Safety Data Sheet

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

1.1. Product identifier

US-CY

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

Phone: + 81-53-484-1224 FAX: + 81-53-484-1226

E-mail:

Revised date: 27-Feb-2020

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is classified as hazardous according to GHS.

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Sensitisation (Skin)	Category 1B
Specific target organ toxicity (Single exposure)	Category 3
Specific target organ toxicity (Repeated exposure)	Category 2
Hazardous to the aquatic environment (Chronic Hazard)	Category 2

2.2. GHS label elements, including precautionary statements

Pictgram(s)

Signal Word: Danger

Hazard Statement:

Causes skin irritation.

Causes serious eye damage.

May cause an allergic skin reaction.

May cause respiratory irritation.
May cause damage to organs through prolonged or repeated exposure.
Toxic to aquatic life with long lasting effects.

Precautionary statements — Prevention:

Do not breathe dust/fume/gas/mist/vapours/spray.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements — Response:

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER/doctor.
If skin irritation or rash occurs: Get medical advice/attention.

2.3. Other hazards

Potential Health Effects:

Eyes:	Causes severe eye injury which may persist for several days.
Skin:	Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation:	Exposure to vapors (mist) will cause respiratory irritation and anesthesia.
Ingestion:	May cause injury of mouth, throat, and stomach.
Chronic Health Hazards:	Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity:	None of the ingredients in this ink is listed by IARC as a carcinogen. (1, 2A and 2B)
Others:	No information.

3. Composition/information on ingredients

Chemical nature: mixture

Composition	CAS No.	% By Weight	GHS Classification
Colorant	CBI	1-5	Not classified as hazardous
Isobornyl acrylate	5888-33-5	10-20	Skin Irrit. 2: H315 Eye Irrit. 2: H319 STOT Single Exp. 3: H335 Aquatic Chronic 2: H411
Oxybis(methyl-2,1-ethanediyl)diacrylate	57472-68-1	10-20	Skin Irrit. 2: H315 Eye Damage 1: H318 Skin Sens. 1: H317
2-Phenoxyethyl acrylate	48145-04-6	10-20	Skin Sens. 1A: H317 Aquatic Chronic 2: H411
Tetrahydrofurfuryl acrylate	2399-48-6	10-20	Skin Irrit. 2: H315 Eye Irrit. 2: H319
Isodecyl acrylate	1330-61-6	1-5	Skin Irrit. 2: H315 Eye Irrit. 2: H319 STOT Single Exp. 3: H335 Aquatic Chronic 2: H411
2-propenoic acid, 1,6-hezanediyl ester, polymer with 2-aminoethanol	67906-98-3	5-10	Skin Irrit. 2: H315 Eye Irrit. 2: H319
N-vinyl caprolactam	2235-00-9	5-10	Acute Tox. 4: H302 Eye Irrit. 2A: H319 Skin Sens. 1B: H317 STOT Rep. Exp. 1: H372
Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide	162881-26-7	1-5	Skin Sens. 1: H317 Aquatic Chronic 4: H413
Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-	75980-60-8	1-3	Repr. 2: H361
Hexamethylene diacrylate	13048-33-4	<1	Skin Irrit. 2: H315 Skin Sens. 1: H317 Eye Irrit. 2: H319

† CBI: Confidential Business Information
‡ For the full text of the H-Statements mentioned in this Section, see Section 16.

4. First aid measures

4.1. Description of first aid measures

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

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

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

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

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

Eyes: Causes severe eye injury which may persist for several days.
Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation: Exposure to vapors (mist) will cause respiratory irritation and anesthesia.
Ingestion: May cause injury of mouth, throat, and stomach.

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

no information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.

Unsuitable extinguishing media:

Water, High-pressure water jet.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.
Flash Point: > 94deg.C

5.3. Advice for firefighters

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

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

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

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections

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

7. Handling and storage

7.1 Precautions for safe handling

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

7.2 Conditions for safe storage, including any incompatibilities

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

7.3 Specific end use(s): Inkjet Printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

Derived No-Effect Level (DNEL)

— Isobornyl acrylate:

[Long term exposure] no hazard identified

[Short term exposure] no hazard identified

— Oxybis(methyl-2,1-ethanediyl)diacrylate:

[Long term exposure] 24.48 mg/m³

[Short term exposure] no data available

— Tetrahydrofurfuryl acrylate:

[Long term exposure] 1.73 mg/m³

[Short term exposure] no hazard identified

— N-vinyl caprolactam:

[Long term exposure] 4.9 mg/m³

[Short term exposure] no hazard identified

— Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide:

[Long term exposure] 21 mg/m³

[Short term exposure] hazard unknown (no further information necessary)

— Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-:

[Long term exposure] 3.5 mg/m³

[Short term exposure] no hazard identified

— Hexamethylene diacrylate:

[Long term exposure] 24.5 mg/m³

[Short term exposure] no hazard identified

8.2. Exposure controls

Appropriate engineering controls

Provide general and/or local exhaust ventilation.

Respiratory protection:

In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with

organic vapor cartridge.For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Hand protection:

Employee must wear appropriate protective impervious gloves to prevent contact with the ink. Recommended Chemical Protective Gloves are ethylene vinyl alcohol (EVA) Gloves and Laminate gloves. Laminate gloves are made by cutting and then heat-sealing patterns of various hand sizes from laminated sheets of EVA sealed between layers of polyethylene.

Eye protection:

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

Skin protection:

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

Hygiene measures:

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

Environmental exposure control:

Avoid release to the environment.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Cyan Liquid
Odour:	Characteristic odour
Odour threshold:	Not defined
pH:	Not applicable
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	No data available
Flash point:	> 94deg.C
Evaporation rate:	No data available
Flammability (solid, gas)	Not applicable
Upper/lower flammability or explosive limits:	No data available
Vapor pressure:	No data available
Vapor density:	No data available
Relative density:	1.0-1.1
Solubility(ies):	Slightly soluble
Partition coefficient: n-octanol/water:	No data available

Auto-ignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	No data available
Explosive properties:	No data available
Oxidizing properties:	No data available
Volatile organic compounds (VOC) content:	185.2 grams/liter

9.2 Other information

No information.

10. Stability and reactivity

10.1 Reactivity:

High temperatures and UV light may cause rapid polymerization.

10.2 Chemical stability:

Stable under normal temperature.

10.3 Possibility of hazardous reactions:

Not expected.

10.4 Conditions to avoid:

Elevated temperatures/heat, UV light, when not in use.

10.5 Incompatible materials:

Avoid contact with acids, amines, free radical initiators, oxidizing agents.

10.6 Hazardous decomposition products:

Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.

11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity:

N-vinyl caprolactam

LD50（oral）: 1114.0mg/kg, LD50 (dermal): 1700.0mg/kg, LD50 (Inhal.): 1.6mg/L

Serious eye damage/eye irritation:

Causes serious eye damage.

- Oxybis(methyl-2,1-ethanediyl)diacrylate

Causes serious eye irritation.

- Isobornyl acrylate
- Tetrahydrofurfuryl acrylate
- Isodecyl acrylate

- 2-propenoic acid, 1,6-hezanediyl ester, polymer with 2-aminoethanol
- N-vinyl caprolactam
- Hexamethylene diacrylate

Skin corrosion/irritation:

Causes skin irritation.

- Isobornyl acrylate
- Oxybis(methyl-2,1-ethanediyl)diacrylate
- Tetrahydrofurfuryl acrylate
- Isodecyl acrylate
- 2-propenoic acid, 1,6-hezanediyl ester, polymer with 2-aminoethanol
- Hexamethylene diacrylate

Respiratory or skin sensitisation:

May cause an allergic skin reaction.

- Oxybis(methyl-2,1-ethanediyl)diacrylate
- 2-Phenoxyethyl acrylate
- N-vinyl caprolactam
- Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide
- Hexamethylene diacrylate

Germ cell mutagenicity:

no data available.

Reproductive toxicity:

Suspected of damaging fertility or the unborn child.

- Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-

Carcinogenicity:

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

Specific target organ toxicity - single exposure, (STOT-SE):

no data available.

Specific target organ toxicity - repeat exposure, (STOT-RE):

Causes damage to organs through prolonged or repeated exposure.

- N-vinyl caprolactam

Aspiration hazard:

no data available.

12. Ecological information

12.1. Toxicity:

Toxic to aquatic life with long lasting effects.

- Isobornyl acrylate
- 2-Phenoxyethyl acrylate
- Isodecyl acrylate

May cause long lasting harmful effects to aquatic life.

- Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide

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

Product:	Dispose as hazardous waste. Packaging with product residues must be disposed of under the same conditions as the product itself.
Recommended waste code:	08 03 12* (waste ink containing dangerous substances)
Uncleaned packaging:	15 01 10* (packaging, the residues of dangerous substances or hazardous waste contain or are contaminated by dangerous substances or special wastes)
Recommendation:	Uncontaminated packaging can be recycled. Non-cleanable packaging must be disposed of in the same way as the substance.

14. Transport information

14.1 UN Class/UN Number

ADR/ADG/DOT, IMDG, or IATA : 3082

14.2 UN proper shipping name

ADR/ADG/DOT, IMDG, or IATA : Environmentall hazardous substance, liquid, n.o.s. (Isobornyl acrylate)

14.3 Transport hazard class(es)

ADR/ADG/DOT, IMDG, or IATA : 9

14.4 Packing group

ADR/ADG/DOT, IMDG, or IATA : III

14.5 Environmental hazards

ADR/ADG/DOT, IMDG, or IATA : Environmentally hazardous substance, liquid, n.o.s.

