardous |
| Dialkylene glycol dialkyl ether | C.B.I. | C.B.I. | N/A for the moment | 15-25 | Not classified as hazardous | Not classified as hazardous |

*C.B.I.: Confidential Business Information

4. First aid measures

4.1. Description of first aid measures

- Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 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. Call a physician. Wash contaminated clothing before reuse.
- 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: Contact with eye may be mildly irritating.
- Skin: Contact with skin may cause irritation, swelling or redness.
- Inhalation: Exposure to vapors (mist) will cause respiratory irritation and anesthesia.
- Ingestion: May cause upset stomach.

4.3. Indication of immediate medical attention and special treatment needed

No information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Water spray, dry chemical, CO₂ or foam.

Unsuitable extinguishing media:

No information

5.2. Special hazards arising from the substance or mixture

Combustible liquid under Hazard Communication Standard (HCS, U.S.A).

Flash Point: 71 deg.C

5.3. Advice for firefighters

Wear self-contained breathing apparatus (SCBA) and full protective equipment.

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

Soak up with sand or earth. Sweep up material and dispose as waste following local regulations. Scrub contaminated area with detergent and water.

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. Keep out of reach of children and do not drink. Do not dismantle container. Make sure cartridge is dry before insertion into printer housing.

7.2. Conditions for safe storage, including any incompatibilities

Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with oxidizing agents or explosives.

7.3. Specific end use(s):

Inkjet printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

US:

| components | OSHA:PEL | ACGIH:TLV |
|--------------|----------------------|----------------------|
| Carbon black | 3.5mg/m ³ | 3.5mg/m ³ |

California OELs (California Code of Regulations, Title 8, Section 5155. Airborne Contaminants)

| components | PEL | STEL |
|---------------------------------|---------------------------|------|
| Carbon black | 3.5mg/m ³ | - |
| Diethylene glycol diethyl ether | 5ppm, 33mg/m ³ | - |

Australia: OELs

| components | TWA | STEL |
|--------------|--------------------|------|
| Carbon black | 3mg/m ³ | - |

8.2. Exposure controls:

Occupational exposure control:

Control the airborne concentrations below the exposure limits. Use only with adequate ventilation.

Personal protective equipment:

Respiratory protection:

Not required under suitable use as setting the cartridge on the printer. However, in case ventilation is not sufficient, wear respiratory protection if necessary.

Hand protection:

Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, use protective gloves if necessary.

Eye protection:

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

Skin protection:

Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, wear protective clothing if necessary.

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 |
| Odor: | Slightly |
| pH: | Not applicable |
| Boiling point: | No data available |
| Flash point: | 71 deg.C |
| Flammability(solid,gas): | Not applicable |
| Explosive properties: | Explosive limits: 0.3-16.0v/v% as γ -Butyrolactone |
| Oxidizing properties: | None |
| Vapor pressure: | No data available |
| Relative density: | No data available |
| Solubility: | No data available |
| Water Solubility: | Soluble |
| Partition coefficient: n-octanol/water: | No data available |
| Viscosity: | No data available |
| Vapor density: | No data available |
| Evaporation rate: | No data available |
| Melting point: | No data available |

9.2. Other information: No information

10. Stability and reactivity

| | |
|---|---------------------------------|
| 10.1. Reactivity: | Stable under normal temperature |
| 10.2. Chemical stability: | Stable under normal temperature |
| 10.3. Possibility of hazardous reactions: | None |
| 10.4. Conditions to avoid: | High and freezing temperatures |
| 10.5. Incompatible materials: | Oxidizers and explosives |
| 10.6. Hazardous decomposition products: | No data available |

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

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:

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

15. Regulatory information

EU Information:

Chemical Safety Assessment according to (EC)1907/2006:

This product has not carried out any Chemical Safety Assessment yet.

US Information:

Toxic Substances Control Act (TSCA): All ingredients are listed on the TSCA Inventory.

Product contains Diethylene glycol diethyl ether and Tetraethylene glycol dimethyl ether that are subject to TSCA Section 5 proposed SNUR and to TSCA Section 12(b) export notification requirements.

California Proposition 65: Not regulated

SARA TITLE III:

Section 313:

Diethylene glycol diethyl ether (Chemical Category N230)

Dialkylene glycol dialkyl ether (Chemical Category N230)

Australia Information:

Hazardous statement: Not classified as hazardous according to NOHSC criteria.

16. Other information

List of relevant H-Statements in section 3: Nothing

List of relevant R-phrases: Nothing

The information in this Material Safety Data Sheet (MSDS) 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.

Material Safety Data Sheet

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

1.1. Product identifier

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

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:

Date Prepared: 27 September, 2012

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is not classified as hazardous according to Directive 1999/45/EC.

2.2. Label elements

The product does not need to be labelled in accordance with Directive 1999/45/EC.

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.

Inhalation: Exposure to vapors (mist) will cause respiratory irritation and anesthesia.

Ingestion: May cause upset stomach.

Chronic Health Hazards: None Known.

