

SAFETY DATA SHEET

Engineering Series Resin - EL400

SECTION 1 : IDENTIFICATION

1.1 Product identifier

Product name Engineering Series Resin- EL400

Recommended use and restrictions on use

Recommended use For use in Phrozen 3D-printers

Restrictions on use Do not use in the situation that easily generate aerosol, steam.

1.2 Name, address and phone of manufacturer , importers or supplier

Manufacturer Phrozen Tech Co., Ltd.287 Niupu Rd, Xiangshan Dist,
Hsinchu City 30091, TAIWAN(R.O.C)

Phone +886-3621-0505

Emergency phone / Fax +886-3621-0505 / +886-3539-6591

SECTION 2 : HAZARD IDENTIFICATION

2.1 Hazard classification

Serious eye damage/eye irritation Category 1 , Acute toxicity: oral Category 4,

Skin sensitization Category 1 , Reproductive toxicity Category 1B,

Skin corrosion/irritation Category 2,

Specific target organ toxicity - single exposure (respiratory tract irritation) Category 3

Hazardous to the aquatic environment - chronic hazard Category 3

2.2 Signal statement

Corrosion, Exclamation mark, Health hazard,



2.3 Pictograms

2.4 Signal word Danger

2.5 Hazard statements

Harmful if swallowed

Causes serious eye damage

Causes skin irritation.

May cause an allergic skin reaction

May damage fertility. May damage the unborn child

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May cause respiratory irritation.
Harmful to aquatic life with long lasting effects.

2.6 Precautionary statements

Wear protective gloves/protective clothing/eye protection/face protection.
If medical advice is needed, have product container or label at hand.
Keep out of reach of children.
Obtain special instructions before use.
Use only outdoors or in a well-ventilated area.
IF IN EYES: Rinse cautiously with water for several minutes.
Remove contact lenses, If present and easy to do. Continue rinsing.
Immediately call a POISON CENTER/doctor.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

2.7 Other hazard

None

SECTION 3 : COMPOSITION / INFORMATION ON INGREDIENTS

3.1. Substances

Not relevant (mixture)

3.2. Mixtures

Components	CAS number	Weight %	Classification acc. to GHS
2-Propenoic acid, 2-hydroxyethyl ester, polymer with .alpha.-hydro-.omega.-hydroxypolyoxy(methyl-1,2-ethanediyl) and 5-isocyanato-1-(isocyanatomethyl)-1,3,3-trimethylcyclohexane	73297-27-5	25-50%	Skin Irrit. 2 / H315 Eye Irrit. 2 / H319
3-ethenyl-5-methyl-1,3-oxazolidin-2-one	3395-98-0	25-50%	Acute Tox. 4 / H302 Skin Irrit. 2 / H315 Eye Dam. 1 / H318 STOT

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			SE 3 / H335
Additives1	Trade Secret	2-5%	Acute Tox. 4 / H302 Skin Irrit. 2 / H315 Skin Sens. 1 / H317 Eye Dam. 1 / H318 Aquatic Acute2/H402
Additives2	Trade Secret	<2 %	Repr. 1B / H360FD

SECTION 4 : FIRST AID MEASURES

4.1. First-aid advice and recommendations for different routes of exposure

4.1.1 Inhalation

If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions. In case of respiratory tract irritation, consult a physician. Provide fresh air.

4.1.2 Skin Contact

Wash with plenty of soap and water.

4.1.3 Eyes Contact

Remove contact lenses, if present and easy to do. Continue rinsing. Irrigate copiously with clean, freshwater for at least 10 minutes, holding the eyelids apart.

4.1.4 Ingestion

Rinse mouth with water (only if the person is conscious). Do NOT induce vomiting.

4.2. Most important symptoms and hazardous effects

None

4.3. Protection of First-aid personnel

None

4.4. Note for physician

None

SECTION 5 : FIRE-FIGHTING MEASURES

5.1 Applicable extinguishing media

Water spray, BC-powder, Carbon dioxide (CO₂)

5.2 Specific hazards confronted during fire fighting

Carbon monoxide (CO), Carbon dioxide (CO₂)

**5.3 Specific fire-fighting procedure**

None

5.4 Specific protective equipments for fire-fighters

In case of fire and/or explosion do not breathe fumes. Co-ordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately. Fight fire with normal precautions from a reasonable distance.

SECTION 6 : ACCIDENTAL RELEASE MEASURES**6.1. Personal precautions**

Wear breathing apparatus if exposed to vapours/dust/spray/gases.

6.2. Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

6.3. Cleaning methods

Wipe up with absorbent material (e.g. cloth, fleece). Collect spillage: sawdust, kieselgur(diatomite), sand, universal binder. Covering of drains.
Place in appropriate containers for disposal. Ventilate affected area.

SECTION 7 : SAFETY HANDLING AND STORAGE**7.1. Handling**

Use local and general ventilation. Use only in well-ventilated areas.
Do not eat, drink and smoke in work areas.
Remove contaminated clothing and protective equipment before entering eating areas.
Wash hands after use.
Never keep food or drink in the vicinity of chemicals.
Never place chemicals in containers that are normally used for food or drink.