14.6. Special precautions for user

ADR/ADG/DOT, IMDG, or IATA : Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.

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

15. Regulatory information

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

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

Australia Information:

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

Canadian Information:

Canadian Ingredient Disclosure list (limit 0.1%)

None of the ingredients are listed.

Canadian Ingredient Disclosure list (limit 1%)

None of the ingredients are listed.

International Information:

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

16. Other information

List of relevant H-Statements:

(Reference for Section 3. "Composition/information on ingredients")

— H302: Harmful if swallowed.
— H315: Causes skin irritation.
— H317: May cause an allergic skin reaction.
— H318: Causes serious eye damage.
— H319: Causes serious eye irritation.
— H335: May cause respiratory irritation.
— H361: Suspected of damaging fertility or the unborn child.
— H372: Causes damage to organs through prolonged or repeated exposure.
— H411: Toxic to aquatic life with long lasting effects.
— H413: May cause long lasting harmful effects to aquatic life.

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

Safety Data Sheet

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

1.1. Product identifier

US-MG

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

Phone: + 81-53-484-1224 FAX: + 81-53-484-1226

E-mail:

Revised date: 27-Feb-2020

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is classified as hazardous according to GHS.

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Sensitisation (Skin)	Category 1A
Specific target organ toxicity (Single exposure)	Category 3
Specific target organ toxicity (Repeated exposure)	Category 2
Hazardous to the aquatic environment (Chronic Hazard)	Category 2

2.2. GHS label elements, including precautionary statements

Pictgram(s)

Signal Word: Danger

Hazard Statement:

Causes skin irritation.

Causes serious eye damage.

May cause an allergic skin reaction.

May cause respiratory irritation.
May cause damage to organs through prolonged or repeated exposure.
Toxic to aquatic life with long lasting effects.

Precautionary statements — Prevention:

Do not breathe dust/fume/gas/mist/vapours/spray.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements — Response:

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER/doctor.
If skin irritation or rash occurs: Get medical advice/attention.

2.3. Other hazards

Potential Health Effects:

Eyes:	Causes severe eye injury which may persist for several days.
Skin:	Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation:	Exposure to vapors (mist) will cause respiratory irritation and anesthesia.
Ingestion:	May cause injury of mouth, throat, and stomach.
Chronic Health Hazards:	Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity:	None of the ingredients in this ink is listed by IARC as a carcinogen. (1, 2A and 2B)
Others:	No information.

3. Composition/information on ingredients

Chemical nature: mixture

Composition	CAS No.	% By Weight	GHS Classification
Isobornyl acrylate	5888-33-5	10-25	Skin Irrit. 2: H315 Eye Irrit. 2: H319 STOT Single Exp. 3: H335 Aquatic Chronic 2: H411
Oxybis(methyl-2,1-ethanediyl)diacrylate	57472-68-1	10-20	Skin Irrit. 2: H315 Eye Damage 1: H318 Skin Sens. 1: H317
2-Phenoxyethyl acrylate	48145-04-6	10-20	Skin Sens. 1A: H317 Aquatic Chronic 2: H411
Tetrahydrofurfuryl acrylate	2399-48-6	10-20	Skin Irrit. 2: H315 Eye Irrit. 2: H319
Isodecyl acrylate	1330-61-6	5-10	Skin Irrit. 2: H315 Eye Irrit. 2: H319 STOT Single Exp. 3: H335 Aquatic Chronic 2: H411
2-propenoic acid, 1,6-hezanediyl ester, polymer with 2-aminoethanol	67906-98-3	5-10	Skin Irrit. 2: H315 Eye Irrit. 2: H319
N-vinyl caprolactam	2235-00-9	5-10	Acute Tox. 4: H302 Eye Irrit. 2A: H319 Skin Sens. 1B: H317 STOT Rep. Exp. 1: H372
Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide	162881-26-7	1-5	Skin Sens. 1: H317 Aquatic Chronic 4: H413
Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-	75980-60-8	1-3	Repr. 2: H361
Hexamethylene diacrylate	13048-33-4	0-1	Skin Irrit. 2: H315 Skin Sens. 1: H317 Eye Irrit. 2: H319

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

4. First aid measures

4.1. Description of first aid measures

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

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

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

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

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

Eyes:	Causes severe eye injury which may persist for several days.
Skin:	Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation:	Exposure to vapors (mist) will cause respiratory irritation and anesthesia.
Ingestion:	May cause injury of mouth, throat, and stomach.

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

no information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.

Unsuitable extinguishing media:

Water, High-pressure water jet.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.
Flash Point: > 94deg.C

5.3. Advice for firefighters

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

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

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

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections

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

7. Handling and storage

7.1 Precautions for safe handling

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

7.2 Conditions for safe storage, including any incompatibilities

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

7.3 Specific end use(s): Inkjet Printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

Derived No-Effect Level (DNEL)

— Isobornyl acrylate:

[Long term exposure] no hazard identified

[Short term exposure] no hazard identified

— Oxybis(methyl-2,1-ethanediyl)diacrylate:

[Long term exposure] 24.48 mg/m³

[Short term exposure] no data available

— Tetrahydrofurfuryl acrylate:

[Long term exposure] 1.73 mg/m³

[Short term exposure] no hazard identified

— N-vinyl caprolactam:

[Long term exposure] 4.9 mg/m³

[Short term exposure] no hazard identified

— Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide:

[Long term exposure] 21 mg/m³

[Short term exposure] hazard unknown (no further information necessary)

— Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-:

[Long term exposure] 3.5 mg/m³

[Short term exposure] no hazard identified

— Hexamethylene diacrylate:

[Long term exposure] 24.5 mg/m³

[Short term exposure] no hazard identified

8.2. Exposure controls

Appropriate engineering controls

Provide general and/or local exhaust ventilation.

Respiratory protection:

In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with organic vapor cartridge.For emergency and other conditions where the exposure guideline may be

exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Hand protection:

Employee must wear appropriate protective impervious gloves to prevent contact with the ink. Recommended Chemical Protective Gloves are ethylene vinyl alcohol (EVA) Gloves and Laminate gloves. Laminate gloves are made by cutting and then heat-sealing patterns of various hand sizes from laminated sheets of EVA sealed between layers of polyethylene.

Eye protection:

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

Skin protection:

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

Hygiene measures:

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

Environmental exposure control:

Avoid release to the environment.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Magenta Liquid
Odour:	Characteristic odour
Odour threshold:	Not defined
pH:	Not applicable
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	No data available
Flash point:	> 94deg.C
Evaporation rate:	No data available
Flammability (solid, gas)	Not applicable
Upper/lower flammability or explosive limits:	No data available
Vapor pressure:	No data available
Vapor density:	No data available
Relative density:	1.0-1.1
Solubility(ies):	Slightly soluble
Partition coefficient: n-octanol/water:	No data available
Auto-ignition temperature:	No data available

Decomposition temperature:	No data available
Viscosity:	No data available
Explosive properties:	No data available
Oxidizing properties:	No data available
Volatile organic compounds (VOC) content:	185.2 grams/liter

9.2 Other information

No information.

10. Stability and reactivity

10.1 Reactivity:

High temperatures and UV light may cause rapid polymerization.

10.2 Chemical stability:

Stable under normal temperature.

10.3 Possibility of hazardous reactions:

Not expected.

10.4 Conditions to avoid:

Elevated temperatures/heat, UV light, when not in use.

10.5 Incompatible materials:

Avoid contact with acids, amines, free radical initiators, oxidizing agents.

10.6 Hazardous decomposition products:

Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.

11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity:

N-vinyl caprolactam

LD50（oral）: 1114.0mg/kg, LD50 (dermal): 1700.0mg/kg, LD50 (Inhal.): 1.6mg/L

Serious eye damage/eye irritation:

Causes serious eye damage.

- Oxybis(methyl-2,1-ethanediyl)diacrylate

Causes serious eye irritation.

- Isobornyl acrylate
- Tetrahydrofurfuryl acrylate
- Isodecyl acrylate
- 2-propenoic acid, 1,6-hezanediyl ester, polymer with 2-aminoethanol

- N-vinyl caprolactam
- Hexamethylene diacrylate

Skin corrosion/irritation:

Causes skin irritation.

- Isobornyl acrylate
- Oxybis(methyl-2,1-ethanediyl)diacrylate
- Tetrahydrofurfuryl acrylate
- Isodecyl acrylate
- 2-propenoic acid, 1,6-hezanediyl ester, polymer with 2-aminoethanol
- Hexamethylene diacrylate

Respiratory or skin sensitisation:

May cause an allergic skin reaction.

- Oxybis(methyl-2,1-ethanediyl)diacrylate
- 2-Phenoxyethyl acrylate
- N-vinyl caprolactam
- Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide
- Hexamethylene diacrylate

Germ cell mutagenicity:

no data available.

Reproductive toxicity:

Suspected of damaging fertility or the unborn child.

- Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-

Carcinogenicity:

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

Specific target organ toxicity - single exposure, (STOT-SE):

no data available.

Specific target organ toxicity - repeat exposure, (STOT-RE):

Causes damage to organs through prolonged or repeated exposure.