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

3. Composition/information on ingredients

Chemical nature: mixture

| Composition | CAS No. | EC No. | EU registration No. | % By Weight | Classification EC No. 1272/2008 | Classification 67/548/EEC |
|-------------------------------------|----------|-----------|---------------------|-------------|---------------------------------|-----------------------------|
| Colorant | C.B.I. | C.B.I. | N/A for the moment | 1-5 | Not classified as hazardous | Not classified as hazardous |
| Proprietary organic materials | C.B.I. | C.B.I. | N/A for the moment | 5-15 | Not classified as hazardous | Not classified as hazardous |
| Diethylene glycol diethyl ether | 112-36-7 | 203-963-7 | N/A for the moment | <50 | Not classified as hazardous | Not classified as hazardous |
| γ -butyrolactone | 96-48-0 | 202-509-5 | N/A for the moment | <20 | Not classified as hazardous | Not classified as hazardous |
| Tetraethylene glycol dimethyl ether | 143-24-8 | 205-594-7 | N/A for the moment | 10-20 | Not classified as hazardous | Not classified as hazardous |
| Dialkylene glycol dialkyl ether | C.B.I. | C.B.I. | N/A for the moment | 15-25 | Not classified as hazardous | Not classified as hazardous |

*C.B.I.: Confidential Business Information

4. First aid measures

4.1. Description of first aid measures

| | |
|-------------|---|
| Eyes: | In case of contact, immediately flush eyes with plenty of water for at least 15 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. Call a physician. Wash contaminated clothing before reuse. |
| 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: | Contact with eye may be mildly irritating. |
| Skin: | Contact with skin may cause irritation, swelling or redness. |
| Inhalation: | Exposure to vapors (mist) will cause respiratory irritation and anesthesia. |
| Ingestion: | May cause upset stomach. |

4.3. Indication of immediate medical attention and special treatment needed

No information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Water spray, dry chemical, CO₂ or foam.

Unsuitable extinguishing media:

No information

5.2. Special hazards arising from the substance or mixture

Combustible liquid under Hazard Communication Standard (HCS, U.S.A).

Flash Point: 71 deg.C

5.3. Advice for firefighters

Wear self-contained breathing apparatus (SCBA) and full protective equipment.

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

Soak up with sand or earth. Sweep up material and dispose as waste following local regulations. Scrub contaminated area with detergent and water.

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. Keep out of reach of children and do not drink. Do not dismantle container. Make sure cartridge is dry before insertion into printer housing.

7.2. Conditions for safe storage, including any incompatibilities

Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with oxidizing agents or explosives.

7.3. Specific end use(s):

Inkjet printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

US:

California OELs (California Code of Regulations, Title 8, Section 5155. Airborne Contaminants)

| components | TWA |
|---------------------------------|---------------------------|
| Diethylene glycol diethyl ether | 5ppm, 33mg/m ³ |

8.2. Exposure controls:

Occupational exposure control:

Control the airborne concentrations below the exposure limits. Use only with adequate ventilation.

Personal protective equipment:

Respiratory protection:

Not required under suitable use as setting the cartridge on the printer. However, in case ventilation is not sufficient, wear respiratory protection if necessary.

Hand protection:

Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, use protective gloves if necessary.

Eye protection:

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

Skin protection:

Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, wear protective clothing if necessary.

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

Odor:

Slightly

pH:

Not applicable

Boiling point:

No data available

Flash point:

71 deg.C (closed cup)

Flammability(solid,gas):

Not applicable

Explosive properties:

Explosive limits: 0.3-16.0v/v% as γ -Butyrolactone

Oxidizing properties:

None

Vapor pressure:

No data available

Relative density:

No data available

Solubility:

No data available

Water Solubility:

Soluble

Partition coefficient: n-octanol/water:

No data available

Viscosity:

Less than 5 mPa·s at 20°C

Vapor density:

No data available

Evaporation rate:

No data available

Melting point:

No data available

9.2. Other information: No information

10. Stability and reactivity

| | |
|---|---------------------------------|
| 10.1. Reactivity: | Stable under normal temperature |
| 10.2. Chemical stability: | Stable under normal temperature |
| 10.3. Possibility of hazardous reactions: | None |
| 10.4. Conditions to avoid: | High and freezing temperatures |
| 10.5. Incompatible materials: | Oxidizers and explosives |
| 10.6. Hazardous decomposition products: | No data available |

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.

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:

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

15. Regulatory information

EU Information:

Chemical Safety Assessment according to (EC)1907/2006:

This product has not carried out any Chemical Safety Assessment yet.

US Information:

Toxic Substances Control Act (TSCA): All ingredients are listed on the TSCA Inventory.

Product contains Diethylene glycol diethyl ether and Tetraethylene glycol dimethyl ether that are subject to TSCA Section 5 proposed SNUR and to TSCA Section 12(b) export notification requirements.

California Proposition 65: Not regulated

SARA TITLE III:

Section 313:

Diethylene glycol diethyl ether (Chemical Category N230)

Dialkylene glycol dialkyl ether (Chemical Category N230)

Australia Information:

Hazardous statement: Not classified as hazardous according to NOHSC criteria.

