

## Technical Data Sheet: Z-PLA Pro

Mechanical Properties	Metric	English	Comments
Tensile Strength at Yield	45 MPa	6530 psi	ISO 527
Tensile Strength at Break	27 MPa	3920 psi	ISO 527
Elongation at Yield	2%	2%	ISO 527
Elongation at Break	17%	17%	ISO 527
Tensile Modulus	4.3 GPa	624 ksi	ISO 527
Charpy Impact	55 kJ/m <sup>2</sup>	26.2 ft-lb/in <sup>2</sup>	ISO 179/1eU
Thermal Properties	Metric	English	Comments
Deflection Temperature at 0.45 MPa (66 psi)	47 °C	117 °F	ISO 75
Other Properties	Metric	English	Comments
Specific Gravity	1.3 - 1.5 g/cm <sup>3</sup>	10.8 - 12.5 lb/gal	
Melt Flow Rate	36 cm <sup>3</sup> /10 min Load 2.16 kg, Temperature 190 °C	2.2 in <sup>3</sup> /10 min Load 4.76 lb, Temperature 374 °F	ISO 1133

The data presented in this document are intended for information and comparison purposes only. They should not be used for project specifications or its quality evaluation. The material's actual properties depend on the printing process conditions, the design structure and its purpose, test conditions, etc.

Samples of Z-PLA Pro used to carry out the tests were made through plastic moulding.

Product specifications are subject to change without notice.

Each user is responsible for complying with product safety standards, its intended use as well as the law and waste disposal (and recycling) rules for electrical and electronic equipment. Zortrax does not make any express or implied warranties, including but not limited to implied warranties of merchantability or fitness for a particular purpose.

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Entered in the Register of Entrepreneurs of the National Court Register kept by the District Court in Olsztyn, VIII Commercial Division of the National Court Register, under KRS number 0000564079, with a share capital of PLN 7 462 500 paid in full.

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## Safety data sheet: Z-PLA Pro

### SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

#### 1.1. PRODUCT IDENTIFIER

Trade name: Z-PLA Pro  
Generic name: PLA (polylactic acid)  
Material type: thermoplastic

#### 1.2. RELEVANT IDENTIFIED USES OF THE SUBSTANCE OR MIXTURE AND USES ADVISED AGAINST

Identified use: thermal processing for 3D printing in Layer Plastic Deposition (LPD) technology.  
Use advised against: other than listed above

#### 1.3. DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

Supplier: Zortrax S.A.  
Lubelska 34  
10-409 Olsztyn  
Poland  
TEL. +48 89 672 40 01  
Made in: EU

#### 1.4. EMERGENCY TELEPHONE NUMBER

Emergency telephone number: 112

### SECTION 2. HAZARD IDENTIFICATION

#### 2.1. CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

This product is not classified as dangerous according to Regulation (EC) No 1272/2008.

#### 2.2. LABEL ELEMENTS

Hazard pictogram(s): not applicable  
Signal word(s): not applicable  
Hazard statement(s): not applicable  
Precautionary statement(s): not applicable

#### 2.3. OTHER HAZARD

The product does not meet the criteria for PBT or vPvB classification.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. SUBSTANCES

Not applicable

### 3.2. MIXTURES

Biopolymers

Additives and colorants

## SECTION 4. FIRST AID MEASURES

### 4.1. DESCRIPTION OF FIRST AID MEASURES

<b>Eye contact:</b>	immediately rinse eyes with water. In case of irritation, contact a physician.
<b>Skin contact:</b>	if molten material comes into contact with the skin, cool immediately with cold water. Removal of solidified molten material from skin as well as treatment of burns require medical assistance.
<b>Ingestion:</b>	remove material residues from mouth and rinse mouth with water. Drink plenty of water. Do NOT induce vomiting. In case of discomfort, contact a physician.
<b>Inhalation:</b>	provide fresh air. In case of noticing worrying symptoms, consult a physician.

