

# Material Safety Data Sheet (MSDS)

## 1. Chemical Product and Company Identification

Product Name IJR-4000 CW100  
Use of Product UV curable Inkjet Marking ink for PCB  
Restriction on the use of product Do not use this product for uses other than as the PCB ink  
Manufacturer/Supplier (1) Company name : (TAIYO INK MFG. CO., (KOREA)LTD.  
(2) Post Code : 425-839  
(3) Address : 166, Manhae-ro, Danwon-gu, Ansan-city Gyeonggi-do KOREA.  
(4) Contact Information : Tel 82-31-491-9250(#306), Fax 82-31-491-7671  
(5) The person in charge : Sales Team  
  
\* 24hours Emergency contact # :  
(In case of occurring the chemical accident , emergency contact #)  
- First : Seller or supplier.  
- Second : Sales Team in TAIYO INK MFG. CO., (KOREA)LTD) (82)-31-491-9250 #306

## 2. Hazards Identification

### Hazards classification

Skin corrosion & Irritation	Category 2(Skin Irritation)
Hazardous to the aquatic environment-chronic hazard	Not established
Carcinogenicity	Category 2
Sensitization-skin	Category 1
Germ cell mutagenicity	Not established
Specific target organ toxicity (repeated exposure)	Not established
Acute toxicity	Not established
Eye damage & Irritation	Category 2A(Eye Irritation)
Toxic to reproduction	Not established
Ozone depletion potential	Not established
Sensitization-respiratory	Not established
Specific target organ toxicity (sigle exposure)	Not established
Aspiration hazard	Not established

\* No pertinent date is not indicated

### Pictograph



The signal term Warning

### Hazards

[H351]Suspected of causing cancer.  
[H315]Causes skin irritation.  
[H317]May cause an allergic skin reaction.  
[H319]Causes serious eye irritation.

### Precautions

[P280]Wear protective gloves/protective clothing/eye protection/face protection.  
[P201]Obtain special instructions before use.  
[P264]Wash thoroughly hands after handling.  
[P202]Do not handle until all safety precautions have been read and understood.  
[P272]Contaminated work clothing should not be allowed out of the workplace.  
[P261]Avoid breathing dust/fume/gas/mist/vapors/spray.

### First Aid Measures

[P321]Specific treatment (see ... on this label).

## First Aid Measures

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

[P337+P313] If eye irritation persists, Get medical advice/attention.

[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.

[P362+P364] Take off contaminated clothing and wash it before reuse.

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

[P333+P313] If skin irritation or rash occurs, Get medical advice/attention.

## storage and waste

[P405] Store locked up.

[P501] Dispose of contents/container to accordance with local/regional/national/International regulations.

## Additional information

NFPA: Health 2

Fire 1

Reactivity 0

OSHA: -

## 3. Composition, Information on Ingredients

Ingredient	CAS#	Wt. %
Titanium dioxide	13463-67-7	>=5 - <15
Additive & Others	Trade Secrets	>=1 - <5
Acrylic Monomers	Trade Secrets	>=85 - <95
Others	Trade Secrets	>=0.1 - <1
Total		100

## 4. First Aid Measures

### Eyes Contact

Wash eyes with the running water during more than 15 minutes and then must be treated by a doctor.

### Skin Contact

Please quickly wash away with water or warm water , wash with soap carefully.

### Inhalation

Inhalation by steam, If It feels uncomfortable, should be moved to the area with fresh air and must be treated by a doctor.

### Ingestion

-It will incur a danger when getting people be vomited because of containing a volatile liquid.  
-Make sure to keep stability and then must be treated by a doctor immediately.

### Notes to Physicians

-If not breathing, give effect to artificial respiration.  
-Consider to give oxygen.  
-A person with a disease in skin and eye can deteriorate by influence of different contaminant.

### The most significant Symptoms of acute and chronic Toxicity

Refer to #11(Toxicological Information)

## 5. Fire Fighting Measures

### Suitable Extinguishing Media

CO2 , bubble , powder ,dry sand

### Special hazardous substances by fire

No data

## 5. Fire Fighting Measures

Special protective equipment & precaution for fire-fighters

- First remove combustible substance and extinguish the fire by CO<sub>2</sub>, bubble, powder, dry sand against the wind.
- Wear the fire clothing and safety shoes, gloves and face shield.
- If it's possible to do, take the container away from the fire district.
- Make sure to not inhale the combustion products.

