

Product:**Tough Resin**

SDS NO.:220911(Version1.0)

Date 2020/09/11 (Cancel and replace :2018/06/14)

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**Trade name:** Tough Resin

PHOTOPOLYMER RESIN

Recommended use of the chemical and restrictions on use :**Use of the Substance/Mixture :** 3D printing**Manufacturer/Supplier:**

Loyol New Material Technology (Suzhou) Co.,Ltd.

Xiangcheng Economic Development Zone, Suzhou City, CHINA

Tel: +86 (0) 512 65801831

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Further information obtainable from: Loyol New Material Technology (Suzhou) Co.,Ltd.**Emergency telephone number :**

Tel: +86 (0) 512 65801831

2. HAZARDS IDENTIFICATION**2.1.Classification of the substance or mixture:**

Oral: Acute toxicity, Category 4, H302

Skin corrosion/irritation, Category 2, H315

Eye damage/irritation, Category 1, H318

Skin sensitisation, Category 1, H317

Acute aquatic toxicity, Category 2, H401

Chronic aquatic toxicity, Category 2, H411

Additional information:

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2.Label elements**GHS-Labeling**

Hazard pictograms:



GHS07



GHS09

Signal word: Danger

Hazard statements:

H302 : Harmful if swallowed.

H315 : Causes skin irritation.

H317 : May cause an allergic skin reaction.

H318 : Causes serious eye damage.

Product:

Tough Resin

SDS NO.:220911(Vers1.0)

Date 2020/09/11 (Cancel and replace :2018/06/14)

H411 : Toxic to aquatic life with long lasting effects.

Precautionary statements:

Prevention:

P261 : Avoid breathing gas/mist/vapours/spray.

P264 : Wash skin 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/ eye protection/ face protection.

Response:

P301 + P312 : IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.

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.

P310 : Immediately call a POISON CENTER or doctor/ physician.

P333 + P313 : If skin irritation or rash occurs: Get medical advice/ attention.

P362 + P364 : Take off contaminated clothing and wash it before reuse.

P391 : Collect spillage.

Disposal:

P501 : Dispose of contents/ container to an approved waste disposal plant.

2.3. Other hazards:

Potential health effects:

Possible irritation of respiratory system

Environmental Effects:

Toxic to fish. Harmful to daphnia. Harmful to algae. Not readily biodegradable.

Physical and chemical hazards:

Formation of toxic products through combustion

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Chemical nature of the mixture:

Hazardous components:

Composition	CAS-No.	Classification	Concentration
Methacrylate oligomers	Trade Secret	Eye Irrit. 2A, H319; Skin Sens. 1, H317	20-50%
Urethane dimethacrylate	Trade Secret	Eye Dam. 1, H318; Skin Irrit. 2, H315; Skin Sens. 1, H317	10-50%
Propylidynetrimethyl trimethacrylate	Trade Secret	Eye Dam. 1, H318; Skin Irrit. 2, H315; Skin Sens. 1, H317	10-30%
Diphenyl(2,4,6- trimethylbenzoyl)phosphine oxide	75980-60-8	Repr. 2, H361	<10%

4. FIRST AID MEASURES

Description of first aid measures

General information:

Immediately remove any clothing soiled by the product.

After inhalation:

Product:**Tough Resin**

SDS NO.:220911(Vers1.0)

Date 2020/09/11 (Cancel and replace :2018/06/14)

Supply fresh air and to be sure call for a doctor.

In case of unconsciousness place patient stably in side position for transportation.

After skin contact:

Immediately wash with water and soap and rinse thoroughly. If skin irritation continues, consult a doctor.

After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing:

Never give anything by mouth to an unconscious person. Rinse out mouth with water.

Seek medical treatment.

Most important symptoms and effects, both acute and delayed No further relevant information available.

Indication of any immediate medical attention and special treatment needed

No further relevant information available.

5. FIREFIGHTING MEASURES

Suitable extinguishing agents: Use fire fighting measures that suit the environment.

Special hazards arising from the substance or mixture: No further relevant information available.

Special protective equipment and precautions for firefighters**Protective equipment:**

Wear fully protective suit.

Mouth respiratory protective device.

6. ACCIDENTAL RELEASE MEASURES**Personal precautions, protective equipment and emergency procedures:**

Use personal protective equipment. Ensure adequate ventilation. Evacuate personnel to safe areas. Remove all sources of ignition.

