

## Material Safety Data Sheet

### 1. Identification of the Substance/Preparation and of the Company/Undertaking

#### 1.1. Identification of the preparation:

EcoXtreme LT Ink, AI2-BK

#### 1.2. Use of the substance/ preparation: Inkjet Printing

#### 1.3. Company/undertaking identification:

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  
 Revision: 4 August 2009  
 E-mail address:

#### 1.4. Emergency telephone:

### 2. Hazard Identification

#### 2.1 Emergency Overview:

This ink meet the criteria for dangerous classification according to EU Directive 1999/45/EC. Ink component is a black liquid that causes eye, nose or throat irritation, and that effects anesthesia, if inhales. Ink may flash, when under high temperature. Avoid contact with eyes or clothing. In the case of skin contact, wash with soap and water. Keep out of reach of children.

#### 2.2 Potential Health Effects

Inhalation: May cause respiratory irritation.  
 Skin Contact: May cause severe skin irritation.  
 Eye Contact: May cause severe eye irritation.  
 Ingestion: Ingestion may be harmful or fatal.

### 3. Composition Information

Ink Composition	CAS No.	EC No.	EU registration No.	% By Weight	EU Symbols	EU R phrases	Remarks
Resin	Trade secret	Trade secret	Not available for the moment	1 - 5%	-	-	-
Black Pigment	8005-02-5	-	Not available for the moment	1 - 5%	-	-	-
1-Methyl-2-pyrrolidinone	872-50-4	212-828-1	Not available for the moment	<5%	Xi	Repr. Cat. 2; R61, R36/37/38	-
Diethylene Glycol Diethyl Ether	112-36-7	203-963-7	Not available for the moment	20 - 30%	-	-	-
Tetraethylene Glycol Dimethyl Ether	143-24-8	205-594-7	Not available for the moment	10 - 15%	-	-	-
Ethylene Glycol Monobutyl Ether Acetate	112-07-2	203-933-3	Not available for the moment	10 - 30%	Xn	R20/21	-
Organic Materials	Trade secret	Trade secret	Not available for the moment	balance	-	-	-
Surfactant	Trade secret	Trade secret	Not available for the moment	0.1 - 1.0%	-	-	-

### 4. First Aid Measures

- 4.1 Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
- 4.2 Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse.
- 4.3 Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
- 4.4 Ingestion : If swallowed, Seek medical advice; and attention if stomach continues to be upset

## 5. Fire Fighting Measures

- 5.1 Flammability: Flash point: approx. 75 °C
- 5.2 Suitable extinguishing media: Water spray, CO2, dry chemical or alcohol foam.
- 5.3 Fire Fighting Instructions: Hazardous gases/vapors produced in fire are carbon monoxide, carbon dioxide, oxides of nitrogen. Wear self-contained breathing apparatus (SCBA) and full protective equipment.

## 6. Accidental Release Measures

- 6.1 Personal protections: Remove the person of the leeward. Keep away the person from periphery of the place of the leakage. Ventilate sufficiently during clean-up in case of inside of a house.
- 6.2 Environmental precautions: Do not flush into surface water or sanitary sewer system.
- 6.3 Method for cleaning up: If a spill occurs, use sponges to wipe-up ink, then rinse area with damp cloth. Place waste in closed container for disposal. Do not disposal of waste to the sewer. Wash hands with soap and water.

## 7. Handling and Storage

- 7.1 Handling: 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 ink.
- 7.2 Storage: Store in a cool, dry place. Avoid freezing or extended storage in high temperatures. Avoid exposure to moisture.
- 7.3 Specific use(s): No information

## 8. Exposure Controls / Personal Protection

### 8.1 Exposure limit values

<u>components</u>	<u>OSHA:PEL</u>	<u>ACGIH:TWA</u>
Ethylene Glycol Monobutyl Ether Acetate	None	20ppm

### 8.2 Exposure controls

<b>Occupational Exposure controls:</b>	Use only with adequate ventilation.
Eye/Face Protection:	Wear safety glasses, or where splash potential exists wear chemical splash goggles.
Respiratory protection:	Where the potential exists for airborne exposure, wear NIOSH approved respiratory protection.
Protective Clothing:	Where there is potential for skin contact, have available and wear as appropriate impervious gloves, apron or smock.
<b>Environmental exposure controls:</b>	Not established

## 9. Physical and Chemical Properties

### 9.1 General Information

Color:	Black
Odor:	Fruity odor

### 9.2 Important health, safety and environmental information

Boiling point/boiling range:	approx. 205 °C
Solidification temperature:	approx. -35 °C
Flash point:	approx. 75 °C
Ignition temperature:	not below 220 °C
Viscosity of ink (cp):	11.0~12.0
Surface Tension:	27.5~30.5
Density:	0.980~0.990 (29 °C)
pH:	No data available
Water content:	< 0.8%
Solid content:	10 - 20%
Explosive properties:	No data available
Oxidizing properties:	No data available
Vapor pressure:	No data available
Solubility	No data available
Water Solubility:	Easily soluble (Diethylene glycol diethyl ether)
Evaporation rate:	No data available
Partition coefficient: n-octanol/water:	No data available
Melting Point	No data available
Decomposition Temperature	No data available

The Physical and chemical data given in Section 9 are typical values for this product and are not intended to be product specifications

## 10. Stability and Reactivity

- Stability: Stable at normal temperatures
- 10.1 Conditions to avoid: High and freezing temperatures
- 10.2 Materials to avoid: Oxidizers and explosives
- 10.3 Hazardous decomposition products: Thermal decomposition may produce carbon dioxide, carbon monoxide.

## 11. Toxicological Information

- Routes of Overexposure: Eye, skin, inhalation, and oral ingestion
- Acute Health Hazards: Overexposure of the eye surface to ink may be mildly irritating. Overexposure of ink contact with the skin may cause irritation and in some people, swelling and redness. Intentional inhalation to ink vapors may result in respiratory tract irritation. Intentional or accidental oral ingestion may cause an upset stomach.
- Chronic Health Hazards: No information available
- Carcinogenicity:
- 1-Methyl-2- pyrrolidone: Toxic influence and carcinogenic were not accepted as a result of inhalation (rat) 0mg/L (0 ppm), 0.04 mg/L (10 ppm), 0.4 mg/L(99 ppm), 6.0 hr/day, 5 day/week, and the exposure test for two years.

**Mutagenicity:** No information available

### Toxicity Data:

- 1-Methyl-2- pyrrolidone: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 100 mg Moderate; Oral, mouse: LD<sub>50</sub> = 5130 mg/kg; Oral, rat: LD<sub>50</sub> = 3914 mg/kg; Skin, rabbit: LD<sub>50</sub> = 8 gm/kg.
- Diethylene Glycol Diethyl Ether: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD<sub>50</sub> = 4970 mg/kg; Skin, rabbit: LD<sub>50</sub> = 6700 uL/kg.
- Tetraethylene Glycol, Dimethyl Ether: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 500 mg Mild; Oral, rat: LD<sub>50</sub> = 5140 mg/kg
- Ethylene Glycol Monobutyl Ether Acetate: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 500 mg/24H Mild; Oral, mouse: LD<sub>50</sub> = 3200 mg/kg; Oral, rat: LD<sub>50</sub> = 2400 mg/kg; Skin, rabbit: LD<sub>50</sub> = 1500 mg/kg.

### Inhalation:

- 1-Methyl-2-pyrrolidone:  
 LC<sub>50</sub>/inhalation/4h/rat > 5100 ppm  
 Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

### Irritating:

- Ethylene Glycol Monobutyl Ether Acetate:  
 Eye irritating : 500mg/24hrs (Rabbit OECD405) mild irritating.  
 Skin irritating : 500mg/24hrs (open@ Rabbit OECD404) mild irritating.
- 1-Methyl-2-pyrrolidone:  
 Eye irritating (Rabbit OECD405): mild irritating.  
 Skin irritating (open @Rabbit OECD404): mild irritating.