- N-vinyl caprolactam

Aspiration hazard:

no data available.

12. Ecological information

12.1. Toxicity:

Toxic to aquatic life with long lasting effects.

- Isobornyl acrylate
- 2-Phenoxyethyl acrylate
- Isodecyl acrylate

May cause long lasting harmful effects to aquatic life.

- Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide

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

Product:	Dispose as hazardous waste. Packaging with product residues must be disposed of under the same conditions as the product itself.
Recommended waste code:	08 03 12* (waste ink containing dangerous substances)
Uncleaned packaging:	15 01 10* (packaging, the residues of dangerous substances or hazardous waste contain or are contaminated by dangerous substances or special wastes)
Recommendation:	Uncontaminated packaging can be recycled. Non-cleanable packaging must be disposed of in the same way as the substance.

14. Transport information

14.1 UN Class/UN Number

ADR/ADG/DOT, IMDG, or IATA : 3082

14.2 UN proper shipping name

ADR/ADG/DOT, IMDG, or IATA : Environmentall hazardous substance, liquid, n.o.s. (Isobornyl acrylate)

14.3 Transport hazard class(es)

ADR/ADG/DOT, IMDG, or IATA : 9

14.4 Packing group

ADR/ADG/DOT, IMDG, or IATA : III

14.5 Environmental hazards

ADR/ADG/DOT, IMDG, or IATA : Environmentally hazardous substance, liquid, n.o.s.

14.6. Special precautions for user

ADR/ADG/DOT, IMDG, or IATA : Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.

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

15. Regulatory information

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

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

Australia Information:

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

Canadian Information:

Canadian Ingredient Disclosure list (limit 0.1%)

None of the ingredients are listed.

Canadian Ingredient Disclosure list (limit 1%)

None of the ingredients are listed.

International Information:

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

16. Other information

List of relevant H-Statements:

(Reference for Section 3. "Composition/information on ingredients")

— H302: Harmful if swallowed.
— H315: Causes skin irritation.
— H317: May cause an allergic skin reaction.
— H318: Causes serious eye damage.
— H319: Causes serious eye irritation.
— H335: May cause respiratory irritation.
— H361: Suspected of damaging fertility or the unborn child.
— H372: Causes damage to organs through prolonged or repeated exposure.
— H411: Toxic to aquatic life with long lasting effects.
— H413: May cause long lasting harmful effects to aquatic life.

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

Safety Data Sheet

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

1.1. Product identifier

US-YE

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

Phone: + 81-53-484-1224 FAX: + 81-53-484-1226

E-mail:

Revised date: 27-Feb-2020

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is classified as hazardous according to GHS.

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Sensitisation (Skin)	Category 1A
Specific target organ toxicity (Single exposure)	Category 3
Specific target organ toxicity (Repeated exposure)	Category 2
Hazardous to the aquatic environment (Chronic Hazard)	Category 2

2.2. GHS label elements, including precautionary statements

Pictgram(s)

Signal Word: Danger

Hazard Statement:

Causes skin irritation.

Causes serious eye damage.

May cause an allergic skin reaction.

May cause respiratory irritation.
May cause damage to organs through prolonged or repeated exposure.
Toxic to aquatic life with long lasting effects.

Precautionary statements — Prevention:

Do not breathe dust/fume/gas/mist/vapours/spray.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements — Response:

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER/doctor.
If skin irritation or rash occurs: Get medical advice/attention.

2.3. Other hazards

Potential Health Effects:

Eyes:	Causes severe eye injury which may persist for several days.
Skin:	Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation:	Exposure to vapors (mist) will cause respiratory irritation and anesthesia.
Ingestion:	May cause injury of mouth, throat, and stomach.
Chronic Health Hazards:	Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity:	This product contains Nickel compounds.IARC evaluated printing ink as a Group 3.(IARC Group 3: Not classifiable as to carcinogenicity to humans)
Others:	No information.

3. Composition/information on ingredients

Chemical nature: mixture

Composition	CAS No.	% By Weight	GHS Classification
Pigment Yellow 150	68511-62-6	1-5	Not classified as hazardous
2-propenoic acid, 1,6-hezanediyl ester, polymer with 2-aminoethanol	67906-98-3	5-10	Skin Irrit. 2: H315 Eye Irrit. 2: H319
Isobornyl acrylate	5888-33-5	10-20	Skin Irrit. 2: H315 Eye Irrit. 2: H319 STOT Single Exp. 3: H335 Aquatic Chronic 2: H411
Tetrahydrofurfuryl acrylate	2399-48-6	10-20	Skin Irrit. 2: H315 Eye Irrit. 2: H319
Oxybis(methyl-2,1-ethanediyl)diacrylate	57472-68-1	10-20	Skin Irrit. 2: H315 Eye Damage 1: H318 Skin Sens. 1: H317
2-Phenoxyethyl acrylate	48145-04-6	10-25	Skin Sens. 1A: H317 Aquatic Chronic 2: H411
N-vinyl caprolactam	2235-00-9	5-10	Acute Tox. 4: H302 Eye Irrit. 2A: H319 Skin Sens. 1B: H317 STOT Rep. Exp. 1: H372
Isodecyl acrylate	1330-61-6	5-10	Skin Irrit. 2: H315 Eye Irrit. 2: H319 STOT Single Exp. 3: H335 Aquatic Chronic 2: H411
Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide	162881-26-7	1-5	Skin Sens. 1: H317 Aquatic Chronic 4: H413
Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-	75980-60-8	1-3	Repr. 2: H361
Hexamethylene diacrylate	13048-33-4	0-1	Skin Irrit. 2: H315 Skin Sens. 1: H317 Eye Irrit. 2: H319

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

4. First aid measures

4.1. Description of first aid measures

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

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

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

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

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

Eyes: Causes severe eye injury which may persist for several days.
Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation: Exposure to vapors (mist) will cause respiratory irritation and anesthesia.
Ingestion: May cause injury of mouth, throat, and stomach.

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

no information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.

Unsuitable extinguishing media:

Water, High-pressure water jet.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.
Flash Point: > 94deg.C

5.3. Advice for firefighters

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

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

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

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections

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

7. Handling and storage

7.1 Precautions for safe handling

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

7.2 Conditions for safe storage, including any incompatibilities

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

7.3 Specific end use(s): Inkjet Printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

Derived No-Effect Level (DNEL)

— Isobornyl acrylate:

[Long term exposure] no hazard identified

[Short term exposure] no hazard identified

— Tetrahydrofurfuryl acrylate:

[Long term exposure] 1.73 mg/m³

[Short term exposure] no hazard identified

— Oxybis(methyl-2,1-ethanediyl)diacrylate:

[Long term exposure] 24.48 mg/m³

[Short term exposure] no data available

— N-vinyl caprolactam:

[Long term exposure] 4.9 mg/m³

[Short term exposure] no hazard identified

— Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide:

[Long term exposure] 21 mg/m³

[Short term exposure] hazard unknown (no further information necessary)

— Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-:

[Long term exposure] 3.5 mg/m³

[Short term exposure] no hazard identified

— Hexamethylene diacrylate:

[Long term exposure] 24.5 mg/m³

[Short term exposure] no hazard identified

8.2. Exposure controls

Appropriate engineering controls

Provide general and/or local exhaust ventilation.

Respiratory protection:

In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with

organic vapor cartridge.For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Hand protection:

Employee must wear appropriate protective impervious gloves to prevent contact with the ink. Recommended Chemical Protective Gloves are ethylene vinyl alcohol (EVA) Gloves and Laminate gloves. Laminate gloves are made by cutting and then heat-sealing patterns of various hand sizes from laminated sheets of EVA sealed between layers of polyethylene.

Eye protection:

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

Skin protection:

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

Hygiene measures:

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

Environmental exposure control:

Avoid release to the environment.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Yellow Liquid
Odour:	Characteristic odour
Odour threshold:	Not defined
pH:	Not applicable
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	No data available
Flash point:	> 94deg.C
Evaporation rate:	No data available
Flammability (solid, gas)	Not applicable
Upper/lower flammability or explosive limits:	No data available
Vapor pressure:	No data available
Vapor density:	No data available
Relative density:	1.0-1.1
Solubility(ies):	Slightly soluble
Partition coefficient: n-octanol/water:	No data available

Auto-ignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	No data available
Explosive properties:	No data available
Oxidizing properties:	No data available
Volatile organic compounds (VOC) content:	185.2 grams/liter

9.2 Other information

No information.

10. Stability and reactivity

10.1 Reactivity:

High temperatures and UV light may cause rapid polymerization.

10.2 Chemical stability:

Stable under normal temperature.

10.3 Possibility of hazardous reactions:

Not expected.

10.4 Conditions to avoid:

Elevated temperatures/heat, UV light, when not in use.

10.5 Incompatible materials:

Avoid contact with acids, amines, free radical initiators, oxidizing agents.

10.6 Hazardous decomposition products:

Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.

11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity:

N-vinyl caprolactam

LD50（oral）: 1114.0mg/kg, LD50 (dermal): 1700.0mg/kg, LD50 (Inhal.): 1.6mg/L

Serious eye damage/eye irritation:

Causes serious eye damage.

- Oxybis(methyl-2,1-ethanediyl)diacrylate

Causes serious eye irritation.

