

# **Material Safety Data Sheet**

## **1. Product and Company Identification**

**A. Product Name :** TEC-PA-088

**B. Recommended use of the chemical and restrictions on use :** Conductive paste ink for Screen Printing  
Do not use for the other application. Restricted to professional users.

**C. Manufacturer :**

Name : InkTec Co.,Ltd.

Address : #98-12, Neungan-ro, Danwon-gu, Ansan-city, Gyeonggi-do, 425-839, Korea

Phone number : +82-031- 494- 0001

FAX number : +82-031- 492- 2041

## **2. Hazards Identification**

**A. Classification of the substance or mixture :**

Skin corrosion/ irritation : Hazard category 2

Serious eye damage/ eye irritation : Hazard category 2

Reproductive toxicity : Hazard category 1

Specific target organ toxicity, single exposure : Hazard category 1

Specific target organ toxicity, repeated exposure : Hazard category 1

Classified as dangerous according to Directive 1999/45/EC.

**B. Label elements, including precautionary statements**

**Hazard symbols**



**Signal word :** Danger

Classified as dangerous according to Regulation (EC) No 1272/2008.

**Hazard statement**

H315 : Causes skin irritation

H317 : May cause an allergic skin reaction

H319 : Causes serious eye irritation

H370 : Causes damage to organs

H372 : Causes damage to organs through prolonged or repeated exposure

H412 : Harmful to aquatic life with long lasting effects

**Precautionary statement****Precautionary**

P260 : Do not breathe dust/fume/gas/mist/vapours/spray.

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.

P272 : Contaminated work clothing should not be allowed out of the workplace.

P273 : Avoid release to the environment.

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

**Countermeasure**

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.

P307+P311 : IF exposed: Call a POISON CENTER or doctor/physician.

P314 : Get medical advice/attention if you feel unwell.

P321 : Specific treatment (see ... on this label).

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

P333+P313 : If skin irritation or rash occurs: Get medical advice/attention.

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

P362 : Take off contaminated clothing and wash before reuse

P363 : Wash contaminated clothing before reuse.

**Storage**

P405: Store locked up.

**Disposal**

P501 : Dispose of contents/container to ...

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

Ingredients	% by weight	Health	Fire	Reactivity
Silver	< 70%	No data available	No data available	No data available
Diethylene glycol monoethyl ether acetate	< 20%	2	1	0
Epoxy resin	< 10%	0	1	0

## 3. Composition Information

Ingredients	% By weight	CAS No.	EC No.	EU Classification			
				DSD 67/548/EEC	CLP		
					Hazard Class and Category Codes	Hazard Statement Codes	Pictogram/Signal word Codes
Silver	< 70%	7440-22-4	231-131-3		Aquatic Acute 1	H400	GHS09 Wng
Diethylene glycol monoethyl ether acetate	< 20%	112-15-2	203-940-1		Eye Irrit. 2	H319	GHS07 Wng
Epoxy resin	< 10%	25068-38-6	500-033-5	Xi; R36/38 R43 N; R51-53	Eye Irrit. 2 Skin Irrit. 2 Skin Sens. 1 Aquatic Chronic 2	H315	GHS07 GHS09 Wng

## 4. First – aid measures

### A. Eye contact

Rinse immediately with plenty of running water (for 10 minutes).  
Seek medical attention if necessary

### B. Skin contact

Rinse immediately with plenty of running water (for 10 minutes).  
Change all contaminated clothing and clean it.  
Consult doctor if complaint persists.

### C. Inhalation

Move to fresh air. If necessary, consult doctor.

If don't respire, Do artificial respiration.or use oxygenator.

Avoid being exposed to it.

#### ***D. Ingestion***

Rinse mouth and consult doctor.

***E. Major emergency and potential health symptoms/effects :*** No data available

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

Take protective measures by medical personnel that recognized those substance.

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

#### ***A. Fire extinguishing agent:***

Use alcohol resistant foam, carbon dioxide or water spray.

Extinguish by smothering, use dried sand and soil

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

In case of fire toxic gases can be released and container can be exploded

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

Wear full protective clothing.

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

Keep distance and extinguish

Dig a ditch for contaminated water

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

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

Avoid skin and eye contact.

Keep away from dust, hume, gas, steam...

Wear protective clothing and blot contaminants.

#### ***B. Precautions***

Do not empty into drains, surface water, ground water...

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

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

Clean contaminated area.

## 7. Handling and storage

### A. Precautions for safe handling

Do not inhale dust, steam, mist or gas.

Do not get in eyes, on skin and clothing.

Use only in a well ventilated area.