Skin Sensitizing: None Known

The information shown in SECTION 2, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## 12. Ecological Information

- 12.1 Ecotoxicity:  
 1-Methyl-2- pyrrolidone: Bluegill LC<sub>50</sub>: 832 mg/L (22 °C), bull trout LC<sub>50</sub>: 3048 mg/L (22 °C)
- 12.2 Mobility: No data available
- 12.3 Persistence and Degradability: No data available
- 12.4 Bioaccumulative Potential: No data available
- 12.5 Result of PBT assessment: Has not carried out PBT assessment
- 12.6 Other Adverse Effects: Disclosure of ink and abandonment has a possibility of affecting environment. Then, cautions are required for handing. It is necessary to cope with it so that especially a product or washing water may not flow to the ground, a river, and a drain.

### 13. Disposal Considerations

13.1 Waste Disposal: 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 General: Not a regulated article under United States DOT, IATA, ADR, IMDG, or RID.

#### IATA

Proper shipping name: Not applicable  
 Hazard class: Not applicable  
 Packaging exceptions: None  
 Identification number: None  
 (UN)  
 Packing group: N/A

### 15. Regulatory Information

#### US Regulation:

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

Product contains Black Pigment that is subject to a TSCA Section 4 test rule and to TSCA Section 12(b) export notification requirements.

#### SARA TITLE III:

Section 313: **1-Methyl-2-pyrrolidinone (N-Methyl pyrrolidone) (1.0% de minimis concentration)**  
**Diethylene Glycol Diethyl Ether (Chemical Category N230)**  
**Ethylene Glycol Monobutyl Ether Acetate (Chemical Category N230)**  
 1.0 % de minimis concentration (applies to R-(OCH<sub>2</sub>CH<sub>2</sub>)<sub>n</sub>-OR', where n = 1, 2, or 3, R=alkyl C7 or less, or R = phenyl or alkyl substituted phenyl, R' = H or alkyl C7 or less, or OR' consisting of carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate, Chemical Category N230) (related to Glycol Ether)

California Proposition 65: 1-Methyl-2-pyrrolidone (N-Methyl pyrrolidone)

**WARNING:** This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

#### EU Information:

Symbols and indication according to 1999/45/EC:



Harmful: Xn

Working of Risk and Safety Phase:

R19: May form explosive peroxides.  
 R20/21: Harmful by inhalation and in contact with skin.  
 R36/38: Irritating to eyes and skin.  
 S24/25: Avoid contact with skin and eyes  
 S41: In case of fire and/or explosion do not breathe fumes.

### 16. Other Information

**List of relevant R-phrases:** R19: May form explosive peroxides.  
 R20/21: Harmful by inhalation and in contact with skin.  
 R36/38: Irritating to eyes and skin.  
 R36/37/38: Irritating to eyes, respiratory system and skin.  
 R61: May cause harm to the unborn child.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

## Material Safety Data Sheet

### 1. Identification of the Substance/Preparation and of the Company/Undertaking

#### 1.1. Identification of the preparation:

EcoXtreme LT Ink, AI2-YE

#### 1.2. Use of the substance/ preparation: Inkjet Printing

#### 1.3. Manufacturer/Distributor:

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  
 Revision: 4 August 2009  
 E-mail address:

#### 1.4. Emergency telephone:

### 2. Hazard Identification

**2.1 Emergency Overview:** This ink meet the criteria for dangerous classification according to EU Directive 1999/45/EC. Ink component is a yellow liquid that causes eye, nose or throat irritation, and that effects anesthesia, if inhales. Ink may flash, when under high temperature. Avoid contact with eyes or clothing. In the case of skin contact, wash with soap and water. Keep out of reach of children.

#### 2.2 Potential Health Effects

Inhalation: May cause respiratory irritation.  
 Skin Contact: May cause severe skin irritation.  
 Eye Contact: May cause severe eye irritation.  
 Ingestion: Ingestion may be harmful or fatal.

### 3. Composition Information

Ink Composition	CAS No.	EC No.	EU registration No.	% By Weight	EU Symbols	EU R phrases	Remarks
Resin	Trade secret	Trade secret	Not available for the moment	1 - 5%	-	-	-
Yellow Pigment	Trade secret	Trade secret	Not available for the moment	1 - 5%	-	-	-
1-Methyl-2-pyrrolidinone	872-50-4	212-828-1	Not available for the moment	<5%	Xi	Repr. Cat. 2; R61, R36/37/38	-
Diethylene Glycol Diethyl Ether	112-36-7	203-963-7	Not available for the moment	20 - 30%	-	-	-
Tetraethylene Glycol Dimethyl Ether	143-24-8	205-594-7	Not available for the moment	10 - 15%	-	-	-
Ethylene Glycol Monobutyl Ether Acetate	112-07-2	203-933-3	Not available for the moment	10 - 30%	Xn	R20/21	-
Organic Materials	Trade secret	Trade secret	Not available for the moment	balance	-	-	-
Surfactant	Trade secret	Trade secret	Not available for the moment	0.1 - 1.0%	-	-	-

### 4. First Aid Measures

- 4.1 Inhalation:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
- 4.2 Skin contact :** In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse.
- 4.3 Eye contact :** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
- 4.4 Ingestion :** If swallowed, Seek medical advice; and attention if stomach continues to be upset

## 5. Fire Fighting Measures

- 5.1 Flammability Flash point: approx. 75 °C
- 5.2 Suitable extinguishing media: Water spray, CO<sub>2</sub>, dry chemical or alcohol foam.
- 5.3 Fire Fighting Instructions: Hazardous gases/vapors produced in fire are carbon monoxide, carbon dioxide, oxides of nitrogen. Wear self-contained breathing apparatus (SCBA) and full protective equipment.

## 6. Accidental Release Measures

- 6.1 Personal protections: Remove the person of the leeward. Keep away the person from periphery of the place of the leakage. Ventilate sufficiently during clean-up in case of inside of a house.
- 6.2 Environmental precautions: Do not flush into surface water or sanitary sewer system.
- 6.3 Method for cleaning up: If a spill occurs, use sponges to wipe-up ink, then rinse area with damp cloth. Place waste in closed container for disposal. Do not disposal of waste to the sewer. Wash hands with soap and water.

## 7. Handling and Storage

- 7.1 Handling: 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 ink.
- 7.2 Storage: Store in a cool, dry place.  
Avoid freezing or extended storage in high temperatures.  
Avoid exposure to moisture.
- 7.3 Specific use(s): No information

## 8. Exposure Controls / Personal Protection

### 8.1 Exposure limit values

<u>components</u>	<u>OSHA:PEL</u>	<u>ACGIH:TWA</u>
Ethylene Glycol Monobutyl Ether Acetate	None	20ppm
<u>components</u>	<u>OSHA:PEL</u>	<u>ACGIH:TWA</u>
Nickel compounds	1 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>

### 8.2 Exposure controls

- Occupational Exposure controls: Use only with adequate ventilation.
- Eye/Face Protection: Wear safety glasses, or where splash potential exists wear chemical splash goggles.
- Respiratory protection: Where the potential exists for airborne exposure, wear NIOSH approved respiratory protection.
- Protective Clothing: Where there is potential for skin contact, have available and wear as appropriate impervious gloves, apron or smock.
- Environmental exposure controls: Not established

## 9. Physical and Chemical Properties

### 9.1 General Information

- Color: Yellow
- Odor: Fruity odor

### 9.2 Important health, safety and environmental information

- Boiling point/boiling range: approx. 207°C
- Solidification temperature: approx. -35 °C
- Flash point: approx. 75 °C
- Ignition temperature: not below 220 °C
- Viscosity of ink (cp): 10.0-11.0
- Surface Tension: 27.5-30.5
- Density: 0.972~0.982 (29 °C)
- pH: No data available
- Water Content (%): < 0.8%
- Solid content: 10 - 20%
- Explosive properties: No data available
- Oxidizing properties: No data available
- Vapor pressure: No data available
- Solubility: No data available
- Water Solubility: Easily soluble (Diethylene glycol diethyl ether)
- Evaporation rate: No data available
- Partition coefficient: n-octanol/water: No data available
- Melting Point: No data available
- Decomposition Temperature: No data available

The Physical and chemical data given in Section 9 are typical values for this product and are not intended to be product specifications

## 10. Stability and Reactivity

- Stability: Stable at normal temperatures
- 10.1 Conditions to avoid: High and freezing temperatures
- 10.2 Materials to avoid: Oxidizers and explosives
- 10.3 Hazardous decomposition products: Thermal decomposition may produce carbon dioxide, carbon monoxide.

