

**1. Identification of the substance/preparation and of the company/undertaking**

1.1 Product identifier

Trade name: NEW ES100 INK-CY

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

Material of Use: Industrial applications: Inkjet ink for drop-on-demand digital printing process.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier: Manufacturer/Supplier: DIGITAL GRAPHICS INCORPORATION  
271-6 GOEUP-DONG, YANGJU-SI, KOREA  
TEL:+82-31-820-8900

**2. Hazards identification**

2.1 Classification of the substance or mixture

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



Danger

*Acute Tox. 4 H302 Harmful if swallowed.*

*Skin Irrit.2 ; H315 Causes skin irritation.*

*Eye Irrit. 2 H318 Causes serious eye irritation.*

*STOT SE 3: H336 May cause drowsiness or dizziness.*

2.2 Label elements

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

Hazard pictograms



Signal word: Danger

Hazard statements:

H302 Harmful if swallowed.

H315 Causes skin irritation.

H318 Causes serious eye irritation.

H336 May cause drowsiness or dizziness.

Precautionary statements:

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P280 Wear protective gloves/ eye protection/ face protection.

P302+P352 - IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P332+P313 - If skin irritation occurs: Get medical advice/attention.

P337 + P313 - If eye irritation persists: Get medical advice/attention.

2.3 Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

**3. Composition/information on ingredients**

Chemical characterization: Mixture

Ink Jet printing ink in organic solvents.

Ingredients	CAS-No.	EINECS	EU registration No.	Percent	Classification
					Regulation (EC) No. 1272/2008 [CLP]
Dipropylene Glycol Monomethyl Ether	34590-94-8	252-104-2	Not available for the moment	1%–10%	–
2-Ethoxy Ethyl Ether	112-36-7	203-963-7	Not available for the moment	20%–40%	Skin Irrit.2 H315
Diethylene Glycol Ethyl Methyl Ether	1002-67-1	213-690-5	Not available for the moment	10%–30%	–
Gamma-Butyrolactone	96-48-0	202-509-5	Not available for the moment	10%–30%	Acute Tox. 4 H302 Eye Irrit. 2 H318 STOT.SE 3 H336

## **4. First aid measures**

### 4.1 Description of first aid measures

- Eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
Skin contact: Wash off with soap and plenty of water. Consult a physician.  
Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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

#### Potential acute health effects

- Eye contact : No known significant effects or critical hazards.  
Inhalation : No known significant effects or critical hazards.  
Skin contact : No known significant effects or critical hazards.  
Ingestion : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

- Eye contact : No specific data.  
Inhalation : No specific data.  
Skin contact : No specific data.  
Ingestion : No specific data.

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

Treat symptomatically.

## **5. Fire-fighting measures**

### 5.1 Extinguishing media

#### **Suitable extinguishing media**

Alcohol-resistant foam, dry chemical, carbon dioxide (CO<sub>2</sub>), water-spray.

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

Carbon oxides

### 5.3 Advice for firefighters

- Use breathing apparatus with independent air supply.  
Protective suit.

### 5.4 Further information

Use water spray to cool unopened containers

### 5.5 NFPA Ratings:

Health: 2 Flammability: 2 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

## **6. Accidental release measures**

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

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

### 6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

### 6.4 Reference to other sections

For disposal see section 13.

## **7. Handling and storage**

### 7.1 Handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

7.2 Conditions for safe storage, including any incompatibilities

Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end uses

no data available

**8. Exposure controls/personal protection**

8.1 Control parameters

Components with workplace control parameters

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**9. Physical and chemical properties**

1	Color	Cyan
2	Odor	Slight odor
3	Odor Threshold	No data available
4	Boiling point/boiling range of ink	176 °C or higher
5	Melting Point/Melting Range	No data available
6	Flash point of ink	72 °C
7	Evaporation Rate	No data available
8	Auto-Ignition Temperature	not below 220 °C
9	Decomposition Temperature	No data available
10	Flammability(solid, gas)	Not Applicable
11	Upper/lower Flammability or Explosive Limits	Lower limits: 2.7 vol% Upper limits: 15.6 vol% (gamma-Butyrolactone)
12	Explosive Properties	No data available
13	Vapour Pressure	No data available
14	Specific Gravity	1.007 ± 0.01(25°C)
15	Solubility	No data available
16	Water solubility	Easily soluble (Diethylene glycol diethyl ether)
17	Partition Coefficient:n-octanol/water	No data available
18	Viscosity	10.5 ± 0.5 cps

19	pH	Not applicable
20	Oxidizing properties	No data available
21	Vapor Density	Not Applicable
22	VOCs	798 g/L
23	Other Information	No data available

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

## **10. Stability and reactivity**

- 10.1 Reactivity  
no data available
- 10.2 Chemical stability  
no data available
- 10.3 Possibility of hazardous reactions  
no data available
- 10.4 Conditions to avoid  
Heat, flames and sparks.
- 10.5 Incompatible materials  
Strong oxidizing agents, Strong bases
- 10.6 Hazardous decomposition products  
Other decomposition products - no data available

## **11. Toxicological information**

- 11.1 Information on toxicological effects  
Routes of Overexposure: Eye, skin, inhalation, and oral ingestion  
**Acute Health Hazards:** Overexposure of the eye surface to ink may be mildly irritating. Overexposure of ink contact with the skin may cause irritation and in some people, swelling and redness. Intentional inhalation to ink vapors may result in respiratory tract irritation. Intentional or accidental oral ingestion may cause an upset stomach.  
**Chronic Health Hazards:** No information available  
**Mutagenicity:** No information available  
**Carcinogenicity:** No information available  
**Acute Toxicity Data:**  
2-Ethoxy Ethyl Ether:  
LD50/LC50: Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD50 = 4970 mg/kg; Skin, rabbit: LD50 = 6700 uL/kg.  
Dipropylene Glycol Monomethyl Ether:  
LD50/LC50: Oral, rat: LD50 = 5130 mg/kg; Dermal, rabbit: LD50 = 9500 mg/kg  
Diethylene Glycol Ethyl Methyl Ether:  
Oral LD50 >6,500mg/kg (Rats), Dermal LD50 >7,070mg/kg (Rabbit)  
Gamma-Butyrolactone:  
LD50/LC50: Dermal, guinea pig: LD50 = >5 gm/kg; Draize test, rabbit, skin: 500 uL Severe; Inhalation, rat: LC50 = >5100 mg/m<sup>3</sup>/4H; Oral, mouse: LD50 = 1460 mg/kg; Oral, rat: LD50 = 1540 mg/kg.  
**Inhalation:**  
Not available  
**Irritating:**  
Diethylene Glycol Ethyl Methyl Ether:  
Eye irritating: moderate irritant(P.I.I=2.5 Draize)  
Gamma-Butyrolactone:  
Irritating to eyes. (rabbit eyes, OECD Guideline 405)  
**Sensitization:**  
Not available  
**Mutagenicity:**  
Not available  
The information shown in SECTION 3, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## **12. Ecological information**

- 12.1 Toxicity  
Aquatic toxicity: No further relevant information available.
- 12.2 Persistence and degradability: No further relevant information available.
- 12.3 Bioaccumulative potential: No further relevant information available.
- 12.4 Mobility in soil: No further relevant information available.
- 12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6 Other adverse effects: No further relevant information available.

### **13. Disposal considerations**

#### 13.1 Waste treatment methods

##### Product

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

##### Contaminated packaging

Dispose of as unused product.

### **14. Transport information**

#### 14.1 UN number

ADR/RID: —            IMDG: —                            IATA: —

#### 14.2 UN proper shipping name

ADR/RID: Not dangerous goods

IMDG: Not dangerous goods

IATA: Not dangerous goods

#### 14.3 Transport hazard class(es)

ADR/RID: —            IMDG: —                            IATA: —

#### 14.4 Packaging group

ADR/RID: —            IMDG: —                            IATA: —

#### 14.5 Environmental hazards

ADR/RID: no            IMDG Marine pollutant: no            IATA: no

#### 14.6 Special precautions for user

no data available

### **15. Regulatory information**

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

EU Regulation (EC) No. 1272/2008 (CLP Regulations)

REACH Status: In compliance.

Pre-registration status: All components are listed or exempted.

Annex XIV - List of substances subject to authorization

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

#### 15.2 Chemical Safety Assessment

No data available

#### 15.3 Other information

##### **US Regulation:**

TSCA Section 4(a) Final Test Rules Regulated: Not regulated.

TSCA Section 8(a) Preliminary Assessment Information Rule (PAIR): Not regulated.

TSCA Section 8(a) Inventory Update Rule: All components on TSCA INVENTORY

TSCA Section 8(d) Health and Safety Study Reporting: Not regulated.

TSCA Section 12(b) One-Time Export Notification Regulated: Not regulated.

California Proposition 65: Not regulated.

### **16. Other information**

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

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

## **1. Identification of the substance/preparation and of the company/undertaking**

### 1.1 Product identifier

Trade name: NEW ES100 INK-MG

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

Material of Use: Industrial applications: Inkjet ink for drop-on-demand digital printing process.

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

Manufacturer/Supplier: Manufacturer/Supplier: DIGITAL GRAPHICS INCORPORATION  
271-6 GOEUP-DONG, YANGJU-SI, KOREA  
TEL:+82-31-820-8900

## **2. Hazards identification**

### 2.1 Classification of the substance or mixture

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



Danger

*Acute Tox. 4 H302 Harmful if swallowed.*

*Skin Irrit.2 ; H315 Causes skin irritation.*

*Eye Irrit. 2 H318 Causes serious eye irritation.*

*STOT SE 3: H336 May cause drowsiness or dizziness.*

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### 2.2 Label elements

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

Hazard pictograms



Signal word: Danger

Hazard statements:

H302 Harmful if swallowed.

H315 Causes skin irritation.

H318 Causes serious eye irritation.

H336 May cause drowsiness or dizziness.

