bigrep

THE **LARGE-SCALE** FFF 3D-PRINTER
FOR **PROFESSIONAL** AND **INDUSTRIAL** USE.

MATERIAL SAFETY DATA SHEET

BigRep PET-CF

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

1.1 Trade name:	**BigRep Filament PET-CF**
1.2 Chemical name:	**Polyethylene Terephthalate with carbon fiber**
1.3 Typical use of the material:	**Monofilament for FFF/FDM technology based 3D printing**
1.4 Identification of the company:	**BigRep GmbH** **Gneisenaustraße 66** **10961 Berlin – Germany** **Phone : +49 30 20 84 82 60** **Email : office@bigrep.com**

2. Hazards identification

2.1 Classification of the substance or mixture:	**Classification (Regulation (EC) 1272/2008**
Eye irritation, Category 2:	**H319: Causes serious eye irritation**
Respiratory sensitization, Category 1:	**H334: May cause allergy or asthma symptoms or breathing difficulties it inhaled.**
Skin sensitization, Category 1:	**H317: May cause an allergic skin reaction**
2.2 Labelling EC No. 1272/2008:	**The dangerous properties of this product are distinctly reduced as dangerous components are embedded into a polymeric matrix and cannot be released if used properly. Consequently labelling of this substance is not necessary (according to CLP regulation 1272/2008/EC, Annex I, Part 1.3.4.).**
Hazard statements :	**H317: May cause an allergic skin reaction.** **H319: Causes serious eye irritation.** **H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.**
Precautionary statements:	
Prevention :	**P261: Avoid breathing dust/fume/gas/mist/vapors/spray.** **P280: Wear protective gloves/eye protection/face protection.** **P284: Wear respiratory protection.**
Response:	**P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.** **P333+P313 If skin irritation or rash occurs: Get medical advice/attention.** **P342+P311 If experiencing respiratory symptoms: Call a Poison Center/doctor.**

Hazardous components which must be listed on the label :	**Benzene-1,2:4,5-tetracarboxylic dianhydride**
2.3 Other Hazards:	**This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher. The hazards of this product are significantly reduced since the hazardous material/s is/are enclosed in a polymer matrix and when used as directed will not be released.**

3. Composition / information on ingredients

3.1 Chemical nature:	**Polymer blend based on Polyethylene Terephthalate**
Hazardous ingredients (GHS)	**According to Regulation (EC) No. 1272/2008**
	Benzene-1,2:4,5-tetracarboxylic dianhydride
Content (W/W):	**>= 1% - < 3%**
CAS Number:	**89-32-7**
EC-Number:	**201-898-9**
Classification:	**Eye Damage 1, H318** **Respiratory Sensitivity 1, H334** **Skin Sensitivity 1, H317**

4. First-aid measures

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. Get medical attention.**
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. Do NOT use solvents or thinners. Get medical attention.**
4.3 On contact with eyes:	**In case of contact with molten material, immediately cool with plenty of cold running water. Keep eye open while rinsing. Get medical attention.**
4.4 On ingestion:	**Rinse mouth with water and then drink plenty of water. Seek medical attention.**
4.5. Important symptoms and effects	**Burns resulted from contacting or handling heated or molten materials. Most important known symptoms and effects are described in section 2.**
4.6. Additional information	**Provide general supportive measures and treat symptomatically. Remove contaminated clothing.**

5. Firefighting 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. Use dry powder, foam or carbon dioxide.**

5.2 Specific hazards:	**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. Do not use solid water stream as it may scatter and spread fire. Harmful vapors and fumes dangerous to health may be formed in case of fire.**
5.3 Hazardous combustion products:	**Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke). Sulphur compounds. Aldehydes. Acids.**
5.4 Further information:	**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:	**Ensure adequate ventilation. Use personal protective equipment. Avoid dust formation. Avoid breathing dust and avoid inhaling vapor or mist. Wear gloves when handling hot melt of material. Avoid eye and skin contact. All ignition sources shall be removed.**
6.2 Environmental precautions:	**Should not be released into the environment. Do not allow material to contaminate soil, surface of ground water system. Avoid dispersal or dust in air.**
6.3 Methods for cleaning up:	**Sweep/shovel into suitable container for disposal. Avoid raising dust and ensure adequate ventilation.**