## 11. Toxicological Information

- Routes of Overexposure: Eye, skin, inhalation, and oral ingestion
- Acute Health Hazards: Overexposure of the eye surface to ink may be mildly irritating. Overexposure of ink contact with the skin may cause irritation and in some people, swelling and redness. Intentional inhalation to ink vapors may result in respiratory tract irritation. Intentional or accidental oral ingestion may cause an upset stomach.
- Chronic Health Hazards: No information available
- Carcinogenicity: This product contains Ni-compound. But this Ni-compound is not listed on the IARC carcinogenicity substances lists. Also, this Ni-compound shows the negative result on AMES test.
- 1-Methyl-2-pyrrolidone: Toxic influence and carcinogenic were not accepted as a result of inhalation (rat) 0mg/L (0 ppm), 0.04 mg/L (10 ppm), 0.4 mg/L (99 ppm), 6.0 hr/day, 5 day/week, and the exposure test for two years.

**Mutagenicity:** No information available

### Toxicity Data:

- 1-Methyl-2-pyrrolidone: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 100 mg Moderate; Oral, mouse: LD<sub>50</sub> = 5130 mg/kg; Oral, rat: LD<sub>50</sub> = 3914 mg/kg; Skin, rabbit: LD<sub>50</sub> = 8 gm/kg.
- Diethylene Glycol Diethyl Ether: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD<sub>50</sub> = 4970 mg/kg; Skin, rabbit: LD<sub>50</sub> = 6700 uL/kg.
- Tetraethylene Glycol, Dimethyl Ether: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 500 mg Mild; Oral, rat: LD<sub>50</sub> = 5140 mg/kg
- Ethylene Glycol Monobutyl Ether Acetate: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 500 mg/24H Mild; Oral, mouse: LD<sub>50</sub> = 3200 mg/kg; Oral, rat: LD<sub>50</sub> = 2400 mg/kg; Skin, rabbit: LD<sub>50</sub> = 1500 mg/kg.

### Inhalation:

- 1-Methyl-2-pyrrolidone:  
 LC<sub>50</sub>/inhalation/4h/rat > 5100 ppm  
 Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

### Irritating:

- Ethylene Glycol Monobutyl Ether Acetate:  
 Eye irritating : 500mg/24hrs (Rabbit OECD405) mild irritating.  
 Skin irritating : 500mg/24hrs (open @ Rabbit OECD404) mild irritating.
- 1-Methyl-2-pyrrolidone:  
 Eye irritating (Rabbit OECD405): mild irritating.  
 Skin irritating (open @ Rabbit OECD404): mild irritating.

Skin Sensitizing: None Known

The information shown in SECTION 2, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## 12. Ecological Information

- 12.1 Ecotoxicity:  
 1-Methyl-2-pyrrolidone: Bluegill LC<sub>50</sub>: 832 mg/L (22 °C), bull trout LC<sub>50</sub>: 3048 mg/L (22 °C)
- 12.2 Mobility: No data available
- 12.3 Persistence and Degradability: No data available
- 12.4 Bioaccumulative Potential: No data available
- 12.5 Result of PBT assessment: Has not carried out PBT assessment
- 12.6 Other Adverse Effects: Disclosure of ink and abandonment has a possibility of affecting environment. Then, cautions are required for handling. It is necessary to cope with it so that especially a product or washing water may not flow to the ground, a river, and a drain.

## 13. Disposal Considerations

- 13.1 Waste Disposal: 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 General:	Not a regulated article under United States DOT, IATA, ADR, IMDG, or RID.
IATA	
Proper shipping name:	Not applicable
Hazard class:	Not applicable
Packaging exceptions:	None
Identification number: (UN)	None
Packing group:	N/A

## 15. Regulatory Information

### 15.1 US Regulation:

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

#### SARA TITLE III:

Section 313: 1-Methyl-2-pyrrolidinone (N-Methyl pyrrolidone) (1.0% de minimis concentration)

Diethylene Glycol Diethyl Ether (Chemical Category N230)

Ethylene Glycol Monobutyl Ether Acetate (Chemical Category N230)

1.0 % de minimis concentration (applies to R-(OCH<sub>2</sub>CH<sub>2</sub>)<sub>n</sub>-OR', where n = 1,2, or 3, R=alkyl C7 or less, or R = phenyl or alkyl substituted phenyl, R' = H or alkyl C7 or less, or OR' consisting of carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate, Chemical Category N230) (related to Glycol Ether)

California Proposition 65: Nickel Compound in Yellow Pigment,  
1-Methyl-2-pyrrolidinone (N-Methyl pyrrolidone)

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

WARNING: This product contains a chemical known to the State of California to cause cancer.

### 15.2 EU Information:

Symbols and indication according to 1999/45/EC:



Harmful: Xn

Working of Risk and Safety Phase:

R19: May form explosive peroxides.

R20/21: Harmful by inhalation and in contact with skin.

R36/38: Irritating to eyes and skin.

S24/25: Avoid contact with skin and eyes

S41: In case of fire and/or explosion do not breathe fumes.

## 16. Other Information

List of relevant R-phrases: R19: May form explosive peroxides.

R20/21: Harmful by inhalation and in contact with skin.

R36/38: Irritating to eyes and skin.

R36/37/38: Irritating to eyes, respiratory system and skin.

R61: May cause harm to the unborn child.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

## Material Safety Data Sheet

### 1. Identification of the Substance/Preparation and of the Company/Undertaking

#### 1.1. Identification of the preparation:

EcoXtreme LT Ink, AI2-CY

#### 1.2. Use of the substance/ preparation: Inkjet Printing

#### 1.3. Manufacturer/Distributor:

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

Revision: 4 August 2009

E-mail address:

#### 1.4. Emergency telephone:

### 2. Hazard Identification

#### 2.1 Emergency Overview:

This ink meet the criteria for dangerous classification according to EU Directive 1999/45/EC Ink component is a cyan liquid that causes eye, nose or throat irritation, and that effects anesthesia, if inhales. Ink may flash, when under high temperature. Avoid contact with eyes or clothing. In the case of skin contact, wash with soap and water. Keep out of reach of children.

#### 2.2 Potential Health Effects

Inhalation: May cause respiratory irritation.  
 Skin Contact: May cause severe skin irritation.  
 Eye Contact: May cause severe eye irritation.  
 Ingestion: Ingestion may be harmful or fatal.

