# Safety Data Sheets

## 1. Identification

| | |
|---|---|
| Product Name | : Discharge liquid 2 |
| Order No. | : SPC-0540 |
| General Use | : Ink jet printing ink |
| Product Description | : Discharge liquid |
| SDS Number | : 037-W110596 |
| Manufacture | |
| Company Name | : Mimaki Engineering Co., Ltd. |
| Address | : 2182-3 Shigeno-otsu, Tomi-shi, Nagano 389-0512 JAPAN |
| Telephone No. | : +81-268-64-2413 |
| Importer / Distributor Established in USA | |
| Company Name | : MIMAKI USA, INC. |
| Address | : 150 Satellite Boulevard NE , suite A, Suwanee, Georgia 30024, U.S.A. |
| Telephone No. | : +1-678-730-0170 |
| Emergency Telephone No. | : +1 866 928 0789 (within United States only, Toll free)<br>+1 215 207 0061 |

## 2. Hazards Identification

[GHS Classification]

Physical Hazards

| | |
|---|---|
| Flammable Liquids | : Not classified |

Health Hazards

| | |
|---|---|
| Acute Toxicity – Inhalation | : Category 4 (~40% unknown) |
| Skin Corrosion / Irritation | : Category 2 |
| Eye Damage / Irritation | : Category 2A |
| Sensitization – Respiratory | : Category 1 |
| Sensitization – Skin | : Category 1 |
| Germ Cell Mutagenicity | : Category 1B |
| Carcinogenicity | : Category 1A |
| Toxic to Reproduction | : Category 1B |
| Specific Target Organ Toxicity (Repeated Exposure) | : Category 1(adrenal gland, bone marrow, kidneys, liver, respiratory system, spleen) |

# Safety Data Sheets

The above list does not include category being non-classifiable or not-applicable.

[GHS Label Elements]

Symbol

Signal Word

Danger

Hazard Statements

H315 Causes skin irritation
H317 May cause an allergic skin reaction
H319 Causes serious eye irritation
H332 Harmful if inhaled
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
H340 May cause genetic defects
H350 May cause cancer
H360 May damage fertility or the unborn child
H372 Causes damage to adrenal gland, bone marrow, kidneys, liver, respiratory system, and spleen through prolonged or repeated exposure.

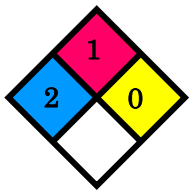
Precautionary Statements

[Prevention]
P201 Obtain SDS (Safety Data Sheet) and printer's operation manual before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe gas/mist.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P284 Wear respiratory protection.
[Response]
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
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.
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P337+P313 If eye irritation persists: Get medical advice/attention.
P342+P311 If experiencing respiratory symptoms: Call a POISON CENTER or doctor/Physician.
P362+P364 Take off contaminated clothing and wash before reuse.
[Storage]
P405 Store locked up.
[Disposal]
P501 Dispose of contents/container in accordance with local/regional/national/

international regulation (to be specified).

NFPA Rating (scale 0 – 4)

Health = 2
Flammability = 1
Instability = 0
Special =




CANADIAN WHMIS SYMBOLS

D2A, D2B

## 3. Composition / Information on Ingredients

| No | Chemical Name | Wt% | CAS No. |
|---|---|---|---|
| 1 | Reducing agent | 4-8 | Trade Secret |
| 2 | (Formaldehyde)* | 1.2 | 50-00-0 |
| 3 | Glycols | 10-20 | Trade Secret |
| 4 | Ethanol, 2,2',2"-nitrilotris- | 3-7 | 102-71-6 |
| 5 | 2-Pyrrolidinone, 1-methyl- | 3-7 | 872-50-4 |
| 6 | Ethanol, 2-(2-methoxyethoxy)- | 3-7 | 111-77-3 |
| 7 | Surface-active agent | 4-8 | Trade Secret |
| 8 | Others | 1-3 | Trade Secret |
| 9 | Water | 55-65 | 7732-18-5 |

*Formaldehyde : Reducing agent is decomposed and generated with heat. This ink contains less than 1%.

