

# 물질안전보건자료

## (Material Safety Data Sheet)

### 1. Product and Company Identification

A. Product Name : ESU-0012C/ESU02-01LC/ESU02-20LC

(Solvent-based pigment ink)

B. Recommended use of the chemical and restrictions on use : Eco Solvent-based ink for inkjet printer

C. Manufacturer :

Name : InkTec Co.,Ltd.

Address : 1124, Shingil-dong, Danwon-gu, Ansan-city, Gyeonggi-do, 425-839, Korea

Phone number : 031-494-0001

FAX number : 031-492-2041

### 2. Hazards Identification

A. Classification of the substance or mixture :

Flammable liquids : Hazard category 3

Acute toxicity, oral : Hazard category 4

Serious eye damage/eye irritation : Hazard category 2A

Acute toxicity, inhalation : Hazard category 4

Germ cell mutagenicity : Hazard category 2

B. Label elements, including precautionary statements

Hazard symbols



Signal word : Warning

Hazard statement :

H226 : Flammable liquid and vapour

H302 : Harmful if swallowed

H319 : Causes serious eye irritation

H332 : Harmful if inhaled

H341 : Suspected of causing genetic defects

Precautionary statement :

Precautionary :

P201 : Obtain Special instructions before use.

P202 : Do not handle until all safety precautions have been read and understood.

P210 : Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

P233 : Keep container tightly closed.

P240 : Ground/bond container and receiving equipment.

P241 : Use explosion-proof electrical/ventilating/lighting/.../equipment.

P242 : Use only non-sparking tools.

P243 : Take precautionary measures against static discharge.

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

P264 : Wash...thoroughly after handling.

P270 : Do not eat, drink or smoke when using this product.

P271 : Use only outdoor or in a well-ventilated area.

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

P281 : Use personal protective equipment as required.

Countermeasure :

P301+P312 : If swallowed – Call a poison center or doctor/physician if you feel unwell.

P303+P361+P353 : If on skin(or hair) – Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

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

P305+P351+P338 : If in eyes – Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308+P313 : If exposed or concerned – Get medical advice/attention.

P312 : Call a poison center or doctor/physician if you feel unwell.

P330 : Rinse mouth.

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

P370+P378 : In case of fire – Use... for extinction.

... Manufacturer/supplier or the competent authority to specify appropriate media.

Storage :

P403+P235 : Store in a well-ventilated place. Keep cool.

P405 : Store locked up.

Disposal :

P501 : Dispose of contents/container to...

... in accordance with local/regional/national/international regulation(to be specified).

**C. Other hazards which do not result in classification :**

No information available

### 3. Composition Information

Ingredients	% By weight	CAS No.	EC No.	EU Classification
Organic pigments	< 5%			
Bis(2-(2-methoxyethoxy)ethyl) ether	< 20%	143-24-8	205-594-7	
$\gamma$ -Butyrolactone	< 20%	96-48-0	202-509-5	
Bis(2-ethoxyethyl) ether	< 70%	112-36-7	203-963-7	
Vinyl chloride/vinyl acetate copolymer resin	< 5%	9003-22-9		
Additives	< 5%			

### 4. First-aid measures

**A. Eye contact :** While lifting upper eyelid, flush eyes with plenty of water for at least 15 minutes, and then get immediate medical attention.

**B. Skin contact :** Get medical attention, if needed.

Wash skin with soap and plenty of water for least 15 minutes.

Thoroughly clean and dry contaminated clothing and shoes before reuse.

Remove contaminated clothing and shoes and wash skin with water and soap for at least 15 minutes.

If skin is irritated or shows other symptoms, get medical attention

**C. Inhalation :** If breathing is difficult, give oxygen.

Give artificial respiration if not breathing, and get immediate medical attention.

If the person develops a symptom, move him to an area where fresh air is available.

If the person develops a side effect, move him to an area free of contamination.

**D. Ingestion :** Get medical attention.

Never make an unconscious person vomit or drink fluids.

If victim is conscious, give 2–4 cups of water or milk.

If the person has swallowed a large quantity, let him get medical attention.