16. Other information

List of relevant H-Statements in section 3: Nothing

List of relevant R-phrases: Nothing

The information in this Material Safety Data Sheet (MSDS) 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.

Material Safety Data Sheet

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

1.1. Product identifier

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:

Date Prepared: 27 September, 2012

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is not classified as hazardous according to Directive 1999/45/EC.

2.2. Label elements

The product does not need to be labelled in accordance with Directive 1999/45/EC.

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.

Inhalation: Exposure to vapors (mist) will cause respiratory irritation and anesthesia.

Ingestion: May cause upset stomach.

Chronic Health Hazards: None Known.

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

3. Composition/information on ingredients

Chemical nature: mixture

| Composition | CAS No. | EC No. | EU registration No. | % By Weight | Classification EC No. 1272/2008 | Classification 67/548/EEC |
|-------------------------------------|----------|-----------|---------------------|-------------|---------------------------------|-----------------------------|
| Colorant | C.B.I. | C.B.I. | N/A for the moment | 1-5 | Not classified as hazardous | Not classified as hazardous |
| Proprietary organic materials | C.B.I. | C.B.I. | N/A for the moment | 5-15 | Not classified as hazardous | Not classified as hazardous |
| Diethylene glycol diethyl ether | 112-36-7 | 203-963-7 | N/A for the moment | <50 | Not classified as hazardous | Not classified as hazardous |
| γ -butyrolactone | 96-48-0 | 202-509-5 | N/A for the moment | <20 | Not classified as hazardous | Not classified as hazardous |
| Tetraethylene glycol dimethyl ether | 143-24-8 | 205-594-7 | N/A for the moment | 10-20 | Not classified as hazardous | Not classified as hazardous |
| Dialkylene glycol dialkyl ether | C.B.I. | C.B.I. | N/A for the moment | 15-25 | Not classified as hazardous | Not classified as hazardous |

*C.B.I.: Confidential Business Information

4. First aid measures

4.1. Description of first aid measures

| | |
|-------------|---|
| Eyes: | In case of contact, immediately flush eyes with plenty of water for at least 15 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. Call a physician. Wash contaminated clothing before reuse. |
| 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: | Contact with eye may be mildly irritating. |
| Skin: | Contact with skin may cause irritation, swelling or redness. |
| Inhalation: | Exposure to vapors (mist) will cause respiratory irritation and anesthesia. |
| Ingestion: | May cause upset stomach. |

4.3. Indication of immediate medical attention and special treatment needed

No information

5. Firefighting measures**5.1. Extinguishing media**

Suitable extinguishing media:

Water spray, dry chemical, CO₂ or foam.

Unsuitable extinguishing media:

No information

5.2. Special hazards arising from the substance or mixture

Combustible liquid under Hazard Communication Standard (HCS, U.S.A).

Flash Point: 71 deg.C

5.3. Advice for firefighters

Wear self-contained breathing apparatus (SCBA) and full protective equipment.

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

Soak up with sand or earth. Sweep up material and dispose as waste following local regulations. Scrub contaminated area with detergent and water.

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. Keep out of reach of children and do not drink. Do not dismantle container. Make sure cartridge is dry before insertion into printer housing.

7.2. Conditions for safe storage, including any incompatibilities

Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with oxidizing agents or explosives.

7.3. Specific end use(s):

Inkjet printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

US: California OELs (California Code of Regulations, Title 8, Section 5155. Airborne Contaminants)

| components | TWA |
|---------------------------------|---------------------------|
| Diethylene glycol diethyl ether | 5ppm, 33mg/m ³ |

8.2. Exposure controls:

| | |
|---------------------------------|--|
| Occupational exposure control: | Control the airborne concentrations below the exposure limits. Use only with adequate ventilation. |
| Personal protective equipment: | |
| Respiratory protection: | Not required under suitable use as setting the cartridge on the printer. However, in case ventilation is not sufficient, wear respiratory protection if necessary. |
| Hand protection: | Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, use protective gloves if necessary. |
| Eye protection: | Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, wear safety glasses or chemical splash goggles if necessary. |
| Skin protection: | Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, wear protective clothing. if necessary |
| 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 |
| Odor: | Slightly |
| pH: | Not applicable |
| Boiling point: | No data available |
| Flash point: | 71 deg.C |
| Flammability(solid,gas): | Not applicable |
| Explosive properties: | Explosive limits: 0.3-16.0v/v% as γ -Butyrolactone |
| Oxidizing properties: | None |
| Vapor pressure: | No data available |
| Relative density: | No data available |
| Solubility: | No data available |
| Water Solubility: | Soluble |
| Partition coefficient: n-octanol/water: | No data available |
| Viscosity: | Less than 5 mPa·s at 20°C |
| Vapor density: | No data available |
| Evaporation rate: | No data available |
| Melting point: | No data available |

9.2. Other information: No information

10. Stability and reactivity

| | |
|---|---------------------------------|
| 10.1. Reactivity: | Stable under normal temperature |
| 10.2. Chemical stability: | Stable under normal temperature |
| 10.3. Possibility of hazardous reactions: | None |
| 10.4. Conditions to avoid: | High and freezing temperatures |
| 10.5. Incompatible materials: | Oxidizers and explosives |
| 10.6. Hazardous decomposition products: | No data available |

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.