Contaminants : The chemical identity and/or percentage of composition is being withheld as a trade secret.

## 4. First Aid Measures

Inhalation : Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician.

Eye Contact : Flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

| | |
|---|---|
| | Get immediate medical attention. |
| Skin Contact | : Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash before re-use. |
| Ingestion | : If swallowed, get medical attention. |
| Note To Physician | : Formaldehyde occurs by heat press at the time of this product use. Formaldehyde stimulates eyes by the atmosphere density of 20ppm |
| Most Important Symptoms/Effects | |
| Acute | : eye irritation, skin irritation, asthma, allergic skin reaction |
| Delayed | : asthma, allergic skin reaction, mutagenic effects, cancer, reproductive effects, adrenal gland effects, bone disorders, kidney damage, liver damage, respiratory system damage, spleen damage |
| Indication of Immediate Medical Attention and Special Treatment Needed, If Needed | : Treat symptomatically and supportively. |

## 5. Fire Fighting Measures

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|---|---|
| Flammable Properties | : Flash Point: Not flammable<br>Explosion Limit: Not applicable<br>The harmful gas such as the carbon monoxide is included in the flue gas of the cartridge and this product. |
| Extinguishing Media | : carbon dioxide, regular dry powder, regular dry chemical, water spray, alcohol resistant foam |
| Unsuitable Extinguishing Media | : Do not scatter spilled material with high-pressure water streams. |
| Special Hazards Arising from the Chemical | : Irritating fumes and gases may be released upon thermal processing or during combustion. |
| Hazardous Combustion Products | : Combustion: oxides of carbon, oxides of sulfur, oxides of sodium, oxides of nitrogen |
| Fire Fighting Measures | : Move container from fire area if it can be done without risk. Do not scatter spilled material with high-pressure water streams. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Avoid inhalation of material or combustion by-products. |

| | |
|---|---|
| Special Protective Equipment and Precautions for Firefighters | : Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure. |

## 6. Accidental Release Measures

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|---|---|
| Personal Precautions, Protective Equipment and Emergency Procedures | : Wear personal protective clothing and equipment, see Section 8. Avoid release to the environment. |
| Methods and Materials for Containment and Cleaning Up | : Eliminate all ignition sources if safe to do so. Stop leak if possible without personal risk. Reduce vapors with water spray.<br>**Small spills:** Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal.<br>**Large spills:** Dike for later disposal. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. |

## 7. Handling and Storage

| | |
|---|---|
| Precautions for Safe Handling | : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe vapor or mist. In case of inadequate ventilation wear respiratory protection. Avoid contact with eyes, skin and clothing. Do not eat, drink, or smoke when using this product. Wear protective gloves and eye/face protection. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. |
| Conditions for Safe Storage, including any Incompatibilities | : Store and handle in accordance with all current regulations and standards. Store in a well-ventilated place. Keep container tightly closed. Keep cool. Store locked up. Keep separated from incompatible substances. |

## 8. Exposure Controls / Personal Protection

Exposure Limit Values : **Triethanolamine (102-71-6)**

OSHA: 15 mg/m³ TWA (mist, total particulate);
5 mg/m³ TWA (mist, respirable fraction)
Mexico 10 mg/m³ TWA LMPE-PPT (mist)

**Formaldehyde (50-00-0)**

ACGIH: 0.3 ppm Ceiling
OSHA: 2 ppm STEL (See 29 CFR 1910.1048, 15 min);
0.5 ppm Action Level (See 29 CFR 1910.1048);
0.75 ppm TWA (See 29 CFR 1910.1048)
0.75 ppm TWA
2 ppm STEL (see 29 CFR 1910.1048)
NIOSH: 0.016 ppm TWA
0.1 ppm Ceiling (15 min)
Mexico: 2 ppm Ceiling; 3 mg/m³ Ceiling

Component Biological Limit Values : There are no biological limit values for the component(s) of this product.

Exposure Controls

Occupational Exposure Controls

Appropriate Engineering Controls : Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection

Respiratory Protection : Consult with a health and safety professional for specific respirators appropriate for your use.


Hand Protection : Wear appropriate chemical resistant gloves.