## 6. Accidental Release Measures

Protection for worker, protective equipment and emergency procedures

Cleaning person must wear safety gloves & protective equipment to protect the contamination of skin.

The measures for the environmental protection

Make sure to not have the leak products flow into river & waterway.

The collection of leak chemistry products, removal measures, disposal of used substance

- In case of small amount of leaked substance, absorb leaked substance by dry sand, soil, sawdust, wet mop and then collect the substance by empty vessel which can be sealed.
- In case of large amount of leaked substance, surround the leaked substance by earthiness to prevent the diffusion and absorb leaked substance by wet mop and then collect the substance by empty vessel which can be sealed.

## 7. Handling and Storage

Handling

- It should be disposed of handle in place with well-ventilated. In case of disposing of handle in outdoor, be ensured that it should be started working against the wind.
- In case of disposing of handle, use special protective equipment.  
(refer to 8. protection of exposure & personal protection equipment)
- In case of disposing of handle in indoor, be ensured that it should be disposed in place with installed all air exhauster & a part of air exhauster.

Storage

- Put it into airtight container and store it in place with well-ventilated.
- Dark place with the lower than 10 ~ 20°C.
- The safe material of container wrapping: The empty vessel which can be sealed.

## 8. Exposure Controls, Personal Protection

Exposure standard of chemicals & Biological, etc

Ingredient(CAS #)	KOSHA-TWA	KOSHA-STEL	ACGIH-TWA	ACGIH-STEL	Biological
13463-67-7	10mg/m <sup>3</sup>		10mg/m <sup>3</sup>		

\*Comment

TLV-TWA (Threshold Limit Value Time Weighted Average)

TLV-STEL (Threshold Limit Value-Short Term Exposure Limit)

The way of process control

It should be installed with all air exhauster & a part of air exhauster in work place.

Personal Protective Equipment

- Protective equipment for the respiratory organ: organic gas mask.
- Protective equipment for Hands: Safety gloves.
- Protective equipment for eyes: Protective eyewear.
- Protective equipment for skin & body: Safety clothing(long sleeves against electric charge, long trousers, an apron), the safety shoes (the protective shoes against electric charge, rubber boots) etc.
- ※ Appropriate sanitation measures: Go to the bathroom and brush one's teeth after completion of handle.

## 9. Physical and Chemical Properties

Boiling Point(° C)	200°C
Flash Point(° C)	134.1°C
Vapor Pressure	0.975
Vapor Density	(air=1) >1

## 9. Physical and Chemical Properties

Partition Coefficient(n-Octanol/Water	-0.13
Decomposition Temperature	205-215°C
Odor	a weak odor
pH	No data
Flammability(Solid, Gas)	Not available
Appearance	White color with Liquid
Specific Gravity	1.18
Evaporation Rate	No data
Explosion (Lower/Upper)Limits	No data
Molecular Weight	Not available
Freezing/Melting Point(° C)	No data
Odor threshold	No data
Viscosity	11.5cPs(50°C)
Oxidizing Property	Not available
Auto ignition temperature	No data
Solubility	Insoluble in water

## 10. Stability and Reactivity

Chemical Stability	Stable under usually work conditions.
(Hazards) Reactivity	It don't react with water.
Conditions which should be avoided	Heat , Light , Flame etc.
Substances which should be avoided	Inflammables , the strong acid, the strong alkali, the strong peroxide , the strong oxidizing agent.
Hazardous substances be Decomposition	-It don't product any breakdown products under the normal conditions. -When burned, It might product the nitrogen oxide, the other organic gas (or steam).

## 11. Toxicological Information

Inhalation : No data.

Ingestion : No data.

Skin : No data.

Eye : No data.

