Safety Data Sheets

1. Identification

Product Name	: LUS-200 White
Order No.	: LUS20-W-BA
Ink Ver.	:1
General Use	: Ink jet printing ink
Product Description	: UV curable ink
SDS Number	: 037-U100249
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.	: +81-268-64-2281

2. Hazards Identification

[GHS Classification]

Physical Hazards	
Flammable Liquids	: Not classified
Health Hazards	
Skin Corrosion / Irritation	: Category 2
Eye Damage / Irritation	: Category 2A
Sensitization – Skin	: Category 1B
Carcinogenicity	: Category 2
Toxic to Reproduction	: Category 2
Specific Target Organ Toxicity (Repeated Exposure)	: Category 1 (respiratory system)
Environmental Hazards	
Hazardous to the Aquatic Environment - Acute Hazard	: Category 1

Hazardous to the Aquatic Environment - Long Term Hazard : Category 1

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

H351 Suspected of causing cancer

H361 Suspected of damaging fertility or the unborn child

H372 Causes damage to organs through prolonged or repeated exposure (respiratory system)

H410 Very toxic to aquatic life with long lasting effects

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 and eyes thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P272 Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

[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.

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

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 it before reuse.

P391 Collect spillage.

[Storage]

P405 Store locked up.

[Disposal]

P501 Dispose of contents/container in accordance with local/regional/national/international regulation (to be specified).

Hazards not otherwise classified

None.

9% of the mixture consists of ingredients of unknown acute oral toxicity.

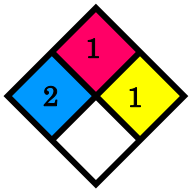
NFPA Rating (scale 0 – 4)

Health = 2

Flammability = 1

Reactivity= 1

Special = None



3. Composition / Information on Ingredients

No	Chemical Name	Wt%	CAS No.
1	ISOBORNYL ACRYLATE	10-30	5888-33-5
2	PHENOXY ETHYL ACRYLATE	10-30	48145-04-6
3	TETRAHYDROFURFURYL ACRYLATE	5-15	2399-48-6
4	TITANIUM DIOXIDE	5-15	13463-67-7
5	2,4,6-TRIMETHYLBENZOYLDIPHENYLPHOSPHINE OXIDE	1-10	75980-60-8
6	ACRYLATE MONOMER	1-10	Trade Secret
7	VINYL MONOMER	1-10	Trade Secret
8	ALIPHATIC URETHANEACRYLATE	1-10	Trade Secret
9	SUBSTITUTED AMINE OLIGOMER	1-10	Trade Secret
10	SILICA	<1.5	7631-86-9
11	DISPERSANT	<1.5	Trade Secret

12	STABILIZER	<1.5	Trade Secret
13	TREATMENT MATERIAL FOR TITANIUM DIOXIDE	<1.5	Trade Secret

4. First Aid Measures

Description of first aid measures

Inhalation	: Remove person to fresh air. If you feel unwell, get medical attention..
Skin Contact	: Immediately wash with soap and water. Remove contaminated clothing and wash before reuse. If signs/symptoms develop, get medical attention.
Eye Contact	: Immediately flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. Get medical attention.
If Swallowed	: Rinse mouth. If you feel unwell, get medical attention.
Most important symptoms and effects, both acute and delayed	: See Section 11 Information on toxicological effects.
Indication of any immediate medical attention and special treatment required	: Not applicable.

5. Fire Fighting Measures

Suitable extinguishing media	: In case of fire: Use a fire fighting agent suitable for ordinary combustible material such as water or foam to extinguish.
Special hazards arising from the substance or mixture	: Closed containers exposed to heat from fire may build pressure and explode.
Hazardous Decomposition or By-Products	: Carbon monoxide / During Combustion Carbon dioxide / During Combustion Irritant Vapors or Gases / During Combustion
Special protective actions for fire-fighters	: No special protective actions for fire-fighters are anticipated.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures	: Evacuate area. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.
Environmental precautions	: Avoid release to the environment. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water.
Methods and material for containment and cleaning up	: Contain spill. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and SDS. Seal the container. Dispose of collected material as soon as possible.

7. Handling and Storage

Precautions for safe handling	: For industrial or professional use only. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wash contaminated clothing before reuse. Avoid contact with oxidizing agents (eg. chlorine, chromic acid etc.) Use personal protective equipment (gloves, respirators, etc.) as required.

Conditions for safe storage including any incompatibilities	: Store in a well-ventilated place. Keep container tightly closed to prevent loss of stabilizing materials. Keep cool. Protect from sunlight. Store away from heat. Store away from acids. Store away from oxidizing agents.

