SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier:
Trade name: High resolution 12K

1.2 Relevant identified uses of the substance or mixture and uses advised against
Relevant identified uses: Photon-curable forming resin for 3D printing. Industrial uses.
Uses advised against: Not for Food additives.

1.3 Details of the supplier of the safety data sheet:

Company:	PANCOLOUR INK CO., LTD.
Address:	No. 72-1, Wenming Rd., Guishan Dist., Taoyuan City 33382 , Taiwan
Telephone:	+886-3-3270177
E-Mail	sales1@pancolourink.com

1.4 Emergency telephone number:
Telephone: +886-3-3270177, ext.110

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:
Classification (Regulation (EC) No. 1272/2008 [CLP]

Acute toxicity (Oral), Cat.5	: H303-May be harmful if swallowed
Skin irritation, Cat.2	: H315-Causes skin irritation
Skin Sensitization, Cat.1	: H317-May cause an allergic skin reaction
Eye damage, Cat.1	: H318-Causes serious eye damage
STOT-Repeated exposure, Cat.2	: H373-May cause damage to organs
Chronic Aquatic hazard, Cat. 3	: H412-harmful to aquatic life with long lasting effects

2.2 Label elements
Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard pictograms

Signal word: Danger

Hazard statements:
H303-May be harmful if swallowed
H315-Causes skin irritation
H317-May cause an allergic skin reaction
H318-Causes serious eye damage
H373-May cause damage to organs
H412-harmful to aquatic life with long lasting effects

Precautionary statements:

Prevention
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/face protection.

Response
P301+ P317 IF SWALLOWED: Get medical help.
P302 + P352 IF ON SKIN: Wash with plenty water
P305 + P354 + P338 IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P319 Get medical help if you feel unwell.
P332 + P317 If skin irritation occurs: Get medical help.
P333 + P317 If skin irritation or rash occurs: Get medical help.
P362 + P364 Take off contaminated clothing and wash it before reuse.

Storage
-

Disposal
P501 Dispose of contents/container in accordance with local regulation.

2.3 Other hazards

Adverse physicochemical effects: Not available
Adverse human health effects and symptoms: Not available
Adverse environmental effects: Not available
Other adverse hazards: Not available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances:

Not applicable.

3.2 Mixtures

Description of the mixture:

Viscous Liquid.

Hazardous ingredients

Substance	Concentration (% w/w)	CAS-No.	Classification regulation 1272/2008/EC, REACH
Dipropylene Glycol Diacrylate	20~30%	57472-68-1	Skin Irrit. 2 H315 Skin Sens. 1 H317 Eye Dam. 1 H318
Epoxy acrylate	10~30%	68958-77-0	Skin Sens. 1B, H317 Aquatic Chronic 4, H413
Acryloyl morpholine	20%	5117-12-4	Acute Tox. 4 H302 STOT RE 2 H373 Eye Dam. 1 H318 Skin Sens. 1 H317
Tris(2-Hydroxy Ethyl) Isocyanurate Triacrylate	15~25%	40220-08-4	Skin Sens. 1, H317 Eye Dam. 1, H318 Aquatic Chronic 2, H411
Urethane acrylate	5~15%	264888-31-5	Skin Sens. 1, H317 Aquatic Chronic 3, H412
Silicon dioxide	1~3%	68611-44-9	Not Classified
BIS(2,4,6-TRIMETHYLBENZOYL)PHENYLPHOSPHINE OXIDE(BAPO)	1~2%	162881-26-7	Skin Sens. 1, H317 Aquatic Chronic 4, H413
Titanium dioxide	0.1~0.5%	13463-67-7	Carc. 2 H351
Carbon black	0.05~0.1%	1333-86-4	Not classified

Additional information:

Full text of H- and EUH-phrases: see SECTION 16.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

General information: Move the victim to fresh air.
Do not leave the victim unattended.
Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.

Following inhalation: If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.

