Safety Data Sheets

1. Identification

Product Name	: UV ink ELS-170 Cyan
Order No.	: ELS170-C-BA
General Use	: Ink jet printing ink
Product Description	: UV Inkjet Ink
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 Singapore	
Company Name	: MIMAKI SINGAPORE PTE. LTD.
Address	: 31 Kaki Bukit Road 3 Singapore 417818 TechLink #02-03
Telephone No.	: +65-6508-2789
Emergency Telephone No.	: +65 3165 2217 (within Singapore only) +65 3158 1074

2. Hazards Identification

[GHS Classification]

Physical Hazards

Flammable Liquids	: Not classified

Health Hazards

Acute Toxicity – Oral	: Category 4
Skin Corrosion / Irritation	: Category 2
Eye Damage / Irritation	: Category 2A
Sensitization – Skin	: Category 1
Specific Target Organ Toxicity (Repeated Exposure)	: Category 1 (Liver, respiratory tract)

Environmental Hazards

Hazardous to the Aquatic Environment - Long Term Hazard	: Category 2

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

[GHS Label Elements]

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Safety Data Sheets

Symbol

Signal Word
Danger

Hazard Statements
H302 Harmful if swallowed.
H315 Causes skin irritation
H319 Cause serious eye irritation
H317 May cause an allergic skin reaction
H372 Causes damage to organs through prolonged or repeated exposure (Liver, respiratory tract)
H411 Toxic to aquatic life with long lasting effects

Precautionary Statements
[Prevention]
P260 Do not breathe gas/mist.
P264 Wash hands and eyes thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P273 Avoid release to the environment.
[Response]
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.
P314 Get medical advice/attention 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.
P362+P364 Take off contaminated clothing and wash before reuse.
P391 Collect spillage.
[Disposal]
P501 Dispose of contents/container in accordance with local/regional/national/international regulation (to be specified).

[Other Information]

Hazards not otherwise classified (HNOC)

Not Applicable

3. Composition / Information on Ingredients

Common name and synonyms: No data available

Pure substance/mixture: Mixture

No	Chemical Name	Wt%	CAS No.
1	(5-ethyl-1,3-dioxan-5-yl)methyl acrylate	50-60	66492-51-1
2	1-vinylhexahydro-2H-azepin-2-one	10-20	2235-00-9
3	2-(2-ethoxyethoxy)ethyl acrylate	10-20	7328-17-8

4	Propylidynetrimethanol, ethoxylated, esters with acrylic acid	3-5	28961-43-5
5	phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide	1-3	162881-26-7
6	hexamethylene diacrylate	0.1-0.3	13048-33-4
7	di-tert-butylhydroquinone	0.1-0.3	88-58-4

4. First Aid Measures

[First aid measures]

Eye Contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention following exposure or if feeling unwell. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin Contact : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place

in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

[Most important symptoms and effects, both acute and delayed]

[Potential acute health effects]

Eye contact	: Causes serious eye irritation.
Inhalation	: No known significant effects or critical hazards.
Skin contact	: Causes skin irritation. May cause an allergic skin reaction.
Ingestion	: Harmful if swallowed.

[Over-exposure signs/symptoms]

Eye contact	: Adverse symptoms may include the following: pain or irritation watering redness
Inhalation	: No specific data.
Skin contact	: Adverse symptoms may include the following: irritation redness
Ingestion	: No specific data.

[Indication of any immediate medical attention and special treatment needed]

Note To Physician	: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Specific treatments	: No specific treatment.
Protection of first-aiders	: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

5. Fire Fighting Measures

Extinguishing Media	: Use CO2, dry chemical, or foam. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media	: None known.
Specific hazards arising from the chemical	: In a fire or if heated, a pressure increase will occur and the container may burst.
Hazardous thermal decomposition products	: Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides phosphorus oxides metal oxide/oxides
Special protective actions for fire-fighters	: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Special protective equipment for fire-fighters	: Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. Accidental Release Measures

[Personal precautions, protective equipment and emergency procedures]

For non-emergency personnel	: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	: If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For nonemergency personnel".
Environmental precautions	: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

[Methods and material for containment and cleaning up]

Small spill	: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste

	disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and Storage

[Precautions for safe handling]

Protective measures	: Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
Advice on general occupational hygiene	: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until

ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

8. Exposure Controls / Personal Protection

[Control parameters]

Occupational exposure limits

None

Appropriate engineering controls	: If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
Environmental exposure controls	: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

[Individual protection measures, such as personal protective equipment]

Respiratory Protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Glove Recommendations : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Eye /Face Protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the

following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/ or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin Protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

General Hygiene Considerations : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

9. Physical and Chemical Properties

[Information on basic physical and chemical properties]

Appearance	- Physical State	: liquid
	- Color	: Indigo blue
Odor		: Characteristic odor
Odor Threshold		: No data available
pH		: No data available
Melting point/freezing point		: No data available
Boiling point/boiling range		: No data available
Flash point		: 105 °C / 221 °F (Estimated from the ingredient flash point)
Evaporation rate		: No data available
Flammability (solid, gas)		: No data available
Flammability Limits in Air		
Upper flammability limits		: No data available
Lower flammability limit		: No data available
Vapor Pressure		: No data available

Vapor density	: No data available
Specific gravity	: 1.0-1.1
Solubility(ies)	: Immiscible in water
Partition coefficient	: No data available
Autoignition temperature	: No data available
Decomposition temperature	: No data available
Kinematic viscosity	: No data available
Dynamic viscosity	: 13-18 mPa·s(25 deg.C)

[Other Information]

Molecular weight	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Softening point	: No data available
VOC Content (%)	: No data available
Density	: No data available
Bulk density	: No data available

10. Stability and Reactivity

Reactivity	: No information available.
Chemical Stability	: Stable under the normal storage and use.
Possibility of Hazardous Reactions	: No information available.
Hazardous polymerization	: None under normal processing.
Conditions to Avoid	: No information available.
Incompatible Materials	: No information available.
Hazardous Decomposition Products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. Toxicological Information

[Information on likely routes of exposure]

Acute toxicity	: Not available.
Irritation/Corrosion	: Not available.
Sensitization	: Not available.

