Conrad Electronic SE, Klaus-Conrad-Str. 1, D-92240 Hirschau

Item No.: 2369299

Material Safety Data Sheet

TOOLCRAFT

Note:

The following pages consists of 4 independet MSDS which are combined into this single PDF.

Material Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product:	PLA for extrusion-based 3D printing
Manufacturer:	Conrad Electronic SE
Address:	Klaus-Conrad-Str. 1, D-92240 Hirschau
Telephone:	+49 (0) 9604 / 40 - 8988
Date:	18.06.2019

2. Hazards Identification

2.1 Classification of the substance of mixture

2.1.1 Classification:

This product does not meet the criteria for classification in any hazard class according to Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures.

Regulation (EC) No 1272/2008:

Hazard classes/Hazard categories	Hazard codes
N/A	N/A

2.2 label elements

Hazard Pictograms: No hazard pictogram is used.

Signal Word(S): No signal word is used.

Hazard Statement: Not applicable.

Precautionary statement: Not applicable.

2.3 Other hazards

Not available.

3. Composition/information on ingredients

Substance/Mixture:

Mixture

Ingredient(s):

This product does not contain hazardous ingredients above cut-off value according to Regulation (EC) 1272/2008.

4. First aid measures

4.1 Description of first aid measures

In all cases of doubt, or when symptoms persist, seek medical attention.

4.1.1 In case of inhalation

Remove to fresh air. Get medical attention for any breathing difficulty.

4.1.2 In case of skin contact

Wash off with soap and plenty of water.

4.1.3 In case of eyes contact

Immediately flush eyes with plenty of water, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

4.1.4 In case of ingestion

If large amounts were swallowed, get medical advice.

4.2 Most important symptoms and effects, both acute and delayed

The product is not classified as harmful to human health effect.

4.3 Indication of any immediate medical attention and special treatment needed

Symptomatic treatment.

5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media:

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media:

Not available.

5.2 Special hazards arising from the substance or mixture

No specific fire or explosion hazard.

5.3 Advice for firefighters

Wear self-contained breathing apparatus for fire fighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel:

Avoid dust formation.

6.1.2 For emergency responders:

Wear an appropriate NIOSH/MSHA approved respirator if dust isgenerated.

6.2 Environmental Precautions

Do not let large amount of product enter drains.

6.3 Methods and material for Containment and Cleaning up

Sweep up and shovel. Keep in suitable, closed and properly labelled containers for disposal.

6.4 Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for information on disposal.

7. Handling and storage

7.1 Precautions for safe handling

7.1.1 Protective measures:

Provide appropriate exhaust ventilation at places where dust is formed.

7.1.2 Advice on general occupational hygiene:

Do not eat, drink and smoke in work areas. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities

Keep container closed in a cool, dry place.

7.3 Specific end use(s)

Not available.

8. Exposure Controls/Personal Protection

8.1 Control parameters

8.1.1 Occupational exposure limits:

Not available.

8.1.2 Additional exposure limits under the conditions of use:

Not available.

8.1.3 DNEL/DMEL and PNEC-Values:

Not available.

8.2 Exposure controls

8.2.1 Appropriate engineering controls:

Use adequate ventilation to keep airborne concentrations low.

8.2.2 Individual protection measures, such as personal protective equipment:

Eye/face protection: Safety goggles.

Hand protection: Wear protective gloves.

Body protection: Wear protective clothing.

Respiratory protection: Use with adequate ventilation. In case of insufficient local exhaust ventilation, wear protective mask.

Thermal hazards: Wear suitable protective clothing to prevent heat.