7.2. Storage

Storage at the area of cool,dry.
Keep away from heat ,direct sunlight, rainy and rapid temperature .
Storage temperature between 15°C/ 59°C to 35°C / 95°F.
Close the lid tightly when not in use.

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SECTION 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Engineering controls

Provide adequate ventilation to the areas where the product is stored and/or handled.

8.2. Control Parameters

Component	TWA	STEL	CEILING	BEI s
Carbon black	3.5 mg / m ³	-	-	-

8.3. Personal protective equipment

8.3.1 Respiratory protection

In case of inadequate ventilation wear respiratory protection. Filtering half mask (EN 149). P1 (filters at least 80 % of airborne particles, colour code: White).

8.3.2 Hand protection

Chemical protection gloves are suitable, which are tested according to EN 374.

8.3.3 Eye protection

Use safety goggles.

8.3.4 Skin protection

Use clothing that provides complete protection to the skin.

8.4. Hygiene measures

Do not eat, drink and smoke in work areas.

Wash thoroughly after handling.

Keep clean of operation area.

Take off polluted clothing as soon as possible after work. The clothing can be re-wear only after washed in clean or discard.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Apperance and color	Gray liquid	Odor	Typical acrylate
Odor threshold	N/A	Melting point	N/A
pH value	6-8	Boiling point	254 °C at 1,013 hPa
Flammable	N/A	Flash point	N/A
Decomposition Temp	305 °C	Testing method	N/A

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Natural Temp	N/A	Explosive limit	N/A
Vapor pressure	0.022 hPa at 20 °C	Vapor density	N/A
Density	1.04 g /cm ³ at 25 °C	Solubility	N/A
Octanol/water distribution coefficient (log Kow)	N/A	Evaporaion rate	N/A

SECTION 10: STABILITY AND REACTIVITY

10.1. Stability

Stable under normal condition.

10.2. Possible hazardous reation under specific conditions

None

10.3. Must avoid condition

UV-radiation/sunlight.

10.4. Must avoid substances

Oxidisers, Reducing agents

10.5. Hazardous decomposed product

None

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Test data are not available for the complete mixture.

11.1. Exposure paths

None

11.2. Symptoms

None

11.3. Acute toxicity

Components	route	Species	End point	Value
3-ethenyl-5-methyl-	Oral	Rat	LD50	>300mg/kg

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1,3-oxazolidin-2-one				
Diphenyl(2,4,6-trimethyl benzoyl) phosphine oxide	Oral	Rat	LD50	> 5,000 mg/kg
	Dermal	Rat	LD50	> 2,000 mg/kg

11.4. Chronic toxicity

None

11.5. Reproductive and/or Developmental Effects

Components	route	Species	End point	Value
Diphenyl(2,4,6-trimethyl benzoyl) phosphine oxide	Ingestion	Rat	NOAEL pre mating into lactation for female	200 mg/kg/day

SECTION 12: ECOLOGICAL INFORMATION

The product has not been tested. The statement has been derived from the properties of the individual components.

12.1. Ecological toxicity

Aquatic toxicity (acute) of components of the mixture				
Components	End point	Value	Species	Exposure time
diphenyl(2,4,6-trimethylbenzoyl) phosphine oxid	LC50	1.4mg/l	fish	96 h
	EC50	3.53mg/l	aquatic invertebrates	48 h
	ErC50	>2.01mg/l	algae	72h
Aquatic toxicity (chronic) of components of the mixture				
Components	End point	Value	Species	Exposure time
3-ethenyl-5-methyl-1,3-oxazolidin-2-one	EC50	110 mg/l	microorganisms	180 min
3-[[[(3R)-3-sulfanylbutanoyl]oxy]-2,2-bis{[(3R)-3-sulfanylbutanoyl]oxy}methyl]propyl (3R)-3-sulfanylbutanoate; 3-[[[(3R)-3-sulfanylbutanoyl]oxy]-2,2-bis{[(3S)-3-sulfanylbutanoyl]oxy}methyl]propyl (3R)-3-sulfanylbutanoate; 3-[[[(3R)-3-	EC50	>1,000 mg/l	microorganisms	3h

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sulfanylbutanoyl]oxy}-2-(((3R)-3-sulfanylbutanoyl]oxy)methyl)-2-(((3S)-3-sulfanylbutanoyl]oxy)methyl)propyl (3R)-3- sulfanylbutanoate; 3-(((3S)-3-sulfanylbutanoyl]oxy)-2,2-bis(((3S)-3-sulfanylbutanoyl]oxy)m				
Diphenyl(2,4,6-trimethyl benzoyl) phosphine oxide	EC50	>1,000 mg/l	microorganisms	180 min