- 2-propenoic acid, 1,6-hezanediyl ester, polymer with 2-aminoethanol
- Isobornyl acrylate
- Tetrahydrofurfuryl acrylate

- N-vinyl caprolactam
- Isodecyl acrylate
- Hexamethylene diacrylate

Skin corrosion/irritation:

Causes skin irritation.

- 2-propenoic acid, 1,6-hezanediyl ester, polymer with 2-aminoethanol
- Isobornyl acrylate
- Tetrahydrofurfuryl acrylate
- Oxybis(methyl-2,1-ethanediyl)diacrylate
- Isodecyl acrylate
- Hexamethylene diacrylate

Respiratory or skin sensitisation:

May cause an allergic skin reaction.

- Oxybis(methyl-2,1-ethanediyl)diacrylate
- 2-Phenoxyethyl acrylate
- N-vinyl caprolactam
- Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide
- Hexamethylene diacrylate

Germ cell mutagenicity:

no data available.

Reproductive toxicity:

Suspected of damaging fertility or the unborn child.

- Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-

Carcinogenicity:

This product contains Nickel compounds.

IARC evaluated printing ink as a Group 3.

(IARC Group 3: Not classifiable as to carcinogenicity to humans)

Specific target organ toxicity - single exposure, (STOT-SE):

no data available.

Specific target organ toxicity - repeat exposure, (STOT-RE):

Causes damage to organs through prolonged or repeated exposure.

- N-vinyl caprolactam

Aspiration hazard:

no data available.

12. Ecological information

12.1. Toxicity:

Toxic to aquatic life with long lasting effects.

- Isobornyl acrylate
- 2-Phenoxyethyl acrylate
- Isodecyl acrylate

May cause long lasting harmful effects to aquatic life.

- Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide

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

Product:	Dispose as hazardous waste. Packaging with product residues must be disposed of under the same conditions as the product itself.
Recommended waste code:	08 03 12* (waste ink containing dangerous substances)
Uncleaned packaging:	15 01 10* (packaging, the residues of dangerous substances or hazardous waste contain or are contaminated by dangerous substances or special wastes)
Recommendation:	Uncontaminated packaging can be recycled. Non-cleanable packaging must be disposed of in the same way as the substance.

14. Transport information

14.1 UN Class/UN Number

ADR/ADG/DOT, IMDG, or IATA : 3082

14.2 UN proper shipping name

ADR/ADG/DOT, IMDG, or IATA : Environmentall hazardous substance, liquid, n.o.s.(Isobornyl acrylate)

14.3 Transport hazard class(es)

ADR/ADG/DOT, IMDG, or IATA : 9

14.4 Packing group

ADR/ADG/DOT, IMDG, or IATA : III

14.5 Environmental hazards

ADR/ADG/DOT, IMDG, or IATA : Environmentally hazardous substance, liquid, n.o.s.

14.6. Special precautions for user

ADR/ADG/DOT, IMDG, or IATA : Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.

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

15. Regulatory information

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

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

Australia Information:

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

Canadian Information:

Canadian Ingredient Disclosure list (limit 0.1%)

None of the ingredients are listed.

Canadian Ingredient Disclosure list (limit 1%)

None of the ingredients are listed.

International Information:

This product contains Nickel compounds.

IARC evaluated printing ink as a Group 3.

(IARC Group 3: Not t classifiable as to carcinogenicity to humans

16. Other information

List of relevant H-Statements:

(Reference for Section 3. "Composition/information on ingredients")

— H302: Harmful if swallowed.
— H315: Causes skin irritation.
— H317: May cause an allergic skin reaction.
— H318: Causes serious eye damage.
— H319: Causes serious eye irritation.
— H335: May cause respiratory irritation.
— H361: Suspected of damaging fertility or the unborn child.
— H372: Causes damage to organs through prolonged or repeated exposure.
— H411: Toxic to aquatic life with long lasting effects.
— H413: May cause long lasting harmful effects to aquatic life.

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

Safety Data Sheet

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

1.1. Product identifier

US-BK

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

Phone: + 81-53-484-1224 FAX: + 81-53-484-1226

E-mail:

Revised date: 27-Feb-2020

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is classified as hazardous according to GHS.

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Sensitisation (Skin)	Category 1A
Specific target organ toxicity (Single exposure)	Category 3
Specific target organ toxicity (Repeated exposure)	Category 2
Hazardous to the aquatic environment (Chronic Hazard)	Category 2

2.2. GHS label elements, including precautionary statements

Pictgram(s)

Signal Word: Danger

Hazard Statement:

Causes skin irritation.

Causes serious eye damage.

May cause an allergic skin reaction.

May cause respiratory irritation.
May cause damage to organs through prolonged or repeated exposure.
Toxic to aquatic life with long lasting effects.

Precautionary statements — Prevention:

Do not breathe dust/fume/gas/mist/vapours/spray.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements — Response:

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER/doctor.
If skin irritation or rash occurs: Get medical advice/attention.

2.3. Other hazards

Potential Health Effects:

Eyes:	Causes severe eye injury which may persist for several days.
Skin:	Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation:	Exposure to vapors (mist) will cause respiratory irritation and anesthesia.
Ingestion:	May cause injury of mouth, throat, and stomach.
Chronic Health Hazards:	Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity:	This product contains Carbon black.IARC evaluated printing ink as a Group 3.(IARC Group 3: Not classifiable as to carcinogenicity to humans)
Others:	No information.

3. Composition/information on ingredients

Chemical nature: mixture

Composition	CAS No.	% By Weight	GHS Classification
Carbon black	1333-86-4	1-5	Not classified as hazardous
Isobornyl acrylate	5888-33-5	10-25	Skin Irrit. 2: H315 Eye Irrit. 2: H319 STOT Single Exp. 3: H335 Aquatic Chronic 2: H411
Tetrahydrofurfuryl acrylate	2399-48-6	10-20	Skin Irrit. 2: H315 Eye Irrit. 2: H319
Oxybis(methyl-2,1-ethanediyl)diacrylate	57472-68-1	10-20	Skin Irrit. 2: H315 Eye Damage 1: H318 Skin Sens. 1: H317
2-Phenoxyethyl acrylate	48145-04-6	10-25	Skin Sens. 1A: H317 Aquatic Chronic 2: H411
Isodecyl acrylate	1330-61-6	5-10	Skin Irrit. 2: H315 Eye Irrit. 2: H319 STOT Single Exp. 3: H335 Aquatic Chronic 2: H411
2-propenoic acid, 1,6-hezanediyl ester, polymer with 2-aminoethanol	67906-98-3	5-10	Skin Irrit. 2: H315 Eye Irrit. 2: H319
N-vinyl caprolactam	2235-00-9	5-10	Acute Tox. 4: H302 Eye Irrit. 2A: H319 Skin Sens. 1B: H317 STOT Rep. Exp. 1: H372
Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide	162881-26-7	1-5	Skin Sens. 1: H317 Aquatic Chronic 4: H413
Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-	75980-60-8	1-3	Repr. 2: H361
Hexamethylene diacrylate	13048-33-4	0-1	Skin Irrit. 2: H315 Skin Sens. 1: H317 Eye Irrit. 2: H319

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

4. First aid measures

4.1. Description of first aid measures

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

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

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

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

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

Eyes: Causes severe eye injury which may persist for several days.
Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation: Exposure to vapors (mist) will cause respiratory irritation and anesthesia.
Ingestion: May cause injury of mouth, throat, and stomach.

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

no information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.

Unsuitable extinguishing media:

Water, High-pressure water jet.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.
Flash Point: > 94deg.C

5.3. Advice for firefighters

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

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

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

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections

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

7. Handling and storage

7.1 Precautions for safe handling

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

7.2 Conditions for safe storage, including any incompatibilities

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

7.3 Specific end use(s): Inkjet Printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

Derived No-Effect Level (DNEL)

— Carbon black:

[Long term exposure] 2 mg/m³

[Short term exposure] no data available

— Isobornyl acrylate:

[Long term exposure] no hazard identified

[Short term exposure] no hazard identified

— Tetrahydrofurfuryl acrylate:

[Long term exposure] 1.73 mg/m³

[Short term exposure] no hazard identified

— Oxybis(methyl-2,1-ethanediyl)diacrylate:

[Long term exposure] 24.48 mg/m³

[Short term exposure] no data available

— N-vinyl caprolactam:

[Long term exposure] 4.9 mg/m³

[Short term exposure] no hazard identified

— Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide:

[Long term exposure] 21 mg/m³

[Short term exposure] hazard unknown (no further information necessary)

— Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-:

[Long term exposure] 3.5 mg/m³

[Short term exposure] no hazard identified

— Hexamethylene diacrylate:

[Long term exposure] 24.5 mg/m³

[Short term exposure] no hazard identified

8.2. Exposure controls

Appropriate engineering controls

Provide general and/or local exhaust ventilation.

Respiratory protection:

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

Hand protection:

Employee must wear appropriate protective impervious gloves to prevent contact with the ink. Recommended Chemical Protective Gloves are ethylene vinyl alcohol (EVA) Gloves and Laminate gloves. Laminate gloves are made by cutting and then heat-sealing patterns of various hand sizes from laminated sheets of EVA sealed between layers of polyethylene.

