

SAFETY DATA SHEET

Engineering Series Resin: Flame Retardant, FR940, Gray

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SECTION 1 : IDENTIFICATION

1.1 Product identifier

Product name	Engineering Series Resin: Flame Retardant, FR940, Gray
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 , Skin sensitization Category 1
Specific target organ toxicity — repeated exposure Category 2 ,
Reproductive toxicity Category 1 B
Hazardous to the aquatic environment –(Chronic) Category 2

2.2. Signal statement

Corrosion ,Exclamation mark , Health hazard ,Environment



2.3. Pictograms

2.4. Signal word

 Danger

2.5. Hazard statements

Causes serious eye damage
May cause an allergic skin reaction
May damage fertility. May damage the unborn child.
May cause damage to organs through prolonged or repeated exposure
Toxic to aquatic life with long lasting effects.

2.6. Precautionary statements

If medical advice is needed, have product container or label at hand.

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SECTION 4 : FIRST AID MEASURES

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

4.1.1. Inhalation

Keep patient calm, remove to fresh air, seek medical attention. Immediately administer a corticosteroid from a controlled/metered dose inhaler.

4.1.2. Skin Contact

Immediately wash thoroughly with plenty of water, apply sterile dressings, consult a skin specialist.

4.1.3. Eyes Contact

Flush immediately with water for 20-30 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing for an additional 15 minutes. Seek medical attention.

4.1.4. Ingestion

Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

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, foam

5.2. Specific hazards confronted during fire fighting

Nitrogen oxides (NO_x), Carbon monoxide (CO), Carbon dioxide (CO₂)

5.3. Specific fire-fighting procedure

None

5.4. Specific protective equipments for fire-fighters

Wear self-contained breathing apparatus and chemical-protective clothing. If exposed to fire, keep containers cool by spraying with water. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

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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°F to 35°C / 95°F.

Close the lid tightly when not in use.

SECTION 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Engineering controls

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

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8.2. Control Parameters

Components	TWA	STEL	CEILING	BEI s
Titanium dioxide	10 mg / m ³	15 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.

For example : NBR: acrylonitrile-butadiene rubber .Material thickness : ≥ 0.6 mm

Breakthrough times of the glove material : >480 minutes (permeation: level 6)

8.3.3. Eye protection

Use safety goggles.

8.3.4. Skin protection

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended. Wash hands thoroughly after handling.

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 viscous liquid	Odor	Typical acrylate
Odor threshold	N/A	Melting point	<- 20 °C at 1,013 hPa
pH value	6- 8	Boiling point	>391°C at 1,013 hPa
Flammable	N/A	Flash point	N/A
Decomposition Temp	N/A	Testing method	close cup

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Natural Temp :	N/A	Explosive limit	N/A
Vapor pressure	0.003 Pa at 20 °C	Vapor density	N/A
Density	1.14 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

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
4-(1-Oxo-2-propenyl)-morpholine	Oral	Rat	LD50	588 mg/kg

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11.4. Chronic toxicity

None

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 (chronic) of components of the mixture				
Components	End point	Value	Species	Exposure time
diphenyl(2,4,6-trimethylbenzoyl)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
(2,4,6-trioxo-1,3,5-triazine-1,3,5(2H,4H,6H)-triazin-2,1-ethanediyl triacrylate	oxygen depletion	19.7%	28d	ECHA
Propylidynetrimethanol, ethoxylated, esters with acrylic acid	carbon dioxide generation	58–61 %	28d	ECHA
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	oxygen depletion	0 -10%	28 d	ECHA

12.3. Bio-accumulative potential

Components	BCF	Log _{kow}	BOD/COD
4-(1-oxo-2-propenyl)-morpholine		-0.46(21°C)	
(2,4,6-trioxo-1,3,5-triazine-1,3,5(2H,4H,6H)-triazin-2,1-ethanediyl triacrylate		1.09(pHvalue : 6.8, 25°C)	

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H)-triyl)tri-2,1-ethanediyl triacrylate			
Propylidynetrimethanol, ethoxylated, esters with acrylic acid		2.89 (pH value: 8.1, 23 °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.

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.

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Further information	N/A
Other requirements	N/A

Additional information for IMDG CODE 3.4.1 :

According to the general provisions 2.10.2.7, if the volume of the product is less than 5L or the mass is less than 5kg when transported, and the packaging complies with the general provisions in 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8, the product is not regarded as dangerous goods transportation.

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	all ingredients are listed
CA	DSL	not all ingredients are listed
CA	NDSL	not all ingredients are listed
CN	IECSC	all ingredients are listed
EU	ECSI	all ingredients are listed
EU	REACH Reg.	all ingredients are listed
JP	CSCL-ENCS	not all ingredients are listed
JP	ISHA-ENCS	not all ingredients are listed
NZ	NZIoC	all ingredients are listed
TR	CICR	not all ingredients are listed

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TW	TCSI	all ingredients are listed
US	TSCA	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 / REACH
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	2023.11.07
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 Tech. Co. Ltd. makes no warranty, expressed or implied, regarding the accuracy of these results to be obtained from the use thereof. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. Phrozen Tech. Co. Ltd. assumes no responsibility for injury from the use of the product described herein.

END OF SAFETY DATASHEET