# Material Safety Data Sheet

*According to EU Regulation No. 1907/2006*
*Issued on: 1 August 2017*

## Volcano PLA

### 1. Identification of the substance/preparation and of the company

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| 1.1 | Trade name: | Volcano PLA |
| 1.2 | Chemical name: | PolyLactic Acid based polymer blend |
| 1.3 | Typical use of the material: | Monofilament for FFF/FDM technology based 3D printing |
| 1.4 | Identification of the company: | Formfutura BV<br>Groenestraat 215<br>6531 HH Nijmegen<br>The Netherlands<br><br>Phone: +31 (0)85 002 0881<br><br>***Emergency phone number: +31 (0)30 274 8888*** |

### 2. Identification of the substance/preparation and of the company

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|---|---|---|
| 2.1 | Risk advise to man and the environment: | No risk exists to the health of users if the product is handled and processed properly. |
| 2.2 | Classification of the substance or mixture: | Not classified as dangerous according to Directive 67/548/EEC |
| 2.3 | Special advice on hazards: | This product does not meet the criteria for PBT or vPvB in accordance with Annex XIII of REACH. |

### 3. Composition / information on ingredients

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| 3.1 | Chemical nature: | Blend of PLA based polymers and added additives enhanced for 3D printing |
| 3.2 | CAS number: | PLA (>98%): 9051-89-2<br>Additives (2%): - |
| 3.3 | Additional information: | No harmful substances used. |

### 4. First-aid measures

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| 4.1 | If inhaled: | After inhalation of decomposition products, gases or dust, bring the affected person to a source of fresh air and keep calm. Contact a physician in case of discomfort. |
| 4.2 | On skin contact: | In case of contact with melted material, immediately cool the skin with plenty of cold running water. Removal of adhering to skin polymer, or burns caused by molten material require hospital treatment. |
| 4.3 | On contact with eyes: | In case of contact with eyes, rinse open eyes, also under the eyelids, for at least 15 minutes thoroughly with water. If irritation develops, seek immediate medical attention. |
| 4.4 | On ingestion: | No effects known. Rinse mouth with water. Seek medical attention if difficulties or discomfort occur. |
| 4.5 | Note to the physician: | Treat symptomatically |

## 5. Firefighting measures

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| 5.1 | Suitable extinguishing media: | Water spray, Foam, Dry powder, Carbon dioxide (CO2). |
| 5.2 | Specific hazards: | Hazardous decomposition products such as carbon oxides and acetaldehyde can be formed during incomplete combustion. The substances mentioned can be releases at highly elevated temperatures and in case of fire. |
| 5.3 | Special protective equipment: | Full protective clothing and self-contained breathing apparatus. |
| 5.4 | Further information: | Fine dust dispersed in air may ignite. Risk of ignition followed by flame propagation or secondary explosions shall be prevented by avoiding accumulation of dust.<br>Dispose of fire debris and contaminated extinguishing water in accordance with official regulations. |

## 6. Accidental Release Measures

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| 6.1 | Personal precautions: | Use personal protective equipment/clothing (see Section 8). Avoid eye contact and dust formation and remove all sources of ignition. Sweep up to prevent slipping hazard. |
| 6.2 | Environmental precautions: | Prevent entry into drainage systems, or surface water. |
| 6.3 | Methods for cleaning up: | Sweep/shovel into suitable container for disposal.<br>Avoid raising dust and ensure adequate ventilation. |

## 7. Handling and storage

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| 7.1 | Handling: | Handle in a well ventilated area. Install local exhaust at 3D printers area is recommended when many printers are operated at once. Avoid contact with heated or molten product. Use personal protective equipment (see Section 8). Avoid dust formation and electrostatic charge. Keep away from fire ignition sources. |
| 7.2 | Storage: | Protect from water, moisture and direct sunlight. Store material in dry rooms and keep material in closed packaging/container with desiccant when not in use. Store at ambient temperatures. Avoid all sources of ignition. |
| 7.3 | Precautions: | No special precautions required. |
| 7.4 | Specific end use(s): | Primarily used for 3D printing. |

## 8. Exposure controls / personal protection

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| 8.1 | Occupational exposure limits: | Given suitable ventilation it can be that the threshold limits will not be reached. |
| 8.2 | Exposure controls: | Provide appropriate exhaust ventilation at places where dust is formed. Avoid electrostatic charge by use of grounding cables. |
| 8.3 | <u>Personal protective equipment</u> | |
| 8.3.1 | Hand protection: | Wear heat protection gloves, preferably cotton or leather, when handling hot molten product. |
| 8.3.2 | Eye protection: | Wear protective glasses, preferable with side-shields. |

