Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name
PLA 3D Printer Filament/ MakerBot PLA

Synonyms
Polyactide resin

Chemical Family
polymer, copolymer

Product Use
3D Printing

Restrictions on Use
Do not use in printers where temperatures exceed 250°C.

Details of the supplier of the safety data sheet

MakerBot Industries LLC
One MetroTech Center
Brooklyn, NY 11201
USA
MakerBot Phone #: (347) 334-6800
E-mail: regulatorycompliance@makerbot.com
Emergency Phone #: +978 495 5580
Emergency Poison Control Hot Line : 1 (800) 222-1222

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.
None needed according to classification criteria

GHS Label Elements

Symbol(s)
None needed according to classification criteria

Signal Word
None needed according to classification criteria

Hazard Statement(s)
None needed according to classification criteria.

Precautionary Statement(s)

Prevention
None needed according to classification criteria.

Response
None needed according to classification criteria.

Storage
None needed according to classification criteria.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
9051-89-2	1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3R-cis)-, polymer with (3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione and trans-3,6-dimethyl-1,4-dioxane-2,5-dione	>98

Section 4 - FIRST AID MEASURES

Inhalation
Heating may release vapors which may be irritating. In case of inhalation of decomposition products, affected person should be moved into fresh air and kept still. Get medical advice/attention.

Skin
It is unlikely that first aid will be required. IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention.

Eyes
It is unlikely that first aid will be required. Dust may be irritating to the eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention, if needed.

Ingestion
IF SWALLOWED: Rinse mouth. Get immediate medical advice/attention.

Indication of any immediate medical attention and special treatment needed
First aid is not expected to be necessary if material is used under ordinary conditions and as recommended. Treat symptomatically and supportively.

Most Important Symptoms/Effects

Acute
Molten material may cause thermal burns.

Delayed
No information on significant adverse effects.

Note to Physicians
Treat symptomatically. Give artificial respiration if not breathing.

Antidote
None known. Treat symptomatically and supportively.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media
Water, alcohol resistant foam, regular dry chemical

Unsuitable Extinguishing Media
None known

Special Hazards Arising from the Chemical
Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Hazardous Combustion Products
Oxides of carbon, aldehydes. May decompose upon heating to produce corrosive and/or toxic fumes.

Fire Fighting Measures
Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.

Special Protective Equipment and Precautions for Firefighters
Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
No measures required.

Methods and Materials for Containment and Cleaning Up
Collect spilled material in appropriate container for reuse or disposal. Dispose in accordance with all applicable regulations.

Environmental Precautions
Avoid release to the environment. Comply with all applicable regulations on spill and release reporting. Prevent entry into waterways, sewers, basements, or confined areas.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling
Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations.

Conditions for Safe Storage, Including any Incompatibilities
None needed according to classification criteria.
Store in a cool dry place. Store below 50 C. Avoid heat, flames, sparks and other sources of ignition. Keep away from incompatible materials.

Incompatible Materials

Oxidizing agents, strong bases

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3R-cis)-, polymer with (3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione and trans-3,6-dimethyl-1,4-dioxane-2,5-dione	9051-89-2
ACGIH:	10 mg/m3 TWA inhalable particles, recommended; 3 mg/m3 TWA respirable particles, recommended (related to Particulates not otherwise classified (PNOC))
OSHA (US):	15 mg/m3 TWA total dust; 5 mg/m3 TWA respirable fraction (related to Particulates not otherwise classified (PNOC))
	15 mppcf TWA respirable fraction; 5 mg/m3 TWA respirable fraction; 50 mppcf TWA total dust; 15 mg/m3 TWA total dust (related to Particulates not otherwise classified (PNOC))

EU - Occupational Exposure (98/24/EC) - Binding Biological Limit Values and Health Surveillance Measures
There are no biological limit values for any of this product's components.

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)
There are no biological limit values for any of this product's components.

Engineering Controls
Provide local exhaust ventilation system. Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection
None during normal use. Protect against molten solid.

Skin Protection
None during normal use. Protect against molten solid.

Respiratory Protection
No respirator is required under normal conditions of use. If respirable dusts are generated, respiratory protection may be needed.