Following skin contact: Wash off immediately with soap and plenty of water.
If skin irritation persists, call a physician.
If on skin, rinse well with water.
If on clothes, remove clothes.

Following eye contact: Immediately flush eye(s) with plenty of water.
Flush eyes with water as a precaution.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

Following ingestion: Keep respiratory tract clear.

Self-protection of the Ensure that medical personnel are aware of the material(s) involved, take

first aider:	precautions to protect themselves and prevent spread of contamination

4.2 Most important symptoms and effects, both acute and delayed

Symptoms	Causes skin irritation. May cause an allergic skin reaction. Suspected of damaging the unborn child
Effects	Not available

4.3 Indication of any immediate medical attention and special treatment needed

This information is not available.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media	Dry sand, ABC powder, Foam
Unsuitable extinguishing media	High volume water jet.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	Possible decomposition products are: COx, NOx

5.3 Advice for fire-fighters

Special protective equipment for fire fighters	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures

For non-emergency personnel

Personal precautions	Evacuate personnel to safe areas. Use personal protective equipment.
Protective equipment	Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Wear protective gloves/clothing and eye/face protection.
Emergency procedures	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 spilt material. Do not breathe vapour or mist.
Personal protective equipment	If specialised 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 non-emergency personnel".

For emergency responders

Personal protective equipment	If specialised 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 non-emergency personnel".

6.2 Environmental precautions

Environmental precautions	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

For containment	Prevent further leakage or spillage if safe to do so.
For cleaning up	Soak up with inert absorbent material (e.g. sand, sawdust etc.).
Other information	Not available

6.4 Reference to other sections
For personal protection, see section 8.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures

Advice on safe handling	Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating, and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Fire preventions	Normal measures for preventive fire protection.

Advice on general occupational hygiene

Hygiene measures	Do not eat, drink, or smoke when using. Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions

Packing materials	Original container, plastic containers with cover.

Requirements for storage rooms and vessels

Requirements for storage areas and containers	Take measures to prevent the build up of electrostatic charge. Use explosion-proof equipment. Keep container closed when not in use.

Hints on storage assembly

Storage class	Store in original container. Keep containers tightly closed in a cool, well-ventilated place.
Materials to avoid	Keep away from sources of ignition, oxidizing agents, strongly alkaline and strongly acid materials to avoid exothermic reactions.

Further information on storage conditions
Protect from humidity and water.

7.3 Specific end uses
This information is not available.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Occupational exposure limits

Substance name	CAS-No.	Limit value - 8-hrs	Limit value - Short term	Basis
Carbon black	1333-86-4	3 mg/m^3	-	BL OEL
TiO2	13463-67-7	10 mg/m^3	-	BL OEL

Biological limit values

Substance name	CAS-No.	Control parameters	Sampling time	Basis
-	-	-	-	TRG903

Exposure limits at intended use

Derived No Effect Level (DNEL)

Substance name	CAS-No.	End use	Exposure route	Effects	Threshold
Acryloyl morpholine	5117-12-4	Workers	Inhalation (L)	Systemic	132.24 mg/m^3
			Inhalation (S)	Systemic	132.24 mg/m^3
			Dermal (L)	Systemic	300 mg/kg bw/day