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| 8.3.3 | Skin and body protection: | Wear (protective) clothing to avoid direct exposure of skin to hot molten product when handling. |
| 8.3.4 | Safety and hygiene measures: | Avoid contact of hot molten material to skin. Avoid inhalation of dust, mists and vapours. Eye wash fountains and safety showers must be easily accessible. Handle in accordance with good industrial hygiene and safety practice. No eating or drinking during working. |
| 8.4 | Environmental exposure controls: | Prevent entry into drainage systems, or surface water. |

## 9. Physical and chemical properties

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| 9.1 | Form: | Granules / Filament |
| 9.2 | Colour: | Natural |
| 9.3 | Odour: | Almost odourless |
| 9.4 | Melting point/range: | 150 °C - 230 °C |
| 9.5 | Auto-ignition temperature: | Not specified |
| 9.6 | Explosions limit: | Not specified |
| 9.7 | Decomposition temperature: | >230 °C |
| 9.8 | Density: | 1.27 g/cc |
| 9.9 | Solubility in water: | Insoluble |

## 10. Stability and reactivity

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| 10.1 | Stability: | Product is stable at recommended storage conditions. |
| 10.2 | Conditions to avoid: | Avoid extreme heat and all sources of ignition. Thermal decomposition > 230 °C. |
| 10.3 | Substances to avoid: | Moisture and water. |
| 10.4 | Hazardous reactions: | The product is chemically stable. |
| 10.4.1 | Hazardous decomposition products: | Hazardous decomposition products formed under fire conditions: Carbon oxides, Acetaldehyde. |

## 11. Toxicological information

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| 11.1 | Information on toxicological effects: | Toxicological data has not been determined for this product. Information is based on similar products. |
| 11.1.1 | Acute toxicity | |
| | Inhalation: | No data available, but not expected. |
| | Ingestion: | After ingestion stomach pain or nausea are possible. |
| | Skin contact: | No data available, but not expected. |
| | Eye contact: | No data available, but not expected. |
| 11.1.2 | Irritation | |
| | Skin: | Dust can cause irritation of eyes, respiratory organs and skin. |
| | Eye: | Dust can cause irritation of eyes, respiratory organs and skin. |
| 11.1.3 | Sensitization: | Not expected to be a skin sensitizer. |
| 11.1.4 | Repeated dose toxicity: | Not expected to cause toxic effects. |
| 11.1.5 | Carcinogenicity: | No data available, but not expected. |
| 11.1.6 | Mutagenicity: | No data available, but not expected. |
| 11.1.7 | Toxicity for reproduction: | No data available, but not expected. |
| 11.2 | Other information: | Based on our state of knowledge and experience no injurious health effects are expected if product is properly handled for the designated use. |

## 12. Ecological information

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|---|---|---|
| 12.1 | Information on eco-toxicity: | No ecological toxicity data has been generated for this product. There are no test results available and information is based on similar products. |
| 12.1.1 | Ecological toxicity effects: | No negative ecological effects are known at the present state of knowledge. |
| 12.2 | Mobility in soil: | The product is essentially insoluble in water.<br>The product has low mobility in soil. |
| 12.3 | Persistence and degradability: | Product is biodegradable. |
| 12.4 | Bioaccumulation potential: | The product will not be readily bioavailable due to its consistency and insolubility in water. |

## 13. Disposal considerations

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| 13.1 | Product: | Generation of waste should be minimized, check possibility for recycling. Waste product can be incinerated or dumped together with domestic waste in compliance with local authority requirements. |
| 13.2 | Packaging: | Packaging material has to be emptied completely and disposed in accordance with the regulations. Packaging can be recycled if not contaminated. |

## 14. Transport information

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| 14.1 | International Air Transportation Association Classification (IATA): | This product is not classified as hazardous. |
| 14.2 | International Maritime Organization (IMDG): | This product is not classified as hazardous. |
| 14.3 | 14.3 UN, IMO, ADR/RID, ICAO Code: | This product is not classified as hazardous. |

## 15. Regulatory information

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|---|---|---|
| 15.1 | EU / National regulations: | This product does not require a hazard warning label in accordance with EC Directives. |

## 16. Other information

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| Company name: | Formfutura BV |
| Additional data: | In addition to the information given in this Material Safety Data Sheet (MSDS) we refer to the products specific Technical Data Sheet (TDS). |
| Disclaimer: | The information given in the Material Safety Data Sheet only applies to the described product in connection with its appropriate use. All information is based on the latest state of our knowledge. In particular, it describes our product under the aspect of possible hazards and pertaining safety measures. The information does not constitute any guarantee of specific product and/or quality properties. The information given in this Material Safety Data Sheet is not required according to article 31 and Annex II of Regulation (EC) No.1907/2006. It merely serves the purpose of providing sufficient information on a voluntary basis to ensure safe use of the compound/product. There is no obligation on the part of Formfutura to revise this document. |