Eye Protection : Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.


Skin Protection : Wear appropriate chemical resistant clothing.


## 9. Physical and Chemical Properties

| | | |
|---|---|---|
| Appearance | - Physical State | : Liquid |
| | - Color | : Clear, colorless |
| Odor | | : sulfer odor |
| pH | | : 8.0-9.9 |
| Boiling Point / Boiling Range | | : 100 ℃ |
| Melting Point / Melting Range | | : Not available |
| Decomposition Temperature | | : Not available |
| Flash Point | | : Not flammable |
| Explosive Properties | | : Not available |
| Oxidizing Properties | | : Not available |
| Upper / Lower Flammability or Explosive Limits | | : Not available |
| Vapor Pressure | | : 2.3kPa (water) |
| Specific Gravity | | : 1.0-1.2 (25 ° C) |
| Solubility | | : Not available |
| Water Solubility | | : Soluble |
| Partition Coefficient (n-octanol / Water) | | : Not available |
| Viscosity | | : 4.0-4.9 mPa·s |
| Vapor Density | | : <1 (water) |
| Evaporation Rate | | : Not available |
| VOC Content(%) | | : 30-50 |

## 10. Stability and Reactivity

| | |
|---|---|
| Reactivity | : No reactivity hazard is expected. |
| Chemical Stability | : Stable under normal conditions of use. |
| Possibility of Hazardous Reactions | : Will not polymerize. |
| Conditions to Avoid | : Avoid flames, sparks, and other sources of ignition. Avoid contact with incompatible materials. |
| Incompatible Materials | : acids, oxidizing materials, bases |
| Hazardous Decomposition | : Combustion: oxides of carbon, oxides of sulfur, oxides of sodium, oxides of nitrogen |

## 11. Toxicological Information

Acute Toxicity Component Analysis - LD50/LC50 : The component(s) of this material have been reviewed in various sources and the following selected endpoints are published:

**Glycols (Trade Secret)**

Dermal LD50 Rabbit 11890 mg/kg; Oral LD50 Rat 12565 mg/kg

**Reducing Agent (Trade Secret)**

Oral LD50 Rat >2 g/kg

**Diethylene glycol monomethyl ether (111-77-3)**

Oral LD50 Rat 4 mL/kg; Dermal LD50 Rabbit 650 mg/kg

**1-Methyl-2-pyrrolidone (872-50-4)**

Oral LD50 Rat 3914 mg/kg; Dermal LD50 Rabbit 8 g/kg; Inhalation LC50 Rat 3.1 mg/L 4 h

**Triethanolamine (102-71-6)**

Dermal LD50 Rabbit >20 mL/kg; Oral LD50 Rat 4190 mg/kg

**Formaldehyde (50-00-0)**

Oral LD50 Rat 100 mg/kg; Dermal LD50 Rabbit 270 mg/kg; Inhalation LC50 Rat 0.578 mg/L 4 h

Information on Likely Routes of Exposure

| | |
|---|---|
| Inhalation | : irritation, headache, drowsiness, dizziness, mutagenic effects, cancer, reproductive effects, kidney damage, nausea, disorientation, allergic reactions |

| | |
|---|---|
| Ingestion | : vomiting, nausea, headache, diarrhea, changes in body temperature, changes in blood pressure, stomach pain, chest pain, difficulty breathing, irregular heartbeat, loss of coordination, lung congestion, blood disorders, kidney damage, convulsions, unconsciousness, coma |
| Skin Contact | : irritation, skin disorders, allergic reactions |
| Eye Contact | : irritation |
| Immediate Effects | : skin irritation, eye irritation, asthma, allergic skin reaction |
| Delayed Effects | : asthma, allergic skin reaction, mutagenic effects, cancer, reproductive effects, adrenal gland effects, bone disorders, kidney damage, liver damage, respiratory system damage, spleen damage |
| Medical Conditions Aggravated by Exposure | : No information available for the product. |
| Irritation/Corrosivity Data | : eye irritation, skin irritation |
| Respiratory Sensitization | : May cause allergy or asthma symptoms or breathing difficulties if inhaled |
| Dermal Sensitization | : May cause an allergic skin reaction |
| Germ Cell Mutagenicity | : Available data characterizes component(s) of this product as a germ cell mutagenic hazard. |
| Carcinogenicity | : Component Carcinogenicity |

