

# Material Safety Data Sheet -PLA filament

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

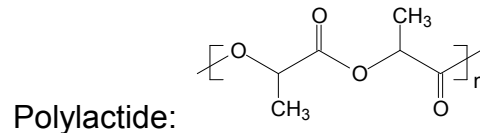
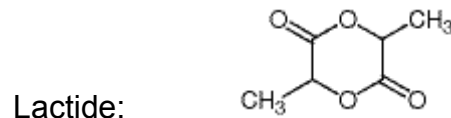
Chemical name: 3, 6-dimethyl-1, 4-dione; polymer.

Chemical family: Polyester

Common names: Polylactide, polylactic acid, PLA.

Chemical formula:  $(C_6H_8O_4)_x$ .

Chemical structure:



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## 2. HAZARDS IDENTIFICATION

<u>Material</u>	<u>CAS#</u>	<u>Hazard</u>
L-Lactide	4511-42-6	none known
DL-Lactide	95-96-5	none known
Poly (DL-lactide)	51063-13-9	none known
Poly (L-lactide)	33135-50-1	none known

Instability: None.

Incompatibility: Stable.

Decomposition: Slow reaction in the presence of water.

Polymerization: Will not occur, already a polymer.

Combustion: Carbon monoxide and / or carbon dioxide may form during the combustion of this product.

### Emergency Overview

CAUTION! May cause eye/skin irritation. Burning produces obnoxious and toxic fumes. Avoid

contact with skin and eyes. Avoid formation of dust and aerosols

Appearance: colorful filament

Physical state: Solid

Odor: None

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### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Solubility in water: React very slowly with water to become soluble.

Appearance: Solid filament.

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polymer	
Residual monomer	< 0.5%
Residual solvent	< 0.05%
Residual catalyst	< 200ppm
Heavy Metal	< 10ppm
Water Content	≅ 0.5%

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### 4. FIRST AID MEASURES

**Eye contact:** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

**Skin contact:** Rinse immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician. Cool skin rapidly with cold water after contact with hot polymer.

**Inhalation:** Move to fresh air. Call a physician immediately.

**Ingestion:** Drink water as a precaution. Never give anything by mouth to an unconscious person. Do not induce vomiting without medical advice. Call a physician immediately.

**Notes to physician:** Treat symptomatically.

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### 5. FIRE FIGHTING MEASURES

Unusual Explosion Hazard and Fire: The material will burn if exposed to sufficient heat and an ignition source. Avoid dispersion of dust in the air to reduce dust explosion hazard potential.

Extinguished Media: Water, Carbon dioxide, Dry chemical powder, Foam.

Special Extinguishing Procedures: Firefighters must wear self-contained breathing apparatus and fully protective equipment.

**Flammability:**

Autoignition temperature: 388°C

Flammability Limits in Air

Flammable limits in air - lower (%): Not determined

Flammable limits in air - upper (%): Not determined

Suitable extinguishing media: Foam. Water. Carbon dioxide (CO<sub>2</sub>). Dry chemical. Alcohol

resistant foams are preferred if available. General-purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively.

Extinguishing media which must not be used for safety reasons: No

information available

Hazardous decomposition products: Burning produces obnoxious and toxic fumes Aldehydes Carbon monoxide (CO) carbon dioxide (CO<sub>2</sub>)

**Special protective equipment for firefighters:** As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

**Under fire conditions:** Cool containers / tanks with spray water. Water mist may be used to cool closed containers.

**Other information:** Fine dust dispersed in air may ignite. Risks of ignition followed by flame propagation or secondary explosions shall be prevented by avoiding accumulation of dust, e.g. on floors and ledges.

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## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Use personal protective equipment. See Section 8. Remove all sources of ignition. Avoid dust formation. Avoid contact with skin and eyes. Sweep up to prevent slipping hazard.

**Environmental precautions:** Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system.

**Methods for cleaning up:** Shovel into suitable container for disposal.

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## 7. HANDLING AND STORAGE

**Safe handling advice:** Avoid contact with skin and eyes. Avoid dust formation. Workers should be protected from the possibility of contact with molten material during fabrication. Low hazard for usual industrial or commercial handling. Use personal protective equipment. See Section 8.

### **Storage:**

Store in cool place. Keep at temperatures below 122F (50 °C).

No special restrictions on storage with other products

**Precautions:** No special precautions required

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## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Engineering measures:** Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. Provide appropriate exhaust ventilation at places where dust is formed.