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:

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

15. Regulatory information

EU Information:

Chemical Safety Assessment according to (EC)1907/2006:

This product has not carried out any Chemical Safety Assessment yet.

US Information:

Toxic Substances Control Act (TSCA): All ingredients are listed on the TSCA Inventory.

Product contains Diethylene glycol diethyl ether and Tetraethylene glycol dimethyl ether that are subject to TSCA Section 5 proposed SNUR and to TSCA Section 12(b) export notification requirements.

California Proposition 65: Not regulated

SARA TITLE III:

Section 313:

Diethylene glycol diethyl ether (Chemical Category N230)

Dialkylene glycol dialkyl ether (Chemical Category N230)

Australia Information:

Hazardous statement: Not classified as hazardous according to NOHSC criteria.

16. Other information

List of relevant H-Statements in section 3: Nothing

List of relevant R-phrases: Nothing

The information in this Material Safety Data Sheet (MSDS) 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.

Material Safety Data Sheet

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

1.1. Product identifier

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

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:

Date Prepared: 27 September, 2012

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is not classified as hazardous according to Directive 1999/45/EC.

2.2. Label elements

The product does not need to be labelled in accordance with Directive 1999/45/EC.

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.
Inhalation: Exposure to vapors (mist) will cause respiratory irritation and anesthesia.
Ingestion: May cause upset stomach.
Chronic Health Hazards: None Known.
Carcinogenicity: None of the ingredients in this ink is listed by IARC as a carcinogen.

3. Composition/information on ingredients

Chemical nature: mixture

| Composition | CAS No. | EC No. | EU registration No. | % By Weight | Classification EC No. 1272/2008 | Classification 67/548/EEC |
|-------------------------------------|----------|-----------|---------------------|-------------|---------------------------------|-----------------------------|
| Colorant | C.B.I. | C.B.I. | N/A for the moment | 1-5 | Not classified as hazardous | Not classified as hazardous |
| Proprietary organic materials | C.B.I. | C.B.I. | N/A for the moment | 5-15 | Not classified as hazardous | Not classified as hazardous |
| Diethylene glycol diethyl ether | 112-36-7 | 203-963-7 | N/A for the moment | <50 | Not classified as hazardous | Not classified as hazardous |
| γ -butyrolactone | 96-48-0 | 202-509-5 | N/A for the moment | <20 | Not classified as hazardous | Not classified as hazardous |
| Tetraethylene glycol dimethyl ether | 143-24-8 | 205-594-7 | N/A for the moment | 10-20 | Not classified as hazardous | Not classified as hazardous |
| Dialkylene glycol dialkyl ether | C.B.I. | C.B.I. | N/A for the moment | 15-25 | Not classified as hazardous | Not classified as hazardous |

*C.B.I.: Confidential Business Information

4. First aid measures

4.1. Description of first aid measures

| | |
|-------------|---|
| Eyes: | In case of contact, immediately flush eyes with plenty of water for at least 15 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. Call a physician. Wash contaminated clothing before reuse. |
| 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: | Contact with eye may be mildly irritating. |
| Skin: | Contact with skin may cause irritation, swelling or redness. |
| Inhalation: | Exposure to vapors (mist) will cause respiratory irritation and anesthesia. |
| Ingestion: | May cause upset stomach. |

4.3. Indication of immediate medical attention and special treatment needed

No information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Water spray, dry chemical, CO₂ or foam.

Unsuitable extinguishing media:

No information

5.2. Special hazards arising from the substance or mixture

Combustible liquid under Hazard Communication Standard (HCS, U.S.A).

Flash Point: 71 deg.C

5.3. Advice for firefighters

Wear self-contained breathing apparatus (SCBA) and full protective equipment.

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

Soak up with sand or earth. Sweep up material and dispose as waste following local regulations. Scrub contaminated area with detergent and water.

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. Keep out of reach of children and do not drink. Do not dismantle container. Make sure cartridge is dry before insertion into printer housing.

7.2. Conditions for safe storage, including any incompatibilities

Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with oxidizing agents or explosives.

7.3. Specific end use(s):

Inkjet printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

US:

California OELs (California Code of Regulations, Title 8, Section 5155. Airborne Contaminants)

| components | TWA |
|---------------------------------|---------------------------|
| Diethylene glycol diethyl ether | 5ppm, 33mg/m ³ |

8.2. Exposure controls:

| | |
|---------------------------------|--|
| Occupational exposure control: | Control the airborne concentrations below the exposure limits. Use only with adequate ventilation. |
| Personal protective equipment: | |
| Respiratory protection: | Not required under suitable use as setting the cartridge on the printer. However, in case ventilation is not sufficient, wear respiratory protection if necessary. |
| Hand protection: | Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, use protective gloves if necessary. |
| Eye protection: | Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, wear safety glasses or chemical splash goggles if necessary. |
| Skin protection: | Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, wear protective clothing if necessary. |
| 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 |
| Odor: | Slightly |
| pH: | Not applicable |
| Boiling point: | No data available |
| Flash point: | 71 deg.C |
| Flammability(solid,gas): | Not applicable |
| Explosive properties: | Explosive limits: 0.3-16.0v/v% as γ -Butyrolactone |
| Oxidizing properties: | None |
| Vapor pressure: | No data available |
| Relative density: | No data available |
| Solubility: | No data available |
| Water Solubility: | Soluble |
| Partition coefficient: n-octanol/water: | No data available |
| Viscosity: | Less than 5 mPa·s at 20°C |
| Vapor density: | No data available |
| Evaporation rate: | No data available |
| Melting point: | No data available |