8. Exposure Controls / Personal Protection

Control parameters

Occupational exposure limits : If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

Ingredient	CAS No.	Agency	Limit type	Additional Comments
TITANIUM DIOXIDE	13463-67-7	ACGIH	TWA:10 mg/m3	A4: Not class. as human carcin
TITANIUM DIOXIDE	13463-67-7	CMRG	TWA(as respirable dust):5 mg/m3	
TITANIUM DIOXIDE	13463-67-7	OSHA	TWA(as total dust):15 mg/m3	
VINYL MONOMER	Trade Secret	Manufacturer determined	TWA:0.1 ppm(0.57 mg/m3)	
TETRAHYDROFURFURYL ACRYLATE	2399-48-6	Manufacturer determined	TWA:0.1 ppm(0.64mg/m3) STEL:0.3 ppm(1.91mg/m3)	
SILICA	7631-86-9	CMRG	TWA(as respirable dust):3 mg/m3	
SILICA, AMORPHOUS	7631-86-9	OSHA	TWA concentration:0.8 mg/m3;TWA:20 millions of particles/cu. ft	

ACGIH: American Conference of Governmental Industrial Hygienists

CMRG: Chemical Manufacturer Recommended Guideline

OSHA : United States Department of Labor - Occupational Safety and Health Administration

TWA: Time-Weighted-Average

STEL: Short Term Exposure Limit

Exposure Controls

Occupational Exposure Controls

Engineering Controls : Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

Personal protective equipment (PPE)

Eye/face protection : Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended: Indirect Vented Goggles

Skin/hand protection : Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions.
Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing. Note: Nitrile gloves may be worn over polymer laminate gloves to improve dexterity. Gloves made from the following material(s) are recommended: Polymer laminate
If this product is used in a manner that presents a higher potential for exposure (eg. spraying, high splash potential etc.), then use of protective coveralls may be necessary. Select and use body protection to prevent contact based on the results of an exposure assessment. The following protective clothing material(s) are recommended: Apron - polymer laminate

Respiratory protection : An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure: Half facepiece or full facepiece air-purifying respirator suitable for organic vapors and particulates
For questions about suitability for a specific application, consult with your respirator manufacturer.

9. Physical and Chemical Properties

Appearance	- Physical State	: liquid
	- Color	: White color
Odor		: Acrylate odor
Odor threshold;		: No Data Available
pH		: No Data Available
Melting Point		: Not Applicable
Boiling Point		: No Data Available
Flash Point		: 95 ºC [Test Method: Closed Cup]
Evaporation Rate		: No Data Available
Flammability (Solid, Gas)		: Not Applicable
Flammable Limits(LEL)		: No Data Available
Flammable Limits(UEL)		: No Data Available
Vapor Pressure		: No Data Available
Vapor Density		: No Data Available
Density		: No Data Available
Specific Gravity		: 1.15 [Ref Std: WATER=1]
Solubility In Water		: No Data Available
Solubility- non-water		: No Data Available
Partition Coefficient (n-octanol / Water)		: No Data Available
Auto ignition temperature		: No Data Available
Decomposition Temperature		: No Data Available
Viscosity		: 20 centipoise [@ 25 ºC]
Percent volatile		: No Data Available

10. Stability and Reactivity

Reactivity	: This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.
Chemical stability	: Stable.
Possibility of hazardous reactions	: Hazardous polymerization may occur.
Conditions to avoid	: Heat
Incompatible materials	: Strong oxidizing agents
Hazardous	: None known.

decomposition products

11. Toxicological Information

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation	: Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.
Skin Contact	: Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, dryness, cracking, blistering, and pain.Allergic Skin Reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.
Eye Contact	: Severe Eye Irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.
Ingestion	: May be harmful if swallowed. Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.
Prolonged or repeated exposure may cause target organ effects	: Respiratory Effects: Signs/symptoms may include cough, shortness of breath, chest tightness, wheezing, increased heart rate, bluish colored skin (cyanosis), sputum production, changes in lung function tests, and/or respiratory failure.
Reproductive/Developmental Toxicity	: Contains a chemical or chemicals which can cause birth defects or other reproductive harm.
Carcinogenicity	: Contains a chemical or chemicals which can cause cancer.