Wash thoroughly after handling.

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

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

Store under refrigeration

Keep distance from food

## 8. Exposure controls/personal protection

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

Occupational exposure limit values listed in Commission Directive 2009/161/EU and 2000/39/EC

Ingredients	CAS No.	Workplace exposure limit				Notation
		Long-term exposure limit (8-hour TWA reference period)		Short-term exposure limit (15-minute reference period)		
		ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>	
Silver	7440-22-4	-	0.1	-	-	-
Diethylene glycol monoethyl ether acetate	112-15-2	-	-	-	-	-
Epoxy resin	25068-38-6	-	-	-	-	-

### B. Appropriate engineering controls

Ensure good ventilation, suction at the workplace. Be furnished with a shower facility.

### 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	Gray	Upper/lower flammability or explosive limits	No data available
Odor	Moderate solvent odor	Vapor pressure	Less than 0.05 mmHg (20 deg. C)
Odor threshold	No data available	Vapor density	6.07 (air=1)
pH	Not applicable	Relative density	2.3 g/cc (25 deg. C)
Melting point/ Freezing point	Less than -13 deg. F / -25 deg. C	Solubility in water	Not Applicable
Boiling point	Greater than 426.2 deg. F / 219 deg. C	Partition coefficient n-octanol/water	Not Applicable
Flash point	Greater than 224.6 deg. F / 107 deg. C	Auto ignition temperature	No data available
Evaporation rate	No data available	Decomposition temperature	No data available
Flammability (Solid/Gas)	No data available	Viscosity	40,000 cPs (25 deg C)

## 10. Stability and reactivity

#### A. Chemical stability

Stable at room temperature and atmospheric pressure.

#### B. Hazardous reactivity

Stable at room temperature and atmospheric pressure.

#### C. Conditions to avoid (electrostatic discharge, shock, vibration, etc)

Avoid heat, flames, sparks and other sources of ignition.

#### D. Incompatibility with other materials

Reducing agents, halogen, inflammables

#### E. Hazardous decomposition products

In case of fire toxic gases can be released.

### 11. Toxicological information

#### A. Primary route of entry

Inhalation toxicity : May cause Irritating to respiratory system.

Oral toxicity : No data available.

Eye, Skin toxicity : May cause Irritating to skin, eyes.

Short-term or long-term exposure cause irritation.

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

Acute toxicity :

Ingredients	CAS No.	Oral	Eye	Inhalation
Silver	7440-22-4	LD50 >5000 mg/kg Rat	LD50 >2000 mg/kg Rat	No data available
Diethylene glycol monoethyl ether acetate	112-15-2	LD50 11000 mg/kg Rat	LD50 15.1 mg/kg Rat	
Epoxy resin	25068-38-6	LD50 >1000 mg/kg Rat	LD50 >20000 mg/kg Rat	No data available

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

Severe eye damage and irritation : According to rabbit tests, it was recovered in 24 hours.

Respiratory sensitization : No data available.

Skin sensitization : May cause an allergic skin reaction

Germ cell mutagenicity : No data available.

Carcinogenicity : No data available.

Reproductive toxicity : No data available.

STOT-single exposure : No data available.

STOT-repeated exposure : No data available.

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 :

Ingredients	CAS No.	fish	crustacean	birds
Silver	7440-22-4	LD50 58 mg/l 96hr	No data available	No data available
Diethylene glycol monoethyl ether acetate	112-15-2	LD50 211.272 mg/l 96hr	LD50 4729.785 mg/l 96hr	EC50 15.811 mg/l 96hr
Epoxy resin	25068-38-6	LD50 1.41 mg/l 96hr	EC50 1.7 mg/l 48hr	No data available

### B. Persistence and degradability :

Ingredients	CAS No.	persistence	degradability
Silver	7440-22-4	No data available	No data available
Diethylene glycol monoethyl ether acetate	112-15-2	log Kow 0.32	No data available
Epoxy resin	25068-38-6	log Kow 2.821(estimation)	No data available

### C. Bio accumulative potential :

Ingredients	CAS No.	Bio-accumulation	biodegradability
Silver	7440-22-4	No data available	No data available
Diethylene glycol monoethyl ether acetate	112-15-2	No data available	98~103(%) 28day
Epoxy resin	25068-38-6	BCF 0.56~0.67	0(%) 28day

**D. Mobility in soil :** No data available

**E. Other adverse effects :** No data available

## 13. Disposal considerations

### A. Method of disposal :

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Dispose the content and container in accordance with all applicable regulations of Waste Management Law.