### 4.2. MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

**Most important symptoms/effect:** no data available

### 4.3. INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

**Notes to physician:** treat symptomatically

## SECTION 5. FIREFIGHTING MEASURES

### 5.1. EXTINGUISHING MEDIA

**Suitable extinguishing media:** fine spray or water mist, dry powder, foam, carbon dioxide (CO<sub>2</sub>).

**Unsuitable extinguishing media:** high volume water jet.

### 5.2. SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

**Special hazards arising from the substance or mixture:** special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases: burning produces irritating and noxious fumes/gases, smoke, carbon monoxide, carbon dioxide, organic decomposition products, nitrogen oxide.

### 5.3. ADVICE FOR FIREFIGHTERS

Special protective equipment for firefighters: self-contained breathing apparatus and full firefighting protective gear.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

### 6.1. PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

Use personal protective equipment. Avoid contact with eyes and skin. Do not breathe vapors. In case of failure in a confined space, ensure proper ventilation. Remove sources of ignition and extinguish open flame.

### 6.2. ENVIRONMENTAL PROTECTION

Prevent or limit further leakage if possible. Avoid discharge of the product into drain, ground and surface water.

### 6.3. METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP

Sweep up and gather solidified material into appropriate containers for disposal. Collected material treat as waste.

### 6.4. REFERENCE TO OTHER SECTIONS

See SECTION 8 for personal protection information. See SECTION 13 for disposal considerations.

## SECTION 7. HANDLING AND STORAGE

### 7.1. PRECAUTIONS FOR SAFE HANDLING

Handle in accordance with general safety regulations. Use personal protective equipment. Ensure proper ventilation. Avoid contact with molten material. Do not eat, drink or smoke when using the product. Do not ingest.

### 7.2. CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

Store in tightly closed packaging in a dry and cool room away from hot surfaces and sources of ignition. Protect from moisture and direct sunlight.

### 7.3. SPECIFIC END USE(S)

See SECTION 1.2.

Exposure scenario: no data available

Other guidelines: no data available

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. CONTROL PARAMETERS

Exposure limits: the product does not contain any hazardous substances with occupational exposure limits.

Biological limit values:	not applicable
Recommended monitoring procedures:	not applicable
Derived No Effect Level (DNEL):	not applicable
Predicated No Effect Concentration:	not applicable

## 8.2. EXPOSURE CONTROL

Appropriate engineering controls:	store at temperatures between 20 and 30 °C. Ensure proper ventilation, especially in confined spaces.
Individual protection measures, such as personal protective equipment:	
Eye protection:	wear safety glasses with side-shields.
Skin protection:	wear heat-resistant gloves when handling molten material.
Respiratory protection:	when working in spaces with high temperatures and with poor ventilation, use breathing equipment with particle filter.
Thermal hazards:	no fire hazard under normal use conditions.
Environmental exposure controls:	do not allow to enter into drains, ground and surface water.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	filament
Physical state:	solid (compressed)
Colors:	gypsum white
Odor:	nearly odorless to slightly sweet
Odor threshold:	not applicable
pH:	no data available
Melting point/freezing point:	104 °C
Initial boiling point and boiling range:	no data available
Flash point:	no data available
Evaporation rate:	no data available
Flammability:	no data available
Upper/lower flammability or explosive limits:	no data available
Vapor pressure:	no data available
Vapor density:	no data available
Relative density:	1,3 -1,5 g/cm <sup>3</sup>
Solubility:	insoluble
Partition coefficient: n-octanol/water:	no data available
Auto-ignition temperature:	no data available
Decomposition temperature:	no data available
Viscosity:	no data available

Explosive properties: no data available

Oxidizing properties: no data available

## 9.2. OTHER INFORMATION

Miscibility: immiscible

Fat solubility: no data available

Conductivity: no data available

Gas group: no data available

## SECTION 10. STABILITY AND REACTIVITY

### 10.1. REACTIVITY

No reactivity under normal storage conditions.

### 10.2. CHEMICAL STABILITY

Stable under normal storage conditions.

### 10.3. POSSIBILITY OF HAZARDOUS REACTIONS

None under normal storage and processing.

### 10.4. CONDITIONS TO AVOID

Sources of heat, ignition and moisture. Working in spaces with poor ventilation.