### 3. Composition Information

Ink Composition	CAS No.	EC No.	EU registration No.	% By Weight	EU Symbols	EU R phrases	Remarks
Resin	Trade secret	Trade secret	Not available for the moment	5 - 10%	-	-	-
Cyan Pigment	Trade secret	Trade secret	Not available for the moment	1 - 5%	-	-	-
1-Methyl-2-pyrrolidinone	872-50-4	212-828-1	Not available for the moment	<5%	Xi	Repr. Cat. 2; R61, R36/37/38	-
Diethylene Glycol Diethyl Ether	112-36-7	203-963-7	Not available for the moment	20 - 30%	-	-	-
Tetraethylene Glycol Dimethyl Ether	143-24-8	205-594-7	Not available for the moment	10 - 15%	-	-	-
Ethylene Glycol Monobutyl Ether Acetate	112-07-2	203-933-3	Not available for the moment	10 - 30%	Xn	R20/21	-
Organic Materials	Trade secret	Trade secret	Not available for the moment	balance	-	-	-
Surfactant	Trade secret	Trade secret	Not available for the moment	0.1 - 1.0%	-	-	-

### 4. First Aid Measures

- 4.1 Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
- 4.2 Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse.
- 4.3 Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
- 4.4 Ingestion : If swallowed, Seek medical advice; and attention if stomach continues to be upset.

## 5. Fire Fighting Measures

- 5.1 Flammability: Flash point: approx. 75 °C
- 5.2 Suitable extinguishing media: CO<sub>2</sub>, Dry Chemical. Do NOT use direct water stream.
- 5.3 Fire Fighting Instructions: Hazardous gases/vapors produced in fire are carbon monoxide, carbon dioxide, oxides of nitrogen. Wear self-contained breathing apparatus (SCBA) and full protective equipment.

## 6. Accidental Release Measures

- 6.1 Personal protections: Remove the person of the leeward. Keep away the person from periphery of the place of the leakage. Ventilate sufficiently during clean-up in case of inside of a house.

6.2 Environmental precautions: Do not flush into surface water or sanitary sewer system.

- 6.3 Method for cleaning up: If a spill occurs, use sponges to wipe-up ink, then rinse area with damp cloth. Place waste in closed container for disposal. Do not disposal of waste to the sewer. Wash hands with soap and water.

## 7. Handling and Storage

- 7.1 Handling: 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 ink.
- 7.2 Storage: Store in a cool, dry place. Avoid freezing or extended storage in high temperatures. Avoid exposure to moisture.
- 7.3 Specific use(s): No information

## 8. Exposure Controls / Personal Protection

### 8.1 Exposure limit values

<u>components</u>	<u>OSHA:PEL</u>	<u>ACGIH:TWA</u>
Ethylene Glycol Monobutyl Ether Acetate	None	20ppm

### 8.2 Exposure controls

- Occupational Exposure controls: Use only with adequate ventilation.
- Eye/Face Protection: Wear safety glasses, or where splash potential exists wear chemical splash goggles
- Respiratory protection: Where the potential exists for airborne exposure, wear NIOSH approved respiratory protection.
- Protective Clothing: Where there is potential for skin contact, have available and wear as appropriate impervious gloves, apron or smock.
- Environmental exposure controls: Not established

## 9. Physical and Chemical Properties

### 9.1 General Information

- Color: Cyan
- Odor: Fruity odor

### 9.2 Important health, safety and environmental information

- Boiling point/boiling range: approx. 209°C
- Solidification temperature: approx. -35 °C
- Flash point: approx. 75 °C
- Ignition temperature: not below 220 °C
- Viscosity of ink (cp): 10.65~11.65
- Surface Tension: 27.5~30.5
- Density: 0.980~0.990 (27 °C)
- pH: No data available
- Water Content (%): < 0.8%
- Solid content: 10 - 20%
- Explosive properties: No data available
- Oxidizing properties: No data available
- Vapor pressure: No data available
- Solubility: No data available
- Water Solubility: Easily soluble (Diethylene glycol diethyl ether)
- Evaporation rate: No data available
- Partition coefficient: n-octanol/water: No data available
- Melting Point: No data available
- Decomposition Temperature: No data available

The Physical and chemical data given in Section 9 are typical values for this product and are not intended to be product specifications

## 10. Stability and Reactivity

- Stability: Stable at normal temperatures  
 10.1 Conditions to avoid: High and freezing temperatures  
 10.2 Materials to avoid: Oxidizers and explosives  
**10.3 Hazardous decomposition products:** Thermal decomposition may produce carbon dioxide, carbon monoxide.

## 11. Toxicological Information

- Routes of Overexposure: Eye, skin, inhalation, and oral ingestion  
 Acute Health Hazards: Overexposure of the eye surface to ink may be mildly irritating. Overexposure of ink contact with the skin may cause irritation and in some people, swelling and redness. Intentional inhalation to ink vapors may result in respiratory tract irritation. Intentional or accidental oral ingestion may cause an upset stomach.  
 Chronic Health Hazards: No information available  
 Carcinogenicity:  
 1-Methyl-2-pyrrolidone: Toxic influence and carcinogenic were not accepted as a result of inhalation (rat) 0mg/L (0 ppm), 0.04 mg/L (10 ppm), 0.4 mg/L(99 ppm), 6.0 hr/day, 5 day/week, and the exposure test for two years.

**Mutagenicity:** No information available

### Toxicity Data:

- 1-Methyl-2- pyrrolidone: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 100 mg Moderate; Oral, mouse: LD<sub>50</sub> = 5130 mg/kg; Oral, rat: LD<sub>50</sub> = 3914 mg/kg; Skin, rabbit: LD<sub>50</sub> = 8 gm/kg.  
 Diethylene Glycol Diethyl Ether: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD<sub>50</sub> = 4970 mg/kg; Skin, rabbit: LD<sub>50</sub> = 6700 uL/kg.  
 Tetraethylene Glycol, Dimethyl Ether: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 500 mg Mild; Oral, rat: LD<sub>50</sub> = 5140 mg/kg  
 Ethylene Glycol Monobutyl Ether Acetate: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 500 mg/24H Mild; Oral, mouse: LD<sub>50</sub> = 3200 mg/kg; Oral, rat: LD<sub>50</sub> = 2400 mg/kg; Skin, rabbit: LD<sub>50</sub> = 1500 mg/kg.

### Inhalation:

- 1-Methyl-2-pyrrolidone:  
 LC<sub>50</sub>/inhalation/4h/rat > 5100 ppm  
 Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

### Irritating:

- Ethylene Glycol Monobutyl Ether Acetate:  
 Eye irritating : 500mg/24hrs (Rabbit OECD405) mild irritating.  
 Skin irritating : 500mg/24hrs (open @ Rabbit OECD404) mild irritating.  
 1-Methyl-2-pyrrolidone:  
 Eye irritating (Rabbit OECD405): mild irritating.  
 Skin irritating (open @Rabbit OECD404): mild irritating.

Skin Sensitizing: None Known

The information shown in SECTION 2, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## 12. Ecological Information

- 12.1 Ecotoxicity:  
 1-Methyl-2-pyrrolidone: Bluegill LC<sub>50</sub>: 832 mg/L (22 °C), bull trout LC<sub>50</sub>: 3048 mg/L (22 °C)  
 12.2 Mobility: No data available  
 12.3 Persistence and Degradability: No data available  
 12.4 Bioaccumulative Potential: No data available  
**12.5 Result of PBT assessment:** Has not carried out PBT assessment  
 12.6 Other Adverse Effects: Disclosure of ink and abandonment has a possibility of affecting environment. Then, cautions are required for handing. It is necessary to cope with it so that especially a product or washing water may not flow to the ground, a river, and a drain.

## 13. Disposal Considerations

- 13.1 Waste Disposal: 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 General: Not a regulated article under United States DOT, IATA, ADR, IMDG, or RID.