Eye protection:

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

Skin protection:

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

Hygiene measures:

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

Environmental exposure control:

Avoid release to the environment.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Black Liquid
Odour:	Characteristic odour
Odour threshold:	Not defined
pH:	Not applicable
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	No data available
Flash point:	> 94deg.C
Evaporation rate:	No data available
Flammability (solid, gas)	Not applicable
Upper/lower flammability or explosive limits:	No data available
Vapor pressure:	No data available
Vapor density:	No data available

Relative density:	1.0-1.1
Solubility(ies):	Slightly soluble
Partition coefficient: n-octanol/water:	No data available
Auto-ignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	No data available
Explosive properties:	No data available
Oxidizing properties:	No data available
Volatile organic compounds (VOC) content:	185.2 grams/liter

9.2 Other information

No information.

10. Stability and reactivity

10.1 Reactivity:

High temperatures and UV light may cause rapid polymerization.

10.2 Chemical stability:

Stable under normal temperature.

10.3 Possibility of hazardous reactions:

Not expected.

10.4 Conditions to avoid:

Elevated temperatures/heat, UV light, when not in use.

10.5 Incompatible materials:

Avoid contact with acids, amines, free radical initiators, oxidizing agents.

10.6 Hazardous decomposition products:

Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.

11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity:

N-vinyl caprolactam

LD50（oral）: 1114.0 mg/kg, LD50 (dermal): 1700.0 mg/kg, LD50 (Inhal.): 1.6 mg/L

Serious eye damage/eye irritation:

Causes serious eye damage.

• Oxybis(methyl-2,1-ethanediyl)diacrylate

Causes serious eye irritation.

- Isobornyl acrylate
- Tetrahydrofurfuryl acrylate
- Isodecyl acrylate
- 2-propenoic acid, 1,6-hezanediyl ester, polymer with 2-aminoethanol
- N-vinyl caprolactam
- Hexamethylene diacrylate

Skin corrosion/irritation:

Causes skin irritation.

- Isobornyl acrylate
- Tetrahydrofurfuryl acrylate
- Oxybis(methyl-2,1-ethanediyl)diacrylate
- Isodecyl acrylate
- 2-propenoic acid, 1,6-hezanediyl ester, polymer with 2-aminoethanol
- Hexamethylene diacrylate

Respiratory or skin sensitisation:

May cause an allergic skin reaction.

- Oxybis(methyl-2,1-ethanediyl)diacrylate
- 2-Phenoxyethyl acrylate
- N-vinyl caprolactam
- Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide
- Hexamethylene diacrylate

Germ cell mutagenicity:

no data available.

Reproductive toxicity:

Suspected of damaging fertility or the unborn child.

- Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-

Carcinogenicity:

This product contains Carbon black.

IARC evaluated printing ink as a Group 3.

(IARC Group 3: Not classifiable as to carcinogenicity to humans)

Specific target organ toxicity - single exposure, (STOT-SE):

no data available.

Specific target organ toxicity - repeat exposure, (STOT-RE):

Causes damage to organs through prolonged or repeated exposure.

- N-vinyl caprolactam

Aspiration hazard:

no data available.

12. Ecological information

12.1. Toxicity:

Toxic to aquatic life with long lasting effects.

- Isobornyl acrylate
- 2-Phenoxyethyl acrylate
- Isodecyl acrylate

May cause long lasting harmful effects to aquatic life.

- Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide

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

Product:	Dispose as hazardous waste. Packaging with product residues must be disposed of under the same conditions as the product itself.
Recommended waste code:	08 03 12* (waste ink containing dangerous substances)
Uncleaned packaging:	15 01 10* (packaging, the residues of dangerous substances or hazardous waste contain or are contaminated by dangerous substances or special wastes)
Recommendation:	Uncontaminated packaging can be recycled. Non-cleanable packaging must be disposed of in the same way as the substance.

14. Transport information

14.1 UN Class/UN Number

ADR/ADG/DOT, IMDG, or IATA : 3082

14.2 UN proper shipping name

ADR/ADG/DOT, IMDG, or IATA : Environmentall hazardous substance, liquid, n.o.s. (Isobornyl acrylate)

14.3 Transport hazard class(es)

ADR/ADG/DOT, IMDG, or IATA : 9

14.4 Packing group

ADR/ADG/DOT, IMDG, or IATA : III

14.5 Environmental hazards

ADR/ADG/DOT, IMDG, or IATA : Environmentally hazardous substance, liquid, n.o.s.

14.6. Special precautions for user

ADR/ADG/DOT, IMDG, or IATA : Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.

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

15. Regulatory information

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

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

Australia Information:

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

Canadian Information:

Canadian Ingredient Disclosure list (limit 0.1%)

None of the ingredients are listed.

Canadian Ingredient Disclosure list (limit 1%)

Carbon black

International Information:

This product contains Carbon black.

IARC evaluated printing ink as a Group 3.

(IARC Group 3: Not t classifiable as to carcinogenicity to humans

16. Other information

List of relevant H-Statements:

(Reference for Section 3. "Composition/information on ingredients")

— H302: Harmful if swallowed.
— H315: Causes skin irritation.
— H317: May cause an allergic skin reaction.
— H318: Causes serious eye damage.
— H319: Causes serious eye irritation.
— H335: May cause respiratory irritation.
— H361: Suspected of damaging fertility or the unborn child.
— H372: Causes damage to organs through prolonged or repeated exposure.
— H411: Toxic to aquatic life with long lasting effects.
— H413: May cause long lasting harmful effects to aquatic life.

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

Safety Data Sheet

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

1.1. Product identifier

US-WH

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

Inkjet Printing

1.3. Details of the supplier of the safety data sheet

Manufacture's name: Roland DG Corporation

Address: 1-6-4 Shinmiyakoda, Kita-ku, Hamamatsu-shi, Shizuoka-ken, 431-2103

Phone: + 81-53-484-1224 FAX: + 81-53-484-1226

E-mail:

Revised date: 27-Feb-2020

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is classified as hazardous according to GHS.

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Sensitisation (Skin)	Category 1A
Reproductive toxicity	Category 2
Specific target organ toxicity (Repeated exposure)	Category 1
Hazardous to the aquatic environment (Chronic Hazard)	Category 2

2.2. GHS label elements, including precautionary statements

Pictgram(s)

Signal Word: Danger

Hazard Statement:

Causes skin irritation.

Causes serious eye damage.

May cause an allergic skin reaction.

Suspected of damaging fertility or the unborn child.
Causes damage to organs through prolonged or repeated exposure.
Toxic to aquatic life with long lasting effects.

Precautionary statements — Prevention:

Obtain special instructions before use.
Do not breathe dust/fume/gas/mist/vapours/spray.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements — Response:

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/attention.
Immediately call a POISON CENTER/doctor/…
If skin irritation or rash occurs: Get medical advice/attention.

2.3. Other hazards

Potential Health Effects:

Eyes:	Causes severe eye injury which may persist for several days.
Skin:	Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation:	Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
Ingestion:	May cause injury of mouth, throat, and stomach.
Chronic Health Hazards:	Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity:	This product contains Titanium dioxide.IARC evaluated printing ink as a Group 3.(IARC Group 3: Not t classifiable as to carcinogenicity to humans)
Others:	No information.

3. Composition/information on ingredients

Chemical nature: mixture

Composition	CAS No.	% By Weight	GHS Classification
titanium dioxide	13463-67-7	10-20	Not classified as hazardous
2-Phenoxyethyl acrylate	48145-04-6	25-50	Skin Sens. 1A: H317 Aquatic Chronic 2: H411
Oxybis(methyl-2,1-ethanediyl)diacrylate	57472-68-1	10-20	Skin Irrit. 2: H315 Eye Damage 1: H318 Skin Sens. 1: H317
N-vinyl caprolactam	2235-00-9	10-20	Acute Tox. 4: H302 Eye Irrit. 2A: H319 Skin Sens. 1B: H317 STOT Rep. Exp. 1: H372
2-[[(Butylamino)carbonyl]oxy]ethyl acrylate	63225-53-6	1-5	Skin Irrit. 2: H315 Eye Irrit. 2: H319
2-Hydroxy-2-methylpropiophenone	7473-98-5	1-5	Acute Tox. 4: H302 Aquatic Chronic 3: H412
Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-	75980-60-8	3-5	Repr. 2: H361

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

4. First aid measures

4.1. Description of first aid measures

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

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

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

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

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

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

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

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

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

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

no information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.

Unsuitable extinguishing media:

Water, High-pressure water jet.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.
Flash Point: > 94deg.C

5.3. Advice for firefighters

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

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

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

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections

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

7. Handling and storage

7.1 Precautions for safe handling

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

7.2 Conditions for safe storage, including any incompatibilities

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

7.3 Specific end use(s): Inkjet Printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

Derived No-Effect Level (DNEL)

— titanium dioxide:

[Long term exposure] no data available

[Short term exposure] no data available

— Oxybis(methyl-2,1-ethanediyl)diacrylate:

[Long term exposure] 24.48 mg/m³

[Short term exposure] no data available

— N-vinyl caprolactam:

[Long term exposure] 4.9 mg/m³

[Short term exposure] no hazard identified

— Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-:

[Long term exposure] 3.5 mg/m³

[Short term exposure] no hazard identified

8.2. Exposure controls

Appropriate engineering controls

Provide general and/or local exhaust ventilation.