8.2.3 Environmental exposure controls:

Avoid discharge into the environment. Dispose of rinse water in accordance with local and national regulations

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties:

Appearance:	Solid
Colour:	Milky white translucent
Odour:	Not available
Odour threshold:	Not available
pH:	Not available
Melting point/range (°C):	Not available
Boiling point/range (°C):	Not available
Flash point (°C):	Not available
Evaporation rate:	Not available
Flammability limit - lower (%):	Not available
Flammability (solid, gas):	Not available
Ignition temperature (°C):	Not available
Upper/lower explosive limits:	Not available
Vapour pressure (20°C):	Not available
Vapour density:	Not available
Relative Density:	1.23
Bulk density (kg/m3):	Not available
Water solubility (g/l):	Insoluble
n-Octanol/Water (log Po/w):	Not available
Auto-ignition temperature:	Not available
Decomposition temperature:	Not available
Viscosity, dynamic (mPa.s):	Not available
Explosive properties:	Not available
Oxidising properties:	Not available

9.2. Other information:

Fat solubility(solvent– oil to be specified) etc:	Not available
Surface tension:	Not available
Dissociation constant in water(pKa):	Not available
Oxidation-reduction Potential:	Not available

10. Stability and reactivity

10.1 Reactivity

The substance is stable under normal storage and handling conditions.

10.2 Chemical stability

Stable at room temperature in closed containers under normal storage and handling conditions.

10.3 Possibility of hazardous reactions

No dangerous reactions known.

10.4 Conditions to avoid

Incompatible materials.

10.5 Incompatible materials

Strong oxidizing agents.

10.6 Hazardous decomposition products

Carbon oxides.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity:

ATEmix(oral):	Not available
ATEmix(Dermal):	Not available
ATEmix(inhalation):	Not available
LD50(Oral, Rat):	Not available
LD50(Dermal, Rabbit):	Not available
LC50(Inhalation, Rat):	Not available
Skin corrosion/Irritation:	Not classified
Serious eye damage/irritation:	Not classified
Respiratory or skin sensitization:	Not classified
Germ cell mutagenicity:	Not classified
Carcinogenicity:	Not classified
Reproductive toxicity:	Not classified
STOT- single exposure:	Not classified
STOT-repeated exposure:	Not classified
Aspiration hazard:	Not classified

12. Ecological information

12.1 Toxicity

Acute (short-term) toxicity:

LC50(96h, Fish): Not available

LC50(48h, Crustacea): Not available

EC50(72h, Algae/aquatic plants): Not available

Chronic (long-term) toxicity:

NOEC(Fish): Not available

NOEC(Crustacea): Not available

EC50(Algae/aquatic plants): Not available

12.2 Persistence and degradability

Not available.

12.3 Bioaccumulative potential

Not available.

12.4 Mobility in soil

Not available.

12.5 Results of PBT and vPvB assessment

Not available.

12.6 Other adverse effects

Not available.

13. Disposal considerations

13.1 Waste treatment methods

The material should be disposed of by incineration in a chemical incinerator in compliance with national and regional requirements.

14. Transport information

	Land transport (ADR/RID)	Inland waterways (ADN)	Sea transport (IMDG)	Air transport (ICAO/IATA)
UN number	Not regulated	Not regulated	Not regulated	Not regulated
UN Proper shipping name	Not regulated	Not regulated	Not regulated	Not regulated
Transport hazard Class(es)	Not regulated	Not regulated	Not regulated	Not regulated
Packing group	Not regulated	Not regulated	Not regulated	Not regulated
Environmental hazards	No	No	No	No
Special precautions for user	See section 2.2	See section 2.2	See section 2.2	See section 2.2
Transport in bulk according to Annex II of Marpol and the IBC Code	Not regulated	Not regulated	Not regulated	Not regulated

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Relevant information regarding authorization:

Not applicable.

Relevant information regarding restriction:

Not applicable.

Other EU regulations:

Employment restrictions concerning young person must be observed.

For use only by technically qualified individuals.

Other National regulations:

Not applicable

15.2 Chemical safety assessment

No.

16. Other information

16.1 Indication of changes

Version 1.0 Amended by (EU) 2015/830

16.2 Abbreviations and acronyms

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation for rail International transportation of Dangerous goods

ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways

IMDG: Code international maritime dangerous goods code

ICAO-TI: International Civil Aviation Organization The International Civil Aviation Covenant

IATA: International Air Transport Association

LC50: median lethal concentration

EC50: The effective concentration of substance that causes 50% of the maximum response.