Precautionary statements:

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P280 Wear protective gloves/ eye protection/ face protection.

P302+P352 - IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P332+P313 - If skin irritation occurs: Get medical advice/attention.

P337 + P313 - If eye irritation persists: Get medical advice/attention.

### 2.3 Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

## **3. Composition/information on ingredients**

Chemical characterization: Mixture

Ink Jet printing ink in organic solvents.

Ingredients	CAS-No.	EINECS	EU registration No.	Percent	Classification
					Regulation (EC) No. 1272/2008 [CLP]
Dipropylene Glycol Monomethyl Ether	34590-94-8	252-104-2	Not available for the moment	1%–10%	–
2-Ethoxy Ethyl Ether	112-36-7	203-963-7	Not available for the moment	30%–50%	Skin Irrit.2 H315
Diethylene Glycol Ethyl Methyl Ether	1002-67-1	213-690-5	Not available for the moment	1%–20%	–
Gamma-Butyrolactone	96-48-0	202-509-5	Not available for the moment	10%–30%	Acute Tox. 4 H302 Eye Irrit. 2 H318 STOT.SE 3 H336

## **4. First aid measures**

### 4.1 Description of first aid measures

- Eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
Skin contact: Wash off with soap and plenty of water. Consult a physician.  
Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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

#### Potential acute health effects

- Eye contact : No known significant effects or critical hazards.  
Inhalation : No known significant effects or critical hazards.  
Skin contact : No known significant effects or critical hazards.  
Ingestion : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

- Eye contact : No specific data.  
Inhalation : No specific data.  
Skin contact : No specific data.  
Ingestion : No specific data.

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

Treat symptomatically.

## **5. Fire-fighting measures**

### 5.1 Extinguishing media

#### **Suitable extinguishing media**

Alcohol-resistant foam, dry chemical, carbon dioxide (CO<sub>2</sub>), water-spray.

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

Carbon oxides

### 5.3 Advice for firefighters

- Use breathing apparatus with independent air supply.  
Protective suit.

### 5.4 Further information

Use water spray to cool unopened containers

### 5.5 NFPA Ratings:

Health: 2 Flammability: 2 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

## **6. Accidental release measures**

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

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

### 6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

### 6.4 Reference to other sections

For disposal see section 13.

## **7. Handling and storage**

### 7.1 Handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

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

Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

#### 7.3 Specific end uses

no data available

### **8. Exposure controls/personal protection**

#### 8.1 Control parameters

Components with workplace control parameters

#### 8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

### **9. Physical and chemical properties**

1	Color	Magenta
2	Odor	Slight odor
3	Odor Threshold	No data available
4	Boiling point/boiling range of ink	176 °C or higher
5	Melting Point/Melting Range	No data available
6	Flash point of ink	72 °C
7	Evaporation Rate	No data available
8	Auto-Ignition Temperature	not below 220 °C
9	Decomposition Temperature	No data available
10	Flammability(solid, gas)	Not Applicable
11	Upper/lower Flammability or Explosive Limits	Lower limits: 2.7 vol% Upper limits: 15.6 vol% (gamma-Butyrolactone)
12	Explosive Properties	No data available
13	Vapour Pressure	No data available
14	Specific Gravity	1.012 ± 0.01(25°C)
15	Solubility	No data available
16	Water solubility	Easily soluble (Diethylene glycol diethyl ether)
17	Partition Coefficient:n-octanol/water	No data available
18	Viscosity	10.5 ± 0.5 cps



19	pH	Not applicable
20	Oxidizing properties	No data available
21	Vapor Density	Not Applicable
22	VOCs	805 g/L
23	Other Information	No data available

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

## **10. Stability and reactivity**

- 10.1 Reactivity  
no data available
- 10.2 Chemical stability  
no data available
- 10.3 Possibility of hazardous reactions  
no data available
- 10.4 Conditions to avoid  
Heat, flames and sparks.
- 10.5 Incompatible materials  
Strong oxidizing agents, Strong bases
- 10.6 Hazardous decomposition products  
Other decomposition products - no data available

## **11. Toxicological information**

- 11.1 Information on toxicological effects  
Routes of Overexposure: Eye, skin, inhalation, and oral ingestion  
**Acute Health Hazards:** Overexposure of the eye surface to ink may be mildly irritating. Overexposure of ink contact with the skin may cause irritation and in some people, swelling and redness. Intentional inhalation to ink vapors may result in respiratory tract irritation. Intentional or accidental oral ingestion may cause an upset stomach.  
**Chronic Health Hazards:** No information available  
**Mutagenicity:** No information available  
**Carcinogenicity:** No information available  
**Acute Toxicity Data:**  
2-Ethoxy Ethyl Ether:  
LD50/LC50: Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD50 = 4970 mg/kg; Skin, rabbit: LD50 = 6700 uL/kg.  
Dipropylene Glycol Monomethyl Ether:  
LD50/LC50: Oral, rat: LD50 = 5130 mg/kg; Dermal, rabbit: LD50 = 9500 mg/kg  
Diethylene Glycol Derivative:  
Oral LD50 >6,500mg/kg (Rats), Dermal LD50 >7,070mg/kg (Rabbit)  
Gamma-Butyrolactone:  
LD50/LC50: Dermal, guinea pig: LD50 = >5 gm/kg; Draize test, rabbit, skin: 500 uL Severe; Inhalation, rat: LC50 = >5100 mg/m<sup>3</sup>/4H; Oral, mouse: LD50 = 1460 mg/kg; Oral, rat: LD50 = 1540 mg/kg.  
**Inhalation:**  
Not available  
**Irritating:**  
Diethylene Glycol Ethyl Methyl Ether:  
Eye irritating: moderate irritant(P.I.I=2.5 Draize)  
Gamma-Butyrolactone:  
Irritating to eyes. (rabbit eyes, OECD Guideline 405)  
**Sensitization:**  
Not available  
**Mutagenicity:**  
Not available  
The information shown in SECTION 3, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## **12. Ecological information**

- 12.1 Toxicity  
Aquatic toxicity: No further relevant information available.
- 12.2 Persistence and degradability: No further relevant information available.
- 12.3 Bioaccumulative potential: No further relevant information available.
- 12.4 Mobility in soil: No further relevant information available.
- 12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6 Other adverse effects: No further relevant information available.

### **13. Disposal considerations**

#### 13.1 Waste treatment methods

##### Product

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

##### Contaminated packaging

Dispose of as unused product.

### **14. Transport information**

#### 14.1 UN number

ADR/RID: —            IMDG: —                            IATA: —

#### 14.2 UN proper shipping name

ADR/RID: Not dangerous goods

IMDG: Not dangerous goods

IATA: Not dangerous goods

#### 14.3 Transport hazard class(es)

ADR/RID: —            IMDG: —                            IATA: —

#### 14.4 Packaging group

ADR/RID: —            IMDG: —                            IATA: —

#### 14.5 Environmental hazards

ADR/RID: no            IMDG Marine pollutant: no            IATA: no

#### 14.6 Special precautions for user

no data available

### **15. Regulatory information**

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

EU Regulation (EC) No. 1272/2008 (CLP Regulations)

REACH Status: In compliance.

Pre-registration status: All components are listed or exempted.

Annex XIV - List of substances subject to authorization

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

#### 15.2 Chemical Safety Assessment

No data available

#### 15.3 Other information

##### **US Regulation:**

TSCA Section 4(a) Final Test Rules Regulated: Not regulated.

TSCA Section 8(a) Preliminary Assessment Information Rule (PAIR): Not regulated.

TSCA Section 8(a) Inventory Update Rule: All components on TSCA INVENTORY

TSCA Section 8(d) Health and Safety Study Reporting: Not regulated.

TSCA Section 12(b) One-Time Export Notification Regulated: Not regulated.

California Proposition 65: Not regulated.

### **16. Other information**

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

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

**1. Identification of the substance/preparation and of the company/undertaking**

1.1 Product identifier

Trade name: NEW ES100 INK-YE

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

Material of Use: Industrial applications: Inkjet ink for drop-on-demand digital printing process.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier: DIGITAL GRAPHICS INCOPORATION  
271-6 GOEUP-DONG, YANGJU-SI, KOREA  
TEL:+82-31-820-8900

**2. Hazards identification**

2.1 Classification of the substance or mixture

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



Danger

*Acute Tox. 4 H302 Harmful if swallowed.*

*Skin Irrit.2 ; H315 Causes skin irritation.*

*Eye Irrit. 2 H318 Causes serious eye irritation.*

*STOT SE 3: H336 May cause drowsiness or dizziness.*

---

2.2 Label elements

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

Hazard pictograms



Signal word: Danger

Hazard statements:

H302 Harmful if swallowed.

H315 Causes skin irritation.

H318 Causes serious eye irritation.

H336 May cause drowsiness or dizziness.

Precautionary statements:

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P280 Wear protective gloves/ eye protection/ face protection.

P302+P352 - IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P332+P313 - If skin irritation occurs: Get medical advice/attention.

P337 + P313 - If eye irritation persists: Get medical advice/attention.

2.3 Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

**3. Composition/information on ingredients**

Chemical characterization: Mixture

Ink Jet printing ink in organic solvents.

Ingredients	CAS-No.	EINECS	EU registration No.	Percent	Classification
					67/548/EEC Regulation (EC) No. 1272/2008 [CLP]
Dipropylene Glycol Monomethyl Ether	34590-94-8	252-104-2	Not available for the moment	1%–10%	–
2-Ethoxy Ethyl Ether	112-36-7	203-963-7	Not available for the moment	30%–50%	Skin Irrit.2 H315
Diethylene Glycol Ethyl Methyl Ether	1002-67-1	213-690-5	Not available for the moment	1%–20%	–
Gamma-Butyrolactone	96-48-0	202-509-5	Not available for the moment	10%–30%	Acute Tox. 4 H302 Eye Irrit. 2 H318 STOT.SE 3 H336

#### **4. First aid measures**

##### 4.1 Description of first aid measures

- Eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
 Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
 Skin contact: Wash off with soap and plenty of water. Consult a physician.  
 Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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

###### Potential acute health effects

- Eye contact : No known significant effects or critical hazards.  
 Inhalation : No known significant effects or critical hazards.  
 Skin contact : No known significant effects or critical hazards.  
 Ingestion : No known significant effects or critical hazards.