Respiratory protection:

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

Hand protection:

Employee must wear appropriate protective impervious gloves to prevent contact with the ink. Recommended Chemical Protective Gloves are ethylene vinyl alcohol (EVA) Gloves and Laminate gloves. Laminate gloves are made by cutting and then heat-sealing patterns of various hand sizes from laminated sheets of EVA sealed between layers of polyethylene.

Eye protection:

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

Skin protection:

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

Hygiene measures:

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

Environmental exposure control:

Avoid release to the environment.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	White Liquid
Odour:	Characteristic odour
Odour threshold:	Not defined
pH:	Not applicable
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	No data available
Flash point:	> 94deg.C
Evaporation rate:	No data available
Flammability (solid, gas)	Not applicable
Upper/lower flammability or explosive limits:	No data available
Vapor pressure:	No data available
Vapor density:	No data available
Relative density:	1.2-1.3
Solubility(ies):	Slightly soluble
Partition coefficient: n-octanol/water:	No data available
Auto-ignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	No data available
Explosive properties:	No data available
Oxidizing properties:	No data available
Volatile organic compounds (VOC) content:	499 grams/liter

9.2 Other information

No information.

10. Stability and reactivity

10.1 Reactivity:

High temperatures and UV light may cause rapid polymerization.

10.2 Chemical stability:

Stable under normal temperature.

10.3 Possibility of hazardous reactions:

Not expected.

10.4 Conditions to avoid:

Elevated temperatures/heat, UV light, when not in use.

10.5 Incompatible materials:

Avoid contact with acids, amines, free radical initiators, oxidizing agents.

10.6 Hazardous decomposition products:

Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.

11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity:

N-vinyl caprolactam

LD50（oral）: 1114.0mg/kg, LD50 (dermal): 1700.0mg/kg, LD50 (Inhal.): 1.6mg/L

2-Hydroxy-2-methylpropiophenone

LD50（oral）: no data available, LD50 (dermal): no data available, LD50 (Inhal.): no data available

Serious eye damage/eye irritation:

Causes serious eye damage.

- Oxybis(methyl-2,1-ethanediyl)diacrylate

Causes serious eye irritation.

- N-vinyl caprolactam
- 2-[[(Butylamino)carbonyl]oxy]ethyl acrylate

Skin corrosion/irritation:

Causes skin irritation.

- Oxybis(methyl-2,1-ethanediyl)diacrylate
- 2-[[(Butylamino)carbonyl]oxy]ethyl acrylate

Respiratory or skin sensitisation:

May cause an allergic skin reaction.

- 2-Phenoxyethyl acrylate
- Oxybis(methyl-2,1-ethanediyl)diacrylate
- N-vinyl caprolactam

Germ cell mutagenicity:

no data available.

Reproductive toxicity:

Suspected of damaging fertility or the unborn child.

- Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-

Carcinogenicity:

This product contains Titanium dioxide.

IARC evaluated printing ink as a Group 3.

(IARC Group 3: Not classifiable as to carcinogenicity to humans)

Specific target organ toxicity - single exposure, (STOT-SE):

no data available.

Specific target organ toxicity - repeat exposure, (STOT-RE):

Causes damage to organs through prolonged or repeated exposure.

• N-vinyl caprolactam

Aspiration hazard:

no data available.

12. Ecological information

12.1. Toxicity:

Toxic to aquatic life with long lasting effects.

• 2-Phenoxyethyl acrylate

Harmful to aquatic life with long lasting effects.

• 2-Hydroxy-2-methylpropiophenone

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

Product:	Dispose as hazardous waste. Packaging with product residues must be disposed of under the same conditions as the product itself.
Recommended waste code:	08 03 12* (waste ink containing dangerous substances)
Uncleaned packaging:	15 01 10* (packaging, the residues of dangerous substances or hazardous waste contain or are contaminated by dangerous substances or special wastes)
Recommendation:	Uncontaminated packaging can be recycled. Non-cleanable packaging must be disposed of in the same way as the substance.

14. Transport information

14.1 UN Class/UN Number

ADR/ADG/DOT, IMDG, or IATA : 3082

14.2 UN proper shipping name

ADR/ADG/DOT, IMDG, or IATA : Environmentall hazardous substance, liquid, n.o.s.(2-Phenoxyethyl acrylate)

14.3 Transport hazard class(es)

ADR/ADG/DOT, IMDG, or IATA : 9

14.4 Packing group

ADR/ADG/DOT, IMDG, or IATA : III

14.5 Environmental hazards

ADR/ADG/DOT, IMDG, or IATA : Environmentally hazardous substance, liquid, n.o.s.

14.6. Special precautions for user

ADR/ADG/DOT, IMDG, or IATA : Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.

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

15. Regulatory information

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

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

Australia Information:

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

Canadian Information:

Canadian Ingredient Disclosure list (limit 0.1%)

None of the ingredients are listed.

Canadian Ingredient Disclosure list (limit 1%)

None of the ingredients are listed.

International Information:

This product contains Titanium dioxide.

IARC evaluated printing ink as a Group 3.

(IARC Group 3: Not t classifiable as to carcinogenicity to humans)

16. Other information

List of relevant H-Statements:

(Reference for Section 3. "Composition/information on ingredients")

— H302: Harmful if swallowed.
— H315: Causes skin irritation.
— H317: May cause an allergic skin reaction.
— H318: Causes serious eye damage.
— H319: Causes serious eye irritation.
— H361: Suspected of damaging fertility or the unborn child.
— H372: Causes damage to organs through prolonged or repeated exposure.
— H411: Toxic to aquatic life with long lasting effects.
— H412: Harmful to aquatic life with long lasting effects.

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

Safety Data Sheet

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

1.1. Product identifier

US-GL

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

Phone: + 81-53-484-1224 FAX: + 81-53-484-1226

E-mail:

Revised date: 27-Feb-2020

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is classified as hazardous according to GHS.

Acute toxicity (oral)	Category 4
Skin corrosion/irritation	Category 1C
Sensitisation (Skin)	Category 1A
Reproductive toxicity	Category 2
Specific target organ toxicity (Single exposure)	Category 3
Hazardous to the aquatic environment (Chronic Hazard)	Category 2

2.2. GHS label elements, including precautionary statements

Pictgram(s)

Signal Word: Danger

Hazard Statement:

Harmful if swallowed.

Causes severe skin burns and eye damage.

May cause an allergic skin reaction.

Suspected of damaging fertility or the unborn child.
May cause respiratory irritation.
Toxic to aquatic life with long lasting effects.

Precautionary statements — Prevention:

Obtain special instructions before use.
Do not breathe dust/fume/gas/mist/vapours/spray.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements — Response:

IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER/doctor
Collect spillage.

2.3. Other hazards

Potential Health Effects:

Eyes:	Causes severe eye injury which may persist for several days.
Skin:	Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation:	Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
Ingestion:	May cause injury of mouth, throat, and stomach.
Chronic Health Hazards:	Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity:	None of the ingredients in this ink is listed by IARC as a carcinogen. (1, 2A and 2B)
Others:	No information.

3. Composition/information on ingredients

Chemical nature: mixture

Composition	CAS No.	% By Weight	GHS Classification
2-Phenoxyethyl acrylate	48145-04-6	22-32	Skin Irrit. 2: H315 Eye Irrit. 2: H319
Isobornyl acrylate	5888-33-5	12-22	Skin Irrit. 2: H315 Eye Irrit. 2: H319 STOT Single Exp. 3: H335 Aquatic Chronic 2: H411
(5-Ethyl-1,3-dioxan-5-yl)methyl acrylate	66492-51-1	10-20	Skin Irrit. 2: H315 Skin Sens. 1B: H317
Morpholine, 4-(1-oxo-2-propenyl)-	5117-12-4	<8	Acute Tox. 4 : H302 Skin Sens. 1: H317 Eye Dam. 1: H318 STOT RE 2 : H373
Tricyclo decane dimethyl diacrylate	42594-17-2	<3	Skin Irrit. 2: H315 Eye Irrit. 2: H319 STOT Single Exp. 3: H335 Aquatic Chronic 2: H411
Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-	75980-60-8	<9	Repr. 2: H361
Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide	162881-26-7	<1.5	Skin Sens. 1: H317 Aquatic Chronic 4: H413

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

4. First aid measures

4.1. Description of first aid measures

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

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

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

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

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

Eyes: Contact with eye will be irritating.

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

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

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

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

no information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.

Unsuitable extinguishing media:

Water, High-pressure water jet.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.
Flash Point: 133deg.C (open cup)

5.3. Advice for firefighters

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

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

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

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections

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

7. Handling and storage

7.1 Precautions for safe handling

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

7.2 Conditions for safe storage, including any incompatibilities

Keep containers tightly closed. Do not store the product in high or freezing temperatures. Keep the product

out of direct sunlight. Do not store the product with metals, amines, free radical initiators, oxidising agents.

7.3 Specific end use(s): Inkjet Printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

Derived No-Effect Level (DNEL)

— Isobornyl acrylate:

[Long term exposure] no hazard identified

[Short term exposure] no hazard identified

— Morpholine, 4-(1-oxo-2-propenyl)-:

[Long term exposure] 132.24 mg/m³

[Short term exposure] 132.24 mg/m³

— Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-:

[Long term exposure] 3.5 mg/m³

[Short term exposure] no hazard identified

— Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide:

[Long term exposure] 21 mg/m³

[Short term exposure] hazard unknown (no further information necessary)

8.2. Exposure controls

Appropriate engineering controls

Provide general and/or local exhaust ventilation.