IATA

Proper shipping name: Not applicable  
 Hazard class: Not applicable  
 Packaging exceptions: None  
 Identification number: None  
 (UN)  
 Packing group: N/A

#### 15. Regulatory Information

15.1 US Regulation:

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

SARA TITLE III:

Section 313: 1-Methyl-2-pyrrolidinone (N-Methyl pyrrolidone) (1.0% de minimis concentration)

Diethylene Glycol Diethyl Ether (Chemical Category N230)

Ethylene Glycol Monobutyl Ether Acetate (Chemical Category N230)

1.0 % de minimis concentration (applies to R-(OCH<sub>2</sub>CH<sub>2</sub>)<sub>n</sub>-OR', where n = 1,2, or 3, R=alkyl C7 or less, or R = phenyl or alkyl substituted phenyl, R' = H or alkyl C7 or less, or OR' consisting of carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate, Chemical Category N230) (related to Glycol Ether)

California Proposition 65: 1-Methyl-2-pyrrolidone (N-Methyl pyrrolidone)

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

15.2 EU Information:

Symbols and indication according to 1999/45/EC:



Working of Risk and Safety Phase:

R19: May form explosive peroxides.

R20/21: Harmful by inhalation and in contact with skin.

R36/38: Irritating to eyes and skin.

S24/25: Avoid contact with skin and eyes

S41: In case of fire and/or explosion do not breathe fumes.

Harmful: Xn

#### 16. Other Information

List of relevant R-phrases: R19: May form explosive peroxides.

R20/21: Harmful by inhalation and in contact with skin.

R36/38: Irritating to eyes and skin.

R36/37/38: Irritating to eyes, respiratory system and skin.

R61: May cause harm to the unborn child.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

## Material Safety Data Sheet

### 1. Identification of the Substance/Preparation and of the Company/Undertaking

#### 1.1. Identification of the preparation:

EcoXtreme LT Ink, AI2-MG

#### 1.2. Use of the substance/ preparation: Inkjet Printing

#### 1.3. Manufacturer/Distributor:

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  
 Revision: 4 August 2009  
 E-mail address:

#### 1.4. Emergency telephone:

### 2. Hazard Identification

#### 2.1 Emergency Overview:

**This ink meet the criteria for dangerous classification according to EU Directive 1999/45/EC.** Ink component is a magenta liquid that causes eye, nose or throat irritation, and that effects anesthesia, if inhales. Ink may flash, when under high temperature. Avoid contact with eyes or clothing. In the case of skin contact, wash with soap and water. Keep out of reach of children.

#### 2.2 Potential Health Effects

Inhalation: May cause respiratory irritation.  
 Skin Contact: May cause severe skin irritation.  
 Eye Contact: May cause severe eye irritation.  
 Ingestion: Ingestion may be harmful or fatal.

### 3. Composition Information

Ink Composition	CAS No.	EC No.	EU registration No.	% By Weight	EU Symbols	EU R phrases	Remarks
Resin	Trade secret	Trade secret	Not available for the moment	1 - 5%	-	-	-
Magenta Pigment	Trade secret	Trade secret	Not available for the moment	5 - 10%	-	-	-
Diethylene Glycol Diethyl Ether	112-36-7	203-963-7	Not available for the moment	20 - 30%	-	-	-
Tetraethylene Glycol, Dimethyl Ether	143-24-8	205-594-7	Not available for the moment	5 - 10%	-	-	-
Ethylene Glycol Monobutyl Ether Acetate	112-07-2	203-933-3	Not available for the moment	10 - 30%	Xn	R20/21	-
Organic Materials	Trade secret	Trade secret	Not available for the moment	balance	-	-	-
Surfactant	Trade secret	Trade secret	Not available for the moment	0.1 - 1.0%	-	-	-

### 4. First Aid Measures

- 4.1 Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
- 4.2 Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse.
- 4.3 Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
- 4.4 Ingestion : If swallowed, Seek medical advice; and attention if stomach continues to be upset

## 5. Fire Fighting Measures

- 5.1 Flammability Flash point: approx. 75 °C
- 5.2 Suitable extinguishing media: Water spray, CO<sub>2</sub>, dry chemical or alcohol foam.
- 5.3 Fire Fighting Instructions: Hazardous gases/vapors produced in fire are carbon monoxide, carbon dioxide, oxides of nitrogen. Wear self-contained breathing apparatus (SCBA) and full protective equipment.

## 6. Accidental Release Measures

- 6.1 Personal protections: Remove the person of the leeward. Keep away the person from periphery of the place of the leakage. Ventilate sufficiently during clean-up in case of inside of a house.
- 6.2 Environmental precautions: **Do not flush into surface water or sanitary sewer system.**
- 6.3 Method for cleaning up: If a spill occurs, use sponges to wipe-up ink, then rinse area with damp cloth. Place waste in closed container for disposal. Do not disposal of waste to the sewer. Wash hands with soap and water.

## 7. Handling and Storage

- 7.1 Handling: 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 ink.
- 7.2 Storage: Store in a cool, dry place.  
Avoid freezing or extended storage in high temperatures.  
Avoid exposure to moisture.
- 7.3 Specific use(s): **No information**

## 8. Exposure Controls / Personal Protection

### 8.1 Exposure limit values

<u>components</u>	<u>OSHA:PEL</u>	<u>ACGIH:TWA</u>
Ethylene Glycol Monobutyl Ether Acetate	None	20ppm

### 8.2 Exposure controls

- Occupational Exposure controls:** Use only with adequate ventilation.
- Eye/Face Protection: Wear safety glasses, or where splash potential exists wear chemical splash goggles.
- Respiratory protection: Where the potential exists for airborne exposure, wear NIOSH approved respiratory protection.
- Protective Clothing: Where there is potential for skin contact, have available and wear as appropriate impervious gloves, apron or smock.
- Environmental exposure controls:** **Not established**

## 9. Physical and Chemical Properties

### 9.1 General Information

- Color: Magenta
- Odor: Fruity odor

### 9.2 Important health, safety and environmental information

- Boiling point/boiling range: approx. 202°C
- Solidification temperature: approx. -35 °C
- Flash point: approx. 75 °C
- Ignition temperature: not below 220 °C
- Viscosity of ink (cp): 10.0~11.0
- Surface Tension: 27.5~30.5
- Density: 0.983~0.993 (29 °C)
- pH: No data available
- Water Content (%): < 0.8%
- Solid content: 10 - 20%
- Explosive properties: No data available
- Oxidizing properties: No data available
- Vapor pressure: No data available
- Solubility: No data available
- Water Solubility: Easily soluble (Diethylene glycol diethyl ether)
- Evaporation rate: No data available
- Partition coefficient: n-octanol/water: No data available
- Melting Point: No data available
- Decomposition Temperature: No data available

The Physical and chemical data given in Section 9 are typical values for this product and are not intended to be product specifications

## 10. Stability and Reactivity

- Stability: Stable at normal temperatures
- 10.1 Conditions to avoid: High and freezing temperatures
- 10.2 Materials to avoid: Oxidizers and explosives
- 10.3 Hazardous decomposition products: Thermal decomposition may produce carbon dioxide, carbon monoxide.

## 11. Toxicological Information

- Routes of Overexposure: Eye, skin, inhalation, and oral ingestion
- Acute Health Hazards: Overexposure of the eye surface to ink may be mildly irritating. Overexposure of ink contact with the skin may cause irritation and in some people, swelling and redness. Intentional inhalation to ink vapors may result in respiratory tract irritation. Intentional or accidental oral ingestion may cause an upset stomach.
- Chronic Health Hazards: No information available
- Carcinogenicity: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
- Mutagenicity: No information available
- Toxicity Data:
- |  |  |
|--|--|
| Diethylene Glycol Diethyl Ether:         | LD <sub>50</sub> /LC <sub>50</sub> : Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD <sub>50</sub> = 4970 mg/kg; Skin, rabbit: LD <sub>50</sub> = 6700 uL/kg.  |
| Tetraethylene Glycol, Dimethyl Ether:    | LD <sub>50</sub> /LC <sub>50</sub> : Draize test, rabbit, eye: 500 mg Mild; Oral, rat: LD <sub>50</sub> = 5140 mg/kg   |
| Ethylene Glycol Monobutyl Ether Acetate: | LD <sub>50</sub> /LC <sub>50</sub> : Draize test, rabbit, eye: 500 mg/24H Mild; Oral, mouse: LD <sub>50</sub> = 3200 mg/kg; Oral, rat: LD <sub>50</sub> = 2400 mg/kg; Skin, rabbit: LD <sub>50</sub> = 1500 mg/kg. |

### Irritating:

#### Ethylene Glycol Monobutyl Ether Acetate:

Eye irritating : 500mg/24hrs (Rabbit OECD405) mild irritating.