12.2. Persistence and degradability

Degradability of components of the mixture				
Components	Process	Degradation rate	Time	Source
3-ethenyl-5-methyl-1,3-oxazolidin-2-one	DOC removal	7 %	28d	ECHA
	carbon dioxide generation	<10%	28d	ECHA
3-(((3R)-3-sulfanylbutanoyl]oxy)-2,2-bis(((3R)-3-sulfanylbutanoyl]oxy)methyl)propyl (3R)-3- sulfanylbutanoate; 3-(((3R)-3-sulfanylbutanoyl]oxy)-2,2-bis(((3S)-3-sulfanylbutanoyl]oxy)methyl)propyl (3R)-3- sulfanylbutanoate; 3-(((3R)-3-sulfanylbutanoyl]oxy)-2-(((3R)-3-sulfanylbutanoyl]oxy)methyl)-2-(((3S)-3-sulfanylbutanoyl]oxy)methyl)propyl (3R)-3- sulfanylbutanoate; 3-(((3S)-3-sulfanylbutanoyl]oxy)-2,2-bis(((3S)-3-sulfanylbutanoyl]oxy)m	carbon dioxide generation	70%	28d	ECHA
Diphenyl(2,4,6-trimethyl benzoyl) phosphine oxide	oxygen depletion	0 -10%	28 d	ECHA



12.3. Bio-accumulative potential

Components	BCF	Log _{kow}	BOD/COD
3-ethenyl-5-methyl-1,3-oxazolidin-2-one		0.8 (pH value: 6.3, 23 °C)	
3-[[[(3R)-3-sulfanylbutanoyl]oxy]-2,2-bis([[[(3R)-3-sulfanylbutanoyl]oxy]methyl)propyl (3R)-3-sulfanylbutanoate; 3-[[[(3R)-3-sulfanylbutanoyl]oxy]-2,2-bis([[[(3S)-3-sulfanylbutanoyl]oxy]methyl)propyl (3R)-3-sulfanylbutanoate; 3-[[[(3R)-3-sulfanylbutanoyl]oxy]-2-([[[(3R)-3-sulfanylbutanoyl]oxy]methyl)-2-([[[(3S)-3-sulfanylbutanoyl]oxy]methyl)propyl (3R)-3-sulfanylbutanoate; 3-[[[(3S)-3-sulfanylbutanoyl]oxy]-2,2-bis([[[(3S)-3-sulfanylbutanoyl]oxy]m		3.99 (pH value: ~7, 40 °C)	
Diphenyl(2,4,6-trimethyl benzoyl) phosphine oxide	47 – 55	3.1 (pH value: 6.4, 23 °C)	-

12.4. Mobility in soil

None

12.5. Other adverse effects

None

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste disposal methods

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities.

13.2. Sewage disposal method

Do not empty into drains. Avoid release to the environment.

13.3. Contaminated Packaging disposal method

Handle contaminated packages in the same way as the substance itself.

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SECTION 14: TRANSPORT INFORMATION

Land transport USDOT	Not classified as dangerous goods under transport regulations.
Sea transport IMDG	Not classified as dangerous goods under transport regulations.
Air transport IATA/ICAO	Not classified as dangerous goods under transport regulations.
Further information	N/A
Other requirements	N/A

SECTION 15: REGULATORY INFORMATION

15.1. List of substances subject to authorisation (REACH, Annex XIV) / SVHC- candidate list

None of the ingredients are listed

15.2. Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

None of the ingredients are listed

15.3. Regulation concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)

None of the ingredients are listed

15.4. Regulation on persistent organic pollutants (POP)

None of the ingredients are listed.

15.5. National inventories

Country	Inventory	Status
AU	AU AICS	not all ingredients are listed
CA	DSL	not all ingredients are listed
CA	NDSL	not all ingredients are listed
CN	IECSC	not all ingredients are listed
EU	ECSI	not all ingredients are listed
EU	REACH Reg.	not all ingredients are listed
JP	CSCL-ENCS	not all ingredients are listed

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JP	ISHA-ENCS	not all ingredients are listed
NZ	NZIoC	not all ingredients are listed
TR	CICR	not all ingredients are listed
TW	TCSI	not all ingredients are listed
US	TSCA	not all ingredients are listed

Legend

AIIC	Australian Inventory of Industrial Chemicals
DSL	Domestic Substances List (DSL)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
EU	EC Substance Inventory (EINECS, ELINCS, NLP)
EU	REACH registered substances
CSCL-ENCS	List of Existing and New Chemical Substances (CSCL-ENCS)
ISHA-ENCS	Inventory of Existing and New Chemical Substances (ISHA-ENCS)
NZIoC	New Zealand Inventory of Chemicals
CICR	Chemical Inventory and Control Regulation
TCSI	Taiwan Chemical Substance Inventory
TSCA	Toxic Substance Control Act

SECTION 16: OTHER INFORMATION

Reference	US OSHA HCS 29 CFR 1910.1200/ECHA
Table formulation unit	Name : Phrozen Tech. Co. Ltd Address / Phone : 287 Niupu Rd, Xiangshan Dist, Hsinchu City 30091, TAIWAN(R.O.C) /+ 886-3-6210505
Table formulator	Job title : Occupational Safety & Health manager Name : Chun-Yao, Kuo
Table formulation Date	2024.05.17
Remarks	In the above described information, the symbol "N/A" means no relevant information currently.

To the best of our knowledge the information contained herein is accurate. However, Phrozen



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END OF SAFETY DATASHEET