###### Over-exposure signs/symptoms

- Eye contact : No specific data.  
 Inhalation : No specific data.  
 Skin contact : No specific data.  
 Ingestion : No specific data.

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

Treat symptomatically.

#### **5. Fire-fighting measures**

##### 5.1 Extinguishing media

###### **Suitable extinguishing media**

Alcohol-resistant foam, dry chemical, carbon dioxide (CO<sub>2</sub>), water-spray.

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

Carbon oxides

##### 5.3 Advice for firefighters

Use breathing apparatus with independent air supply.  
 Protective suit.

##### 5.4 Further information

Use water spray to cool unopened containers

##### 5.5 NFPA Ratings:

Health: 2 Flammability: 2 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

#### **6. Accidental release measures**

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

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

##### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

##### 6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

##### 6.4 Reference to other sections

For disposal see section 13.

#### **7. Handling and storage**

### 7.1 Handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

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

Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

### 7.3 Specific end uses

no data available

## **8. Exposure controls/personal protection**

### 8.1 Control parameters

Components with workplace control parameters

### 8.2 Exposure controls

Components	ACGIH: TLV	OSHA: PEL
Nickel compounds	0.2mg/m <sup>3</sup>	1mg/m <sup>3</sup>

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

## **9. Physical and chemical properties**

1	Color	Yellow
2	Odor	Slight odor
3	Odor Threshold	No data available
4	Boiling point/boiling range of ink	176 °C or higher
5	Melting Point/Melting Range	No data available
6	Flash point of ink	72 °C
7	Evaporation Rate	No data available
8	Auto-Ignition Temperature	not below 220 °C
9	Decomposition Temperature	No data available
10	Flammability(solid, gas)	Not Applicable
11	Upper/lower Flammability or Explosive Limits	Lower limits: 2.7 vol% Upper limits: 15.6 vol% (gamma-Butyrolactone)
12	Explosive Properties	No data available
13	Vapour Pressure	No data available
14	Specific Gravity	1.009 ± 0.01(25°C)
15	Solubility	No data available
16	Water solubility	Easily soluble (Diethylene glycol diethyl ether)

17	Partition Coefficient:n-octanol/water	No data available
18	Viscosity	10.5 ± 0.5 cps
19	pH	Not applicable
20	Oxidizing properties	No data available
21	Vapor Density	Not Applicable
22	VOCs	812 g/L
23	Other Information	No data available

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

## **10. Stability and reactivity**

### 10.1 Reactivity

no data available

### 10.2 Chemical stability

no data available

### 10.3 Possibility of hazardous reactions

no data available

### 10.4 Conditions to avoid

Heat, flames and sparks.

### 10.5 Incompatible materials

Strong oxidizing agents, Strong bases

### 10.6 Hazardous decomposition products

Other decomposition products - no data available

## **11. Toxicological information**

### 11.1 Information on toxicological effects

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

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

**Chronic Health Hazards:** No information available

**Mutagenicity:** No information available

**Carcinogenicity:** Contains Nickel compounds

IARC: Group 1

NTP: Known to be human carcinogen

Proposition 65: Known to cause cancer

#### **Acute Toxicity Data:**

2-Ethoxy Ethyl Ether:

LD50/LC50: Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD50 = 4970 mg/kg; Skin, rabbit: LD50 = 6700 uL/kg.

Dipropylene Glycol Monomethyl Ether:

LD50/LC50: Oral, rat: LD50 = 5130 mg/kg; Dermal, rabbit: LD50 = 9500 mg/kg

Diethylene Glycol Ethyl methyl Ether:

Oral LD50 >6,500mg/kg (Rats), Dermal LD50 >7,070mg/kg (Rabbit)

Gamma-Butyrolactone:

LD50/LC50: Dermal, guinea pig: LD50 = >5 gm/kg; Draize test, rabbit, skin: 500 uL Severe; Inhalation, rat: LC50 = >5100 mg/m<sup>3</sup>/4H; Oral, mouse: LD50 = 1460 mg/kg; Oral, rat: LD50 = 1540 mg/kg.

#### **Inhalation:**

Not available

#### **Irritating:**

Diethylene Glycol Ethyl Methyl Ether:

Eye irritating: moderate irritant(P.I.I=2.5 Draize)

Gamma-Butyrolactone:

Irritating to eyes. (rabbit eyes, OECD Guideline 405)

#### **Sensitization:**

Not available

#### **Mutagenicity:**

Not available

The information shown in SECTION 3, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## **12. Ecological information**

### 12.1 Toxicity

Acquatic toxicity: No further relevant information available.

### 12.2 Persistence and degradability: No further relevant information available.

### 12.3 Bioaccumulative potential: No further relevant information available.

### 12.4 Mobility in soil: No further relevant information available.

### 12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

### 12.6 Other adverse effects: No further relevant information available.

## **13. Disposal considerations**

### 13.1 Waste treatment methods

Product

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

## **14. Transport information**

### 14.1 UN number

ADR/RID: —            IMDG: —                            IATA: —

### 14.2 UN proper shipping name

ADR/RID: Not dangerous goods

IMDG: Not dangerous goods

IATA: Not dangerous goods

### 14.3 Transport hazard class(es)

ADR/RID: —            IMDG: —                            IATA: —

### 14.4 Packaging group

ADR/RID: —            IMDG: —                            IATA: —

### 14.5 Environmental hazards

ADR/RID: no            IMDG Marine pollutant: no            IATA: no

### 14.6 Special precautions for user

no data available

## **15. Regulatory information**

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

EU Regulation (EC) No. 1272/2008 (CLP Regulations)

REACH Status: In compliance.

Pre-registration status: All components are listed or exempted.

Annex XIV - List of substances subject to authorization

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

### 15.2 Chemical Safety Assessment

No data available

### 15.3 Other information

**US Regulation:**

TSCA Section 4(a) Final Test Rules Regulated: Not regulated.

TSCA Section 8(a) Preliminary Assessment Information Rule (PAIR): Not regulated.

TSCA Section 8(a) Inventory Update Rule: All components on TSCA INVENTORY

TSCA Section 8(d) Health and Safety Study Reporting: Not regulated.

TSCA Section 12(b) One-Time Export Notification Regulated: Not regulated.

California Proposition 65: Nickel Compound in Yellow Pigment.

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

## **16. Other information**

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

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

**1. Identification of the substance/preparation and of the company/undertaking**

1.1 Product identifier

Trade name: NEW ES100 INK-BK

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

Material of Use: Industrial applications: Inkjet ink for drop-on-demand digital printing process.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier: DIGITAL GRAPHICS INCORPORATION  
271-6 GOEUP-DONG, YANGJU-SI, KOREA  
TEL:+82-31-820-8900

**2. Hazards identification**

2.1 Classification of the substance or mixture

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



Danger

*Acute Tox. 4 H302 Harmful if swallowed.*

*Skin Irrit.2 ; H315 Causes skin irritation.*

*Eye Irrit. 2 H318 Causes serious eye irritation.*

*STOT SE 3: H336 May cause drowsiness or dizziness.*

---

2.2 Label elements

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

Hazard pictograms



Signal word: Danger

Hazard statements:

H302 Harmful if swallowed.

H315 Causes skin irritation.

H318 Causes serious eye irritation.

H336 May cause drowsiness or dizziness.

Precautionary statements:

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P280 Wear protective gloves/ eye protection/ face protection.

P302+P352 - IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P332+P313 - If skin irritation occurs: Get medical advice/attention.

P337 + P313 - If eye irritation persists: Get medical advice/attention.

2.3 Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

**3. Composition/information on ingredients**

Chemical characterization: Mixture



Ink Jet printing ink in organic solvents.

Ingredients	CAS-No.	EINECS	EU registration No.	Percent	Classification
					Regulation (EC) No. 1272/2008 [CLP]
Dipropylene Glycol Monomethyl Ether	34590-94-8	252-104-2	Not available for the moment	1%–10%	–
2-Ethoxy Ethyl Ether	112-36-7	203-963-7	Not available for the moment	30%–50%	Skin Irrit.2 H315
Diethylene Glycol Ethyl Methyl Ether	1002-67-1	213-690-5	Not available for the moment	1%–20%	–
Gamma-Butyrolactone	96-48-0	202-509-5	Not available for the moment	10%–30%	Acute Tox. 4 H302 Eye Irrit. 2 H318 STOT.SE 3 H336

## **4. First aid measures**

### 4.1 Description of first aid measures

- Eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
Skin contact: Wash off with soap and plenty of water. Consult a physician.  
Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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

#### Potential acute health effects

- Eye contact : No known significant effects or critical hazards.  
Inhalation : No known significant effects or critical hazards.  
Skin contact : No known significant effects or critical hazards.  
Ingestion : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

- Eye contact : No specific data.  
Inhalation : No specific data.  
Skin contact : No specific data.  
Ingestion : No specific data.

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

Treat symptomatically.

## **5. Fire-fighting measures**

### 5.1 Extinguishing media

#### **Suitable extinguishing media**

Alcohol-resistant foam, dry chemical, carbon dioxide (CO<sub>2</sub>), water-spray.

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

Carbon oxides

### 5.3 Advice for firefighters

Use breathing apparatus with independent air supply.  
Protective suit.

### 5.4 Further information

Use water spray to cool unopened containers

### 5.5 NFPA Ratings:

Health: 2 Flammability: 2 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

## **6. Accidental release measures**

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

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

### 6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

### 6.4 Reference to other sections

For disposal see section 13.