Respiratory protection:

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

Hand protection:

Employee must wear appropriate protective impervious gloves to prevent contact with the ink. Recommended Chemical Protective Gloves are ethylene vinyl alcohol (EVA) Gloves and Laminate gloves. Laminate gloves are made by cutting and then heat-sealing patterns of various hand sizes from laminated sheets of EVA sealed between layers of polyethylene.

Eye protection:

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

Skin protection:

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

Hygiene measures:

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

Environmental exposure control:

Avoid release to the environment.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Clear Liquid
Odour:	Characteristic odour
Odour threshold:	Not defined
pH:	Not applicable
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	No data available
Flash point:	133deg.C (open cup)
Evaporation rate:	No data available
Flammability (solid, gas)	Not applicable
Upper/lower flammability or explosive limits:	No data available
Vapor pressure:	No data available
Vapor density:	No data available
Relative density:	1.1
Solubility(ies):	Slightly soluble
Partition coefficient: n-octanol/water:	No data available
Auto-ignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	No data available
Explosive properties:	No data available
Oxidizing properties:	No data available
Volatile organic compounds (VOC) content:	No data available

9.2 Other information

No information.

10. Stability and reactivity

10.1 Reactivity:

High temperatures and UV light may cause rapid polymerization.

10.2 Chemical stability:

Stable under normal temperature.

10.3 Possibility of hazardous reactions:

Not expected.

10.4 Conditions to avoid:

Elevated temperatures/heat, UV light, when not in use.

10.5 Incompatible materials:

Avoid contact with acids, amines, free radical initiators, oxidizing agents.

10.6 Hazardous decomposition products:

Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.

11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity:

LD50 (Oral) > 300mg/kg (Rat)

Serious eye damage/eye irritation:

Causes serious eye damage.

- Morpholine, 4-(1-oxo-2-propenyl)-

Causes serious eye irritation.

- 2-Phenoxyethyl acrylate
- Isobornyl acrylate
- Tricyclo decane dimethyl diacrylate

Skin corrosion/irritation:

OECD404 Result: Corrosive (Rabbit)

Respiratory or skin sensitisation:

May cause an allergic skin reaction.

- (5-Ethyl-1,3-dioxan-5-yl)methyl acrylate
- Morpholine, 4-(1-oxo-2-propenyl)-
- Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide

Germ cell mutagenicity:

no data available.

Reproductive toxicity:

Suspected of damaging fertility or the unborn child.

- Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-

Carcinogenicity:

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

Specific target organ toxicity - single exposure, (STOT-SE):

no data available.

Specific target organ toxicity - repeat exposure, (STOT-RE):

May cause damage to organs through prolonged or repeated exposure.

- Morpholine, 4-(1-oxo-2-propenyl)-

Aspiration hazard:

no data available.

12. Ecological information

12.1. Toxicity:

Toxic to aquatic life with long lasting effects.

- Isobornyl acrylate
- Tricyclo decane dimethyl diacrylate

May cause long lasting harmful effects to aquatic life.

- Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide

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

Product:	Dispose as hazardous waste. Packaging with product residues must be disposed of under the same conditions as the product itself.
Recommended waste code:	08 03 12* (waste ink containing dangerous substances)
Uncleaned packaging:	15 01 10* (packaging, the residues of dangerous substances or hazardous waste contain or are contaminated by dangerous substances or special wastes)
Recommendation:	Uncontaminated packaging can be recycled. Non-cleanable packaging must be disposed of in the same way as the substance.

14. Transport information

14.1 UN Class/UN Number

ADR/ADG/DOT, IMDG, or IATA : 3066

14.2 UN proper shipping name

ADR/ADG/DOT, IMDG, or IATA : Paint related material

14.3 Transport hazard class(es)

ADR/ADG/DOT, IMDG, or IATA : 8

14.4 Packing group

ADR/ADG/DOT, IMDG, or IATA : III

14.5 Environmental hazards

ADR/ADG/DOT, IMDG, or IATA : Environmentally hazardous substance, liquid, n.o.s.

14.6. Special precautions for user

ADR/ADG/DOT, IMDG, or IATA : Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.

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

15. Regulatory information

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

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

Australia Information:

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

Canadian Information:

Canadian Ingredient Disclosure list (limit 0.1%)

None of the ingredients are listed.

Canadian Ingredient Disclosure list (limit 1%)

None of the ingredients are listed.

International Information:

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

16. Other information

List of relevant H-Statements:

(Reference for Section 3. "Composition/information on ingredients")

— H302: Harmful if swallowed.
— H315: Causes skin irritation.
— H317: May cause an allergic skin reaction.
— H318: Causes serious eye damage.
— H319: Causes serious eye irritation.
— H335: May cause respiratory irritation.
— H361: Suspected of damaging fertility or the unborn child.
— H373: May cause damage to organs through prolonged or repeated exposure.
— H411: Toxic to aquatic life with long lasting effects.
— H413: May cause long lasting harmful effects to aquatic life.

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

Safety Data Sheet

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

1.1. Product identifier

US-PR

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

Phone: + 81-53-484-1224 FAX: + 81-53-484-1226

E-mail:

Revised date: 27-Feb-2020

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is classified as hazardous according to GHS.

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Sensitisation (Skin)	Category 1B
Reproductive toxicity	Category 2
Specific target organ toxicity (Single exposure)	Category 3
Hazardous to the aquatic environment (Chronic Hazard)	Category 1

2.2. GHS label elements, including precautionary statements

Pictgram(s)

Signal Word: Danger

Hazard Statement:

Causes skin irritation.

Causes serious eye damage.

May cause an allergic skin reaction.

Suspected of damaging fertility or the unborn child.
May cause respiratory irritation.
Very toxic to aquatic life with long lasting effects.

Precautionary statements — Prevention:

Obtain special instructions before use.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Wash thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements — Response:

IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER/doctor.

2.3. Other hazards

Potential Health Effects:

Eyes:	Causes severe eye injury which may persist for several days.
Skin:	Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation:	Exposure to vapors (mist) may be harmful to the unborn child and at the risk of impaired fertility and irritate nose, throat/respiratory system.
Ingestion:	May cause injury of mouth, throat, and stomach.
Chronic Health Hazards:	Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity:	None of the ingredients in this ink is listed by IARC as a carcinogen. (1, 2A and 2B)
Others:	No information.

3. Composition/information on ingredients

Chemical nature: mixture

Composition	CAS No.	% By Weight	GHS Classification
Isobornyl acrylate	5888-33-5	30-50	Skin Irrit. 2: H315 Eye Irrit. 2: H319 STOT Single Exp. 3: H335 Aquatic Chronic 2: H411
2-Hydroxy-3-phenoxypropyl	16969-10-1	30-50	Eye Damage 1: H318 Skin Sens. 1B: H317 Aquatic Chronic 2: H411
acrylate	103-11-7	10-20	Skin Irrit. 2: H315 Skin Sens. 1: H317 STOT SE 3: H335
Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-	75980-60-8	10-20	Repr. 2: H361

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

4. First aid measures

4.1. Description of first aid measures

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

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

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

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

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

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

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

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

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

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

no information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.

Unsuitable extinguishing media:

Water, High-pressure water jet.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.
Flash Point: > 94deg.C

5.3. Advice for firefighters

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

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

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

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections

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

7. Handling and storage

7.1 Precautions for safe handling

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

7.2 Conditions for safe storage, including any incompatibilities

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

7.3 Specific end use(s): Inkjet Printing

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:
Derived No-Effect Level (DNEL)

— Isobornyl acrylate:

[Long term exposure] no hazard identified

[Short term exposure] no hazard identified

— Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-:

[Long term exposure] 3.5 mg/m³

[Short term exposure] no hazard identified

8.2. Exposure controls

Appropriate engineering controls

Provide general and/or local exhaust ventilation.

Respiratory protection:

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

Hand protection:

Employee must wear appropriate protective impervious gloves to prevent contact with the ink. Recommended Chemical Protective Gloves are ethylene vinyl alcohol (EVA) Gloves and Laminate gloves. Laminate gloves are made by cutting and then heat-sealing patterns of various hand sizes from laminated sheets of EVA sealed between layers of polyethylene.

Eye protection:

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

Skin protection:

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

Hygiene measures:

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

Environmental exposure control:

Avoid release to the environment.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Clear Liquid

Odour:	Characteristic odour
Odour threshold:	Not defined
pH:	Not applicable
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	No data available
Flash point:	> 94deg.C
Evaporation rate:	No data available
Flammability (solid, gas)	Not applicable
Upper/lower flammability or explosive limits:	No data available
Vapor pressure:	No data available
Vapor density:	No data available
Relative density:	1.0-1.1
Solubility(ies):	Slightly soluble
Partition coefficient: n-octanol/water:	No data available
Auto-ignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	No data available
Explosive properties:	No data available
Oxidizing properties:	No data available
Volatile organic compounds (VOC) content:	No data available

9.2 Other information

No information.

10. Stability and reactivity

10.1 Reactivity:

High temperatures and UV light may cause rapid polymerization.

10.2 Chemical stability:

Stable under normal temperature.

10.3 Possibility of hazardous reactions:

Not expected.