NOEC: No Observed Effect Concentration

DNEL: derived no-effect level

PNEC: predicted no-effect concentration

16.3 Key literature references and sources for data

ECHA Registered substances data

16.4 Training instructions

Not applicable.

16.5 Further information

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

16.6 Notice to reader

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgment of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Material Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product:	PLA with carbon fiber for extrusion-based 3D printing
Manufacturer:	Conrad Electronic SE
Address:	Klaus-Conrad-Str. 1, D-92240 Hirschau
Telephone:	+49 (0) 9604 / 40 - 8988
Date:	29.01.2021

2. Hazards Identification

GHS classification

Physical hazards	Not classified
Health hazards	Not classified
Environmental hazards	Not classified

GHS label elements

Hazard Pictograms	No hazard pictogram is used.
Signal word	No signal word is used.
Hazard statement	Not applicable.

Precautionary statement

Prevention	Not applicable.
Response	Not applicable.
Storage	Not applicable.
Disposal	Not applicable.
Other hazards	Not available.

3. Composition / Information on Ingredients

Components	CAS#	Percent
Chopped Carbon Fiber	7440-44-0	5-20%

4. First Aid Measures

First aid procedures:

Eye contact

None expected to require first aid measures. Flush with running water for at least 15 minutes. If irritation persists get medical attention.

Skin contact

None expected to require first aid measures. Wash thoroughly with soap and water. Get medical attention in the unlikely event that irritation persists.

Inhalation

None expected to require first aid measures. If breathed in, remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical attention.

Ingestion

Immediate first aid is not likely to be required. A physician or poison control center can be contacted for advice.

Notes to physician

Treat symptoms.

5. Fire Fighting Measure

Flammable properties

Not available.

Extinguishing media

Suitable extinguishing media Use extinguishers suitable for surrounding fire.

Unsuitable extinguishing media

Not available.

Firefighting equipment/instructions

Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products

Carbon oxides.

6. Accidental Release Measures

Personal precautions

Use personal protective equipment. Ensure adequate ventilation. Evacuate personnel to safe areas.

Environmental precautions

Avoid disposing into drainage/sewer system or directly into the aquatic environment.

Methods for cleaning up

Sweep up and shovel into suitable containers. Clean up affected area.

7. Handling and Storage

Handling

Ensure good ventilation/exhaustion at the workplace. Wash thoroughly after handling.

Storage

Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

8. Exposure Controls / Personal Protection

Occupational exposure limits

US. OSHA Table Z-3 (29 CFR 1910.1000)

Component	Type	Value	Form
Chopped Carbon Fiber (CAS 7440-44-0)	TWA	5 mg/m3 15 mg/m3	Respirable fraction. Total dust.

US. NIOSH: Pocket Guide to Chemical Hazards

Component	Type	Value	Form
Chopped Carbon Fiber (CAS 7440-44-0)	TWA	2.5 mg/m3Respirable.	Respirable.

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls:

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Individual protection measures, such as personal protective equipment:

Eye / face protection No special protection required.

Skin protection No special protection required.

Respiratory protection No special protection required.

General hygiene considerations

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

9. Physical & Chemical Properties

Appearance

Physical state	Solid
Form	Solid
Color	Black
Odor	Odorless
Odor threshold	Not available
pH	Not available
Vapor pressure	Not available
Vapor density	Not available
Boiling point	Not available
Melting point/Freezing point	165 °C
Solubility (water)	Insoluble
Relative Density	1.27
Flash point	Not available
Partition coefficient	Not available
Flammability limits in air, upper, %by volume	Not available
Flammability limits in air, lower, % by volume	Not available
Auto-ignition temperature	Not available
VOC	Not available
Percent volatile	Not available
Molecular Formula	Not available
Molecular Weight	Not available

Other data

Viscosity	Not available
Dissociation constant	Not available

10. Chemical Stability & Reactivity Information

Reactivity

The substance is stable under normal storage and handling conditions.