## **7. Handling and storage**

### 7.1 Handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

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

Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

#### 7.3 Specific end uses

no data available

### **8. Exposure controls/personal protection**

#### 8.1 Control parameters

Components with workplace control parameters

#### 8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

### **9. Physical and chemical properties**

1	Color	Black
2	Odor	Slight odor
3	Odor Threshold	No data available
4	Boiling point/boiling range of ink	176 °C or higher
5	Melting Point/Melting Range	No data available
6	Flash point of ink	72 °C
7	Evaporation Rate	No data available
8	Auto-Ignition Temperature	not below 220 °C
9	Decomposition Temperature	No data available
10	Flammability(solid, gas)	Not Applicable
11	Upper/lower Flammability or Explosive Limits	Lower limits: 2.7 vol% Upper limits: 15.6 vol% (gamma-Butyrolactone)
12	Explosive Properties	No data available
13	Vapour Pressure	No data available
14	Specific Gravity	1.019 ± 0.01(25°C)
15	Solubility	No data available
16	Water solubility	Easily soluble (Diethylene glycol diethyl ether)
17	Partition Coefficient:n-octanol/water	No data available
18	Viscosity	10.5 ± 0.5 cps

19	pH	Not applicable
20	Oxidizing properties	No data available
21	Vapor Density	Not Applicable
22	VOCs	795.5 g/L
23	Other Information	No data available

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

## **10. Stability and reactivity**

- 10.1 Reactivity  
no data available
- 10.2 Chemical stability  
no data available
- 10.3 Possibility of hazardous reactions  
no data available
- 10.4 Conditions to avoid  
Heat, flames and sparks.
- 10.5 Incompatible materials  
Strong oxidizing agents, Strong bases
- 10.6 Hazardous decomposition products  
Other decomposition products - no data available

## **11. Toxicological information**

### 11.1 Information on toxicological effects

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

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

**Chronic Health Hazards:** No information available

**Mutagenicity:** No information available

**Carcinogenicity:** With excessive exposure, carbon black has been listed as a possible human carcinogen. However, as engineered within this ink cartridge, emissions to air of carbon black during normal printing use have not been found. IARC, the International Agency for Research on Cancer, has found printing inks to be not classifiable as human carcinogens.

#### **Acute Toxicity Data:**

2-Ethoxy Ethyl Ether:

LD50/LC50: Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD50 = 4970 mg/kg; Skin, rabbit: LD50 = 6700 uL/kg.

Dipropylene Glycol Monomethyl Ether:

LD50/LC50: Oral, rat: LD50 = 5130 mg/kg; Dermal, rabbit: LD50 = 9500 mg/kg

Diethylene Glycol Derivative :

Oral LD50 >6,500mg/kg (Rats), Dermal LD50 >7,070mg/kg (Rabbit)

Gamma-Butyrolactone:

LD50/LC50: Dermal, guinea pig: LD50 = >5 gm/kg; Draize test, rabbit, skin: 500 uL Severe; Inhalation, rat: LC50 = >5100 mg/m<sup>3</sup>/4H; Oral, mouse: LD50 = 1460 mg/kg; Oral, rat: LD50 = 1540 mg/kg.

#### **Inhalation:**

Not available

#### **Irritating:**

Diethylene Glycol Ethyl Methyl Ether:

Eye irritating: moderate irritant(P.I.I.=2.5 Draize)

Gamma-Butyrolactone:

Irritating to eyes. (rabbit eyes, OECD Guideline 405)

#### **Sensitization:**

Not available

#### **Mutagenicity:**

Not available

The information shown in SECTION 3, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## **12. Ecological information**

### 12.1 Toxicity

Acquatic toxicity: No further relevant information available.

12.2 Persistence and degradability: No further relevant information available.

12.3 Bioaccumulative potential: No further relevant information available.

- 12.4 Mobility in soil: No further relevant information available.
- 12.5 Results of PBT and vPvB assessment  
PBT: Not applicable.  
vPvB: Not applicable.
- 12.6 Other adverse effects: No further relevant information available.

### **13. Disposal considerations**

#### 13.1 Waste treatment methods

##### Product

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

##### Contaminated packaging

Dispose of as unused product.

### **14. Transport information**

#### 14.1 UN number

ADR/RID: —            IMDG: —                            IATA: —

#### 14.2 UN proper shipping name

ADR/RID: Not dangerous goods

IMDG: Not dangerous goods

IATA: Not dangerous goods

#### 14.3 Transport hazard class(es)

ADR/RID: —            IMDG: —                            IATA: —

#### 14.4 Packaging group

ADR/RID: —            IMDG: —                            IATA: —

#### 14.5 Environmental hazards

ADR/RID: no            IMDG Marine pollutant: no            IATA: no

#### 14.6 Special precautions for user

no data available

### **15. Regulatory information**

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

EU Regulation (EC) No. 1272/2008 (CLP Regulations)

REACH Status: In compliance.

Pre-registration status: All components are listed or exempted.

Annex XIV - List of substances subject to authorization

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

#### 15.2 Chemical Safety Assessment

No data available

#### 15.3 Other information

##### **US Regulation:**

TSCA Section 4(a) Final Test Rules Regulated: Not regulated.

TSCA Section 8(a) Preliminary Assessment Information Rule (PAIR): Not regulated.

TSCA Section 8(a) Inventory Update Rule: All components on TSCA INVENTORY

TSCA Section 8(d) Health and Safety Study Reporting: Not regulated.

TSCA Section 12(b) One-Time Export Notification Regulated: Not regulated.

California Proposition 65: Not regulated.

### **16. Other information**

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

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

## **1. Identification of the substance/preparation and of the company/undertaking**

### 1.1 Product identifier

Trade name: NEW ES100 INK-LC

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

Material of Use: Industrial applications: Inkjet ink for drop-on-demand digital printing process.

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

Manufacturer/Supplier: DIGITAL GRAPHICS INCORPORATION  
271-6 GOEUP-DONG, YANGJU-SI, KOREA  
TEL:+82-31-820-8900

## **2. Hazards identification**

### 2.1 Classification of the substance or mixture

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



Danger

*Acute Tox. 4 H302 Harmful if swallowed.*

*Skin Irrit.2 ; H315 Causes skin irritation.*

*Eye Irrit. 2 H318 Causes serious eye irritation.*

*STOT SE 3: H336 May cause drowsiness or dizziness.*

---

### 2.2 Label elements

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

Hazard pictograms



Signal word: Danger

Hazard statements:

H302 Harmful if swallowed.

H315 Causes skin irritation.

H318 Causes serious eye irritation.

H336 May cause drowsiness or dizziness.

Precautionary statements:

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P280 Wear protective gloves/ eye protection/ face protection.

P302+P352 - IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P332+P313 - If skin irritation occurs: Get medical advice/attention.

P337 + P313 - If eye irritation persists: Get medical advice/attention.

### 2.3 Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

## **3. Composition/information on ingredients**

Chemical characterization: Mixture

Ink Jet printing ink in organic solvents.

Ingredients	CAS-No.	EINECS	EU registration No.	Percent	Classification
					Regulation (EC) No. 1272/2008 [CLP]
Dipropylene Glycol Monomethyl Ether	34590-94-8	252-104-2	Not available for the moment	1%–10%	–
2-Ethoxy Ethyl Ether	112-36-7	203-963-7	Not available for the moment	20%–40%	Skin Irrit.2 H315
Diethylene Glycol Ethyl Methyl Ether	1002-67-1	213-690-5	Not available for the moment	10%–30%	–
Gamma-Butyrolactone	96-48-0	202-509-5	Not available for the moment	10%–30%	Acute Tox. 4 H302 Eye Irrit. 2 H318 STOT.SE 3 H336

## **4. First aid measures**

### 4.1 Description of first aid measures

- Eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
 Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
 Skin contact: Wash off with soap and plenty of water. Consult a physician.  
 Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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

#### Potential acute health effects

- Eye contact : No known significant effects or critical hazards.  
 Inhalation : No known significant effects or critical hazards.  
 Skin contact : No known significant effects or critical hazards.  
 Ingestion : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

- Eye contact : No specific data.  
 Inhalation : No specific data.  
 Skin contact : No specific data.  
 Ingestion : No specific data.

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

Treat symptomatically.

## **5. Fire-fighting measures**

### 5.1 Extinguishing media

#### **Suitable extinguishing media**

Alcohol-resistant foam, dry chemical, carbon dioxide (CO<sub>2</sub>), water-spray.

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

Carbon oxides

### 5.3 Advice for firefighters

Use breathing apparatus with independent air supply.  
 Protective suit.

### 5.4 Further information

Use water spray to cool unopened containers

### 5.5 NFPA Ratings:

Health: 2 Flammability: 2 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

## **6. Accidental release measures**

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

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

### 6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

### 6.4 Reference to other sections

For disposal see section 13.