Chemical Name	Category	Route of exposure
(5-ethyl-1,3-dioxan-5-yl)methyl acrylate	Category 1B	SKIN

1-vinylhexahydro-2H-azepin-2-one	Category 1B	SKIN
2-(2-ethoxyethoxy)ethyl acrylate	Category 1A	SKIN
Propylidynetrimethanol, ethoxylated, esters with acrylic acid	Category 1	SKIN
phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide	Category 1A	SKIN
hexamethylene diacrylate	Category 1	SKIN
2,5-di-tert-butylhydroquinone	Category 1B	SKIN

Mutagenicity : Not available.

Carcinogenicity : Not available.

Reproductive toxicity : Not available.

Specific target organ toxicity (single exposure)

Chemical Name	Category	Route of exposure	Target organs
2,5-di-tert-butylhydroquinone	Category 3	-	respiratory tract irritation

Specific target organ toxicity(repeated exposure)

Chemical Name	Category	Route of exposure	Target organs
1-vinylhexahydro-2H-azepin-2-one	Category 1	-	liver, respiratory tract
2,5-di-tert-butylhydroquinone	Category 2	-	blood

Aspiration hazard : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritaion.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes skin irritation. May cause an allergic skin reaction.

Ingestion : Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
Pain or irritation
watering
redness

Inhalation : No specific data

Skin contact : Adverse symptoms may include the following:
irritation

redness

Ingestion : No specific data

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

: Not available.

General : Causes damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

[Numerical measures of toxicity]

Acute toxicity estimates

Chemical Name	Oral LD50(mg/kg)	Dermal LD50(mg/kg)	Inhalation LC50
Product	1846.8	2301.7	N/A
(5-ethyl-1,3-dioxan-5-yl)methyl acrylate	2500	N/A	N/A
1-vinylhexahydro-2H-azepin-2-one	1114	1700	N/A
2-(2-ethoxyethoxy)ethyl acrylate	1106	400	N/A
Propylidynetrimethanol, ethoxylated, esters with acrylic acid	2000.1	N/A	N/A
phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide	2500	2500	N/A
hexamethylene diacrylate	5000	3620	N/A
2,5-di-tert-butylhydroquinone	1000	N/A	N/A

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.

Ecotoxicity	: Toxic to aquatic life. Toxic to aquatic life with long lasting effects.
Persistence and degradability	: No data available.
Bioaccumulation	: No data available.
Mobility	: No data available.
Other adverse effects	: No data available.

13. Disposal Considerations

[Waste treatment methods]

Disposal Methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.
Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

14. Transport Information

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

[DOT]

UN/ID no	: UN3082
Proper shipping name	: Environmentally hazardous substance, liquid, n.o.s. (Cyclic

	Trimethylolpropane Formal Acrylate)
Hazard Class	: 9
Packing Group	: III
Special Provisions	: 8, 146, 173, 335, IB3, T4, TP1, TP29
Emergency Response Guide Number	: 171
Description	: UN3082, Environmentally hazardous substance, liquid, n.o.s. (Cyclic Trimethylolpropane Formal Acrylate), 9, III

[TDG]

UN/ID no	: UN3082
Proper shipping name	: Environmentally hazardous substance, liquid, n.o.s. (Cyclic Trimethylolpropane Formal Acrylate)
Hazard Class	: 9
Packing Group	: III
Marine pollutant	: This material meets the definition of a marine pollutant
Description	: UN3082, Environmentally hazardous substance, liquid, n.o.s. (Cyclic Trimethylolpropane Formal Acrylate), 9, III

[MEX]

UN/ID no	: UN3082
Proper shipping name	: Environmentally hazardous substance, liquid, n.o.s. (Cyclic Trimethylolpropane Formal Acrylate)
Hazard Class	: 9
Packing Group	: III
Special Provisions	: 274, 331, 335
Description	: UN3082, Environmentally hazardous substance, liquid, n.o.s. (Cyclic Trimethylolpropane Formal Acrylate), 9, III

[IATA]

UN/ID no	: UN3082
Proper shipping name	: Environmentally hazardous substance, liquid, n.o.s. (Cyclic Trimethylolpropane Formal Acrylate)
Hazard Class	: 9
Packing Group	: III
Special Provisions	: A197 *1
Description	: UN3082, Environmentally hazardous substance, liquid, n.o.s. (Cyclic Trimethylolpropane Formal Acrylate), 9, III

[IMDG]

UN/ID no	: UN3082

Proper shipping name	: Environmentally hazardous substance, liquid, n.o.s. (Cyclic Trimethylolpropane Formal Acrylate)
Hazard Class	: 9
Packing Group	: III
EmS-No	: F-A, S-F
Special Provisions	: 2.10.2.7 *1
Marine pollutant	: This material meets the definition of a marine pollutant
Description	: UN3082, Environmentally hazardous substance, liquid, n.o.s. (Cyclic Trimethylolpropane Formal Acrylate), 9, III
Environmental hazard	: Yes

*1: Single or inner packaging less than 5 L (liquid) or 5 kg net (solids) is excepted from Dangerous Goods regulations - see UN Special Provision.

15. Regulatory Information

Singapore - hazardous chemicals under government control	: None.

16. Other Information

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973
as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
SGG = Segregation Group
UN = United Nations

Safety Data Sheets

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