Ingredient	CAS No.	Class Description	Regulation
TITANIUM DIOXIDE	13463-67-7	Grp. 2B: Possible human carc	International Agency for Research on Cancer

Acute Toxicity

Name	Route	Species	Value
Overall product	Ingestion		No data available; calculated ATE 2,000 - 5,000mg/kg
ISOBORNYL ACRYLATE	Dermal	Rabbit	LD50 > 5,000 mg/kg

ISOBORNYL ACRYLATE	Ingestion	Rat	LD50 > 4,350 mg/kg
PHENOXY ETHYL ACRYLATE	Dermal	Rat	LD50 > 2,000 mg/kg
PHENOXY ETHYL ACRYLATE	Ingestion	Rat	LD50 > 5,000 mg/kg
TITANIUM DIOXIDE	Dermal	Rabbit	LD50 > 10,000 mg/kg
TITANIUM DIOXIDE	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 6.82 mg/l
TITANIUM DIOXIDE	Ingestion	Rat	LD50 > 10,000 mg/kg
TETRAHYDROFURFURYL ACRYLATE	Ingestion	Rat	LD50 551 mg/kg
2,4,6-TRIMETHYLBENZOYLDIPHENYLPHOSPHINE OXIDE	Dermal	Professional judgement	LD50 estimated to be > 5,000 mg/kg
2,4,6-TRIMETHYLBENZOYLDIPHENYLPHOSPHINE OXIDE	Ingestion	Rat	LD50 > 5,000 mg/kg
VINYL MONOMER	Ingestion	Rat	LD50 > 1,400 mg/kg
ACRYLATE MONOMER	Dermal	Professional judgement	LD50 estimated to be > 5,000 mg/kg
ACRYLATE MONOMER	Ingestion	Rat	LD50 > 15,400 mg/kg
SILICA	Dermal	Rabbit	LD50 > 5,000 mg/kg
SILICA	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 0.691 mg/l
SILICA	Ingestion	Rat	LD50 > 5,110 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
ISOBORNYL ACRYLATE	Rabbit	Minimal irritation
PHENOXY ETHYL ACRYLATE	Rabbit	No significant irritation
TITANIUM DIOXIDE	Rabbit	No significant irritation
TETRAHYDROFURFURYL ACRYLATE	Rabbit	Irritant
2,4,6-TRIMETHYLBENZOYLDIPHENYLPHOSPHINE OXIDE	Rabbit	No significant irritation
VINYL MONOMER	Rabbit	Minimal irritation
ACRYLATE MONOMER	Rabbit	No significant irritation
SILICA	Rabbit	No significant irritation

Serious Eye Damage/Irritation

Name	Species	Value
ISOBORNYL ACRYLATE	Rabbit	Mild irritant
PHENOXY ETHYL ACRYLATE	Rabbit	Moderate irritant
TITANIUM DIOXIDE	Rabbit	No significant irritation
TETRAHYDROFURFURYL ACRYLATE	Rabbit	Severe irritant
2,4,6-TRIMETHYLBENZOYLDIPHENYLPHOSPHINE OXIDE	Rabbit	No significant irritation
VINYL MONOMER	Rabbit	Severe irritant
ACRYLATE MONOMER	Rabbit	Mild irritant
SILICA	Rabbit	No significant irritation

Skin Sensitization

Name	Species	Value
ISOBORNYL ACRYLATE	Mouse	Sensitizing
PHENOXY ETHYL ACRYLATE	Guinea pig	Sensitizing
TITANIUM DIOXIDE	Human and animal	Not sensitizing
TETRAHYDROFURFURYL ACRYLATE	Human and animal	Some positive data exist, but the data are not sufficient for classification
VINYL MONOMER	Mouse	Sensitizing
ACRYLATE MONOMER	Guinea pig	Sensitizing
SILICA	Human and animal	Not sensitizing

Respiratory Sensitization

For the component/components, either no data are currently available or the data are not sufficient for classification.

Germ Cell Mutagenicity

Name	Route	Value
ISOBORNYL ACRYLATE	In Vitro	Some positive data exist, but the data are not sufficient for classification
TITANIUM DIOXIDE	In Vitro	Not mutagenic
TITANIUM DIOXIDE	In Vitro	Not mutagenic
TETRAHYDROFURFURYL ACRYLATE	In Vitro	Not mutagenic
2,4,6-TRIMETHYLBENZOYLDIPHENYLPHOSPHINE OXIDE	In Vitro	Not mutagenic
VINYL MONOMER	In Vitro	Not mutagenic