## **7. Handling and storage**

### 7.1 Handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

7.2 Conditions for safe storage, including any incompatibilities

Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end uses

no data available

**8. Exposure controls/personal protection**

8.1 Control parameters

Components with workplace control parameters

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**9. Physical and chemical properties**

1	Color	Light Cyan
2	Odor	Slight odor
3	Odor Threshold	No data available
4	Boiling point/boiling range of ink	176 °C or higher
5	Melting Point/Melting Range	No data available
6	Flash point of ink	72 °C
7	Evaporation Rate	No data available
8	Auto-Ignition Temperature	not below 220 °C
9	Decomposition Temperature	No data available
10	Flammability(solid, gas)	Not Applicable
11	Upper/lower Flammability or Explosive Limits	Lower limits: 2.7 vol% Upper limits: 15.6 vol% (gamma-Butyrolactone)
12	Explosive Properties	No data available
13	Vapour Pressure	No data available
14	Specific Gravity	1.00 ± 0.01(25°C)
15	Solubility	No data available
16	Water solubility	Easily soluble (Diethylene glycol diethyl ether)
17	Partition Coefficient:n-octanol/water	No data available
18	Viscosity	10.5 ± 0.5 cps

19	pH	Not applicable
20	Oxidizing properties	No data available
21	Vapor Density	Not Applicable
22	VOCs	790 g/L
23	Other Information	No data available

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

## **10. Stability and reactivity**

- 10.1 Reactivity  
no data available
- 10.2 Chemical stability  
no data available
- 10.3 Possibility of hazardous reactions  
no data available
- 10.4 Conditions to avoid  
Heat, flames and sparks.
- 10.5 Incompatible materials  
Strong oxidizing agents, Strong bases
- 10.6 Hazardous decomposition products  
Other decomposition products - no data available

## **11. Toxicological information**

- 11.1 Information on toxicological effects  
Routes of Overexposure: Eye, skin, inhalation, and oral ingestion  
**Acute Health Hazards:** Overexposure of the eye surface to ink may be mildly irritating. Overexposure of ink contact with the skin may cause irritation and in some people, swelling and redness. Intentional inhalation to ink vapors may result in respiratory tract irritation. Intentional or accidental oral ingestion may cause an upset stomach.  
**Chronic Health Hazards:** No information available  
**Mutagenicity:** No information available  
**Carcinogenicity:** No information available  
**Acute Toxicity Data:**  
2-Ethoxy Ethyl Ether:  
LD50/LC50: Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD50 = 4970 mg/kg; Skin, rabbit: LD50 = 6700 uL/kg.  
Dipropylene Glycol Monomethyl Ether:  
LD50/LC50: Oral, rat: LD50 = 5130 mg/kg; Dermal, rabbit: LD50 = 9500 mg/kg  
Diethylene Glycol Ethyl Methyl Ether:  
Oral LD50 >6,500mg/kg (Rats), Dermal LD50 >7,070mg/kg (Rabbit)  
Gamma-Butyrolactone:  
LD50/LC50: Dermal, guinea pig: LD50 = >5 gm/kg; Draize test, rabbit, skin: 500 uL Severe; Inhalation, rat: LC50 = >5100 mg/m<sup>3</sup>/4H; Oral, mouse: LD50 = 1460 mg/kg; Oral, rat: LD50 = 1540 mg/kg.  
**Inhalation:**  
Not available  
**Irritating:**  
Diethylene Glycol Ethyl Methyl Ether:  
Eye irritating: moderate irritant(P.I.I=2.5 Draize)  
Gamma-Butyrolactone:  
Irritating to eyes. (rabbit eyes, OECD Guideline 405)  
**Sensitization:**  
Not available  
**Mutagenicity:**  
Not available  
The information shown in SECTION 3, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## **12. Ecological information**

- 12.1 Toxicity  
Aquatic toxicity: No further relevant information available.
- 12.2 Persistence and degradability: No further relevant information available.
- 12.3 Bioaccumulative potential: No further relevant information available.
- 12.4 Mobility in soil: No further relevant information available.
- 12.5 Results of PBT and vPvB assessment



PBT: Not applicable.

vPvB: Not applicable.

12.6 Other adverse effects: No further relevant information available.

### **13. Disposal considerations**

#### 13.1 Waste treatment methods

##### Product

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

##### Contaminated packaging

Dispose of as unused product.

### **14. Transport information**

#### 14.1 UN number

ADR/RID: —            IMDG: —                            IATA: —

#### 14.2 UN proper shipping name

ADR/RID: Not dangerous goods

IMDG: Not dangerous goods

IATA: Not dangerous goods

#### 14.3 Transport hazard class(es)

ADR/RID: —            IMDG: —                            IATA: —

#### 14.4 Packaging group

ADR/RID: —            IMDG: —                            IATA: —

#### 14.5 Environmental hazards

ADR/RID: no            IMDG Marine pollutant: no            IATA: no

#### 14.6 Special precautions for user

no data available

### **15. Regulatory information**

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

EU Regulation (EC) No. 1272/2008 (CLP Regulations)

REACH Status: In compliance.

Pre-registration status: All components are listed or exempted.

Annex XIV - List of substances subject to authorization

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

#### 15.2 Chemical Safety Assessment

No data available

#### 15.3 Other information

##### **US Regulation:**

TSCA Section 4(a) Final Test Rules Regulated: Not regulated.

TSCA Section 8(a) Preliminary Assessment Information Rule (PAIR): Not regulated.

TSCA Section 8(a) Inventory Update Rule: All components on TSCA INVENTORY

TSCA Section 8(d) Health and Safety Study Reporting: Not regulated.

TSCA Section 12(b) One-Time Export Notification Regulated: Not regulated.

California Proposition 65: Not regulated.

### **16. Other information**

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

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

**1. Identification of the substance/preparation and of the company/undertaking**

1.1 Product identifier

Trade name: NEW ES100 INK-LM

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

Material of Use: Industrial applications: Inkjet ink for drop-on-demand digital printing process.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier:  
DIGITAL GRAPHICS INCORPORATION  
271-6 GOEUP-DONG, YANGJU-SI, KOREA  
TEL:+82-31-820-8900

**2. Hazards identification**

2.1 Classification of the substance or mixture

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



Danger

*Acute Tox. 4 H302 Harmful if swallowed.*

*Skin Irrit.2 ; H315 Causes skin irritation.*

*Eye Irrit. 2 H318 Causes serious eye irritation.*

*STOT SE 3: H336 May cause drowsiness or dizziness.*

---

2.2 Label elements

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

Hazard pictograms



Signal word: Danger

Hazard statements:

H302 Harmful if swallowed.

H315 Causes skin irritation.

H318 Causes serious eye irritation.

H336 May cause drowsiness or dizziness.

Precautionary statements:

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P280 Wear protective gloves/ eye protection/ face protection.

P302+P352 - IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P332+P313 - If skin irritation occurs: Get medical advice/attention.

P337 + P313 - If eye irritation persists: Get medical advice/attention.

2.3 Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

**3. Composition/information on ingredients**

Chemical characterization: Mixture

Ink Jet printing ink in organic solvents.

Ingredients	CAS-No.	EINECS	EU registration No.	Percent	Classification
					Regulation (EC) No. 1272/2008 [CLP]
Dipropylene Glycol Monomethyl Ether	34590-94-8	252-104-2	Not available for the moment	1%–10%	–
2-Ethoxy Ethyl Ether	112-36-7	203-963-7	Not available for the moment	30%–50%	Skin Irrit.2 H315
Diethylene Glycol Ethyl Methyl Ether	1002-67-1	213-690-5	Not available for the moment	1%–20%	–
Gamma-Butyrolactone	96-48-0	202-509-5	Not available for the moment	10%–30%	Acute Tox. 4 H302 Eye Irrit. 2 H318 STOT.SE 3 H336

## **4. First aid measures**

### 4.1 Description of first aid measures

- Eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
Skin contact: Wash off with soap and plenty of water. Consult a physician.  
Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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

#### Potential acute health effects

- Eye contact : No known significant effects or critical hazards.  
Inhalation : No known significant effects or critical hazards.  
Skin contact : No known significant effects or critical hazards.  
Ingestion : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

- Eye contact : No specific data.  
Inhalation : No specific data.  
Skin contact : No specific data.  
Ingestion : No specific data.

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

Treat symptomatically.

## **5. Fire-fighting measures**

### 5.1 Extinguishing media

#### **Suitable extinguishing media**

Alcohol-resistant foam, dry chemical, carbon dioxide (CO<sub>2</sub>), water-spray.

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

Carbon oxides

### 5.3 Advice for firefighters

Use breathing apparatus with independent air supply.  
Protective suit.

### 5.4 Further information

Use water spray to cool unopened containers

### 5.5 NFPA Ratings:

Health: 2 Flammability: 2 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

## **6. Accidental release measures**

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

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

### 6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

### 6.4 Reference to other sections

For disposal see section 13.

## **7. Handling and storage**

### 7.1 Handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

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

Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

#### 7.3 Specific end uses

no data available

### **8. Exposure controls/personal protection**

#### 8.1 Control parameters

Components with workplace control parameters

#### 8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

### **9. Physical and chemical properties**

1	Color	Light Magenta
2	Odor	Slight odor
3	Odor Threshold	No data available
4	Boiling point/boiling range of ink	176 °C or higher
5	Melting Point/Melting Range	No data available
6	Flash point of ink	72 °C
7	Evaporation Rate	No data available
8	Auto-Ignition Temperature	not below 220 °C
9	Decomposition Temperature	No data available
10	Flammability(solid, gas)	Not Applicable
11	Upper/lower Flammability or Explosive Limits	Lower limits: 2.7 vol% Upper limits: 15.6 vol% (gamma-Butyrolactone)
12	Explosive Properties	No data available
13	Vapor Pressure	No data available
14	Specific Gravity	1.01 ± 0.01(25°C)
15	Solubility	No data available
16	Water solubility	Easily soluble (Diethylene glycol diethyl ether)
17	Partition Coefficient:n-octanol/water	No data available
18	Viscosity	10.5 ± 0.5 cps

19	pH	Not applicable
20	Oxidizing properties	No data available
21	Vapor Density	Not Applicable
22	VOCs	795 g/L
23	Other Information	No data available

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

## **10. Stability and reactivity**

- 10.1 Reactivity  
no data available
- 10.2 Chemical stability  
no data available
- 10.3 Possibility of hazardous reactions  
no data available
- 10.4 Conditions to avoid  
Heat, flames and sparks.
- 10.5 Incompatible materials  
Strong oxidizing agents, Strong bases
- 10.6 Hazardous decomposition products  
Other decomposition products - no data available