9.2. Other information: No information

10. Stability and reactivity

| | |
|---|---------------------------------|
| 10.1. Reactivity: | Stable under normal temperature |
| 10.2. Chemical stability: | Stable under normal temperature |
| 10.3. Possibility of hazardous reactions: | None |
| 10.4. Conditions to avoid: | High and freezing temperatures |
| 10.5. Incompatible materials: | Oxidizers and explosives |
| 10.6. Hazardous decomposition products: | No data available |

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.

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:

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

15. Regulatory information

EU Information:

Chemical Safety Assessment according to (EC)1907/2006:

This product has not carried out any Chemical Safety Assessment yet.

US Information:

Toxic Substances Control Act (TSCA): All ingredients are listed on the TSCA Inventory.

Product contains Diethylene glycol diethyl ether and Tetraethylene glycol dimethyl ether that are subject to TSCA Section 5 proposed SNUR and to TSCA Section 12(b) export notification requirements.

California Proposition 65: Not regulated

SARA TITLE III:

Section 313:

Diethylene glycol diethyl ether (Chemical Category N230)

Dialkylene glycol dialkyl ether (Chemical Category N230)

Australia Information:

Hazardous statement: Not classified as hazardous according to NOHSC criteria.

16. Other information

List of relevant H-Statements in section 3: Nothing

List of relevant R-phrases: Nothing

The information in this Material Safety Data Sheet (MSDS) 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.

Material 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

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:

Date Prepared: 27 September, 2012

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is not classified as hazardous according to Directive 1999/45/EC.

2.2. Label elements

The product does not need to be labelled in accordance with Directive 1999/45/EC.

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.

Inhalation: Exposure to vapors (mist) will cause respiratory irritation and anesthesia.

Ingestion: May cause upset stomach.

Chronic Health Hazards: None Known.

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

3. Composition/information on ingredients

Chemical nature: mixture

| Composition | CAS No. | EC No. | EU registration No. | % By Weight | Classification EC No. 1272/2008 | Classification 67/548/EEC |
|-------------------------------------|----------|-----------|---------------------|-------------|---------------------------------|-----------------------------|
| Colorant | C.B.I. | C.B.I. | N/A for the moment | <1 | Not classified as hazardous | Not classified as hazardous |
| Proprietary organic materials | C.B.I. | C.B.I. | N/A for the moment | 5-15 | Not classified as hazardous | Not classified as hazardous |
| Diethylene glycol diethyl ether | 112-36-7 | 203-963-7 | N/A for the moment | <50 | Not classified as hazardous | Not classified as hazardous |
| γ -butyrolactone | 96-48-0 | 202-509-5 | N/A for the moment | <20 | Not classified as hazardous | Not classified as hazardous |
| Tetraethylene glycol dimethyl ether | 143-24-8 | 205-594-7 | N/A for the moment | 10-20 | Not classified as hazardous | Not classified as hazardous |
| Dialkylene glycol dialkyl ether | C.B.I. | C.B.I. | N/A for the moment | 15-25 | Not classified as hazardous | Not classified as hazardous |

*C.B.I.: Confidential Business Information

4. First aid measures

4.1. Description of first aid measures

| | |
|-------------|---|
| Eyes: | In case of contact, immediately flush eyes with plenty of water for at least 15 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. Call a physician. Wash contaminated clothing before reuse. |
| 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: | Contact with eye may be mildly irritating. |
| Skin: | Contact with skin may cause irritation, swelling or redness. |
| Inhalation: | Exposure to vapors (mist) will cause respiratory irritation and anesthesia. |
| Ingestion: | May cause upset stomach. |

4.3. Indication of immediate medical attention and special treatment needed

No information

5. Firefighting measures**5.1. Extinguishing media**

Suitable extinguishing media:

Water spray, dry chemical, CO₂ or foam.

Unsuitable extinguishing media:

No information

5.2. Special hazards arising from the substance or mixture

Combustible liquid under Hazard Communication Standard (HCS, U.S.A).

Flash Point: 71 deg.C

5.3. Advice for firefighters

Wear self-contained breathing apparatus (SCBA) and full protective equipment.

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

Soak up with sand or earth. Sweep up material and dispose as waste following local regulations. Scrub contaminated area with detergent and water.

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. Keep out of reach of children and do not drink. Do not dismantle container. Make sure cartridge is dry before insertion into printer housing.

7.2. Conditions for safe storage, including any incompatibilities

Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with oxidizing agents or explosives.