**Control parameters:** None

### **PERSONAL PROTECTIVE EQUIPMENT:**

**Eye protection:** Safety glasses with side-shields. Goggles.

### **Skin and body**

**protection:** Impervious clothing.

### **Respiratory protection:**

Respirator must be worn if exposed to dust. Wear respirator with dust filter.

Respiratory protection is needed if any of the exposure limits in Section 3 are exceeded. Consult an industrial hygiene professional prior to respirator selection and use. Use a positive-pressure air supplied respirator if there is any

potential for an uncontrolled release, exposure levels are not known, or any other circumstances where airpurifying respirators may not provide adequate protection. **WARNING:** Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

**Hand protection:** Preventive skin protection.

**Hygiene measures:** Avoid contact with skin, eyes and clothing.

**Exposure limits:** See Section 3.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:** colorful filament.

**Physical state:** Solid

**Odor:** None

**Odor threshold:** No data available

**pH:** Not applicable

**Vapor pressure:** Not determined

**Vapor density:** Not determined

**Evaporation rate:** No data available

**Density:** 1.24 g/cc

**Decomposition temperature:** 482F (250C)

**Autoignition temperature:** 388°C

**Melting point/range:** Not determined

**Water solubility:** Insoluble

**Solubility in other solvents:** None known

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## 10. STABILITY AND REACTIVITY

**Stability:** Stable under recommended storage conditions

**Conditions to avoid:** Temperatures above 50 °C.

**Materials to avoid:** Oxidizing agents. Strong bases.

**Hazardous decomposition products:** Burning produces obnoxious and toxic fumes. Aldehydes. Carbon monoxide (CO). carbon dioxide (CO<sub>2</sub>).

**Polymerization:** Not applicable

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## 11. TOXICOLOGICAL INFORMATION

**Principle Routes of Exposure:** Eye contact. Skin contact. Inhalation. Ingestion.

**Acute toxicity:** There were no target organ effects noted following ingestion or dermal exposure in animal studies.

**Local effects:** May cause eye/skin irritation. Product dust may be irritating to eyes, skin and respiratory system. Caused mild to moderate conjunctival irritation in eye irritation studies using rabbits. Caused very mild redness in dermal irritation studies using rabbits (slightly irritating). Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

**Long term toxicity:** Did not cause skin allergic reactions in skin sensitization studies using guinea pigs.

**Specific effects:** May cause skin irritation and/or dermatitis. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough. Burning produces irritant fumes.

**Mutagenic effects:** No data is available on the product itself.

**Reproductive toxicity:** No data is available on the product itself.

**Carcinogenic effects:** No data is available on the product itself.

**Target organ effects:** There were no target organ effects noted following ingestion or

dermal exposure in animal studies.

**Skin:** LD50/dermal/rabbit > 2000 mg/kg

**Ingestion:** LD50/oral/rat > 5000 mg/kg.

**Further information:** No information available

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## 12. ECOLOGICAL INFORMATION

**Mobility:** No data available

**Bioaccumulation:** Does not bioaccumulate. Inherently biodegradable.

**Ecotoxicity effects:** EC50/72h/algae > 1100 mg/L

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## 13. DISPOSAL CONSIDERATIONS

**Waste from residues / unused products:** In accordance with local and national regulations.

Do not contaminate ponds, waterways or ditches with chemical or used container. Contact manufacturer.

**Contaminated packaging:** Empty remaining contents. Do not re-use empty containers. Empty containers should be transported/delivered using a registered waste carrier to local recyclers for disposal.

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## 14. TRANSPORT INFORMATION

**U.S. Department of Transportation (DOT):**

**Proper shipping name:** None

**Hazard class:** Not regulated.

**UN-No:** None

**Packing group:** None

**Hazardous substances (RQ):** None

**IMDG:**

**Proper shipping name:** None

**Hazard class:** Not regulated.

**UN/Id No.:** None

**Packing group:** None

**ICAO/IATA:**

**Proper shipping name:** None

**Hazard Class:** Not regulated.

**UN-No.:** None

**Packing group:** None

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**15. REGULATORY INFORMATION**

**Product name:** ESUN PLA filament

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**16. OTHER INFORMATION**

**Label information:** ESUN PLA filament

**Reason for revision:** Not applicable

**Revision date:** 13/2/2014

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