## **11. Toxicological information**

- 11.1 Information on toxicological effects  
Routes of Overexposure: Eye, skin, inhalation, and oral ingestion  
**Acute Health Hazards:** Overexposure of the eye surface to ink may be mildly irritating. Overexposure of ink contact with the skin may cause irritation and in some people, swelling and redness. Intentional inhalation to ink vapors may result in respiratory tract irritation. Intentional or accidental oral ingestion may cause an upset stomach.  
**Chronic Health Hazards:** No information available  
**Mutagenicity:** No information available  
**Carcinogenicity:** No information available  
**Acute Toxicity Data:**  
2-Ethoxy Ethyl Ether:  
LD50/LC50: Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD50 = 4970 mg/kg; Skin, rabbit: LD50 = 6700 uL/kg.  
Dipropylene Glycol Monomethyl Ether:  
LD50/LC50: Oral, rat: LD50 = 5130 mg/kg; Dermal, rabbit: LD50 = 9500 mg/kg  
Diethylene Glycol Derivative:  
Oral LD50 >6,500mg/kg (Rats), Dermal LD50 >7,070mg/kg (Rabbit)  
Gamma-Butyrolactone:  
LD50/LC50: Dermal, guinea pig: LD50 = >5 gm/kg; Draize test, rabbit, skin: 500 uL Severe; Inhalation, rat: LC50 = >5100 mg/m<sup>3</sup>/4H; Oral, mouse: LD50 = 1460 mg/kg; Oral, rat: LD50 = 1540 mg/kg.  
**Inhalation:**  
Not available  
**Irritating:**  
Diethylene Glycol Ethyl Methyl Ether:  
Eye irritating: moderate irritant(P.I.I=2.5 Draize)  
Gamma-Butyrolactone:  
Irritating to eyes. (rabbit eyes, OECD Guideline 405)  
**Sensitization:**  
Not available  
**Mutagenicity:**  
Not available  
The information shown in SECTION 3, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## **12. Ecological information**

- 12.1 Toxicity  
Aquatic toxicity: No further relevant information available.
- 12.2 Persistence and degradability: No further relevant information available.
- 12.3 Bioaccumulative potential: No further relevant information available.
- 12.4 Mobility in soil: No further relevant information available.
- 12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6 Other adverse effects: No further relevant information available.

### **13. Disposal considerations**

#### 13.1 Waste treatment methods

##### Product

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

##### Contaminated packaging

Dispose of as unused product.

### **14. Transport information**

#### 14.1 UN number

ADR/RID: —            IMDG: —                            IATA: —

#### 14.2 UN proper shipping name

ADR/RID: Not dangerous goods

IMDG: Not dangerous goods

IATA: Not dangerous goods

#### 14.3 Transport hazard class(es)

ADR/RID: —            IMDG: —                            IATA: —

#### 14.4 Packaging group

ADR/RID: —            IMDG: —                            IATA: —

#### 14.5 Environmental hazards

ADR/RID: no            IMDG Marine pollutant: no            IATA: no

#### 14.6 Special precautions for user

no data available

### **15. Regulatory information**

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

EU Regulation (EC) No. 1272/2008 (CLP Regulations)

REACH Status: In compliance.

Pre-registration status: All components are listed or exempted.

Annex XIV - List of substances subject to authorization

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

#### 15.2 Chemical Safety Assessment

No data available

#### 15.3 Other information

##### **US Regulation:**

TSCA Section 4(a) Final Test Rules Regulated: Not regulated.

TSCA Section 8(a) Preliminary Assessment Information Rule (PAIR): Not regulated.

TSCA Section 8(a) Inventory Update Rule: All components on TSCA INVENTORY

TSCA Section 8(d) Health and Safety Study Reporting: Not regulated.

TSCA Section 12(b) One-Time Export Notification Regulated: Not regulated.

California Proposition 65: Not regulated.

### **16. Other information**

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

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

# ***Safety Data Sheet in accordance with Regulation (EU)***

**No.453/2010**

Printing date 22.10.2009 Version: 4 Revision: 25.06.2015

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## **1. Identification of the substance/preparation and of the company/undertaking**

### 1.1 Product identifier

Trade name: NEW ES100 INK-RM

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

Material of Use: Industrial applications: Inkjet ink for drop-on-demand digital printing process.

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

Manufacturer/Supplier:

DIGITAL GRAPHICS INCORPORATION  
271-6 GOEUP-DONG, YANGJU-SI, KOREA  
TEL:+82-31-820-8900

## **2. Hazards identification**

### 2.1 Classification of the substance or mixture

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



*Acute Tox. 4 H302 Harmful if swallowed.*

*Skin Irrit. 2 ; H315 Causes skin irritation.*

*Eye Irrit. 2 H318 Causes serious eye irritation.*

*STOT SE 3: H336 May cause drowsiness or dizziness.*

---

### 2.2 Label elements

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

Hazard pictograms



Signal word: Danger

Hazard statements:

H302 Harmful if swallowed.

H315 Causes skin irritation.

H318 Causes serious eye irritation.

H336 May cause drowsiness or dizziness.

Precautionary statements:

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P280 Wear protective gloves/ eye protection/ face protection.

P302+P352 - IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P332+P313 - If skin irritation occurs: Get medical advice/attention.

P337 + P313 - If eye irritation persists: Get medical advice/attention.

### 2.3 Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

## **3. Composition/information on ingredients**

Chemical characterization: Mixture

Ink Jet printing ink in organic solvents.

Ingredients	CAS-No.	EINECS	EU registration No.	Percent	Classification
					Regulation (EC) No. 1272/2008 [CLP]
Dipropylene Glycol Monomethyl Ether	34590-94-8	252-104-2	Not available for the moment	1%–10%	–
2-Ethoxy Ethyl Ether	112-36-7	203-963-7	Not available for the moment	10%–20%	Skin Irrit.2 H315
Diethylene Glycol Ethyl Methyl Ether	1002-67-1	213-690-5	Not available for the moment	20%–60%	–
Gamma-Butyrolactone	96-48-0	202-509-5	Not available for the moment	10%–30%	Acute Tox. 4 H302 Eye Irrit. 2 H318 STOT.SE 3 H336

## **4. First aid measures**

### 4.1 Description of first aid measures

- Eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
Skin contact: Wash off with soap and plenty of water. Consult a physician.  
Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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

#### Potential acute health effects

- Eye contact : No known significant effects or critical hazards.  
Inhalation : No known significant effects or critical hazards.  
Skin contact : No known significant effects or critical hazards.  
Ingestion : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

- Eye contact : No specific data.  
Inhalation : No specific data.  
Skin contact : No specific data.  
Ingestion : No specific data.

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

Treat symptomatically.

## **5. Fire-fighting measures**

### 5.1 Extinguishing media

#### **Suitable extinguishing media**

Alcohol-resistant foam, dry chemical, carbon dioxide (CO<sub>2</sub>), water-spray.

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

Carbon oxides

### 5.3 Advice for firefighters

- Use breathing apparatus with independent air supply.  
Protective suit.

### 5.4 Further information

Use water spray to cool unopened containers

### 5.5 NFPA Ratings:

Health: 2 Flammability: 2 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

## **6. Accidental release measures**

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

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

### 6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

### 6.4 Reference to other sections

For disposal see section 13.

## **7. Handling and storage**

### 7.1 Handling



Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

7.2 Conditions for safe storage, including any incompatibilities

Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end uses

no data available

**8. Exposure controls/personal protection**

8.1 Control parameters

Components with workplace control parameters

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**9. Physical and chemical properties**

1	Color	Reddish Magenta
2	Odor	Slight odor
3	Odor Threshold	No data available
4	Boiling point/boiling range of ink	176 °C or higher
5	Melting Point/Melting Range	No data available
6	Flash point of ink	72 °C
7	Evaporation Rate	No data available
8	Auto-Ignition Temperature	not below 220 °C
9	Decomposition Temperature	No data available
10	Flammability(solid, gas)	Not Applicable
11	Upper/lower Flammability or Explosive Limits	Lower limits: 2.7 vol% Upper limits: 15.6 vol% (gamma-Butyrolactone)
12	Explosive Properties	No data available
13	Vapor Pressure	No data available
14	Specific Gravity	1.01 ± 0.01(25°C)
15	Solubility	No data available
16	Water solubility	Easily soluble (Diethylene glycol diethyl ether)
17	Partition Coefficient:n-octanol/water	No data available
18	Viscosity	10.5 ± 0.5 cps

19	pH	Not applicable
20	Oxidizing properties	No data available
21	Vapor Density	Not Applicable
22	VOCs	800 g/L
23	Other Information	No data available

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

## **10. Stability and reactivity**

- 10.1 Reactivity  
no data available
- 10.2 Chemical stability  
no data available
- 10.3 Possibility of hazardous reactions  
no data available
- 10.4 Conditions to avoid  
Heat, flames and sparks.
- 10.5 Incompatible materials  
Strong oxidizing agents, Strong bases
- 10.6 Hazardous decomposition products  
Other decomposition products - no data available

## **11. Toxicological information**

- 11.1 Information on toxicological effects  
Routes of Overexposure: Eye, skin, inhalation, and oral ingestion  
**Acute Health Hazards:** Overexposure of the eye surface to ink may be mildly irritating. Overexposure of ink contact with the skin may cause irritation and in some people, swelling and redness. Intentional inhalation to ink vapors may result in respiratory tract irritation. Intentional or accidental oral ingestion may cause an upset stomach.  
**Chronic Health Hazards:** No information available  
**Mutagenicity:** No information available  
**Carcinogenicity:** No information available  
**Acute Toxicity Data:**  
2-Ethoxy Ethyl Ether:  
LD50/LC50: Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD50 = 4970 mg/kg; Skin, rabbit: LD50 = 6700 uL/kg.  
Dipropylene Glycol Monomethyl Ether:  
LD50/LC50: Oral, rat: LD50 = 5130 mg/kg; Dermal, rabbit: LD50 = 9500 mg/kg  
Diethylene Glycol Derivative:  
Oral LD50 >6,500mg/kg (Rats), Dermal LD50 >7,070mg/kg (Rabbit)  
Gamma-Butyrolactone:  
LD50/LC50: Dermal, guinea pig: LD50 = >5 gm/kg; Draize test, rabbit, skin: 500 uL Severe; Inhalation, rat: LC50 = >5100 mg/m<sup>3</sup>/4H; Oral, mouse: LD50 = 1460 mg/kg; Oral, rat: LD50 = 1540 mg/kg.  
**Inhalation:**  
Not available  
**Irritating:**  
Diethylene Glycol Ethyl Methyl Ether:  
Eye irritating: moderate irritant(P.I.I=2.5 Draize)  
Gamma-Butyrolactone:  
Irritating to eyes. (rabbit eyes, OECD Guideline 405)  
**Sensitization:**  
Not available  
**Mutagenicity:**  
Not available  
The information shown in SECTION 3, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## **12. Ecological information**

- 12.1 Toxicity  
Aquatic toxicity: No further relevant information available.
- 12.2 Persistence and degradability: No further relevant information available.
- 12.3 Bioaccumulative potential: No further relevant information available.
- 12.4 Mobility in soil: No further relevant information available.
- 12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6 Other adverse effects: No further relevant information available.