Chemical stability

Material is stable under normal conditions.

Conditions to avoid

Incompatible materials.

Incompatible materials

Strong oxidizing agents.

Hazardous decomposition products

Carbon oxides.

Possibility of hazardous reactions

No hazardous reactions known.

11. Toxicological Information

Toxicokinetics, metabolism and distribution:

Non-human toxicological data:

Not available

Information on toxicological effects:

Acute toxicity:

LD50(Oral, Rat):	Not available
LD50(Dermal, Rabbit):	Not available
LC50(Inhalation, Rat):	Not available
Skin corrosion/Irritation:	Not classified
Serious eye damage/irritation:	Not classified
Respiratory or skin sensitization:	Not classified
Germ cell mutagenicity:	Not classified
Carcinogenicity:	Not classified
Reproductive toxicity:	Not classified
STOT- single exposure:	Not classified
STOT-repeated exposure:	Not classified
Aspiration hazard:	Not classified

12. Ecological Information

Toxicity:

Acute toxicity		Time	Species	Method	Evaluation	Remarks
LC50	N/A	96h	Fish	OECD 203	N/A	N/A
EC50	N/A	48h	Daphnia	OECD 202	N/A	N/A
EC50	N/A	72h	Algae	OECD 201	N/A	N/A

Persistence and degradability:

Not available.

Bioaccumulative potential:

Not available.

Mobility in soil:

Not available.

Results of PBT&vPvB assessment:

Not available.

Other adverse effects:

Not available.

13. Disposal Considerations

Disposal instructions

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

Contaminated packaging

Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport Information

DOT

Basic shipping requirements:

UN number	Not regulated
Proper shipping name	Not regulated
Hazard class	Not regulated
Packing group	Not regulated
Environmental hazards	No

IATA

UN number	Not regulated
UN proper shipping name	Not regulated
Transport hazard class(es)	Not regulated
Packing group	Not regulated
Environmental hazards	No

IMDG

UN number	Not regulated
UN proper shipping name	Not regulated
Transport hazard class(es)	Not regulated
Packing group	Not regulated
Environmental hazards	No

15. Regulatory Information

US federal regulations:

Toxic Substances Control Act (TSCA)

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical

Yes

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)

Not regulated.

16. Other Information

HMIS®ratings

Health: 0

Flammability: 1

Physical hazard: 0

NFPA ratings

Health: 0

Flammability: 1

Instability: 0

Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available.

Material Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product:	PLA for extrusion-based 3D printing
Manufacturer:	Conrad Electronic SE
Address:	Klaus-Conrad-Str. 1, D-92240 Hirschau
Telephone:	+49 (0) 9604 / 40 - 8988
Date:	07.02.2017

Identified Uses:

For fused deposition modeling (FDM) or fused filament fabrication (FFF) based additive manufacturing and 3D printing processes

2. Hazards Identification

Emergency Overview

Not likely to be an irritant in the solid form. Burning produces obnoxious and toxic fumes. Avoid prolonged contact with skin and contact with eyes. Not likely to form a dust in the solid filament form.

Potential Acute Health Effects

Inhalation:

Not likely to form an inhalable dust in the solid filament form and for the intended use. Aerosols generated during printing may cause shortness of breath, tightness of the chest, a sore throat and cough.

Eye:

Direct contact with eyes may cause irritation.

Skin:

May cause slight skin irritation.

Ingestion:

Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Potential Chronic Health Effects

Carcinogenic Effects: No known carcinogenic effects

Mutagenic Effects: No known mutagenic effects

Teratogenic Effects: No known teratogenic effects

Developmental Toxicity: No known developmental toxicity

3 . Composition/information on ingredients

Chemical Name	CAS No.	Weight %	Exposure Limits
Poly(lactic acid) resin	9051-89-2	80-100%	None
Acrylic polymer(s)	-	0-20%	None

4 . First aid measures

Inhalation:

Move to fresh air and keep at rest in a position comfortable for breathing. Call a physician immediately if irritation persists.