#### **E. Major emergency and potential health symptoms/effects**

##### Inhalation

Short term exposure : 2–Ethoxyethyl ether – irritation

Tetraethylene glycol dimethyl ether – irritation, nausea, vomiting, diarrhea, headache, sleepiness, dizziness, disphonia, convulsions, pulmonary, kidney failure, liver disorders

Butyrolactone – irritation, nausea, headache, sleepiness, Dizziness, unconscious, coma

Long term exposure : Tetraethylene glycol dimethyl ether – nausea, loss of appetite, headache, sleepiness, convulsions, blood disorders

##### Ingestion

Short term exposure : Tetraethylene glycol dimethyl ether – headache, sleepiness, dizziness, disphonia,

Butyrolactone – irritation, nausea, headache, sleepiness, Dizziness, unconscious, coma

Long term exposure : Tetraethylene glycol dimethyl ether – nausea, kidney failure, liver disorders

##### Skin contact

Short term exposure : 2–Ethoxyethyl ether – irritation

Tetraethylene glycol dimethyl ether – irritation

Butyrolactone – irritation, nausea, headache, sleepiness, Dizziness, unconscious, coma

Long term exposure : Tetraethylene glycol dimethyl ether – irritation, headache, sleepiness, dizziness, disphonia, pulmonary, blood disorders, convulsions, blood disorders, kidney failure, liver disorders

##### Eye contact

Short term exposure : 2–Ethoxyethyl ether – irritation

Tetraethylene glycol dimethyl ether – irritation

Butyrolactone – irritation

Vinyl chloride/vinyl acetate copolymer – irritation, eye damage

Long term exposure : Butyrolactone – irritation

Vinyl chloride/vinyl acetate copolymer – irritation, eye damage

#### **F. Indication of immediate medical attention and special treatment needed, if necessary :**

Major health hazards : There has been no report of major effect on targeted internal organs.

## 5. Fire-fighting measures

### A. Fire extinguishing agent:

Appropriate fire extinguisher : Powder fire extinguishing agent

Spray stream

Carbon dioxide

General foam extinguishing agent

Alcohol resistant foam extinguishing agent

Water

Improper fire extinguishing agent : No data available.

For a large fire : Use alcohol resistant foam extinguishing agent, or flood with fine water spray.

Use general foam extinguishing agent, or flood with fine water spray.

Move containers from fire area if it can be done without risk.

Keep fire extinguishing water in a dike or ditch to handle later.

### B. Certain toxic materials produced by chemical agents.

Products from thermal cracking : Discharge of toxic smoke, like carbon oxide, sulfur compounds, acrolein and nitroxide.

Fire and explosion hazards : There' s a small change of fire.

A mixture of vapor and air can be explosive at above a certain ignition point.

Vapor or gas can spread instantly after being ignited from a distanced ignition point.

Vapor is heavier than air.

Halogen gas can be produced when it contacts metal.

May develop irritating, corrosive, or toxic gases by fire.

### C. Protect gears that should be worn while controlling fire and preventive measures :

Move containers from fire area if it can be done without risk.

Cool container with flooding quantities of water until well after fire is out.

Do not approach both ends of the tank.

When there' s a fire in shipping and unloading or storage area : Cool container with flooding quantities of water until well after fire is out by using unmanned hose holders or monitor nozzles.

If that is not possible, consider following preventive measures.

Keep unnecessary people away, isolate hazard area and deny entry. And allow the fire to burn itself out.

Withdraw immediately in case of rising sound from safety devices due to the fire or discoloration of tank.

Fire involving tank, rail, car, or tank truck : Evacuation for 0.8Km (1/2 mile) in all directions.

Shut off the source of the leakage before trying to extinguish fire.

Flood with fine water spray.

Do not scatter spilled material with high-pressure water streams.

Cool containers with water spray until well after the fire is out.

Apply water from a protected location or from a safe distance.

Avoid inhalation of material or combustion by-products.

Stay upwind and keep out of low areas.

Dike for later disposal.

Use extinguishing agent appropriate for surrounding fire.

The most effect measures would be removing fuel source and suffocating by blocking air supply.

## 6. Accidental release measures

### A. Personal precautions, protective equipment and emergency procedures

Absorb with paper.

Ventilate to eliminate all vapors, and burn papers.

Eliminate all ignition sources.

Absorb with dry earth, sand or other non-combustible material, and place in a container.

Ventilate a closed area before entering.

Use water spray to reduce vapors.