7.3. Specific end use(s):

Inkjet printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

US:

California OELs (California Code of Regulations, Title 8, Section 5155. Airborne Contaminants)

| components | TWA |
|---------------------------------|---------------------------|
| Diethylene glycol diethyl ether | 5ppm, 33mg/m ³ |

8.2. Exposure controls:

Occupational exposure control: Control the airborne concentrations below the exposure limits. Use only with adequate ventilation.

Personal protective equipment:

Respiratory protection: Not required under suitable use as setting the cartridge on the printer. However, in case ventilation is not sufficient, wear respiratory protection if necessary.

Hand protection: Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, use protective gloves if necessary.

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

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

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 |
| Odor: | Slightly |
| pH: | Not applicable |
| Boiling point: | No data available |
| Flash point: | 71 deg.C |
| Flammability(solid,gas): | Not applicable |
| Explosive properties: | Explosive limits: 0.3-16.0v/v% as γ -Butyrolactone |
| Oxidizing properties: | None |
| Vapor pressure: | No data available |
| Relative density: | No data available |
| Solubility: | No data available |
| Water Solubility: | Soluble |
| Partition coefficient: n-octanol/water: | No data available |
| Viscosity: | Less than 5 mPa·s at 20°C |
| Vapor density: | No data available |
| Evaporation rate: | No data available |
| Melting point: | No data available |

9.2. Other information: No information

10. Stability and reactivity

| | |
|---|---------------------------------|
| 10.1. Reactivity: | Stable under normal temperature |
| 10.2. Chemical stability: | Stable under normal temperature |
| 10.3. Possibility of hazardous reactions: | None |
| 10.4. Conditions to avoid: | High and freezing temperatures |
| 10.5. Incompatible materials: | Oxidizers and explosives |
| 10.6. Hazardous decomposition products: | No data available |

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.

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:

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

15. Regulatory information

EU Information:

Chemical Safety Assessment according to (EC)1907/2006:

This product has not carried out any Chemical Safety Assessment yet.

US Information:

Toxic Substances Control Act (TSCA): All ingredients are listed on the TSCA Inventory.

Product contains Diethylene glycol diethyl ether and Tetraethylene glycol dimethyl ether that are subject to TSCA Section 5 proposed SNUR and to TSCA Section 12(b) export notification requirements.

California Proposition 65: Not regulated

SARA TITLE III:

Section 313:

Diethylene glycol diethyl ether (Chemical Category N230)

Dialkylene glycol dialkyl ether (Chemical Category N230)

Australia Information:

Hazardous statement: Not classified as hazardous according to NOHSC criteria.

16. Other information

List of relevant H-Statements in section 3: Nothing

List of relevant R-phrases: Nothing

The information in this Material Safety Data Sheet (MSDS) 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.

Material Safety Data Sheet

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

E-mail Address:

Date Prepared: 27 September, 2012

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is not classified as hazardous according to Directive 1999/45/EC.

2.2. Label elements

The product does not need to be labelled in accordance with Directive 1999/45/EC.

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.

Inhalation: Exposure to vapors (mist) will cause respiratory irritation and anesthesia.

Ingestion: May cause upset stomach.

Chronic Health Hazards: None Known.

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

3. Composition/information on ingredients

Chemical nature: mixture

| Composition | CAS No. | EC No. | EU registration No. | % By Weight | Classification EC No. 1272/2008 | Classification 67/548/EEC |
|-------------------------------------|----------|-----------|---------------------|-------------|---------------------------------|-----------------------------|
| Colorant | C.B.I. | C.B.I. | N/A for the moment | 1-5 | Not classified as hazardous | Not classified as hazardous |
| Proprietary organic materials | C.B.I. | C.B.I. | N/A for the moment | 5-15 | Not classified as hazardous | Not classified as hazardous |
| Diethylene glycol diethyl ether | 112-36-7 | 203-963-7 | N/A for the moment | <50 | Not classified as hazardous | Not classified as hazardous |
| γ -butyrolactone | 96-48-0 | 202-509-5 | N/A for the moment | <20 | Not classified as hazardous | Not classified as hazardous |
| Tetraethylene glycol dimethyl ether | 143-24-8 | 205-594-7 | N/A for the moment | 10-20 | Not classified as hazardous | Not classified as hazardous |
| Dialkylene glycol dialkyl ether | C.B.I. | C.B.I. | N/A for the moment | 15-25 | Not classified as hazardous | Not classified as hazardous |

*C.B.I.: Confidential Business Information

4. First aid measures

4.1. Description of first aid measures

| | |
|-------------|---|
| Eyes: | In case of contact, immediately flush eyes with plenty of water for at least 15 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. Call a physician. Wash contaminated clothing before reuse. |
| 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: | Contact with eye may be mildly irritating. |
| Skin: | Contact with skin may cause irritation, swelling or redness. |
| Inhalation: | Exposure to vapors (mist) will cause respiratory irritation and anesthesia. |
| Ingestion: | May cause upset stomach. |

4.3. Indication of immediate medical attention and special treatment needed

No information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Water spray, dry chemical, CO₂ or foam.

Unsuitable extinguishing media:

No information

5.2. Special hazards arising from the substance or mixture

Combustible liquid under Hazard Communication Standard (HCS, U.S.A).