10.4 Conditions to avoid:

Elevated temperatures/heat, UV light, when not in use.

10.5 Incompatible materials:

Avoid contact with acids, amines, free radical initiators, oxidizing agents.

10.6 Hazardous decomposition products:

Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.

11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity: None of the ingredients in this ink is classified as acute toxicant.

Serious eye damage/eye irritation:

Causes serious eye damage.

- 2-Hydroxy-3-phenoxypropyl

Causes serious eye irritation.

- Isobornyl acrylate

Skin corrosion/irritation:

Causes skin irritation.

- Isobornyl acrylate
- acrylate

Respiratory or skin sensitisation:

May cause an allergic skin reaction.

- 2-Hydroxy-3-phenoxypropyl
- acrylate

Germ cell mutagenicity:

no data available.

Reproductive toxicity:

Suspected of damaging fertility or the unborn child.

- Phospine oxide, diphenyl(2,4,6-trimethylbenzoyl)-

Carcinogenicity:

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

Specific target organ toxicity - single exposure, (STOT-SE):

no data available.

Specific target organ toxicity - repeat exposure, (STOT-RE):

no data available.

Aspiration hazard:

no data available.

12. Ecological information

12.1. Toxicity:

Toxic to aquatic life with long lasting effects.

- Isobornyl acrylate
- 2-Hydroxy-3-phenoxypropyl

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

Product:	Dispose as hazardous waste. Packaging with product residues must be disposed of under the same conditions as the product itself.
Recommended waste code:	08 03 12* (waste ink containing dangerous substances)
Uncleaned packaging:	15 01 10* (packaging, the residues of dangerous substances or hazardous waste contain or are contaminated by dangerous substances or special wastes)
Recommendation:	Uncontaminated packaging can be recycled. Non-cleanable packaging must be disposed of in the same way as the substance.

14. Transport information

14.1 UN Class/UN Number

ADR/ADG/DOT, IMDG, or IATA : 3082

14.2 UN proper shipping name

ADR/ADG/DOT, IMDG, or IATA : Environmentall hazardous substance, liquid, n.o.s.(Isobornyl acrylate)

14.3 Transport hazard class(es)

ADR/ADG/DOT, IMDG, or IATA : 9

14.4 Packing group

ADR/ADG/DOT, IMDG, or IATA : III

14.5 Environmental hazards

ADR/ADG/DOT, IMDG, or IATA : Environmentally hazardous substance, liquid, n.o.s.

14.6. Special precautions for user

ADR/ADG/DOT, IMDG, or IATA : Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.

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

15. Regulatory information

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

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

Australia Information:

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

Canadian Information:

Canadian Ingredient Disclosure list (limit 0.1%)

None of the ingredients are listed.

Canadian Ingredient Disclosure list (limit 1%)

acrylate

International Information:

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

16. Other information

List of relevant H-Statements:

(Reference for Section 3. "Composition/information on ingredients")

— H315: Causes skin irritation.

— H317: May cause an allergic skin reaction.

— H318: Causes serious eye damage.

— H319: Causes serious eye irritation.

— H335: May cause respiratory irritation.

— H361: Suspected of damaging fertility or the unborn child.

— H411: Toxic to aquatic life with long lasting effects.

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

Safety Data Sheet

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

1.1. Product identifier

US-CL

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

Cleaning liquid

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

Phone: + 81-53-484-1224 FAX: + 81-53-484-1226

E-mail:

Revised date: 27-Feb-2020

1.4. Emergency telephone:

2. Hazard identification

2.1. Classification of the substance or mixture

This product is classified as hazardous according to GHS.

Serious eye damage/eye irritation Category 2A

2.2. GHS label elements, including precautionary statements

Pictgram(s)

Signal Word: Warning

Hazard Statement:

Causes serious eye irritation.

Precautionary statements — Prevention:

Wash… thoroughly after handling.

Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements — Response:

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and

easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.

2.3. Other hazards

Potential Health Effects:

Eyes:	Causes severe eye injury which may persist for several days.
Skin:	Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation:	Exposure to vapors (mist) will cause respiratory irritation and anesthesia.
Ingestion:	May cause injury of mouth, throat, and stomach.
Chronic Health Hazards:	Repeated skin contact may cause a persistent irritation or dermatitis.
Carcinogenicity:	None of the ingredients in this ink is listed by IARC as a carcinogen. (1, 2A and 2B)
Others:	No information.

3. Composition/information on ingredients

Chemical nature: mixture

Composition	CAS No.	% By Weight	GHS Classification
Diethylene glycol mono-n-butyl ether acetate	124-17-4	>99	Skin Irrit. 2: H315

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

4. First aid measures

4.1. Description of first aid measures

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

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

Eyes:	Causes severe eye injury which may persist for several days.
Skin:	Contact with skin may cause irritation, swelling or redness, allergic sensitization.
Inhalation:	Exposure to vapors (mist) will cause respiratory irritation and anesthesia.
Ingestion:	May cause injury of mouth, throat, and stomach.

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

no information

5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.

Unsuitable extinguishing media:

Water, High-pressure water jet.

5.2. Special hazards arising from the substance or mixture

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

Flash Point: 124deg.C

5.3. Advice for firefighters

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

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

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

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections

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

7. Handling and storage

7.1 Precautions for safe handling

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

7.2 Conditions for safe storage, including any incompatibilities

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

7.3 Specific end use(s): Cleaning liquid

8. Exposure controls/ personal protection

8.1. Control parameters

Occupational Exposure Limits:

Derived No-Effect Level (DNEL)

— Diethylene glycol mono-n-butyl ether acetate:

[Long term exposure] no hazard identified

[Short term exposure] no hazard identified

8.2. Exposure controls

Appropriate engineering controls

Provide general and/or local exhaust ventilation.

Respiratory protection:

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

Hand protection:

Employee must wear appropriate protective impervious gloves to prevent contact with the ink. Recommended Chemical Protective Gloves are ethylene vinyl alcohol (EVA) Gloves and Laminate gloves. Laminate gloves are made by cutting and then heat-sealing patterns of various hand sizes from laminated sheets of EVA sealed between layers of polyethylene.

Eye protection:

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

Skin protection:

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

Hygiene measures:

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

Environmental exposure control:

Avoid release to the environment.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Clear Liquid
Odour:	Slightly odour
Odour threshold:	Not defined
pH:	Not applicable
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	No data available
Flash point:	124deg.C
Evaporation rate:	No data available
Flammability (solid, gas)	Not applicable
Upper/lower flammability or explosive limits:	No data available
Vapor pressure:	No data available
Vapor density:	No data available
Relative density:	0.9-1.0
Solubility(ies):	soluble
Partition coefficient: n-octanol/water:	No data available
Auto-ignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	No data available
Explosive properties:	No data available
Oxidizing properties:	No data available
Volatile organic compounds (VOC) content:	980 grams/liter

9.2 Other information

No information.

10. Stability and reactivity

10.1 Reactivity:

High temperatures and UV light may cause rapid polymerization.

10.2 Chemical stability:

Stable under normal temperature.

10.3 Possibility of hazardous reactions:

Not expected.

10.4 Conditions to avoid:

Elevated temperatures/heat, UV light, when not in use.

10.5 Incompatible materials:

Avoid contact with acids, amines, free radical initiators, oxidizing agents.

10.6 Hazardous decomposition products:

Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.

11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity: None of the ingredients in this ink is classified as acute toxicant.

Serious eye damage/eye irritation:

no data available.

Skin corrosion/irritation:

Causes skin irritation.

- Diethylene glycol mono-n-butyl ether acetate

Respiratory or skin sensitisation:

no data available.

Germ cell mutagenicity:

no data available.

Reproductive toxicity:

no data available.

Carcinogenicity:

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

Specific target organ toxicity - single exposure, (STOT-SE):

no data available.

Specific target organ toxicity - repeat exposure, (STOT-RE):

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

Product:	Dispose as hazardous waste. Packaging with product residues must be disposed of under the same conditions as the product itself.
Recommended waste code:	08 03 12* (waste ink containing dangerous substances)
Uncleaned packaging:	15 01 10* (packaging, the residues of dangerous substances or hazardous waste contain or are contaminated by dangerous substances or special wastes)
Recommendation:	Uncontaminated packaging can be recycled. Non-cleanable packaging must be disposed of in the same way as the substance.

14. Transport information

14.1 UN Class/UN Number

ADR/ADG/DOT, IMDG, or IATA : Not regulated

14.2 UN proper shipping name

ADR/ADG/DOT, IMDG, or IATA : Not regulated

14.3 Transport hazard class(es)

ADR/ADG/DOT, IMDG, or IATA : Not regulated

14.4 Packing group

ADR/ADG/DOT, IMDG, or IATA : Not regulated

14.5 Environmental hazards

ADR/ADG/DOT, IMDG, or IATA : Not regulated

14.6. Special precautions for user

ADR/ADG/DOT, IMDG, or IATA : Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.

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

15. Regulatory information

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

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

Australia Information:

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

Canadian Information:

Canadian Ingredient Disclosure list (limit 0.1%)

None of the ingredients are listed.

Canadian Ingredient Disclosure list (limit 1%)

None of the ingredients are listed.

International Information:

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

16. Other information

List of relevant H-Statements:

(Reference for Section 3. "Composition/information on ingredients")

— H315: Causes skin irritation.

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