Skin contact:

Rinse immediately with plenty of water. If skin irritation persists, call a physician. Cool skin rapidly with cold water after contact with hot polymer.

Eye contact:

Rinse immediately with plenty of water. Call a physician immediately.

Ingestion:

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

Notes for the doctor:

Treat symptomatically.

5 . Fire-fighting measures

General Information:

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

Suitable Extinguishing Agents:

Foam. Water. Carbon dioxide (CO_2). Dry chemical. Alcohol resistant foams are preferred if available. General-purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively.

Products of Combustion:

Burning produces obnoxious and toxic fumes, aldehydes, carbon monoxide (CO), and carbon dioxide (CO_2).

Special Fire Fighting Procedures:

Firefighters should wear self-contained breathing apparatus and full fire-fighting turn-out gear (bunker gear). Keep personnel removed and upwind of fire. Water should be used to keep fire-exposed containers cool.

Special Remarks on Fire and Explosion Hazards:

Toxic gases/vapors/fumes may emit in a fire.

6 . Accidental release measures

General:

Wear gloves when handling hot melt of the material.

Environmental precautions:

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

Methods and material for containment and cleaning up:

Shovel into suitable container for disposal.

7 . Handling and storage

Precautions:

No special precautions required.

Handling:

Wear gloves when handling molten material. Low hazard for usual industrial or commercial handling.

Storage:

Store in cool place. Keep at temperatures below 122°F (50°C). No special restrictions on storage with other products.

8 . Exposure controls/personal protection

Ventilation protection:

Provide good ventilation during 3D printing processes.

Skin protection:

Avoid direct contact to the hot melt of material or wear gloves.

Eye and face protection:

Safety glasses if necessary.

General:

Wear protective clothing to prevent contact with hot melt materials.

9 . Physical and chemical properties

Appearance:	Filament, Solid
Color:	Various
Odour:	Odorless
pH:	Not applicable
Melting point:	> 140 °C
Boiling point:	Not applicable
Density:	1.22 g/cm3
Vapor pressure:	Not applicable
Partition coefficient (n -octanol/water):	Not applicable
Solubility(ies):	Not determined
Flash point:	Not determined
Auto-ignition temperature:	> 350 °C

10 . Stability and reactivity

Stability:

Stable under recommended storage conditions

Polymerization:

Not applicable

Dangerous Decomposition Products:

Burning produces obnoxious and toxic fumes. Aldehydes. Carbon monoxide (CO). carbon dioxide (CO2).

Conditions to avoid:

Temperatures above 446F (230 ° C).

Materials to avoid:

Oxidizing agents. Strong bases.

11 . Toxicological information

Routes of entry:

N.A.

Acute toxicity:

Not likely to cause targeted organ effects or skin allergic reactions.

12 . Ecological information

Mobility:

No data available

Bioaccumulation:

The main resin is biodegradable.

Ecotoxicity effects:

Data not available.

13 . Disposal considerations

Waste Disposal Methods:

In accordance with local and national regulations. Do not contaminate ponds, waterways or ditches with chemical or used container. Contact manufacturer if needed.

14 . Transport information

No a DOT controlled material (United States)

Proper Shipping Name:	Not regulated
Hazzard Class:	Not regulated
UN. NO.:	Not regulated
Packing Group:	Not regulated
IMDG EMS:	Not regulated

15 . Regulatory information

European/International Regulations

This product is on the European Inventory of Existing Commercial Chemical Substances.

European Labeling in Accordance with EC Directives

Hazard Symbols: N/A

Risk phrases: N/A

Safety phrases: N/A

HMIS (U.S.A.):

Health Hazard: 0

Fire Hazard: 1

Reactivity: 0

Personal Protection:

National Fire Protection Association(U.S.A.):

Health: 0

Flammability: 1

Reactivity: 0

Specific Hazard:

Federal and State Regulations: TSCA 8(b) inventory: Listed

Canada---WHMIS: Not controlled

For details regulations you should contact the appropriate agency in your country.