Substance name	CAS-No.	End use	Exposure route	Effects	Threshold
			Dermal (S)	Systemic	300 mg/kg bw/day
Carbon black	1333-86-4	Workers	Inhalation (L)	Systemic	1 mg/m³
			Inhalation (L)	Local	500 µg/m³
		General population	Inhalation (L)	Systemic	60 µg/m³
Dipropylene Glycol Diacrylate	57472-68-1	Workers	Inhalation (L)	Systemic	24.48 mg/m³
			Dermal (L)	Systemic	2.77 mg/kg bw/day
		General population	Inhalation (L)	Systemic	7.24 mg/m³
			Dermal (L)	Systemic	1.66 mg/kg bw/day
			Oral (L)	Systemic	2.08 mg/kg bw/day
Epoxy acrylate	68958-77-0	Workers	Inhalation (L)	Systemic	1.64 mg/m³
			Dermal (L)	Systemic	467 µg/kg bw/day
Tris(2-Hydroxy Ethyl) Isocyanurate Triacrylate	40220-08-4	Workers	Inhalation (L)	Systemic	1.65 mg/m³
			Dermal (L)	Systemic	2.3 mg/kg bw/day
		General population	Inhalation (L)	Systemic	290 µg/m³
			Dermal (L)	Systemic	830 µg/kg bw/day
			Oral (L)	Systemic	83 µg/kg bw/day
BIS(2,4,6-TRIMETHYLBENZOYL)PHENYLPHOSPHINE OXIDE(BAPO)	162881-26-7	Workers	Inhalation (L)	Systemic	7.84 mg/m³
			Dermal (L)	Systemic	3 mg/kg bw/day
		General population	Inhalation (L)	Systemic	1.93 mg/m³
			Dermal (L)	Systemic	1.5 mg/kg bw/day
			Oral (L)	Systemic	1.5 mg/kg bw/day

Note: (L)=Long-term; (S)=Short-term

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	CAS-No.	Environment type	Environmental Compartment	Threshold
Acryloyl morpholine	5117-12-4	Aquatic Organisms	Freshwater	12 µg/L
		Aquatic Organisms	Sediment (freshwater)	9.428 µg/kg sediment dw
		Terrestrial Organism	Soil	1.442 µg/kg soil dw
Carbon black	1333-86-4	Aquatic Organisms	Freshwater	1 - 50 mg/L
			Intermittent releases (freshwater)	10 mg/L
			Marine water	100 µg/L
			Intermittent releases (marine water)	1 mg/L
Dipropylene Glycol Diacrylate	57472-68-1	Aquatic Organisms	Freshwater	3.4 µg/L
			Intermittent releases (freshwater)	34 µg/L
			Marine water	340 ng/L
			Sewage treatment plant (STP)	100 mg/L
			Sediment (freshwater)	8.84 µg/kg sediment dw
		Terrestrial Organism	Soil	1.3 µg/kg soil dw
Epoxy acrylate	68958-77-0	Aquatic Organisms	Freshwater	70 - 100000 ng/L
			Intermittent releases (freshwater)	680 - 1 000 000 ng/L
			Marine water	7 - 10 000 ng/L
			Intermittent releases (marine water)	680 ng/L
			Sewage treatment plant	100 mg/L
			Sediment (freshwater)	3.13-4600 mg/kg sediment dw
			Sediment (marine water)	310-460000 µg/kg sediment dw
		Terrestrial Organism	Soil	620 - 917000 µg/kg soil dw
Tris(2-Hydroxy Ethyl) Isocyanurate	40220-08-4	Aquatic Organisms	Freshwater	9.43µg/L
			Intermittent releases	94.3µg/L

Substance name	CAS-No.	Environment type	Environmental Compartment	Threshold
Triacrylate			(freshwater)	
			Marine water	943ng/L
			Sewage treatment plant	10 mg/L
			Sediment (freshwater)	620.3 µg/kg sediment dw
			Sediment (marine water)	62 µg/kg sediment dw
		Terrestrial Organism	Soil	118.5 µg/kg soil dw
BIS(2,4,6-TRIMETHYLBENZOYL) PHENYLPHOSPHINE OXIDE(BAPO)	162881-26-7	Aquatic Organisms	Freshwater	800 - 1 000 ng/L
			Intermittent releases (freshwater)	800 - 1 000 ng/L
			Marine water	800 - 1 000 ng/L
			Sediment (freshwater)	712 µg/kg sediment dw
			Sediment (marine water)	712 µg/kg sediment dw
		Terrestrial Organism	Soil	20 mg/kg soil dw

8.2 Exposure controls

Appropriate engineering controls

Personal protective equipment

Eye protection: Goggles, Safety glasses

Hand protection: Solvent-resistant gloves (butyl-rubber)
Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). The exact break through time can be obtained from the protective glove producer and this has to be observed. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Recommended preventive skin protection Skin should be washed after contact. The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Skin and body protection: Choose body protection according to the amount and concentration of the dangerous substance at the workplace.

