

Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name IJR-4000 MW300
Use of Product UV curable Ink jet Marking ink for PCB
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

Distributed by: Taiyo America, Inc.
2675 Antler Drive
Carson City, NV 89701 U.S.A.

Tel 775-885-9959

※ 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

Acute toxicity	Category 3(Derma)
Skin corrosion & Irritation	Category 2(Skin Irritationn)
Eye damage & Irritation	Category 2A(Eye Irritationn)
Sensitization-respiratory	Not established
Sensitization-skin	Category 1
Carcinogenicity	Category 2
Germ cell mutagenicity	Not established
Toxic to reproduction	Not established
Specific target organ toxicity (sigle exposure)	Not established
Specific target organ toxicity (repeated exposure)	Not established
Aspiration hazard	Not established
Hazardous to the aquatic environment-acute hazard	Not established
Hazardous to the aquatic environment-chronic hazard	Not established

※ No pertinent date is not indicated

Pictograph



The signal term Danger

Hazards

[H351]Suspected of causing cancer.
[H311]Toxic in contact with skin.
[H317]May casue an allergic skin reaction.
[H315]Causes skin irritation.
[H319]Causes serious eye irritation.

Precautions

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

First Aid Measures

[P308+P313]IF exposed or concerned: Get medical advice/attention.

First Aid Measures

[P302+P352] IF ON SKIN: Wash with plenty of water/...

[P312] Call a POISON CENTER/doctor/if you feel unwell.

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

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

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

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

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

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

[P361+P364] Take off immediately all contaminated clothing and wash it before reuse.

storage and waste

[P405] Store locked up.

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

Additional information

NFPA: Health 3

Fire 1

Reactivity 0

OSHA: -

3. Composition, Information on Ingredients

Ingredient	CAS#	Wt. %
Titanium dioxide	13463-67-7	5 ~ 10
Acrylic Monomers	Trade Secrets	80 ~ 90
Others	Trade Secrets	5 ~ 10
Aluminum Hydroxide	21645-51-2	0.3 ~ 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.

The most significant Symptoms of acute and chronic Toxicity

Refer to #11(Toxicological Information)

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.

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 combustibile substance and extinguish the fire by CO2, 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 stared 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 ³		10mg/m ³		
150-76-5	5mg/m ³		5mg/m ³		

*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

Appearance	white color with Liquid
Odor	a weak odor
Odor threshold	No data

9. Physical and Chemical Properties

pH	6
Freezing/Melting Point(° C)	No data
Boiling Point(° C)	200°C
Flash Point(° C)	110°C
Evaporation Rate	No data
Flammability(Solid, Gas)	Not available
Explosion (Lower/Upper)Limits	No data
Vapor Pressure	1/150°C
Solubility	Insoluble in water
Vapor Density	(air=1) >1
Specific Gravity	1.18
Partition Coefficient(n-Octanol/Water	-0.13
Auto ignition temperature	No data
Decomposition Temperature	205-215°C
Viscosity	14.0cPs(45°C)
Molecular Weight	Not available
Oxidizing Property	Not available

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

A exposure channel and Symptoms

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

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 Irritationn) -물질명 : Acrylic Monomers
Eye damage/irritation	Mixture : Category 2A(Eye Irritationn) -물질명 : Acrylic Monomers
Respiratory sensitization	No data
Skin sensitization	Mixture : Category 1 -물질명 : Acrylic Monomers -물질명 : Aromatic Carbonyl Compounds
Carcinogenicity	Mixture : Category 2 -물질명 : Titanium dioxide ,(출처 : IARC)
Germ cell mutagenicity	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
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
Aspiration hazard	No data
Effects in mixture(estimated(datas)	
Acute toxicity(Oral)	No data
Acute toxicity(Dermal)	471.08 Category 3(Derma) -물질명 : Acrylic Monomers
Acute toxicity(Inhalation)	No data
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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

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)	No data
Acute hazard-Hazardous to the aquatic environment(Crustacea)	No data
Acute hazard-Hazardous to the aquatic environment(Algae or Aquatic plant)	No data

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 : UN2810

Proper shipping name : Toxic Liquid, Organic, N.O.S. (2- Propenoic acid, 2,2- dimethyl- 1,3- propanediyl ester)

UN Classification : 6.1 (F.P : 110°C, Seta Closed Test)

Packaging group : 3

Marine pollutant(IMDG Code) : UN2810

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

Registration and Evaluation of Chemicals & Chemicals Control

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>

EEC Labeling	T = Toxic	
Risk Phrases	R24 : Toxic in contact with skin.	
Safety Phrases	S1/2 : Keep locked up and out of the reach of children	
	S28 : After contact with skin, wash immediately with plenty of ... (to be specified by the manufacturer)	
	S39 : Wear eye/face protection	
	S45 : In case of accident or if you feel unwell seek medical advice immediately (show the label where possible)	

<Raw materials Information>

CAS No.	Ec Number	Classification	R&S Code	H Code
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
2223-82-7	218-741-5	T = Toxic	R24, R36/38, R43, S1/2, S28, S39, S45	H311, H315, H317, H319
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

- R24 : Toxic in contact with skin.
- R36/38 : Irritating to eyes and skin.
- R43 : May cause sensitisation by skin contact.
- R53 : May cause long-term adverse effects in the aquatic environment.
- S1/2 : Keep locked up and out of the reach of children

- "Risk & Safety" Phrases
 - S22 : Do not breathe dust
 - S24 : Avoid contact with skin
 - S26 : In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
 - S28 : After contact with skin, wash immediately with plenty of ... (to be specified by the manufacturer)
 - S37 : Wear suitable gloves
 - S39 : Wear eye/face protection
 - S45 : In case of accident or if you feel unwell seek medical advice immediately (show the label where possible)
 - S61 : Avoid release to the environment. Refer to special instructions/safety data sheet
- "Harzard" Phrases
 - H311 : Toxic in contact with skin.
 - H315 : Causes skin irritation.
 - H317 : May casue an allergic skin reaction.
 - H319 : Causes serious eye irritation.
 - 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 2012-14 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 : 2013/10/02 Revision date : 2015/01/22, (Rev.2)
 Revision reason : Regular updates and Application of the latest laws.

*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 January 05, 2015.
 2. Registration and Evaluation of Chemicals & Chemicals Control Act: : The following regulatory items were examined on January 05, 2015.
 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 2014.12.31 Decree of the Ministry of Environment No. 25951] was examined on January 05, 2015.
 5. Persistent Organic Pollutants Control Act: Schedule 1 of Enforcement Ordinance of Persistent Organic Pollutants Control Act [Revised on 2013.12.30 Presidential Decree No. 25050] was examined on January 05, 2015.
 6. Atmosphere environment preservation law : The regulatory items were examined on January 05, 2015.
 7. Schedule 1 of Enforcement Regulations of Malodor Prevention Act (Specified malodorous substance) [Revised on 2014.9.25 Decree of the Ministry of Environment No. 573] was examine on January 05, 2015.
 8. Controlled substance by the International Convention (Montreal Protocol, Rotterdam Protocol & Stockholm Agreement) was examined on January 05, 2015.
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