A exposure channel and Symptoms

The most significant Symptoms of acute and chronic Toxicity

Acute toxicity(Oral)	Not available
Acute toxicity(Dermal)	Not available
Acute toxicity(Inhalation)	Not available
Skin corrosion/irritation	Mixture : Category 2(Skin Irritation) -Chemical name : Acrylic Monomers
Eye damage/irritation	Mixture : Category 2A(Eye Irritation) -Chemical name : Acrylic Monomers
Respiratory sensitization	No data
Skin sensitization	Mixture : Category 1 -Chemical name : Acrylic Monomer -Chemical name : Aromatic Carbonyl Compounds
Carcinogenicity	Mixture : Category 2 -Chemical name : Titanium dioxide ,(Reference : IARC)
Germ cell mutagenicity	No data
Toxic to reproduction	No data

The most significant Symptoms of acute and chronic Toxicity	
Specific target organ toxicity (Single exposure)	No data
Specific target organ toxicity (Repeated exposure)	No data
Aspiration hazard	No data

Effects in mixture(estimated( datas)	
Acute toxicity(Oral)	No data
Acute toxicity(Dermal)	No data
Acute toxicity(Inhalation)	No data

## 12. Ecological Information

Ecotoxicity(Acute hazard-Hazardous to the aquatic environment)	Not available
Persistence and degradability	No data
Bioaccumulative potential	No data
(Soil)Mobility	No data
Other adverse effects	No data

Effects in mixture(estimated datas)

Acute hazard-Hazardous to the aquatic environment(Fishes)	Not available(Less than 25%)
Acute hazard-Hazardous to the aquatic environment(Crustacea)	No data
Acute hazard-Hazardous to the aquatic environment(Algae or Aquatic plant)	No data
Chronic hazard-Hazardous to the aquatic environment(Fishes)	No data
Chronic hazard-Hazardous to the aquatic environment(Crustacea)	No data
Chronic hazard-Hazardous to the aquatic environment(Algae or Aquatic plant)	No data
Chronic hazard-Hazardous to the aquatic environment(Fishes)	Not available
Chronic hazard-Hazardous to the aquatic environment(Crustacea)	Not available
Chronic hazard-Hazardous to the aquatic environment(Algae or Aquatic plant)	Not available
Ozone depletion potential	Not available

## 13. Disposal Considerations

Disposal method

Make sure to proceed to dispose in compliance of relevant laws of the waste disposal.

Disposal precaution

In case of outsourcing all the disposal of the waste disposal, It should be consigned by the company which obtained permission from local authority.

## 14. Transport Information

UN number : Not available

Proper shipping name : Not available

UN Classification : Not available (F.P : 134.1°C, Seta Closed Test)

Packaging group : Not available

Marine pollutant(IMDG Code) : Not available

Other applicable information

-Make sure to confirm whether there is no damage in the container before the shipping , and should be prevented the container from turning inside out & falling & being damaged when the load.

-Also, It should be prevented the container from being loose by tying tightly in the middle of the shipping.

## 15. Regulatory Information

### 1)Regulatory information of Korea

#### Industrial Safety and Health Law

Manufacturing prohibited substance	: Not available
Manufacturing permission substance	: Not available
Management target toxic substance	: 13463-67-7
Operational environment measurement object substance	: 13463-67-7
Exposure standard setting object substance	: Ref to 8#(Exposure information)
Carcinogen Group A1	: Not available
Carcinogen Group A2	: 13463-67-7
Special health examination object substance	: Not available
Special Management target toxic substance	: Not available
ACT ON THE PROTECTION OF THE OZONE LAYER	: Not available

#### Chemicals Control Act

Handling prohibited substance	: Not available
Handling permission substance	: Not available
Toxic substance	: Not available
Observation substance	: Not available
Accident correspondency substance	: Not available
Toxics Release Inventory-Level1	: Not available
Toxics Release Inventory-Level2	: Not available

#### Dangerous Safety and Health Law(Fire fighting law)

: The 4 th-class 3 petroleums, Risk rating3, Fire strict prohibition

#### Waste Matters Control Law

: Designated waste (Industrial waste)

### 2)International regulation(Eu Regulatory Information)

#### <Viscosity Liquid Products Information>

#### <Raw materials Information>

CAS No.	Ec Number	Classification	R&S Code	H Code
13048-33-4	235-921-9	Xi = Irritant	R36/38, R43, S2, S39	H315, H317, H319
15625-89-5	239-701-3	Xi = Irritant	R36/38, R43, S2, S39	H315, H317, H319
162881-26-7	423-340-5	Xi = Irritant	R43, R53, S2, S22, S24, S37, S61	H317, H413
3524-68-3	222-540-8	Xi = Irritant	R36/38, R43, S2, S39	H315, H317, H319
4986-89-4	225-644-1	Xi = Irritant	R36/38, R43, S2, S26, S39	H315, H317, H319

#### - "Risk & Safety" Phrases

R43 : May cause sensitisation by skin contact.