Triethanolamine (102-71-6)

| | |
|---|---|
| IARC | Monograph 77 [2000] (Group 3 (not classifiable)) |

Formaldehyde (50-00-0)

| | |
|---|---|
| ACGIH | A2 - Suspected Human Carcinogen |
| IARC | Monograph 100F [2012]; Monograph 88 [2006]; Monograph 62 [1995]; Supplement 7 [1987] (Group 1 (carcinogenic to humans)) |
| NTP | Known Human Carcinogen |
| DFG | Category 4 (no significant contribution to human cancer) |
| OSHA | Present<br>see 29 CFR 1910.1048 |

| | |
|---|---|
| Reproductive Toxicity | : Available data characterizes components of this product as reproductive hazards. |

| | |
|---|---|
| Specific Target Organ Toxicity - Single Exposure | : No target organs identified. |
| Specific Target Organ Toxicity - Repeated Exposure | : adrenal gland, bone marrow, kidneys, liver, reproductive system, spleen |
| Aspiration Hazard | : Not expected to be an aspiration hazard. |

## 12. Ecological Information

Handling is noted because it might influence the environment when leaking and abandoning it.
Especially, note that the product doesn't flow directly to ground, the river, and the drain ditch.

Component Analysis - Aquatic Toxicity

: **Glycols (Trade Secret)**

Fish: 96 Hr LC50 Pimephales promelas: 75200 mg/L [flow-through]

Invertebrate: 48 Hr EC50 Daphnia magna: 84000 mg/L

**Diethylene glycol monomethyl ether (111-77-3)**

Fish: 96 Hr LC50 Lepomis macrochirus: 7500 mg/L [static]; 96 Hr LC50 Lepomis macrochirus: 7500 mg/L; 96 Hr LC50 Pimephales promelas: 5741 mg/L

Algae: 72 Hr EC50 Desmodesmus subspicatus: >500 mg/L

Invertebrate: 48 Hr EC50 Daphnia magna: >500 mg/L

**1-Methyl-2-pyrrolidone (872-50-4)**

Fish: 96 Hr LC50 Lepomis macrochirus: 832 mg/L [static]; 96 Hr LC50 Pimephales promelas: 1072 mg/L [static]; 96 Hr LC50 Poecilia reticulata: 1400 mg/L [static]

Algae: 72 Hr EC50 Desmodesmus subspicatus: >500 mg/L

Invertebrate: 48 Hr EC50 Daphnia magna: 4897 mg/L

**Triethanolamine (102-71-6)**

Fish: 96 Hr LC50 Pimephales promelas: 10600 - 13000 mg/L [flow-through]; 96 Hr LC50 Pimephales promelas: >1000 mg/L [static]; 96 Hr LC50 Lepomis macrochirus: 450 - 1000 mg/L [static]

Algae: 72 Hr EC50 Desmodesmus subspicatus: 216 mg/L; 96 Hr EC50 Desmodesmus subspicatus: 169 mg/L

**Formaldehyde (50-00-0)**

Fish: 96 Hr LC50 Pimephales promelas: 22.6 - 25.7 mg/L [flow-through]; 96 Hr LC50 Lepomis macrochirus: 1510 µg/L [static]; 96 Hr LC50 Brachydanio rerio: 41 mg/L [static]; 96 Hr LC50 Oncorhynchus mykiss: 0.032 - 0.226 mL/L [flow-through]; 96 Hr LC50 Oncorhynchus mykiss: 100 - 136 mg/L [static]; 96 Hr LC50 Pimephales promelas: 23.2 - 29.7 mg/L [static]

Invertebrate: 48 Hr LC50 Daphnia magna: 2 mg/L; 48 Hr EC50 Daphnia magna: 11.3 - 18 mg/L [Static]

| | |
|---|---|
| Persistence and Degradability | : No information available for the product. |
| Bioaccumulation | : No information available for the product. |
| Mobility | : No information available for the product. |
| Other Toxicity | : No additional information is available. |

## 13. Disposal Considerations

: Comply with all USA, national and local regulations.
Do not dump this product into sewers, on the ground or into any body of water.