### 10.5. INCOMPATIBLE MATERIALS

Strong oxidizing and reducing agents, strong acids and bases.

### 10.6. HAZARDOUS DECOMPOSITION PRODUCTS

No decomposition under normal conditions. Combustion products: see SECTION 5.2.

## SECTION 11. TOXICOLOGICAL INFORMATION

### 11.1. INFORMATION ON TOXICOLOGICAL EFFECTS

Acute toxicity: shows no toxic effects

Skin corrosion/irritation: contact with skin may cause irritation.

Serious eye damage/irritation: contact with eyes may cause irritation.

Respiratory or skin sensitization: no sensitizing effects are known.

Germ cell mutagenicity: no data available

Carcinogenicity:	IARC (International Agency for Research on Cancer) - none of the ingredients is listed. NTP (National Toxicology Program) - none of the ingredients is listed. MAK (German Maximum Workplace Concentration) - 100-42-5 Styrene.
Reproductive toxicity:	no data available
STOT-single exposure:	no data available
STOT-repeated exposure:	no data available
Aspiration hazard:	no data available

## SECTION 12. ECOLOGICAL INFORMATION

### 12.1. TOXICITY

Non-toxic

### 12.2. PERSISTENCE AND DEGRADABILITY

Biodegradable under industrial composting conditions.

### 12.3. BIOACCUMULATIVE POTENTIAL

No data available

### 12.4. MOBILITY AT SOIL

No data available

### 12.5. RESULTS OF PBT AND vPvB ASSESSMENT

No data available

### 12.6. OTHER ADVERSE EFFECTS

See SECTION 6.2.

## SECTION 13. DISPOSAL CONSIDERATIONS

### 13.1. WASTE TREATMENT METHODS

Do not discard into drains, water courses or onto the ground. Waste and empty containers should be disposed of in accordance with local regulations.

## SECTION 14. TRANSPORT INFORMATION

### 14.1. UN NUMBER

DOT, ADR, IMDG, IATA - not applicable



14.2. UN PROPER SHIPPING NAME

DOT, ADR, IMDG, IATA - not applicable

14.3. TRANSPORT HAZARD CLASS(ES)

DOT, ADR, IMDG, IATA - not applicable

14.4. PACKING GROUP

DOT, ADR, IMDG, IATA - not applicable

14.5. ENVIRONMENTAL HAZARDS

DOT, ADR, IMDG, IATA - not applicable

14.6. SPECIAL PRECAUTIONS FOR USER

DOT, ADR, IMDG, IATA - not applicable

14.7. TRANSPORT IN BULK TO ANNEX II OF MARPOL AND THE IBC CODE

Not applicable

SECTION 15. REGULATORY INFORMATION

15.1. SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/LEGISLATION  
SPECIFIC FOR THE SUBSTANCE OR MIXTURE

Safety, health and environmental regulations/legislation specific for the substance or mixture US EPA TSCA:

- CERCLA Section 103 (40CFR302.4) - not listed,
- SARA Section 311/312 (40CFR370.21) - not listed,
- SARA Section 313 (40CFR372.65) - not listed,
- SARA Section 355 (extremely hazardous substances) - not listed,
- STATE REGULATIONS (California Proposition 65) - not listed,
- TSCA - Toxic Substances Control Act (USA) - not listed,
- DSL - Domestic Substances List (Canada) - not listed,
- ENCS - Existing and New Chemical Substances (Japan) - not listed,
- KECL - Korea Existing Chemicals List (Korea) - not listed,
- AICS - Australian Inventory of Chemical Substances (Australia) - not listed.

European regulations:

- EC NUMBER - not assigned,
- Directive 96/82/EC - not applicable.

## 15.2. CHEMICAL SAFETY ASSESSMENT

A chemical safety assessment for the product has not been carried out.

## SECTION 16. OTHER INFORMATION

This Safety Data Sheet has been prepared on the basis of the currently available data on the product as well as of the Manufacturer's experience and knowledge. It should be treated as a guide for safe transportation, storage and handling. The given information is not to be considered as a warranty or quality specification. Additionally, it is the user's responsibility to handle the product in accordance with local regulations and standards.

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