16 . Other information

Declare to reader

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. This shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Material Safety Data Sheet

TOOLCRAFT

1. Identification of the substance/mixture and of the company/undertaking

Product:	Polyamid for extrusion-based 3D printing
Manufacturer:	Conrad Electronic SE
Address:	Klaus-Conrad-Str. 1, D-92240 Hirschau
Telephone:	+49 (0) 9604 / 40 - 8988
Date:	31.03.2017

2. Hazards Identification

2.1 Classification of the substance of mixture

2.1.1 Classification according to Directive 67/548/EEC or 1999/45/EC as amended

This substance does not meet the criteria for classification according to Directive 67/548/EEC as amended.

2.1.2 Classification according to Regulation (EC) No 1272/2008 as amended

This substance does not meet the criteria for classification according to Regulation (EC) 1272/2008 as amended.

2.2 Label elements

Not applicable.

2.3 Other hazards

Not likely to be an irritant in the solid form. Danger of burns when heated/molten material is handled.

3. Composition/information on ingredients

3.1 Substances

Chemical Name	CAS No.	Weight %	Exposure Limits
Polyamide copolymer	32131-17-2	> 60%	None

4. First aid measures

4.1 Description of first aid measures

4.1.1 Inhalation:

Move to fresh air. Call a physician immediately if irritation persists.

4.1.2 Skin contact:

Rinse immediately with plenty of water. If skin irritation persists, call a physician. Cool skin rapidly with cold water after contact with hot polymer.

4.1.3 Eye contact:

Rinse immediately with plenty of water. Call a physician immediately.

4.1.4 Ingestion:

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

4.2 Most important symptoms and effects, both acute and delayed

Burns resulted from contacting or handling heated/molten materials

4.3 Indication of any immediate medical attention and special treatment needed

Provide general supportive measures and treat symptomatically.

5. Fire-fighting measures

5.1 Suitable extinguishing media

Use fire-extinguishing media appropriate for surrounding materials. Do not use a solid water stream as it may scatter and spread fire.

5.2 Special hazards arising from the substance or mixture

During fire, gases hazardous to health may be formed.

5.3 Advice for fire fighters

Follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Wear gloves when handling hot melt of material.

6.2 Environmental precautions

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

6.3 Methods and materials for containment and cleaning up

Shovel into suitable container for disposal.

7. Handling and storage

7.1 Precautions for safe handling

Avoid prolonged contact with skin and eyes. Avoid dust formation. Workers should be protected from the possibility of contact with molten material. Low hazard for usual industrial or commercial handling.

7.2 Conditions for safe storage

Store in ambient temperatures. Avoid exposure to high moisture levels. No special restrictions on storage with other products.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

UK. EH40 Workplace Exposure Limits (WELs)

Components	Type	Value	Form
Dust (CAS -)	TWA	4 mg/m3	Respirable dust
	TWA	10 mg/m3	Inhalable dust

Biological limit values:

No biological exposure limits noted for the ingredient(s)

Recommended monitoring procedures:

Not available

Derived no-effect level (DNEL):

Not available

Predicted no effect concentrations (PNECs):

Not available

8.2 Engineering controls

Provide appropriate exhaust ventilation at places where dust is formed or the material is molten, such as during printing.

8.3 Personal protective equipment

Wear gloves when handling hot/molten material.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Filament, Solid
Color:	Depending on version
Odor:	Odorless
Odor threshold:	Not available
pH:	Not applicable
Melting point/freezing point:	135 – 210 °C
Boiling point:	Not applicable
Flash point:	Not applicable
Evaporation rate:	Not applicable
Flammability:	Not available
Upper/lower flammability or explosive limits:	Not available
Vapor pressure:	Not applicable
Vapor density:	Not applicable
Relative density:	1.1 (20 °C) Approximate
Solubility:	Soluble in alcohols
Partition coefficient (n-octanol/water):	No data available
Auto-ignition temperature:	> 380 °C
Decomposition temperature:	Onset of decomposition > 370 °C
Viscosity:	Not applicable

10. Stability and reactivity

10.1 Reactivity

Stable at normal conditions.