Store in an area separated from water supply and sewer.

Check shipping information and included documents, and contact related agencies and companies to find detailed information on the material.

Keep unnecessary people away, isolate hazard area and deny entry.

Keep away from heat, fire, flame and other sources of ignition.

Stop leak if without risk.

Deny entry to an area within 25~50m radius from leak, and keep unnecessary people away.

Stop leak, if it can be done without risk to worker.

Stay upwind.

Vaporize the surface leaked.

Place leaked material in an appropriate container to dispose.

### B. Precautions :

Store in an area separated from water supply and sewer.

### C. Methods and materials for containment and cleaning up :

Small leak : Place leaked material in an appropriate container to dispose.

Absorb with dry earth, sand or other non-combustible material.

Prevent entry into waterways, sewers, basements or confined areas.

Keep unnecessary people away, isolate hazard area and deny entry.

Do not touch a damaged container or spilled material without wearing proper protective gears.

Notify the central government and local independent commission for discharge of amounts greater than or equal to the standard.

Large leak : Stay upwind and keep out of low areas.

Dike for later disposal.

Keep unnecessary people away, isolate hazard area and deny entry.

## 7. Handling and storage

**A. Precautions for safe handling :** Do not press, cut, weld, solder, join, perforate, grind, or heat.

An empty container containing residues (liquid, steam) can be dangerous.

Store by closing a container.

Store in a closed container.

Do not inhale dust, steam, mist or gas.

Minimize development and accumulation of dust.

Use spark-proof tools and explosion-proof equipment.

Do not inhale or ingest.

Wash hands before eating.

Remove contaminated clothing and wash before reuse.

Perform proper ventilation.

Wash thoroughly after handling.

Use only in a well ventilated area.

Handle according to current laws and regulations.

Do not get in eyes, on skin and clothing.

Avoid flame, sparks, static electricity and other ignition sources.

**B. Conditions for safe storage, including any incompatibilities :**

US Warehouse Regulations: U.S. OSHA 29 CFR 1910.106.

Grounding and equipotential bonding are required.

Avoid contacting halogen or halogen compounds.

Store and handle in accordance with all current regulations and standards.

Keep separated from incompatible substances.

Notify the central government or local independent commission for storage or use at amounts greater than or equal to the TPQ (U.S. SARA Section 302).

SARA section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355.30).

Avoid contacting strong oxidizer.

Store in a cool, dry place.

Store in a dark area.

Keep away from sources of ignition.

## 8. Exposure controls/personal protection

### A. Exposure limits for chemical and biological materials :

None established.

### B. Appropriate engineering controls :

According to studies so far, additional ventilation equipment is not required.

If a material has a potential to explode, install explosion-proof equipment in the corresponding ventilation equipment.

Check if the corresponding exposure level is appropriate.

Install a local exhaust ventilation, and make sure it maintains a proper capture velocity.

### C. Individual protection measures, such as personal protective equipment :

Respiratory protection : Consider warning properties before use.

None required under normal operating conditions.

Under conditions of frequent use or heavy exposure, respiratory protection may be needed.

Respiratory protection is ranked in order from minimum to maximum.

Wear respiratory protection that has received the Korea Occupational Safety and Health Agency' s black “ Safety” mark.

Eye protection : Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Wear splash-proof eye goggles.

Wear splash resistant safety goggles with a face shield.

Hand protection : Protective gloves are not required.

Wear appropriate chemical resistant gloves.

Body protection : Body protection clothing is not required.

Wear appropriate chemical resistant clothing.

## 9. Physical and chemical properties

Properties	Data	Properties	Data
Appearance	Cyan liquid	Upper/lower flammability or explosive limits	
Odor	Slightly	Vapor pressure	
Odor threshold	None	Vapor density	
pH	None	Relative density	0.985
Melting point/ Freezing point		Solubility in water	< 0.01
Boiling point	140~160 °C	Partition coefficient n-octanol/water	



Flash point	> 80°C	Auto ignition temperature	None
Evaporation rate		Decomposition temperature	
Flammability (Solid/Gas)		Viscosity	3.7~4.7 cP