Skin irritating : 500mg/24hrs (open@ Rabbit OECD404) mild irritating.

- Skin Sensitizing: None Known

The information shown in SECTION 2, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## 12. Ecological Information

- 12.1 Ecotoxicity: No data available
- 12.2 Mobility: No data available
- 12.3 Persistence and Degradability: No data available
- 12.4 Bioaccumulative Potential: No data available
- 12.5 Result of PBT assessment: Has not carried out PBT assessment
- 12.6 Other Adverse Effects: Disclosure of ink and abandonment has a possibility of affecting environment. Then, cautions are required for handing. It is necessary to cope with it so that especially a product or washing water may not flow to the ground, a river, and a drain.

## 13. Disposal Considerations

- 13.1 Waste Disposal: 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 General: Not a regulated article under United States DOT, IATA, ADR, IMDG, or RID.
- IATA
- |                             |                |
|-----------------------------|----------------|
| Proper shipping name:       | Not applicable |
| Hazard class:               | Not applicable |
| Packaging exceptions:       | None           |
| Identification number: (UN) | None           |
| Packing group:              | N/A            |

## 15. Regulatory Information

### 15.1 US Regulation:

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

SARA Title III:

Section 313: **Diethylene Glycol Diethyl Ether (Chemical Category N230)**

**Ethylene Glycol Monobutyl Ether Acetate (Chemical Category N230)**

1.0 % de minimis concentration (applies to R-(OCH<sub>2</sub>CH<sub>2</sub>)<sub>n</sub>-OR', where n = 1,2, or 3, R=alkyl C7 or less, or R = phenyl or alkyl substituted phenyl, R' = H or alkyl C7 or less, or OR' consisting of carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate, Chemical Category N230) (related to Glycol Ether)

California Proposition 65: Not regulated

### 15.2 EU Information:

Symbols and indication according to 1999/45/EC:

Working of Risk and Safety Phase:

R19: May form explosive peroxides.

R20/21: Harmful by inhalation and in contact with skin.

R36/38: Irritating to eyes and skin.

S24/25: Avoid contact with skin and eyes

S41: In case of fire and/or explosion do not breathe fumes.



Harmful: Xn

## 16. Other Information

List of relevant R-phrases: **R19: May form explosive peroxides.**

**R20/21: Harmful by inhalation and in contact with skin.**

**R36/38: Irritating to eyes and skin.**

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

# Material Safety Data Sheet

## 1. Identification of the Substance/Preparation and of the Company/Undertaking

### 1.1. Identification of the preparation:

EcoXtreme LT Ink, AI2-LC

### 1.2. Use of the substance/ preparation: Inkjet Printing

### 1.3. Manufacturer/Distributor:

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

Revision 4 August 2009

E-mail address:

### 1.4 Emergency telephone:

## 2. Hazard Identification

### 2.1 Emergency Overview:

This ink meet the criteria for dangerous classification according to EU Directive 1999/45/EC. Ink component is a light cyan liquid that causes eye, nose or throat irritation, and that effects anesthesia, if inhales. Ink may flash, when under high temperature. Avoid contact with eyes or clothing. In the case of skin contact, wash with soap and water. Keep out of reach of children.

### 2.2 Potential Health Effects

Inhalation: May cause respiratory irritation.  
 Skin Contact: May cause severe skin irritation.  
 Eye Contact: May cause severe eye irritation.  
 Ingestion: Ingestion may be harmful or fatal.

## 3. Composition Information

Ink Composition	CAS No.	EC No.	EU registration No.	% By Weight	EU Symbols	EU R phrases	Remarks
Resin	Trade secret	Trade secret	Not available for the moment	5 - 10%	-	-	-
Cyan Pigment	Trade secret	Trade secret	Not available for the moment	0.5- 5%	-	-	-
1-Methyl-2-pyrrolidinone	872-50-4	212-828-1	Not available for the moment	<5%	Xi	Repr. Cat. 2; R61, R36/37/38	-
Diethylene Glycol Diethyl Ether	112-36-7	203-963-7	Not available for the moment	30 - 40%	-	-	-
Tetraethylene Glycol, Dimethyl Ether	143-24-8	205-594-7	Not available for the moment	10 - 15%	-	-	-
Ethylene Glycol Monobutyl Ether Acetate	112-07-2	203-933-3	Not available for the moment	10 - 30%	Xn	R20/21	-
Organic Materials	Trade secret	Trade secret	Not available for the moment	balance	-	-	-
Surfactant	Trade secret	Trade secret	Not available for the moment	0.1 - 1.0%	-	-	-

## 4. First Aid Measures

- 4.1 Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
- 4.2 Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse.
- 4.3 Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
- 4.4 Ingestion : If swallowed, Seek medical advice; and attention if stomach continues to be upset.

## 5. Fire Fighting Measures

- 5.1 Flammability: Flash point: approx. 75 °C
- 5.2 Suitable extinguishing media: CO<sub>2</sub>, Dry Chemical. Do NOT use direct water stream.
- 5.3 Fire Fighting Instructions: Hazardous gases/vapors produced in fire are carbon monoxide, carbon dioxide, oxides of nitrogen. Wear self-contained breathing apparatus (SCBA) and full protective equipment.

## 6. Accidental Release Measures

- 6.1 Personal protections: Remove the person of the leeward. Keep away the person from periphery of the place of the leakage. Ventilate sufficiently during clean-up in case of inside of a house.
- 6.2 Environmental precautions: Do not flush into surface water or sanitary sewer system.
- 6.3 Method for cleaning up: If a spill occurs, use sponges to wipe-up ink, then rinse area with damp cloth. Place waste in closed container for disposal. Do not disposal of waste to the sewer. Wash hands with soap and water.

## 7. Handling and Storage

- 7.1 Handling: 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 ink.
- 7.2 Storage: Store in a cool, dry place.  
Avoid freezing or extended storage in high temperatures.  
Avoid exposure to moisture.
- 7.3 Specific use(s): No information

## 8. Exposure Controls / Personal Protection

- 8.1 Exposure limit values
- | components                              | OSHA:PEL | ACGIH:TWA |
|---|----------|-----------|
| Ethylene Glycol Monobutyl Ether Acetate | None     | 20ppm     |
- 8.2 Exposure controls
- Occupational Exposure controls: Use only with adequate ventilation.
- Eye/Face Protection: Wear safety glasses, or where splash potential exists wear chemical splash goggles.
- Respiratory protection: Where the potential exists for airborne exposure, wear NIOSH approved respiratory protection.
- Protective Clothing: Where there is potential for skin contact, have available and wear as appropriate impervious gloves, apron or smock.
- Environmental exposure controls: Not established

## 9. Physical and Chemical Properties

### 9.1 General Information

- Color: Light Cyan
- Odor: Fruity odor

### 9.2 Important health, safety and environmental information

- Boiling point/boiling range: approx. 206°C
- Solidification temperature: approx. -35 °C
- Flash point: approx. 75 °C
- Ignition temperature: not below 220 °C
- Viscosity of ink (cp): 9.95~10.95
- Surface Tension: 27.5~30.5
- Density: 0.964~0.974 (27 °C)
- pH: No data available
- Water Content (%): < 0.8%
- Solid content: 10 - 20%
- Explosive properties: No data available
- Oxidizing properties: No data available
- Vapor pressure: No data available
- Solubility: No data available
- Water Solubility: Easily soluble (Diethylene glycol diethyl ether)
- Evaporation rate: No data available
- Partition coefficient: n-octanol/water: No data available
- Melting Point: No data available
- Decomposition Temperature: No data available

The Physical and chemical data given in Section 9 are typical values for this product and are not intended to be product specifications

## 10. Stability and Reactivity

Stability:	Stable at normal temperatures
10.1 Conditions to avoid:	High and freezing temperatures
10.2 Materials to avoid:	Oxidizers and explosives
<b>10.3 Hazardous decomposition products:</b>	Thermal decomposition may produce carbon dioxide, carbon monoxide.