10.2 Chemical stability

Material is stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous polymerization does not occur.

10.4 Conditions to avoid

Avoid extreme heat. Avoid all sources of ignition: heat, sparks, open flames, etc.

10.5 Incompatible materials

Strong oxidizing agents. Strong acids.

10.6 Hazardous decomposition products

Carbon oxides

11. Toxicological information

11.1 Likely routes of exposure

Inhalation:

Dust irritates the respiratory system, and may cause coughing and difficulties in breathing.

Skin contact:

Dust may irritate skin.

Eye contact:

Dust may irritate the eyes.

Ingestion:

May cause discomfort if swallowed.

11.2 Symptoms

Dust may irritate throat and respiratory system and cause coughing. Direct contact with eyes may cause temporary irritation.

11.3 Information on toxicological effects

Acute toxicity: Dusts may irritate the respiratory tract, skin and eyes.

Skin corrosion/irritation: Dust may irritate skin.

Serious eye damage/eye irritation: Dust may irritate the eyes. Exposed may experience eye tearing, redness, and discomfort.

Respiratory sensitization: Not classified.

Skin sensitization: Not a skin sensitiser.

Germ cell mutagenicity: Not expected to be mutagenic.

Carcinogenicity: Not classified.

Reproductive toxicity: Not classified.

Specific target organ toxicity - single exposure: No data available

Specific target organ toxicity - repeated exposure: No data available

Aspiration hazard: Due to the physical form of the product it is not an aspiration hazard.

Mixture versus substance information: Not applicable.

Other information: Pre-existing skin and respiratory conditions including dermatitis, asthma and chronic lung disease might be aggravated by exposure.

12. Ecological information

12.1 Toxicity

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

12.2 Persistence and degradability

No data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

Not available

12.5 Other adverse effects

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

13. Disposal considerations

13.1 Waste treatment methods

In accordance with local and national regulations. Do not contaminate ponds, waterways or ditches with chemical or used container. Contact manufacturer if needed.

14. Transport information

ADR

Not regulated as dangerous goods.

RID

Not regulated as dangerous goods.

ADN

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

This substance/mixture is not intended to be transported in bulk.

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I

Not listed.

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex II

Not listed.

Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3 as amended

Not listed.

Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorisation, as amended

Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended

Not listed.

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work

Not listed.

Directive 92/85/EEC: on the safety and health of pregnant workers and workers who have recently given birth or are breastfeeding

Not listed.

Other EU regulations

Directive 96/82/EC (Seveso II) on the control of major-accident hazards involving dangerous substances

Not listed.

Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Not listed.

Directive 94/33/EC on the protection of young people at work

Not listed.

Other regulations

This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006.

National regulations:

Not available.

15.2 Chemical safety assessment

No Chemical Safety Assessment has been carried out.

16. Other information

Declare to reader

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. This shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Not likely to be an irritant in the solid form. Burning produces obnoxious and toxic fumes. Avoid prolonged contact with skin and contact with eyes. Not likely to form a dust in the solid filament form.

Potential Acute Health Effects

Inhalation:

Not likely to form an inhalable dust in the solid filament form and for the intended use. Aerosols generated during printing may cause shortness of breath, tightness of the chest, a sore throat and cough.

Eye:

Direct contact with eyes may cause irritation.

Skin:

May cause slight skin irritation.

Ingestion:

Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Potential Chronic Health Effects

Carcinogenic Effects: No known carcinogenic effects

Mutagenic Effects: No known mutagenic effects

Teratogenic Effects: No known teratogenic effects

Developmental Toxicity: No known developmental toxicity

3 . Composition/information on ingredients

Chemical Name	CAS No.	Weight %	Exposure Limits
Poly(lactic acid) resin	9051-89-2	80-100%	None
Acrylic polymer(s)	-	0-20%	None

4 . First aid measures

Inhalation:

Move to fresh air and keep at rest in a position comfortable for breathing. Call a physician immediately if irritation persists.