Respiratory protection: Use suitable breathing protection if workplace concentration requires.

Environmental exposure controls

Water: The product should not be allowed to enter drains, water courses or the soil.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state	Viscous liquid	**Odor**	Typical arylates
Color	Refer to product label	**Odor Threshold**	Not available
pH	Not applicable		
Melting point / Freezing point	No data available	**Initial boiling point / Boiling range**	Not available
Flash point	> 110°C (Closed-cup)	**Evaporation rate**	Not available
Flammability (Solid, gas)	Not available	**Explosive limits**	Not available
Vapor pressure	Not available	**Vapor density**	Not available
Relative density	ca. 1.15g/cm^3	**Solubility**	Not available
Partition Coefficient: n-Octanol/Water	Not available	**Auto-ignition temperature**	Not available

Decomposition Temperature	Not available	**Viscosity (25°C)**	270~320 cP

9.2 Other information:
No data available

SECTION 10:STABILITY AND REACTIVITY

10.1 Reactivity
No decomposition if stored and applied as directed.

10.2 Chemical stability
No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions
Hazardous reactions: Contact with acids and alkalis may release hydrogen.
Stable under recommended storage conditions.

10.4 Conditions to avoid:
Conditions to avoid: High temperature, exposure to direct sun light.

10.5 Incompatible materials:
Materials to avoid: Acids, Bases, Oxidizing agents

10.6 Hazardous decomposition products:
Contact with water or humidity: This information is not available.
Thermal decomposition: This information is not available.

SECTION 11:TOXICOLOGICAL INFORMATION

11.1 Information on likely routes on exposure
None known

11.2 Information on toxicological effects

Acute toxicity
Product: May be harmful if swallowed
Components:
Acryloyl morpholine: (Oral) Harmful
(Inhalation) LC50 (4 h) 1 mg/L air (rat)
(Dermal) Not classified
Remarks: data from ECHA REACH-dossier information

Skin corrosion/irritation
Product: Causes skin irritation
Components: No data available

Eye damage/irritation
Product: Causes serious eye damage
Components: No data available

Skin/Respiratory sensitization
Product: May cause an allergic skin reaction
Components: No data available

Germ cell mutagenicity
Product: Not classified based on available information.
Components: No data available

Carcinogenicity
Product: Not classified based on available information.
Components: No data available

Reproductive toxicity
Product: Not classified based on available information.
Components:

BIS(2,4,6-TRIMETHYLBENZOYL) PHENYLPHOSPHINE OXIDE(BAPO)	Oral route - systemic effects: Adverse effect observed NOAEL 300 mg/kg bw/day (subchronic, rat)

Remarks: data from ECHA REACH-dossier information

STOT – Single exposure

Product: Not classified based on available information.

Components: No data available

STOT- Repeated exposure

Product: May cause damage to organs

Components: No data available

Aspiration toxicity

Product: Not classified based on available information.

