

Material Safety Data Sheet (MSDS)

1. Chemical Product and Company Identification

Product Name REDUCER IJ02
Use of Product Diluted solution for ink-jet marking ink
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

2. Hazards Identification

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

※ No pertinent date is not indicated.

Pictograph



The signal term Warning

Hazards

[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.
[P264]Wash thoroughly hands after handling.
[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).
[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.

[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

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

Additional information

NFPA: Health 1

Fire : 1

Reactivity : 0

OSHA: -

3. Composition, Information on Ingredients

Ingredient	CAS#	Wt. %
Additive & Others	Trade Secrets	>=1 - <5
Acrylic Monomers	Trade Secrets	>=95 - <=100
Others	Trade Secrets	>=1 - <5
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

Special protective equipment & precaution for fire-fighters

-First remove combustible 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
-------------------	-----------	------------	-----------	------------	------------

*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

Odor threshold	No data
Boiling Point(°C)	205°C
Flash Point(°C)	105°C
Explosion (Lower/Upper)Limits	No data
Vapor Pressure	0.126
Vapor Density	(air=1) 4.5
Partition Coefficient(n-Octanol/Water)	0.42 at 25°C
Auto ignition temperature	214°C
Decomposition Temperature	No data
Odor	a weak odor
pH	7
Flammability(Solid, Gas)	Not available
Appearance	Colorless liquid with viscosity
Specific Gravity	1.005
Evaporation Rate	No data
Molecular Weight	Not available
Freezing/Melting Point(°C)	No data
Viscosity	20cPs
Oxidizing Property	Not available
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

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 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 Monomers
Carcinogenicity	No data
Germ cell mutagenicity	No data
Toxic to reproduction	No data
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)	No data
Acute hazard-Hazardous to the aquatic environment(Crustacea)	No data
Acute hazard-Hazardous to the aquatic environment(Algae or Aquatic plant)	Not available(Less than 25%)
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 : 105°C, Seta Closed Test)
Packaging group : Not available
Marine pollutant (IMDG Code) : No data
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	Not available
Operational environment measurement object Substance	Not available
Exposure standard setting object substance	Ref to 8#(Exposure information)
Carcinogen Group A1	Not available
Carcinogen Group A2	Not available
Special health examination object substance	Not available

Toxic Chemical Control Law

Handling prohibited substance	Not available
Handling permission substance	Not available
Toxic substance : Not available	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
Designated waste (Industrial waste)

Waste Matters Control Law

2)International regulation(Eu Regulatory Information)

<Viscosity Liquid Products Information>

<Raw materials Information>

CAS No.	E.C Number	Classification	R &S Code	H Code
868-77-9	212-782-2	Xi = Irritant	R36/38, R43, S2, S26, S28	H315, H317, H319

- "Risk Safety" Phrases

R43 : May cause sensitisation by skin contact.

R36/38 : Irritating to eyes and 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 water and soap

S2 : Keep out of the reach of children

- "Harzard" Phrases

H319 : Causes serious eye irritation.

H315 : Causes skin irritation.

H317 : May cause an allergic skin reaction.

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 : 2013/10/02

Revision date : 03/31/2018,

(Rev.4)

Revision reason : Update of material information.

*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.

-The end.-