Skin contact:

Rinse immediately with plenty of water. If skin irritation persists, call a physician. Cool skin rapidly with cold water after contact with hot polymer.

Eye contact:

Rinse immediately with plenty of water. Call a physician immediately.

Ingestion:

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

Notes for the doctor:

Treat symptomatically.

5 . Fire-fighting measures

General Information:

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

Suitable Extinguishing Agents:

Foam. Water. Carbon dioxide (CO_2). Dry chemical. Alcohol resistant foams are preferred if available. General-purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively.

Products of Combustion:

Burning produces obnoxious and toxic fumes, aldehydes, carbon monoxide (CO), and carbon dioxide (CO_2).

Special Fire Fighting Procedures:

Firefighters should wear self-contained breathing apparatus and full fire-fighting turn-out gear (bunker gear). Keep personnel removed and upwind of fire. Water should be used to keep fire-exposed containers cool.

Special Remarks on Fire and Explosion Hazards:

Toxic gases/vapors/fumes may emit in a fire.

6 . Accidental release measures

General:

Wear gloves when handling hot melt of the material.

Environmental precautions:

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

Methods and material for containment and cleaning up:

Shovel into suitable container for disposal.

7 . Handling and storage

Precautions:

No special precautions required.

Handling:

Wear gloves when handling molten material. Low hazard for usual industrial or commercial handling.

Storage:

Store in cool place. Keep at temperatures below 122°F (50°C). No special restrictions on storage with other products.

8 . Exposure controls/personal protection

Ventilation protection:

Provide good ventilation during 3D printing processes.

Skin protection:

Avoid direct contact to the hot melt of material or wear gloves.

Eye and face protection:

Safety glasses if necessary.

General:

Wear protective clothing to prevent contact with hot melt materials.

9 . Physical and chemical properties

Appearance:	Filament, Solid
Color:	Various
Odour:	Odorless
pH:	Not applicable
Melting point:	> 140 °C
Boiling point:	Not applicable
Density:	1.22 g/cm3
Vapor pressure:	Not applicable
Partition coefficient (n -octanol/water):	Not applicable
Solubility(ies):	Not determined
Flash point:	Not determined
Auto-ignition temperature:	> 350 °C

10 . Stability and reactivity

Stability:

Stable under recommended storage conditions

Polymerization:

Not applicable

Dangerous Decomposition Products:

Burning produces obnoxious and toxic fumes. Aldehydes. Carbon monoxide (CO). carbon dioxide (CO2).

Conditions to avoid:

Temperatures above 446F (230 ° C).

Materials to avoid:

Oxidizing agents. Strong bases.

11 . Toxicological information

Routes of entry:

N.A.

Acute toxicity:

Not likely to cause targeted organ effects or skin allergic reactions.

12 . Ecological information

Mobility:

No data available

Bioaccumulation:

The main resin is biodegradable.

Ecotoxicity effects:

Data not available.

13 . Disposal considerations

Waste Disposal Methods:

In accordance with local and national regulations. Do not contaminate ponds, waterways or ditches with chemical or used container. Contact manufacturer if needed.

14 . Transport information

No a DOT controlled material (United States)

Proper Shipping Name:	Not regulated
Hazzard Class:	Not regulated
UN. NO.:	Not regulated
Packing Group:	Not regulated
IMDG EMS:	Not regulated

15 . Regulatory information

European/International Regulations

This product is on the European Inventory of Existing Commercial Chemical Substances.

European Labeling in Accordance with EC Directives

Hazard Symbols: N/A

Risk phrases: N/A

Safety phrases: N/A

HMIS (U.S.A.):

Health Hazard: 0

Fire Hazard: 1

Reactivity: 0

Personal Protection:

National Fire Protection Association(U.S.A.):

Health: 0

Flammability: 1

Reactivity: 0

Specific Hazard:

Federal and State Regulations: TSCA 8(b) inventory: Listed

Canada---WHMIS: Not controlled

For details regulations you should contact the appropriate agency in your country.

16 . Other information

Declare to reader

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