S24 : Avoid contact with skin

R36/38 : Irritating to eyes and skin.

S22 : Do not breathe dust

S26 : In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

S37 : Wear suitable gloves

R53 : May cause long-term adverse effects in the aquatic environment.

S2 : Keep out of the reach of children

S39 : Wear eye/face protection

S61 : Avoid release to the environment. Refer to special instructions/safety data sheet

- "Harzard" Phrases
  - H319 : Causes serious eye irritation.
  - H315 : Causes skin irritation.
  - H317 : May cause an allergic skin reaction.
  - H413 : May cause long lasting harmful effects to aquatic life.

### 3)International agreement

- Rotterdam : Not available
- Stockholm : Not available
- Montreal : Not available

## 16. Additional Information

- 1) This MSDS is written in accordance with the law occupation safety and health acts 41 clause & the notification 2016-19 in The ministry of Labor(The classification & labeling of chemical substance, the standard on the safety & health data) & GHS classification / labeling of UN for protecting the safety of worker & health obstacle.
- 2) This MSDS is written on the basis of our company's research result and each of the data & information on the substance available now (each of the substance data's source, refer to the below data's source
  - \* This examined result in MSDS is based in the below information on The regulation by our company's perspective, therefore The regulation may be changed by the region of use & the point of view. and Make sure to take actions in accordance with appropriate regulation after confirming the regulation on chemical substance by regional groups including this article of the regulation.
- 3) This MSDS isn't guarantee for safety & quality , but have a purpose in supply of information only. and If this product will be delivered to overseas country, contact with the person in charge of sales in advance.

<"MSDS creation and Revision" History>

MSDS creation date : 09/06/2018                      Revision date : 10/24/2018                      (Rev.1)

Revision reason : Hazardous substances exclusion

## \*Appending Data

### [1]Source

1. Source of mixture: Technical research institute of TAIYOINK MFG, CO., (KOREA)LTD.
2. Source of single material: Research on the basic information of material stated following Database (Research Institute for Environmental medicine of Korea university)
  - 1) Hazardous Substances Data Bank(HSDB)
  - 2) National Library of Medicine(NLM)
  - 3) Chemical Carcinogenesis Research Information System(CCRIS)
  - 4) The Chemical Data base, The Department of Chemistry at the University of Akron
  - 5) International Chemical Safety Cards(ICSC)
  - 6) International Uniform Chemical Information Database(IUCID)
  - 7) IARC: monographs on the evaluation of the carcinogenic risk of chemical to humans
  - 8) NCIS : National Chemicals Information System in Korea
  - 9) Korea Occupational Safety & Health Agency (KOSHA) MSDS
  - 10) UNECE - Globally Harmonized System of Classification and Labelling of Chemicals(GHS)
  - 11) Refer to raw materials maker

### [2]Regulatory information

1. Occupation Safety and Health Acts: The following regulatory items were examined through KOSHA.net and applicable laws and regulations as of April 30, 2017.
2. Registration and Evaluation of Chemicals & Chemicals Control Act: : The following regulatory items were examined on April 30, 2017.
3. The classification of Dangerous Substances of its mixtures in accordance with the criteria for Dangerous Substances Classification pursuant to Article 2 of Safety Control of Dangerous Substances Act was carried out.
4. Specified waste of Wastes Control Act: Schedule 1 of Enforcement Ordinance of Wastes Control Act [Revised on 01.19.2016 Presidential Decree No. 27792] was examined on April 30, 2017.
5. Persistent Organic Pollutants Control Act: Schedule 1 of Enforcement Ordinance of Persistent Organic Pollutants Control Act [Revised on 03.27.2017 Presidential Decree No. 27965] was examined on April 30, 2017.
6. Atmosphere environment preservation law : The regulatory items were examined on April 30, 2017.
7. Schedule 1 of Enforcement Regulations of Malodor Prevention Act (Specified malodorous substance) [Revised on 01.19.2017 Decree of the Ministry of Environment No. 688] was examine on April 30, 2017.
8. Controlled substance by the International Convention (Montreal Protocol, Rotterdam Protocol & Stockholm Agreement) was examined on April 30, 2017.