### **13. Disposal considerations**

#### 13.1 Waste treatment methods

##### Product

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

##### Contaminated packaging

Dispose of as unused product.

### **14. Transport information**

#### 14.1 UN number

ADR/RID: —            IMDG: —                            IATA: —

#### 14.2 UN proper shipping name

ADR/RID: Not dangerous goods

IMDG: Not dangerous goods

IATA: Not dangerous goods

#### 14.3 Transport hazard class(es)

ADR/RID: —            IMDG: —                            IATA: —

#### 14.4 Packaging group

ADR/RID: —            IMDG: —                            IATA: —

#### 14.5 Environmental hazards

ADR/RID: no            IMDG Marine pollutant: no            IATA: no

#### 14.6 Special precautions for user

no data available

### **15. Regulatory information**

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

EU Regulation (EC) No. 1272/2008 (CLP Regulations)

REACH Status: In compliance.

Pre-registration status: All components are listed or exempted.

Annex XIV - List of substances subject to authorization

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

#### 15.2 Chemical Safety Assessment

No data available

#### 15.3 Other information

##### **US Regulation:**

TSCA Section 4(a) Final Test Rules Regulated: Not regulated.

TSCA Section 8(a) Preliminary Assessment Information Rule (PAIR): Not regulated.

TSCA Section 8(a) Inventory Update Rule: All components on TSCA INVENTORY

TSCA Section 8(d) Health and Safety Study Reporting: Not regulated.

TSCA Section 12(b) One-Time Export Notification Regulated: Not regulated.

California Proposition 65: Not regulated.

### **16. Other information**

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

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

# ***Safety Data Sheet in accordance with Regulation (EU)***

**No.453/2010**

Printing date 22.10.2009 Version: 4 Revision: 25.06.2015

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## **1. Identification of the substance/preparation and of the company/undertaking**

### 1.1 Product identifier

Trade name: NEW ES100 INK-RLM

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

Material of Use: Industrial applications: Inkjet ink for drop-on-demand digital printing process.

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

Manufacturer/Supplier:  
DIGITAL GRAPHICS INCORPORATION  
271-6 GOEUP-DONG, YANGJU-SI, KOREA  
TEL:+82-31-820-8900

## **2. Hazards identification**

### 2.1 Classification of the substance or mixture

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



*Acute Tox. 4 H302 Harmful if swallowed.*

*Skin Irrit.2 ; H315 Causes skin irritation.*

*Eye Irrit. 2 H318 Causes serious eye irritation.*

*STOT SE 3: H336 May cause drowsiness or dizziness.*

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### 2.2 Label elements

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

Hazard pictograms



Signal word: Danger

Hazard statements:

H302 Harmful if swallowed.

H315 Causes skin irritation.

H318 Causes serious eye irritation.

H336 May cause drowsiness or dizziness.

Precautionary statements:

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P280 Wear protective gloves/ eye protection/ face protection.

P302+P352 - IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P332+P313 - If skin irritation occurs: Get medical advice/attention.

P337 + P313 - If eye irritation persists: Get medical advice/attention.

### 2.3 Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

## **3. Composition/information on ingredients**

Chemical characterization: Mixture

Ink Jet printing ink in organic solvents.

Ingredients	CAS-No.	EINECS	EU registration No.	Percent	Classification
					Regulation (EC) No. 1272/2008 [CLP]
Dipropylene Glycol Monomethyl Ether	34590-94-8	252-104-2	Not available for the moment	1%–10%	–
2-Ethoxy Ethyl Ether	112-36-7	203-963-7	Not available for the moment	10%–20%	Skin Irrit.2 H315
Diethylene Glycol Ethyl Methyl Ether	1002-67-1	213-690-5	Not available for the moment	20%–60%	–
Gamma-Butyrolactone	96-48-0	202-509-5	Not available for the moment	10%–30%	Acute Tox. 4 H302 Eye Irrit. 2 H318 STOT.SE 3 H336

## **4. First aid measures**

### 4.1 Description of first aid measures

- Eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
 Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
 Skin contact: Wash off with soap and plenty of water. Consult a physician.  
 Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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

#### Potential acute health effects

- Eye contact : No known significant effects or critical hazards.  
 Inhalation : No known significant effects or critical hazards.  
 Skin contact : No known significant effects or critical hazards.  
 Ingestion : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

- Eye contact : No specific data.  
 Inhalation : No specific data.  
 Skin contact : No specific data.  
 Ingestion : No specific data.

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

Treat symptomatically.

## **5. Fire-fighting measures**

### 5.1 Extinguishing media

#### **Suitable extinguishing media**

Alcohol-resistant foam, dry chemical, carbon dioxide (CO<sub>2</sub>), water-spray.

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

Carbon oxides

### 5.3 Advice for firefighters

Use breathing apparatus with independent air supply.  
 Protective suit.

### 5.4 Further information

Use water spray to cool unopened containers

### 5.5 NFPA Ratings:

Health: 2 Flammability: 2 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

## **6. Accidental release measures**

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

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

### 6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

### 6.4 Reference to other sections

For disposal see section 13.

## **7. Handling and storage**

### 7.1 Handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

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

Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

#### 7.3 Specific end uses

no data available

### **8. Exposure controls/personal protection**

#### 8.1 Control parameters

Components with workplace control parameters

#### 8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

### **9. Physical and chemical properties**

1	Color	Light Reddish Magenta
2	Odor	Slight odor
3	Odor Threshold	No data available
4	Boiling point/boiling range of ink	176 °C or higher
5	Melting Point/Melting Range	No data available
6	Flash point of ink	72 °C
7	Evaporation Rate	No data available
8	Auto-Ignition Temperature	not below 220 °C
9	Decomposition Temperature	No data available
10	Flammability(solid, gas)	Not Applicable
11	Upper/lower Flammability or Explosive Limits	Lower limits: 2.7 vol% Upper limits: 15.6 vol% (gamma-Butyrolactone)
12	Explosive Properties	No data available
13	Vapor Pressure	No data available
14	Specific Gravity	1.01 ± 0.01(25°C)
15	Solubility	No data available
16	Water solubility	Easily soluble (Diethylene glycol diethyl ether)
17	Partition Coefficient:n-octanol/water	No data available
18	Viscosity	10.5 ± 0.5 cps

19	pH	Not applicable
20	Oxidizing properties	No data available
21	Vapor Density	Not Applicable
22	VOCs	788 g/L
23	Other Information	No data available

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

## **10. Stability and reactivity**

- 10.1 Reactivity  
no data available
- 10.2 Chemical stability  
no data available
- 10.3 Possibility of hazardous reactions  
no data available
- 10.4 Conditions to avoid  
Heat, flames and sparks.
- 10.5 Incompatible materials  
Strong oxidizing agents, Strong bases
- 10.6 Hazardous decomposition products  
Other decomposition products - no data available

## **11. Toxicological information**

- 11.1 Information on toxicological effects  
Routes of Overexposure: Eye, skin, inhalation, and oral ingestion  
**Acute Health Hazards:** Overexposure of the eye surface to ink may be mildly irritating. Overexposure of ink contact with the skin may cause irritation and in some people, swelling and redness. Intentional inhalation to ink vapors may result in respiratory tract irritation. Intentional or accidental oral ingestion may cause an upset stomach.  
**Chronic Health Hazards:** No information available  
**Mutagenicity:** No information available  
**Carcinogenicity:** No information available  
**Acute Toxicity Data:**  
2-Ethoxy Ethyl Ether:  
LD50/LC50: Draize test, rabbit, eye: 50 mg Moderate; Oral, rat: LD50 = 4970 mg/kg; Skin, rabbit: LD50 = 6700 uL/kg.  
Dipropylene Glycol Monomethyl Ether:  
LD50/LC50: Oral, rat: LD50 = 5130 mg/kg; Dermal, rabbit: LD50 = 9500 mg/kg  
Diethylene Glycol Derivative:  
Oral LD50 >6,500mg/kg (Rats), Dermal LD50 >7,070mg/kg (Rabbit)  
Gamma-Butyrolactone:  
LD50/LC50: Dermal, guinea pig: LD50 = >5 gm/kg; Draize test, rabbit, skin: 500 uL Severe; Inhalation, rat: LC50 = >5100 mg/m<sup>3</sup>/4H; Oral, mouse: LD50 = 1460 mg/kg; Oral, rat: LD50 = 1540 mg/kg.  
**Inhalation:**  
Not available  
**Irritating:**  
Diethylene Glycol Ethyl Methyl Ether:  
Eye irritating: moderate irritant(P.I.I=2.5 Draize)  
Gamma-Butyrolactone:  
Irritating to eyes. (rabbit eyes, OECD Guideline 405)  
**Sensitization:**  
Not available  
**Mutagenicity:**  
Not available  
The information shown in SECTION 3, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## **12. Ecological information**

- 12.1 Toxicity  
Aquatic toxicity: No further relevant information available.
- 12.2 Persistence and degradability: No further relevant information available.
- 12.3 Bioaccumulative potential: No further relevant information available.
- 12.4 Mobility in soil: No further relevant information available.
- 12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6 Other adverse effects: No further relevant information available.