Glove Recommendations
Protect against molten solid. In the molten form: Wear protective gloves.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Spool,string,strand	**Physical State**	solid
Odor	odorless,sweet,plastic	**Color**	clear,translucent,opaque
Odor Threshold	varies	**pH**	Not available
Melting Point	150 - 180 °C	**Boiling Point**	Not available
Freezing point	Not available	**Evaporation Rate**	Not available
Boiling Point Range	Not available	**Flammability (solid, gas)**	Not available
Autoignition	388 °C	**Flash Point**	Not available
Lower Explosive Limit	Not applicable	**Decomposition**	>250 °C
Upper Explosive Limit	Not applicable	**Vapor Pressure**	Not available
Vapor Density (air=1)	Not available	**Specific Gravity (water=1)**	Not available
Water Solubility	Insoluble	**Partition coefficient: n-octanol/water**	Not available
Viscosity	Not available	**Solubility (Other)**	Not available
Density	1.25 g/cc	**Molecular Weight**	Not available

Section 10 - STABILITY AND REACTIVITY

Reactivity
The product is chemically stable under recommended conditions of storage, use and temperature.

Chemical Stability
Stable under normal conditions of use.

Possibility of Hazardous Reactions
Will not polymerize.

Conditions to Avoid
Avoid contact with temperatures above 250 C.

Incompatible Materials
Oxidizing agents, strong bases

Hazardous decomposition products
Oxides of carbon, aldehydes

Thermal decomposition products
May decompose upon heating to produce corrosive and/or toxic fumes.

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation
No hazard is expected from the normal use of this product. Dust may cause irritation of the nose, throat and upper respiratory tract.

Skin Contact
Molten material may cause burns.

Eye Contact
Molten material may cause burns.

Ingestion
No information on significant adverse effects.

Acute and Chronic Toxicity

Component Analysis - LD50/LC50
The components of this material have been reviewed in various sources and the following selected endpoints are published:
1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3R-cis)-, polymer with (3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione and trans-3,6-dimethyl-1,4-dioxane-2,5-dione (9051-89-2)
Oral LD50 Rat >5000 mg/kg
Dermal LD50 Rabbit >2000 mg/kg

Immediate Effects
Molten material may cause thermal burns.

Delayed Effects
No information on significant adverse effects.

Irritation/Corrosivity Data
No data available.

Respiratory Sensitization
No data available.

Dermal Sensitization
Found to be non-sensitizing when tested on guinea pigs.

Component Carcinogenicity
None of this product's components are listed by ACGIH, IARC, NTP, DFG or OSHA

Germ Cell Mutagenicity
Negative in the Ames test for mutagenicity.

Tumorigenic Data
No data available

Reproductive Toxicity
No data available.

Specific Target Organ Toxicity - Single Exposure
No target organs identified.

Specific Target Organ Toxicity - Repeated Exposure

No target organs identified.

Aspiration hazard
No data available.

Medical Conditions Aggravated by Exposure
No data available.

Section 12 - ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity

1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3R-cis)-, polymer with (3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione and trans-3,6-dimethyl-1,4-dioxane-2,5-dione	9051-89-2
Algae:	EC50 72 hr Algae >1100 mg/L

Persistence and Degradability
No information available for the product.

Bioaccumulative Potential
No information available for the product.

Mobility
No information available for the product.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods
Dispose of contents/container in accordance with local/regional/national/international regulations. Avoid release to the environment. Incineration should be done in accordance with prevailing municipal, state, and federal laws and standards from local environmental agencies.

Component Waste Numbers
The U.S. EPA has not published waste numbers for this product's components

Section 14 - TRANSPORT INFORMATION

US DOT Information:
UN#: Not regulated

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA Section 311/312 (40 CFR 370 Subparts B and C)

Acute Health: No **Chronic Health:** No **Fire:** No **Pressure:** No **Reactivity:** No

U.S. State Regulations

None of this product's components are listed on the state lists from CA, MA, MN, NJ or PA

Not listed under California Proposition 65

Canadian WHMIS Ingredient Disclosure List (IDL)

The components of this product are either not listed on the IDL or are present below the threshold limit listed on the IDL.

Component Analysis - Inventory

1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3R-cis)-, polymer with (3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione and trans-3,6-dimethyl-1,4-dioxane-2,5-dione (9051-89-2)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX	TW
Yes	DSL	No	Yes	No	Yes	No	No	No	Yes	Yes	No	Yes

Section 16 - OTHER INFORMATION

NFPA Ratings

Health: 0 Fire: 1 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes

New SDS : 08/26/2015

New SDS: 11/2/2016

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH -

Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information

Disclaimer:
Supplier gives no warranty whatsoever, including the warranties of merchantability or of fitness for a particular purpose. Any product purchased is sold on the assumption the purchaser shall determine the quality and suitability of the product. Supplier expressly disclaims any and all liability for incidental, consequential or any other damages arising out of the use or misuse of this product. No information provided shall be deemed to be a recommendation to use any product in conflict with any existing patent rights.

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