Prohibit contact with skin and eyes. Avoid inhalation of vapour or mist.

Environmental precautions:

Do not flush into surface water or sanitary sewer system. Do not release into the environment.

Methods and materials for containment and cleaning up:**Methods for cleaning up:**

After cleaning, flush away traces with water. Recover waste water for processing later.

Recovery:

Shovel into suitable container for disposal. Absorb the remainder with an inert absorbent material (sand, vermiculite, perlite). Use clean non-sparking tools to collect absorbed material.

Elimination:

Contain spillage, and then collect with non-combustable absorbent material and place in container for disposal according to local/national regulations

Reference to other sections: None.

7. HANDLING AND STORAGE**7.1. Precautions for safe handling:****Technical measures/Precautions:**

Storage and handling precautions applicable to products: Liquid. Irritant even corrosive. Sensitizing. Dangerous for the environment.

Provide appropriate exhaust ventilation at machinery. Provide showers, eye-baths

Safe handling advice:

Remove all sources of ignition. Avoid static electricity build up with connection to earth. In case of insufficient ventilation, wear suitable respiratory equipment. Most acrylic monomers have low viscosities; hence, pouring, material transfer and processing of these materials do not necessitate heating. DO NOT use localized heat sources such as band heaters or steam. Use hot boxes or hot rooms for heating or melting. Do not overheat - this may compromise product quality and/or result in an uncontrolled hazardous polymerization. To facilitate product transfer from original container when the product is viscous liquid/solid, this product may be heated to a maximum of 80C/176F for up to 24 hours.

Hygiene measures:

Take off immediately all contaminated clothing. Prohibit contact with skin and eyes. Wash hands before breaks and at the end of workday. When using do not eat, drink or smoke. Avoid inhalation of vapours. Wash hands after handling. Remove contaminated clothing and protective equipment before entering eating areas.

Product:

Tough Resin

SDS NO.:220911(Version1.0)

Date 2020/09/11 (Cancel and replace :2018/06/14)

7.2. Conditions for safe storage, including any incompatibilities:

Keep tightly closed in a dry, cool and well-ventilated place. Store in original container. Protect from frost, heat and sunlight. Keep away from open flames, hot surfaces and sources of ignition. Make sure of the presence of air and inhibitor in the drums. In addition, the product's inhibitor(s) require the presence of dissolved oxygen. An air space is required above the liquid in all containers; avoid storage under an oxygen-free atmosphere. Provide impermeable floor. Provide a catch-tank in a bunded area.

Storage temperature: > 0 °C

Storage temperature: < 38 °C

Unless specified elsewhere, shelf life is 6 month from receipt.

Incompatible products:

Acids Bases Oxidizing agents Reducing agents

Packaging material:

Recommended: Baked phenolic lined carbon steel drums, Plastic drum

To be avoided: copper, Iron

7.3. Specific end use(s): None.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters:

Exposure Limit Values Not relevant

8.2. Exposure controls:

Appropriate engineering controls: When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment.

Personal protective equipment:

Respiratory protection:

In case of insufficient ventilation, wear suitable respiratory equipment.

Hand protection:



Protective gloves

Gloves nitrile rubber Products used with solvents Do not use: Natural Rubber, Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye/face protection:

Safety glasses with side-shields, Do not wear contact lenses.

Skin and body protection:

Long sleeved clothing

9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

Appearance:

Form: Liquid

Color: -

Odor: Slight

Odor threshold: Not available.

pH-value: pH ~ 7

Change in condition

Melting point/freezing point: Not available.

Boiling point / Boiling range: Not available.

Flash point: > 90 °C

Flammability (solid, gaseous): Not applicable.

Auto-Ignition temperature: Not available.

Decomposition temperature: Not available.

Explosion limits:

Lower: Not available.

Product:**Tough Resin**

SDS NO.:220911 (Version 1.0)

Date 2020/09/11 (Cancel and replace :2018/06/14)

Upper:	Not available.
Vapor pressure:	Not available.
Density:	Not available.
Relative density (Water=1) :	1.1-1.2 g/ml at 25°C
Vapor density	Not available.
Evaporation rate	Not available.
Solubility in / Miscibility with Water:	Not available.
Partition coefficient (n-octanol/water):	Not available.
Viscosity:	
Dynamic:	600 - 800 mPa.s , at 25 °C (Brookfield).
Kinematic:	Not available.