Components: No data available

SECTION 12: ECOLOGICAL INFORMATION

12.1 Ecotoxicity:

Product: No data available

Components:

Acryloyl morpholine	to fish: LC50 (4 days) 220 mg/L to aquatic invertebrates: EC50 (48 h) 120 mg/L to aquatic algae and cyanobacteria: EC50 (72 h) 120 mg/L to microorganisms: IC50 (72 h) 100 mg/L
Dipropylene Glycol Diacrylate	to fish: LC50 (4 days) 2.2 - 4.64 mg/L to aquatic invertebrates: EC50 (48 h) 22.3 mg/L to aquatic algae and cyanobacteria: EC50 (72 h) 16.7 mg/L to microorganisms: EC50 (30 min) 1 g/L
Epoxy acrylate	to fish: LC50 (4 days) 82 µg/L to aquatic invertebrates: EC50 (48 h) 110 µg/L to aquatic algae and cyanobacteria: EC50 (72 h) 68 µg/L to microorganisms: EC50 (3 h) 1 g/L
Tris(2-Hydroxy Ethyl) Isocyanurate Triacrylate	to fish: LC50 (4 days) 9.43 mg/L to aquatic invertebrates: EC50 (48 h) 158.3 mg/L to aquatic algae and cyanobacteria: EC50 (72 h) 11.3 - 25.7 mg/L to microorganisms: NOEC (14 days) 100 mg/L
Urethane acrylate	to fish: LL0 (4 days) 100 mg/L to aquatic invertebrates: EL50 (48 h) 58 mg/L

Remarks: data from ECHA REACH-dossier information

12.2 Persistence and degradability

Product: No data available

Components:

Dipropylene Glycol Diacrylate	Biodegradation in water: Readily biodegradable (100%)
Epoxy acrylate	Biodegradation in water: Not readily biodegradable (100%)
Tris(2-Hydroxy Ethyl) Isocyanurate Triacrylate	Biodegradation in water: Inherently biodegradable (100%)
Urethane acrylate	Biodegradation in water: Not readily biodegradable (100%)

Remarks: data from ECHA REACH-dossier information

12.3 Bioaccumulative potential

Product: No data available

Components: No data available

12.4 Mobility in soil

Product:	No data available
Components:	
Epoxy acrylate	Adsorption/desorption: log Koc-0.49 - 5.66 dimensionless @ 35 °C
Tris(2-Hydroxy Ethyl) Isocyanurate Triacrylate	Adsorption/desorption: Koc 141.8 - 621.8 L/kg

Remarks: data from ECHA REACH-dossier information

12.5 Results of PBT and vPvB assessment

The substances are not considered to be persistent, accumulative, and toxic (PBT). The substances are not considered to be very persistent and very bioaccumulating (vPvB).

12.6 Other adverse effects:

No data available.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product	The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, water ways or ditches with chemical or used container. Send to a licensed waste management company. In accordance with local and national regulations.
Contaminated packaging	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. In accordance with local and national regulations.

SECTION 14: TRANSPORT INFORMATION

14.1 UN number or ID number
Not applicable

14.2 UN Proper shipping name
Not applicable

14.3 Transport hazard class(es)
Not applicable

14.4 Packing group
Not applicable

14.5 Environmental hazards
Not classified as marine pollutant

14.6 Transport in bulk according to IMO instruments
Not applicable for product as supplied.

14.7 Special precautions for user
Not classified as dangerous in the meaning of transport regulations.

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health, and environmental regulations/legislation specific for the substance or mixture
REACH-Candidate List of Substances of Very High Concern for Authorisation (Article 59): Not applicable

15.2 Chemical Safety Assessment
None

SECTION 16: OTHER INFORMATION

Reference
- Globally Harmonized System of Classification and Labelling of Chemicals (GHS), rev.9, 2021
- (EC) No.1272/2008, Annex VI to CLP, ATP14, 2020
- REACH-dossier documents, ECHA
- PBT assessment list, ECHA
- IFA GESTIS - International limit values for chemical agents (Occupational exposure limits, OELs)
- TRGS 903 Biological Limit Values (BGW) Technical rule for hazardous substances

Prepared by Pancolour Ink Co., Ltd. / QA / +886 (3) 3270177

The information provided in this Safety Data Sheet is according to the best of our knowledge and information at the date of its publication. The information in this SDS was obtained from sources, which we believe are reliable. However, the information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal, and release. It is not to be considered a warranty or quality specification. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable.

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