## 11. Toxicological Information

Routes of Overexposure:	Eye, skin, inhalation, and oral ingestion
Acute Health Hazards:	Overexposure of the eye surface to ink may be mildly irritating. Overexposure of ink contact with the skin may cause irritation and in some people, swelling and redness. Intentional inhalation to ink vapors may result in respiratory tract irritation. Intentional or accidental oral ingestion may cause an upset stomach.
Chronic Health Hazards:	No information available
Carcinogenicity:	
1-Methyl-2-pyrrolidone	Toxic influence and carcinogenic were not accepted as a result of inhalation (rat) 0mg/L (0 ppm), 0.04 mg/L (10 ppm), 0.4 mg/L(99 ppm), 6.0 hr/day, 5 day/week, and the exposure test for two years.

**Mutagenicity:** No information available

### Toxicity Data:

1-Methyl-2- pyrrolidone:	LD <sub>50</sub> /LC <sub>50</sub> : Draize test, rabbit, eye: 100 mg Moderate; Oral, mouse: LD <sub>50</sub> = 5130 mg/kg; Oral, rat: LD <sub>50</sub> = 3914 mg/kg; Skin, rabbit: LD <sub>50</sub> = 8 gm/kg.
Diethylene Glycol Diethyl Ether:	LD <sub>50</sub> /LC <sub>50</sub> : Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD <sub>50</sub> = 4970 mg/kg; Skin, rabbit: LD <sub>50</sub> = 6700 uL/kg.
Tetraethylene Glycol, Dimethyl Ether:	LD <sub>50</sub> /LC <sub>50</sub> : Draize test, rabbit, eye: 500 mg Mild; Oral, rat: LD <sub>50</sub> = 5140 mg/kg
Ethylene Glycol Monobutyl Ether Acetate:	LD <sub>50</sub> /LC <sub>50</sub> : Draize test, rabbit, eye: 500 mg/24H Mild; Oral, mouse: LD <sub>50</sub> = 3200 mg/kg; Oral, rat: LD <sub>50</sub> = 2400 mg/kg; Skin, rabbit: LD <sub>50</sub> = 1500 mg/kg.

### Inhalation:

#### 1-Methyl-2-pyrrolidone:

LC<sub>50</sub>/inhalation/4h/rat > 5100 ppm

Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

### Irritating:

#### Ethylene Glycol Monobutyl Ether Acetate:

Eye irritating : 500mg/24hrs (Rabbit OECD405) mild irritating.

Skin irritating : 500mg/24hrs (open@ Rabbit OECD404) mild irritating.

#### 1-Methyl-2-pyrrolidone:

Eye irritating (Rabbit OECD405): mild irritating.

Skin irritating (open @Rabbit OECD404): mild irritating.

Skin Sensitizing: None Known

The information shown in SECTION 2, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## 12. Ecological Information

12.1 Ecotoxicity:	
1-Methyl-2-pyrrolidone:	Bluegill LC <sub>50</sub> : 832 mg/L (22 °C), bull trout LC <sub>50</sub> : 3048 mg/L (22 °C)
12.2 Mobility:	No data available
12.3 Persistence and Degradability:	No data available
12.4 Bioaccumulative Potential:	No data available
<b>12.5 Result of PBT assessment:</b>	<b>Has not carried out PBT assessment</b>
12.6 Other Adverse Effects:	Disclosure of ink and abandonment has a possibility of affecting environment. Then, cautions are required for handing. It is necessary to cope with it so that especially a product or washing water may not flow to the ground, a river, and a drain.

## 13. Disposal Considerations

13.1 Waste Disposal:	Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. <b>Do not flush to surface water or sanitary sewer system.</b>
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## 14. Transport Information

14.1 General: Not a regulated article under United States DOT, IATA, ADR, IMDG, or RID.

### IATA

Proper shipping name: Not applicable  
 Hazard class: Not applicable  
 Packaging exceptions: None  
 Identification number: None  
 (UN)  
 Packing group: N/A

## 15. Regulatory Information

### 15.1 US Regulation:

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

#### SARA TITLE III:

Section 313: 1-Methyl-2-pyrrolidinone (N-Methyl pyrrolidone) (1.0% de minimis concentration)

Diethylene Glycol Diethyl Ether (Chemical Category N230)

Ethylene Glycol Monobutyl Ether Acetate (Chemical Category N230)

1.0 % de minimis concentration (applies to R-(OCH<sub>2</sub>CH<sub>2</sub>)<sub>n</sub>-OR', where n = 1,2, or 3, R=alkyl C7 or less, or R = phenyl or alkyl substituted phenyl, R' = H or alkyl C7 or less, or OR' consisting of carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate, Chemical Category N230) (related to Glycol Ether)

California Proposition 65: 1-Methyl-2-pyrrolidone (N-Methyl pyrrolidone)

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

### 15.2 EU Information:

Symbols and indication according to 1999/45/EC:



Working of Risk and Safety Phase:

R19: May form explosive peroxides.

R20/21: Harmful by inhalation and in contact with skin.

R36/38: Irritating to eyes and skin.

S24/25: Avoid contact with skin and eyes

S41: In case of fire and/or explosion do not breathe fumes.

Harmful: Xn

## 16. Other Information

List of relevant R-phrases: R19: May form explosive peroxides.

R20/21: Harmful by inhalation and in contact with skin.

R36/38: Irritating to eyes and skin.

R36/37/38: Irritating to eyes, respiratory system and skin.

R61: May cause harm to the unborn child.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

## Material Safety Data Sheet

### 1. Identification of the Substance/Preparation and of the Company/Undertaking

#### 1.1. Identification of the preparation:

EcoXtreme LT Ink, AI2-LM

#### 1.2. Use of the substance/ preparation: Inkjet Printing

#### 1.3. Manufacturer/Distributor:

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  
 Revision: 4 August 2009

E-mail address:

#### 1.4. Emergency telephone:

### 2. Hazard Identification

#### 2.1 Emergency Overview:

This ink meet the criteria for dangerous classification according to EU Directive 1999/45/EC. Ink component is a light magenta liquid that causes eye, nose or throat irritation, and that effects anesthesia, if inhales. Ink may flash, when under high temperature. Avoid contact with eyes or clothing. In the case of skin contact, wash with soap and water. Keep out of reach of children.

#### 2.2 Potential Health Effects

Inhalation: May cause respiratory irritation.  
 Skin Contact: May cause severe skin irritation.  
 Eye Contact: May cause severe eye irritation.  
 Ingestion: Ingestion may be harmful or fatal.