Other information	No further relevant information available.
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10. STABILITY AND REACTIVITY

Reactivity: No data available.

Chemical stability: The product is stable under recommended handling and storage conditions.

Possibility of hazardous reactions: Inhibitors have been added to stabilize this product. Maintaining air in the storage containers is important to keep inhibitors active. Unless inhibited, hazardous polymerisation may occur. Polymerization is exothermic and can degenerate into an uncontrolled reaction.

Conditions to avoid: Heat, flames and sparks. Remove all sources of ignition. Take precautionary measures against static discharges.

Incompatible materials to avoid: Acids, Bases, Oxidizing agents, Reducing agents

Hazardous decomposition products: Formation of toxic products through combustion:, Carbon oxides, Nitrogen oxides (NOx)

11. TOXICOLOGICAL INFORMATION**Acute toxicity**

LD/LC50 values that are relevant for classification: Not available.

Primary irritant effect

Skin corrosion/irritation: Irritant to skin and mucous membranes.

Serious eye damage/irritation: Strong irritant with the danger of severe eye injury.

Respiratory or skin sensitisation: Sensitization possible through skin contact.

Additional toxicological information:

The product shows the following dangers according to internally approved calculation methods for preparations:

Corrosive

Irritant

Suspected to cause damage to fertility.

Carcinogenic categories**IARC (International Agency for Research on Cancer)**

None of the ingredients is listed.

NTP (National Toxicology Program)

None of the ingredients is listed.

12. ECOLOGICAL INFORMATION**Toxicity**

Aquatic toxicity: No further relevant information available.

Product:**Tough Resin**

SDS NO.:220911(Vers1.0)

Date 2020/09/11 (Cancel and replace :2018/06/14)

Persistence and degradability No further relevant information available.**Bioaccumulative potential** No further relevant information available.**Mobility in soil** No further relevant information available.**Other adverse effects** No further relevant information available.**13. DISPOSAL CONSIDERATIONS****Waste treatment methods****Recommendation:**

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

Uncleaned packagings

Recommendation: Disposal must be made according to official regulations.

14. TRANSPORT INFORMATION

Regulation	14.1. UN number	14.2. UN proper shipping name	14.3. Class*	Label	14.4. PG*	14.5. Environmental hazards	14.6. Special precautions for user
CNDG	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	9	9	III	yes	
IATA Cargo	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	9	9MI	III	yes	
IATA Passenger	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	9	9MI	III	yes	
IMDG	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	9	9	III	Marine pollutant	EmS Number: F-A,S-F Mark:MP

***Description:** 14.3. Transport hazard class(es)

14.4. Packing group

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

15. REGULATORY INFORMATION**Safety, health and environmental regulations/legislation specific for the substance or mixture****Section 355 (extremely hazardous substances):**

None of the ingredient is listed.

Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

TSCA (Toxic Substances Control Act):

All ingredients are listed.

Chemicals known to cause cancer:

None of the ingredients is listed.

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

New Jersey Right-to-Know List:

None of the ingredients is listed.

New Jersey Special Hazardous Substance List:

None of the ingredients is listed.

Pennsylvania Right-to-Know List:

None of the ingredients is listed.

Pennsylvania Special Hazardous Substance List:

Product:**Tough Resin**

SDS NO.:220911(Vers1.0)

Date 2020/09/11 (Cancel and replace :2018/06/14)

None of the ingredients is listed.

Cancerogenity categories**EPA (Environmental Protection Agency):**

None of the ingredients is listed.

TLV (Threshold Limit Value established by ACGIH):

None of the ingredients is listed.

NIOSH-Ca (National Institute for Occupational Safety and Health):

None of the ingredients is listed.

16. OTHER INFORMATION**Relevant hazard statements**

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H318 Causes serious eye damage.

H319 Causes serious eye irritation.

H361 Suspected of damaging fertility or the unborn child.

DISCLAIMER OF LIABILITY :

The information in this SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. 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.

Date of preparation / last revision 01/07/2019 / -

Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

ACGIH: American Conference of Governmental Industrial Hygienists

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety & Health

Skin Irrit. 2: Skin corrosion/irritation – Category 2

Eye Dam. 1: Serious eye damage/eye irritation – Category 1

Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A

Skin Sens. 1: Skin sensitisation – Category 1

Repr. 2: Reproductive toxicity – Category 2

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