#### **B. Discourage sewage disposal :**

Consider all cautions specified in all applicable regulations of Waste Management Law.

### **14. Transport information**

Ingredients	CAS No.	UN No.	적정 선적명	위험성 등급	용기등급	해양오염 물질	특별 안전대책
Silver	7440-22-4	No data	No data	No data	No data	No data	No data
Diethylene glycol monoethyl ether acetate	112-15-2	No data	No data	No data	No data	No data	No data
Epoxy resin	25068-38-6	3082	Environm ental harful substanc e (liquid)	9	III	No data	No data

### **15. Regulatory information**

#### **A. Regulation by the Korea Industrial Safety and Health Act**

Ingredients	CAS No.	Directive
Silver	7440-22-4	Working environment measurement substance (Inspection cycle: 6 months) Managed harmful substances Exposure limits set material
Diethylene glycol monoethyl ether acetate	112-15-2	Not applicable
Epoxy resin	25068-38-6	Not applicable

#### **B. Regulation by the Enforcement Decree of the Toxic Chemicals Control Act : Not applicable**

#### **C. Regulation by the Safety Control of Dangerous Substances Act :**

Ingredients	CAS No.	Directive
Silver	7440-22-4	Not applicable
Diethylene glycol monoethyl ether acetate	112-15-2	Class 4 petroleum of 3 type(soluble liquid) 4000ℓ
Epoxy resin	25068-38-6	Not applicable

#### **D. Regulation by the Waste Management Law : specified waste**

***E. Regulation by other national and international regulations :***

There are restrictions for substances classified as toxic to reproduction category 1A or 1B under Title VIII of Regulation (EC) No. 1907/2006.

Annex XVII to Regulation (EC) No 1907/2006 - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles:

Substances which appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 classified as toxic to reproduction category 1A or 1B (Table 3.1) or toxic to reproduction category 1 or 2 (Table 3.2) and listed as follows :

Without prejudice to the implementation of other Community provisions relating to the classification, packaging and labelling of substances and mixtures, suppliers shall ensure before the placing on the market that the packaging of such substances and mixtures is marked visibly, legibly and indelibly as follows: 'Restricted to professional users'.

Substances classified as toxic to reproduction category 1B contained in the mixture are not subject to authorization under Title VII of Regulation (EC) No. 1907/2006. Other substances in the mixture are not subject to authorisation under Title VII or restrictions under Title VIII of Regulation (EC) No. 1907/2006. Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

Regulation (EC) No 1272/2008 of the European parliament and of the Council of 16 December 2008 on classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006;

DIRECTIVE 1999/45/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations ;

COUNCIL DIRECTIVE of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances (67/548/EEC).

***16. Other information******A. Literature references and sources for data :***

Korea Occupational Safety and Health Agency SDS was elaborated according to requirements set in Annex II of Regulation (EC) No 1907/2006 of the European Parliament and of the Council. SDS was prepared using data from the producer.

Regulation (EC) No 1272/2008 Annex VI (Table 3.1) (Table 3.2)

Regulation (EC) No 1907/2006 XVII

Directive 67/548/EEC

Directive 1999/45/EC

Directive 2000/39/EC

Directive 2009/161/EU

European Chemicals Agency

Korea Occupational Safety and Health Agency

Chemical Information System

National Institute of Chemical Safety

***B. Date of preparation : 2015-07-20***

***C. Latest revision and changes Date : 2015-11-16***

***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.

***List of relevant risk phrases and hazard statements :***

R36/38 : Irritating to eyes and skin.

R43 : May cause sensitization by skin contact.

R51/53 : Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R61 : May cause harm to the unborn child.

R : Risk Phrases

Xn : Harmful Substance

Xi : Irritant Substance

***Instructions for the training :***

Product handling instruction shall be included into the educational system about the safety work (initial training, training at the workplace, repeated training) according to specific conditions at the workplace.

***Recommended restrictions on use (i.e. non-statutory recommendations by supplier) :***

Mixture should not be used for any other purpose than for which is appointed.

Because of the fact that specific conditions of use of mixture are out of supplier's control,

It is responsibility of the user to adjust the prescribed warnings to local laws and regulations.

Safety information describes the product in terms of safety and it cannot be considered as technical information about product.

***Sources of key data used to compile the Safety Data Sheet :***

InkTec Co.,Ltd

SDS was elaborated according to requirements set in Annex II of Regulation (EC) No 1907/2006 of the European Parliament and of the Council. SDS was prepared using data from the producer.

***Purpose of SDS:***

Purpose of this SDS is to provide relevant information for users of product to ensure proper handling and control of risks/hazards.