Disposal Methods : Dispose in accordance with all applicable regulations.

Component Waste Numbers : **Formaldehyde (50-00-0)**

| | |
|---|---|
| RCRA | waste number U122 |

Disposal of Contaminated Packaging : Empty containers may contain product residue. Dispose in accordance with all applicable regulations.

## 14. Transport Information

Check a thing without a leak in a container.
Perform prevention of collapse of cargo surely.

US DOT Information : Not regulated as a hazardous material for transport.

IATA Information : Not regulated as dangerous goods for transport.

# Safety Data Sheets

| | |
|---|---|
| ICAO Information | : Not regulated as dangerous goods for transport. |
| IMDG Information | : Not regulated as dangerous goods for transport. |
| TDG Information | : Not regulated as dangerous goods for transport. |
| UN Number | : Not regulated |
| Marine Pollutant | : **1-Methyl-2-pyrrolidone (872-50-4)** |
| | IBC Code: Category Y |
| | **Triethanolamine (102-71-6)** |
| | IBC Code: Category Z |
| | **Formaldehyde (50-00-0)** |
| | IBC Code: Category Y (solutions, <=45%) |

## 15. Regulatory Information

U.S. Federal Regulations : This material contains one or more of the following chemicals required to be identified under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

**Reducing Agent (Trade Secret)**

| | |
|---|---|
| TSCA 12b: | Section 4, 1 % de minimus concentration |

**1-Methyl-2-pyrrolidone (872-50-4)**

| | |
|---|---|
| SARA 313: | 1.0 % de minimis concentration |

**Formaldehyde (50-00-0)**

| | |
|---|---|
| SARA 302: | 500 lb TPQ<br>100 lb EPCRA RQ |
| SARA 313: | 0.1 % de minimis concentration |
| CERCLA | 100 lb final RQ; 45.4 kg final RQ |
| OSHA(safety) | 1000 lb TQ |

SARA TitleⅢ Section 311/312 : Acute Health: Yes
Chronic Health: Yes
Fire: No
Pressure: No
Reactive: No

U.S. State Regulations : The following components appear on one or more of the following state hazardous substances lists

| Component | CAS No. | CA | MA | MN | NJ | PA |
|---|---|---|---|---|---|---|
| Glycols | Trade Secret | No | No | Yes | No | Yes |
| Diethylene glycol monomethyl ether | 111-77-3 | No | Yes | No | No | Yes |
| 1-Methyl-2-pyrrolidone | 872-50-4 | No | Yes | Yes | Yes | Yes |
| Triethanolamine | 102-71-6 | No | Yes | Yes | Yes | Yes |
| Formaldehyde | 50-00-0 | Yes | Yes | Yes | Yes | Yes |

California Proposition 65 : **WARNING:**

This product can expose you to chemicals including N-Methylpyrrolidone, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Canada WHMIS CLASSIFICATION : D2A, D2B.

Canadian WHMIS Ingredient Disclosure List (IDL) : Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which fall under WHMIS criteria specified in the Controlled Products Regulations and present above the threshold limits listed on the IDL.

**Diethylene glycol monomethyl ether (111-77-3)**

1 %

**Triethanolamine (102-71-6)**

1 %

**Formaldehyde (50-00-0)**

0.1 %

## 16. Other Information

Key/Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; CAS - Chemical Abstracts Service; CLP - Classification, Labelling and Packaging; EEC - European Economic Community; EIN (EINECS) - European Inventory of Existing

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Commercial Chemical Substances; ELN (ELINCS) - European List of Notified Chemical Substances; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IMDG - International Maritime Dangerous Goods; IBC Code - International Bulk Chemical Code; Kow - Octanol/water partition coefficient; LEL - Lower Explosive Limit; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NTP = National Toxicology Program; REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - European Rail Transport; STEL - Short-term Exposure Limit; TWA - Time Weighted Average; UEL - Upper Explosive Limit

Other Information

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