### 3. Composition Information

Ink Composition	CAS No.	EC No.	EU registration No.	% By Weight	EU Symbols	EU R phrases	Remarks
Resin	Trade secret	Trade secret	Not available for the moment	5 - 10%	-	-	-
Magenta Pigment	Trade secret	Trade secret	Not available for the moment	0.5 - 5%	-	-	-
Diethylene Glycol Diethyl Ether	112-36-7	203-963-7	Not available for the moment	30 - 40%	-	-	-
Tetraethylene Glycol, Dimethyl Ether	143-24-8	205-594-7	Not available for the moment	10 - 15%	-	-	-
Ethylene Glycol Monobutyl Ether Acetate	112-07-2	203-933-3	Not available for the moment	10 - 30%	Xn	R20/21	-
Organic Materials	Trade secret	Trade secret	Not available for the moment	balance	-	-	-
Surfactant	Trade secret	Trade secret	Not available for the moment	0.1 - 1.0%	-	-	-

### 4. First Aid Measures

- 4.1 Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
- 4.2 Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse.
- 4.3 Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
- 4.4 Ingestion : If swallowed, Seek medical advice; and attention if stomach continues to be upset

## 5. Fire Fighting Measures

- 5.1 Flammability Flash point: approx. 75 °C
- 5.2 Suitable extinguishing media: Water spray, CO<sub>2</sub>, dry chemical or alcohol foam.
- 5.3 Fire Fighting Instructions: Hazardous gases/vapors produced in fire are carbon monoxide, carbon dioxide, oxides of nitrogen. Wear self-contained breathing apparatus (SCBA) and full protective equipment.

## 6. Accidental Release Measures

- 6.1 Personal protections: Remove the person of the leeward. Keep away the person from periphery of the place of the leakage. Ventilate sufficiently during clean-up in case of inside of a house.
- 6.2 Environmental precautions: **Do not flush into surface water or sanitary sewer system.**
- 6.3 Method for cleaning up: If a spill occurs, use sponges to wipe-up ink, then rinse area with damp cloth. Place waste in closed container for disposal. Do not disposal of waste to the sewer. Wash hands with soap and water.

## 7. Handling and Storage

- 7.1 Handling: 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 ink.
- 7.2 Storage: Store in a cool, dry place.  
Avoid freezing or extended storage in high temperatures.  
Avoid exposure to moisture.
- 7.3 Specific use(s): **No information**

## 8. Exposure Controls / Personal Protection

- 8.1 Exposure limit values
- | <u>components</u>                       | <u>OSHA:PEL</u> | <u>ACGIH:TWA</u> |
|---|-----------------|------------------|
| Ethylene Glycol Monobutyl Ether Acetate | None            | 20ppm            |
- 8.2 Exposure controls
- Occupational Exposure controls:** Use only with adequate ventilation.
- Eye/Face Protection: Wear safety glasses, or where splash potential exists wear chemical splash goggles.
- Respiratory protection: Where the potential exists for airborne exposure, wear NIOSH approved respiratory protection.
- Protective Clothing: Where there is potential for skin contact, have available and wear as appropriate impervious gloves, apron or smock.
- Environmental exposure controls:** **Not established**

## 9. Physical and Chemical Properties

### 9.1 General Information

Color: Light Magenta  
 Odor: Fruity odor

### 9.2 Important health, safety and environmental information

Boiling point/boiling range: approx. 205°C  
 Solidification temperature: approx. -35 °C  
 Flash point: approx. 75 °C  
 Ignition temperature: not below 220 °C  
 Viscosity of ink (cp): 9.70~10.70  
 Surface Tension: 27.5~30.5  
 Density: 0.960~0.970 (29 °C)  
 pH: No data available  
 Water Content (%): < 0.8%  
 Solid content: 10 - 20%  
 Explosive properties: No data available  
 Oxidizing properties: No data available  
 Vapor pressure: No data available  
 Solubility: No data available  
 Water Solubility: Easily soluble (Diethylene glycol diethyl ether)  
 Evaporation rate: No data available  
 Partition coefficient: n-octanol/water: No data available  
 Melting Point: No data available  
 Decomposition Temperature: No data available

The Physical and chemical data given in Section 9 are typical values for this product and are not intended to be product specifications

## 10. Stability and Reactivity

- Stability: Stable at normal temperatures  
 10.1 Conditions to avoid: High and freezing temperatures  
 10.2 Materials to avoid: Oxidizers and explosives  
**10.3 Hazardous decomposition products:** Thermal decomposition may produce carbon dioxide, carbon monoxide.

## 11. Toxicological Information

- Routes of Overexposure: Eye, skin, inhalation, and oral ingestion  
 Acute Health Hazards: Overexposure of the eye surface to ink may be mildly irritating. Overexposure of ink contact with the skin may cause irritation and in some people, swelling and redness. Intentional inhalation to ink vapors may result in respiratory tract irritation. Intentional or accidental oral ingestion may cause an upset stomach.

- Chronic Health Hazards: No information available  
 Carcinogenicity: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

**Mutagenicity:** No information available

### Toxicity Data:

- Diethylene Glycol Diethyl Ether: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD<sub>50</sub> = 4970 mg/kg; Skin, rabbit: LD<sub>50</sub> = 6700 uL/kg.  
 Tetraethylene Glycol, Dimethyl Ether: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 500 mg Mild; Oral, rat: LD<sub>50</sub> = 5140 mg/kg  
 Ethylene Glycol Monobutyl Ether Acetate: LD<sub>50</sub>/LC<sub>50</sub>: Draize test, rabbit, eye: 500 mg/24H Mild; Oral, mouse: LD<sub>50</sub> = 3200 mg/kg; Oral, rat: LD<sub>50</sub> = 2400 mg/kg; Skin, rabbit: LD<sub>50</sub> = 1500 mg/kg.

### Irritating:

- Ethylene Glycol Monobutyl Ether Acetate:**  
 Eye irritating : 500mg/24hrs (Rabbit OECD405) mild irritating.  
 Skin irritating : 500mg/24hrs (open@ Rabbit OECD404) mild irritating.

- Skin Sensitizing: None Known

The information shown in SECTION 2, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## 12. Ecological Information

- 12.1 Ecotoxicity: No data available  
 12.2 Mobility: No data available  
 12.3 Persistence and Degradability: No data available  
 12.4 Bioaccumulative Potential: No data available  
**12.5 Result of PBT assessment:** Has not carried out PBT assessment  
 12.6 Other Adverse Effects: Disclosure of ink and abandonment has a possibility of affecting environment. Then, cautions are required for handing. It is necessary to cope with it so that especially a product or washing water may not flow to the ground, a river, and a drain.

## 13. Disposal Considerations

- 13.1 Waste Disposal: 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 General: Not a regulated article under United States DOT, IATA, ADR, IMDG, or RID.  
 IATA  
 Proper shipping name: Not applicable  
 Hazard class: Not applicable  
 Packaging exceptions: None  
 Identification number: None  
 (UN)  
 Packing group: N/A

## 15. Regulatory Information

### 15.1 US Regulation:

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

SARA TITLE III:

Section 313: Diethylene Glycol Diethyl Ether (Chemical Category N230)

Ethylene Glycol Monobutyl Ether Acetate (Chemical Category N230)

1.0 % de minimis concentration (applies to R-(OCH<sub>2</sub>CH<sub>2</sub>)<sub>n</sub>-OR', where n = 1,2, or 3, R=alkyl C7 or less, or R = phenyl or alkyl substituted phenyl, R' = H or alkyl C7 or less, or OR' consisting of carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate, Chemical Category N230) (related to Glycol Ether)

California Proposition 65: Not regulated

### 15.2 EU Information:

Symbols and indication according to 1999/45/EC:



Harmful: Xn

Working of Risk and Safety Phase:

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R20/21: Harmful by inhalation and in contact with skin.

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S24/25: Avoid contact with skin and eyes

S41: In case of fire and/or explosion do not breathe fumes.

## 16. Other Information

List of relevant R-phrases: R19: May form explosive peroxides.

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