ACRYLATE MONOMER	In Vitro	Not mutagenic
SILICA	In Vitro	Not mutagenic

Carcinogenicity

Name	Route	Species	Value
TITANIUM DIOXIDE	Ingestion	Multiple animal species	Not carcinogenic
TITANIUM DIOXIDE	Ingestion	Rat	Carcinogenic
SILICA	Not Specified	Mouse	Some positive data exist, but the data are not sufficient for classification

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test Result	Exposure Duration
2,4,6-TRIMETHYLBENZOYLDIPHENYLPHOSPHINE OXIDE	Ingestion	Toxic to male reproduction	Rat	NOAEL 100 mg/kg/day	90 days
SILICA	Ingestion	Not toxic to female reproduction	Rat	NOAEL 509 mg/kg/day	1 generation
SILICA	Ingestion	Not toxic to male reproduction	Rat	NOAEL 497 mg/kg/day	1 generation
SILICA	Ingestion	Not toxic to development	Rat	NOAEL 1,350 mg/kg/day	During organogenesis

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
ISOBORNYL ACRYLATE	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Official classification	NOAEL Not available	
TETRAHYDROFURFURYL ACRYLATE	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification		NOAEL Not available	
VINYL MONOMER	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for	Rat	NOAEL Not available	

			classification			

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
TITANIUM DIOXIDE	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Rat	LOAEL 0.01 mg/l	2 years
TITANIUM DIOXIDE	Inhalation	pulmonary fibrosis	All data are negative	Human	NOAEL Not available	Occupational exposure
2,4,6-TRIMETHYLBENZOYLDIPHENYLPHO SPHINE OXIDE	Ingestion	Skin, blood, liver, kidney and/or, bladder	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 1,000 mg/mg/kg/day	
2,4,6-TRIMETHYLBENZOYLDIPHENYLPHO SPHINE OXIDE	Ingestion	nervous system	All data are negative	Rat	NOAEL 1,000 mg/kg/day	
VINYL MONOMER	Inhalation	respiratory system	Causes damage to organs through prolonged or repeated exposure	Rat	NOAEL 0.001 mg/l	28 days
VINYL MONOMER	Inhalation	Blood, liver, kidney, and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 0.18 mg/l	90 days
VINYL MONOMER	Inhalation	eyes	All data are negative	Rat	NOAEL 0.18 mg/l	90 days
VINYL MONOMER	Ingestion	liver	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 260 mg/kg/day	3 months
SILICA	Inhalation	respiratory system , silicosis	All data are negative	Human	NOAEL Not available	Occupational exposure

Aspiration Hazard

For the component/components, either no data are currently available or the data are not sufficient

for classification.

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.

13. Disposal Considerations

Disposal Method	: Dispose of contents/ container in accordance with the local/regional/national/international regulations. Dispose of waste product in a permitted industrial waste facility. As a disposal alternative, incinerate in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.
EPA Hazardous Waste Number (RCRA)	: Not regulated

14. Transport Information

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

Sea Transport (IMDG)

Class	: 9
Packing Group (PG)	: Ⅲ
UN Number	: UN 3082
Proper Shipping Name	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (ISOBORNYL ACRYLATE)
Marine Pollutant	: ISOBORNYL ACRYLATE

Air Transport (ICAO/IATA)

Class	: 9
Packing Group(PG)	: Ⅲ
UN Number	: UN 3082
Proper Shipping Name	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (ISOBORNYL ACRYLATE)
Remarks	: Single or inner packaging less than 5 L (liquid) or 5 kg net (solids) is excepted from Dangerous Goods regulations. Refer to ICAO/IATA A197, IMDG 2.10.2.7, ADR SP 375.

15. Regulatory Information

SARA Title Ⅲ

Section 311/312 (40 CFR 370) Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - Yes

Section 313 (40 CFR 372)

Ingredient	CAS No.	% by Wt
PHENOXY ETHYL ACRYLATE (GLYCOL ETHERS)	48145-04-6	10 - 30

CHEMICAL INVENTORIES

The components of this product are in compliance with the chemical notification requirements of TSCA.

The components of this material are in compliance with the provisions of Japan Industrial Safety and Health Law. Certain restrictions may apply. Contact the selling division for additional information.

The components of this material are in compliance with the provisions of Japan Chemical Substance Control Law. Certain restrictions may apply. Contact the selling division for additional information.

16. Other Information

This information is furnished without warranty, express or implied, except that it is accurate to the best knowledge of Mimaki Engineering Corporation.

It relates only to the specific material designated herein, and does not relate to use in combination with any other material or process.

Mimaki Engineering Corporation assumes no legal responsibility for use or reliance upon this information.