7. Handling and storage

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 Avoid dust formation and electrostatic charge. Minimize dust generation and accumulation. Dust must be collected and disposed of carefully. Do not breathe vapors or dust. Keep away from fire ignition sources. Protect against moisture. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Wash hand before breaks and immediately after handling the product. Regular cleaning of equipment, work area and clothing. Keep away from food and drinks. General industrial hygiene practice. When using do not eat, drink or smoke.**
7.2 Storage:	**Protect from water, moisture and direct sunlight. Store material in dry rooms and keep material in sealed packaging/container with desiccant when not in use. Store**

at room temperatures. Avoid all sources of ignition. Keep away from food, drinks and animal feedingstuffs.

7.3 Specific end use(s): Primarily used for 3D printing.

8. Exposure controls / personal protection

8.1 Control parameters

Occupational exposure limits
Carbon black
CAS-No. 1333-86-4
Value type TWA: 3.5 mg/m3 (GB EH40)
STEL: 7 mg/m3 (GB EH40)
Derived No Effect Level acc to EC No. 1907/2006
Carbon black
End use: Workers
Exposure routes: Inhalation
Value: 2mg/m3
Remarks: DNEL (long-term rep)

8.2 Exposure controls: Provide sufficient air exchange and/or exhaust in work rooms. Handle product only in closed system or provide appropriate exhaust ventilation at machinery. Apply measures to prevent dust explosions.

8.3 Personal protective equipment

8.3.1 Hand protection: Wear heat protection and chemical resistant gloves (e.g. EN 374).

8.3.2 Eye protection: Wear protective glasses, preferable with side-shields (e.g. EN166).

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 vapors. Wear effective dust mask. In case of vapor formation use a respirator with an approved filter. 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

9.1 Form: Filament, Solid

9.2 Colour: black

9.3 Odour: characteristic

9.4 Melting point/range: > 250 °C

9.5 Auto-ignition temperature: > 440 °C

9.6 Explosions limit:	**Not specified, for solids not relevant for classification**
9.7 Relative density:	**1.23 g/cm3**
9.8 Solubility:	**Not soluble in water. Other solvents not determined**

10. Stability and reactivity

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.**
10.3 Substances to avoid:	**No data available.**
10.4 Hazardous reactions:	**The product is chemically stable.**
10.4.1 Hazardous decomposition products:	**Carbon monoxides, carbon dioxides, smoke. Sulphur compounds. Aldehydes. Organic acids.**

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: No applicable information available. Skin sensitization: May cause skin irritation. Germ cell mutagenicity: No applicable information available. Carcinogenicity: No applicable information available. Reproductive toxicity: No data available. 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. There is a high probability that the product is not acutely harmful to aquatic organisms.**
12.2 Persistence and degradability:	**Assessment biodegradation and elimination (H2O): Product is not expected to be readily biodegradable.**
12.3 Bioaccumulative potential:	**No data available.**
12.4 Mobility in soil:	**No data available.**
12.5 Results of PBT and vPvB:	**The product does not contain a substance fulfilling the PBT (persistent/bioaccumulative/toxic) criteria or the vPvB (very persistent/very bioaccumulative) criteria.**

13. Disposal considerations

13.1 Product:	**Generation of waste should be minimized, check possibility for recycling. Observe national and local legal 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.** ***WARNING - Plastic bags and desiccant bag can be dangerous. To avoid danger of suffocation, keep these bags away from babies, children and animals.***

14. Transport information

14. Transport hazard class	**ADR: Not regulated as dangerous goods.** **RID: Not regulated as dangerous goods.** **AND: 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 EU / National regulations:	**Safety, health and environmental regulations/legislation specific for the substance or mixture.**
15.2 Chemical safety assessment:	**No Chemical Safety Assessment required.**

16. Other information

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 BigRep GmbH to revise this document. BigRep does not take responsibility for the data provided in this document.

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