## 10. Stability and reactivity

- A. Chemical stability :** Do not store for an extended period, or store or use in an area in direct contact with air and sun and above room temperature.  
 May form explosive peroxides.  
 Stable at room temperature and atmospheric pressure.
- B. Hazardous reactivity :** Stable at room temperature and atmospheric pressure. Polymerization will not occur.
- C. Conditions to avoid (electrostatic discharge, shock, vibration, etc) :** Avoid heat, flames, sparks and other sources of ignition.  
 Keep separated from incompatible substances.  
 If container is exposed to heat, it may rupture or explode.
- D. Incompatibility with other materials :** acid, base, oxidizing agents, metallic oxide, peroxides, reducing agents, halogen, inflammables, mineral salt.
- E. Hazardous decomposition products :** Produce carbon oxide and sulfur compounds during thermal decomposition.  
 Variety of organic matters, cyanide compounds, ammonia, nitrogen oxide.

## 11. Toxicological information

### A. Primary route of entry :

Inhalation toxicity : May cause irritation, nausea, headache, drowsiness, dizziness, dyspnea, pulmonary congestion, internal bleeding, blood disorders , kidney failure, unconsciousness, loss of coordination(function).

Oral toxicity : May cause hypothermia or fever, change in blood pressure, nausea, vomiting, diarrhea, headache, dizziness, stomach pain, chest pain, dyspnea, irregular heart beat, drowsiness, sleep disorders, blood disorders , kidney failure, paralysis, convulsions, loss of coordination(function), pulmonary congestion, convulsions, unconsciousness, lethargy.

Eye, skin toxicity : Long term exposure can create irritation.

It can be absorbed through skin, making it red and developing irritation.

### B. Delayed, immediate and chorinic effects following short-term and long-term exposures :

Acute toxicity : No data available.

Skin corrosion or irritation : Skin rabbit, according to skin Irritation test.

Severe eye damage and irritation : According to rabbit tests, it can develop corneal opacity with pain to human, but it was recovered in a few days.

Respiratory sensitization : No data available.

Skin sensitization : No data available.

Germ cell mutagenicity : No data available.

Carcinogenicity : No data available.

Reproductive toxicity : No data available.

STOT–single exposure : It develops lethargy, dizziness, dyspnea, metabolic acidosis, hematuria, or liver disease. When it is inhaled, it irritates nose and neck. It develops repetitive respiratory irritation.

STOT–repeated exposure : According to animal tests, inhalation can cause toxic effects on blood.

Aspiration hazard : No data available.

C. Numerical measures of toxicity (such as acute toxicity estimates) : No data available.

## 12. Ecological information

A. Aquatic and/or terrestrial organisms toxicity : No data available.

B. Persistence and degradability : No data available.

C. Bio accumulative potential : No data available.

D. Mobility in soil : No data available.

E. Other adverse effects : No data available.

## 13. Disposal considerations

A. **Method of disposal:** Dispose the content and container in accordance with all applicable regulations of Waste Management Law.

Please dispose by using one of the following methods:

1. Neutralize, hydrolyze, oxidize, or restore it.
2. Incinerate or melt it in high temperature.
3. Solidify it.

B. **Discourage sewage disposal** : Consider all cautions specified in all applicable regulations of Waste Management Law.

## 14. Transport information

A. UN number : No data available.

B. UN proper shipping number : Not applicable.

- C. Transport hazard class : Not applicable.
- D. Packing group, if applicable : Not applicable.
- E. Environmental hazards : No data available.
- F. Special precautions for user: Not applicable.

## 15. Regulatory information

- A. Regulation by the Korea Industrial Safety and Health Act : Work environment measuring material, special health diagnosis material (Inspection cycle : 12 months)
- B. Regulation by the Enforcement Decree of the Toxic Chemicals Control Act : No data available.
- C. Regulation by the Safety Control of Dangerous Substances Act : No data available.
- D. Regulation by the Waste Management Law : Authorized waste
- E. Regulation by other national and international regulations: Not applicable.

## 16. Other information

- A. Literature references and sources for data : Korea Occupational Safety and Health Agency
- B. Date of preparation : 29. May. 2009
- C. Latest revision and changes Date : 29. May. 2009
- D. Explanation : This MSDS (Material Safety Data Sheets) contains health, safety and environment information, and was written by reflecting our company' s current technology. This data is not a guarantee for the product' s character or quality, and should be used only as a reference in relation to safe use of the product.