Flash Point: 71 deg.C

5.3. Advice for firefighters

Wear self-contained breathing apparatus (SCBA) and full protective equipment.

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

Soak up with sand or earth. Sweep up material and dispose as waste following local regulations. Scrub contaminated area with detergent and water.

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. Keep out of reach of children and do not drink. Do not dismantle container. Make sure cartridge is dry before insertion into printer housing.

7.2. Conditions for safe storage, including any incompatibilities

Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with oxidizing agents or explosives.

7.3. Specific end use(s):

Inkjet printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

US:

California OELs (California Code of Regulations, Title 8, Section 5155. Airborne Contaminants)

| components | TWA |
|---------------------------------|---------------------------|
| Diethylene glycol diethyl ether | 5ppm, 33mg/m ³ |

8.2. Exposure controls:

Occupational exposure control:

Control the airborne concentrations below the exposure limits. Use only with adequate ventilation.

Personal protective equipment:

Respiratory protection:

Not required under suitable use as setting the cartridge on the printer. However, in case ventilation is not sufficient, wear respiratory protection if necessary.

Hand protection:

Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, use protective gloves if necessary.

Eye protection:

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

Skin protection:

Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, wear protective clothing if necessary.

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 |
| Odor: | Slightly |
| pH: | Not applicable |
| Boiling point: | No data available |
| Flash point: | 71 deg.C |
| Flammability(solid,gas): | Not applicable |
| Explosive properties: | Explosive limits: 0.3-16.0v/v% as γ -Butyrolactone |
| Oxidizing properties: | None |
| Vapor pressure: | No data available |
| Relative density: | No data available |
| Solubility: | No data available |
| Water Solubility: | Soluble |
| Partition coefficient: n-octanol/water: | No data available |
| Viscosity: | Less than 5 mPa·s at 20°C |
| Vapor density: | No data available |
| Evaporation rate: | No data available |
| Melting point: | No data available |

9.2. Other information: No information

10. Stability and reactivity

| | |
|---|---------------------------------|
| 10.1. Reactivity: | Stable under normal temperature |
| 10.2. Chemical stability: | Stable under normal temperature |
| 10.3. Possibility of hazardous reactions: | None |
| 10.4. Conditions to avoid: | High and freezing temperatures |
| 10.5. Incompatible materials: | Oxidizers and explosives |
| 10.6. Hazardous decomposition products: | No data available |

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.

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:

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

15. Regulatory information

EU Information:

Chemical Safety Assessment according to (EC)1907/2006:

This product has not carried out any Chemical Safety Assessment yet.

US Information:

Toxic Substances Control Act (TSCA): All ingredients are listed on the TSCA Inventory.

Product contains Diethylene glycol diethyl ether and Tetraethylene glycol dimethyl ether that are subject to TSCA Section 5 proposed SNUR and to TSCA Section 12(b) export notification requirements.

California Proposition 65: Not regulated

SARA TITLE III:

Section 313:

Diethylene glycol diethyl ether (Chemical Category N230)

Dialkylene glycol dialkyl ether (Chemical Category N230)

Australia Information:

Hazardous statement: Not classified as hazardous according to NOHSC criteria.

16. Other information

List of relevant H-Statements in section 3: Nothing

List of relevant R-phrases: Nothing

The information in this Material Safety Data Sheet (MSDS) 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.

Material 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:

Date Prepared: 27 September, 2012

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is not classified as hazardous according to Directive 1999/45/EC.

2.2. Label elements

The product does not need to be labelled in accordance with Directive 1999/45/EC.

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.

Inhalation: Exposure to vapors (mist) will cause respiratory irritation and anesthesia.

Ingestion: May cause upset stomach.

Chronic Health Hazards: None Known.

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

| Composition | CAS No. | EC No. | EU registration No. | % By Weight | Classification EC No. 1272/2008 | Classification 67/548/EEC |
|-------------------------------------|-----------|-----------|---------------------|-------------|---------------------------------|-----------------------------|
| Carbon black | 1333-86-4 | 215-609-9 | N/A for the moment | 1-5 | Not classified as hazardous | Not classified as hazardous |
| Proprietary organic materials | C.B.I. | C.B.I. | N/A for the moment | 5-15 | Not classified as hazardous | Not classified as hazardous |
| Diethylene glycol diethyl ether | 112-36-7 | 203-963-7 | N/A for the moment | <50 | Not classified as hazardous | Not classified as hazardous |
| γ -butyrolactone | 96-48-0 | 202-509-5 | N/A for the moment | <20 | Not classified as hazardous | Not classified as hazardous |
| Tetraethylene glycol dimethyl ether | 143-24-8 | 205-594-7 | N/A for the moment | 10-20 | Not classified as hazardous | Not classified as hazardous |
| Dialkylene glycol dialkyl ether | C.B.I. | C.B.I. | N/A for the moment | 15-25 | Not classified as hazardous | Not classified as hazardous |

*C.B.I.: Confidential Business Information

4. First aid measures

4.1. Description of first aid measures

| | |
|-------------|---|
| Eyes: | In case of contact, immediately flush eyes with plenty of water for at least 15 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. Call a physician. Wash contaminated clothing before reuse. |
| 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: | Contact with eye may be mildly irritating. |
| Skin: | Contact with skin may cause irritation, swelling or redness. |
| Inhalation: | Exposure to vapors (mist) will cause respiratory irritation and anesthesia. |
| Ingestion: | May cause upset stomach. |

4.3. Indication of immediate medical attention and special treatment needed

No information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Water spray, dry chemical, CO₂ or foam.