### **13. Disposal considerations**

#### 13.1 Waste treatment methods

##### Product

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

##### Contaminated packaging

Dispose of as unused product.

### **14. Transport information**

#### 14.1 UN number

ADR/RID: —            IMDG: —                            IATA: —

#### 14.2 UN proper shipping name

ADR/RID: Not dangerous goods

IMDG: Not dangerous goods

IATA: Not dangerous goods

#### 14.3 Transport hazard class(es)

ADR/RID: —            IMDG: —                            IATA: —

#### 14.4 Packaging group

ADR/RID: —            IMDG: —                            IATA: —

#### 14.5 Environmental hazards

ADR/RID: no            IMDG Marine pollutant: no            IATA: no

#### 14.6 Special precautions for user

no data available

### **15. Regulatory information**

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

EU Regulation (EC) No. 1272/2008 (CLP Regulations)

REACH Status: In compliance.

Pre-registration status: All components are listed or exempted.

Annex XIV - List of substances subject to authorization

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

#### 15.2 Chemical Safety Assessment

No data available

#### 15.3 Other information

##### **US Regulation:**

TSCA Section 4(a) Final Test Rules Regulated: Not regulated.

TSCA Section 8(a) Preliminary Assessment Information Rule (PAIR): Not regulated.

TSCA Section 8(a) Inventory Update Rule: All components on TSCA INVENTORY

TSCA Section 8(d) Health and Safety Study Reporting: Not regulated.

TSCA Section 12(b) One-Time Export Notification Regulated: Not regulated.

California Proposition 65: Not regulated.

### **16. Other information**

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

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



# Safety Data Sheet in accordance with Regulation (EU)

No.453/2010

Printing date 22.10.2009 Version: 4 Revision: 25.06.2015

## **1. Identification of the substance/preparation and of the company/undertaking**

### 1.1 Product identifier

Trade name: ES100 INK S

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

Material of Use: Industrial applications: Inkjet ink for drop-on-demand digital printing process.

### 1.3 SDS No.

### 1.4 Details of the supplier of the safety data sheet

Manufacturer/Supplier:

DIGITAL GRAPHICS INCORPORATION  
271-6 GOEUP-DONG, YANGJU-SI, KOREA  
TEL:+82-31-820-8900

## **2. Hazards identification**

### 2.1 Classification of the substance or mixture

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



Warning

Acute tox 4: H312 Harmful in contact with skin.

Acute tox 4: H332 Harmful if inhaled.

### 2.2 Label elements

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

Hazard pictograms



Signal word: Warning

Hazard statements:

H312 Harmful in contact with skin.

H332 Harmful if inhaled.

Precautionary statements:

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P302+P352 IF ON SKIN: Wash with plenty of soap and water.

P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

### 2.3 Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

## **3. Composition/information on ingredients**

Chemical characterization: Mixture

Ink Jet printing ink in organic solvents.

Ingredients	CAS-No.	EINECS	EU registration No.	Percent	Classification
					Regulation (EC) No. 1272/2008 [CLP]
Ethylene Glycol Monobutyl	112-07-2	203-933-3	Not available for	30%–50%	Acute tox 4: H312,

Ether Acetate			the moment		Acute tox 4: H332
Diethylene Glycol Monobutyl Ether Acetate	124-17-4	204-685-9	Not available for the moment	30%–60%	—

#### **4. First aid measures**

##### 4.1 Description of first aid measures

- Eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
 Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
 Skin contact: Wash off with soap and plenty of water. Consult a physician.  
 Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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

###### Potential acute health effects

- Eye contact : No known significant effects or critical hazards.  
 Inhalation : No known significant effects or critical hazards.  
 Skin contact : No known significant effects or critical hazards.  
 Ingestion : No known significant effects or critical hazards.

###### Over-exposure signs/symptoms

- Eye contact : No specific data.  
 Inhalation : No specific data.  
 Skin contact : No specific data.  
 Ingestion : No specific data.

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

Treat symptomatically.

#### **5. Fire-fighting measures**

##### 5.1 Extinguishing media

###### **Suitable extinguishing media**

Alcohol-resistant foam, dry chemical, carbon dioxide (CO<sub>2</sub>), water-spray.

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

Carbon oxides

##### 5.3 Advice for firefighters

Use breathing apparatus with independent air supply.  
 Protective suit.

##### 5.4 Further information

Use water spray to cool unopened containers

##### 5.5 NFPA Ratings:

Health: 2 Flammability: 2 Reactivity: 0  
 Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

#### **6. Accidental release measures**

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

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

##### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

##### 6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

##### 6.4 Reference to other sections

For disposal see section 13.

#### **7. Handling and storage**

##### 7.1 Handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

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

Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

##### 7.3 Specific end uses

no data available

#### **8. Exposure controls/personal protection**

##### 8.1 Control parameters

Components with workplace control parameters

## 8.2 Exposure controls

Components ACGIH: TWA

Ethylene Glycol Monobutyl Ether Acetate 20 ppm

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

## **9. Physical and chemical properties**

1	Color	Colorless to light yellow
2	Odor	Slight odor
3	Boiling point/boiling range of ink	approx. 185 °C or higher
4	Melting Point/Melting Range	No data available
5	Flash point of ink	approx. 76 °C
6	Auto-Ignition Temperature	not below 220 °C
7	Flammability(solid, gas)	Not Applicable
8	Explosive Properties	Lower limits: 1.0 vol% Upper limits: 5.3 vol% (Diethylene Glycol Monobutyl Ether Acetate) Lower limits: 0.88 vol% Upper limits: 8.54 vol% (Ethylene Glycol Monobutyl Ether Acetate)
9	Vapour Pressure	No data available
10	Specific Gravity	0.95 ± 0.01(25°C)
11	Solubility	No data available
12	Water solubility	No data available
13	Viscosity	2.5 ± 0.5 cps
14	pH	Not applicable
15	Oxidizing properties	No data available
16	Vapor Density	Not Applicable
17	VOCs	950 g/L

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

## **10. Stability and reactivity**

### 10.1 Reactivity

no data available

### 10.2 Chemical stability

no data available

- 10.3 Possibility of hazardous reactions  
no data available
- 10.4 Conditions to avoid  
Heat, flames and sparks.
- 10.5 Incompatible materials  
Strong oxidizing agents, Strong bases
- 10.6 Hazardous decomposition products  
Other decomposition products - no data available

## **11. Toxicological information**

### 11.1 Information on toxicological effects

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

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

**Chronic Health Hazards:** No information available

**Mutagenicity:** No information available

**Carcinogenicity:** No information available

**Acute Toxicity Data:**

Diethylene Glycol Monobutyl Ether Acetate:

Draize test, Eye rabbit: 500 mg Moderate

LC50 Inhalation, rat: 72,500 mg/m<sup>3</sup>/4H

LD50 Oral, rat: 6,500 mg/kg

LD50 Oral, mouse: 6,600 uL/kg

LD50 Oral, rabbit: 2,260 mg/kg

LD50 Skin, rabbit: 14,500 mg/kg

Ethylene Glycol Monobutyl Ether Acetate:

LD50 Oral, rat: 2,400 mg/kg

LD50 Oral, mouse: 3,200 mg/kg

LD50 Skin, rabbit: 1,500 mg/kg

Draize test, Eye rabbit: 500 mg/24H Mild

**Inhalation:**

Not available

**Irritating:**

Ethylene Glycol Monobutyl Ether Acetate:

Eye irritating: 500mg/24H Mild (Rabbit OECD405)

Skin irritating: 500mg/24H Mild (open@ Rabbit OECD404)

**Sensitization:**

Not available

**Mutagenicity:**

Not available

The information shown in SECTION 3, Hazards identification, is based on toxicity profiles of similar materials or on the components present in this material.

## **12. Ecological information**

### 12.1 Toxicity

Acquatic toxicity: No further relevant information available.

### 12.2 Persistence and degradability: No further relevant information available.

### 12.3 Bioaccumulative potential: No further relevant information available.

### 12.4 Mobility in soil: No further relevant information available.

### 12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

### 12.6 Other adverse effects: No further relevant information available.

## **13. Disposal considerations**

### 13.1 Waste treatment methods

Product

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

## **14. Transport information**

14.1 UN number	ADR/RID: —	IMDG: —	IATA: —
14.2 UN proper shipping name	ADR/RID: Not dangerous goods		
	IMDG: Not dangerous goods		
	IATA: Not dangerous goods		
14.3 Transport hazard class(es)	ADR/RID: —	IMDG: —	IATA: —
14.4 Packaging group	ADR/RID: —	IMDG: —	IATA: —
14.5 Environmental hazards	ADR/RID: no	IMDG Marine pollutant: no	IATA: no
14.6 Special precautions for user	no data available		

## **15. Regulatory information**

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

EU Regulation (EC) No. 1272/2008 (CLP Regulations)

REACH Status: In compliance.

Pre-registration status: All components are listed or exempted.

Annex XIV - List of substances subject to authorization

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

15.2 Chemical Safety Assessment

No data available

15.3 Other information

### **US Regulation:**

TSCA Section 4(a) Final Test Rules Regulated: Not regulated.

TSCA Section 8(a) Preliminary Assessment Information Rule (PAIR): Not regulated.

TSCA Section 8(a) Inventory Update Rule: All components on TSCA INVENTORY

TSCA Section 8(d) Health and Safety Study Reporting: Not regulated.

TSCA Section 12(b) One-Time Export Notification Regulated: Not regulated.

California Proposition 65: Not regulated.

## **16. Other information**

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

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