Unsuitable extinguishing media:

No information

5.2. Special hazards arising from the substance or mixture

Combustible liquid under Hazard Communication Standard (HCS, U.S.A).

Flash Point: 71 deg.C

5.3. Advice for firefighters

Wear self-contained breathing apparatus (SCBA) and full protective equipment.

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

Soak up with sand or earth. Sweep up material and dispose as waste following local regulations. Scrub contaminated area with detergent and water.

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. Keep out of reach of children and do not drink. Do not dismantle container. Make sure cartridge is dry before insertion into printer housing.

7.2. Conditions for safe storage, including any incompatibilities

Do not store the product in high or freezing temperatures. Keep the product out of direct sunlight. Do not store the product with oxidizing agents or explosives.

7.3. Specific end use(s):

Inkjet printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

US:

| components | OSHA:PEL | ACGIH:TLV |
|--------------|----------------------|----------------------|
| Carbon black | 3.5mg/m ³ | 3.5mg/m ³ |

California OELs (California Code of Regulations, Title 8, Section 5155. Airborne Contaminants)

| components | PEL | STEL |
|---------------------------------|---------------------------|------|
| Carbon black | 3.5mg/m ³ | - |
| Diethylene glycol diethyl ether | 5ppm, 33mg/m ³ | - |

Australia: OELs

| components | TWA | STEL |
|--------------|--------------------|------|
| Carbon black | 3mg/m ³ | - |

8.2. Exposure controls:

| | |
|---------------------------------|--|
| Occupational exposure control: | Control the airborne concentrations below the exposure limits. Use only with adequate ventilation. |
| Personal protective equipment: | |
| Respiratory protection: | Not required under suitable use as setting the cartridge on the printer. However, in case ventilation is not sufficient, wear respiratory protection if necessary. |
| Hand protection: | Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, use protective gloves if necessary. |
| Eye protection: | Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, wear safety glasses or chemical splash goggles if necessary. |
| Skin protection: | Not required under suitable use as setting the cartridge on the printer. However, in case of direct contact to ink, wear protective clothing if necessary. |
| 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 |
| Odor: | Slightly |
| pH: | Not applicable |
| Boiling point: | No data available |
| Flash point: | 71 deg.C |
| Flammability(solid,gas): | Not applicable |
| Explosive properties: | Explosive limits: 0.3-16.0v/v% as γ -Butyrolactone |
| Oxidizing properties: | None |
| Vapor pressure: | No data available |
| Relative density: | No data available |
| Solubility: | No data available |
| Water Solubility: | Soluble |
| Partition coefficient: n-octanol/water: | No data available |
| Viscosity: | No data available |
| Vapor density: | No data available |
| Evaporation rate: | No data available |
| Melting point: | No data available |

9.2. Other information: No information

10. Stability and reactivity

| | |
|---|---------------------------------|
| 10.1. Reactivity: | Stable under normal temperature |
| 10.2. Chemical stability: | Stable under normal temperature |
| 10.3. Possibility of hazardous reactions: | None |
| 10.4. Conditions to avoid: | High and freezing temperatures |
| 10.5. Incompatible materials: | Oxidizers and explosives |
| 10.6. Hazardous decomposition products: | No data available |

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: | <table> <tr> <td>Oral LD50</td><td>>2500mg/kg(Rat)*</td></tr> <tr> <td>Dermal LD50</td><td>>2000mg/kg(Rat)*</td></tr> <tr> <td>Inhalant LC50</td><td>No data available</td></tr> </table> | Oral LD50 | >2500mg/kg(Rat)* | Dermal LD50 | >2000mg/kg(Rat)* | Inhalant LC50 | No data available |
| 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 | | | | | | |
| 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:

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

15. Regulatory information

EU Information:

Chemical Safety Assessment according to (EC)1907/2006:

This product has not carried out any Chemical Safety Assessment yet.

US Information:

Toxic Substances Control Act (TSCA): All ingredients are listed on the TSCA Inventory.

Product contains Diethylene glycol diethyl ether and Tetraethylene glycol dimethyl ether that are subject to TSCA Section 5 proposed SNUR and to TSCA Section 12(b) export notification requirements.

California Proposition 65: Not regulated

SARA TITLE III:

Section 313:

Diethylene glycol diethyl ether (Chemical Category N230)

Dialkylene glycol dialkyl ether (Chemical Category N230)

Australia Information:

Hazardous statement: Not classified as hazardous according to NOHSC criteria.

16. Other information

List of relevant H-Statements in section 3: Nothing

List of relevant R-phrases: Nothing

The information in this Material Safety Data Sheet (MSDS) 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.