



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

MATERIAL SAFETY DATA SHEET

BigRep BVOH

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

1.1 Trade name:	BigRep Filament BVOH
1.2 Chemical name:	Butene Vinyl Alcohol Copolymer
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 Risk advise to man and the environment:	Not likely to be a risk in the solid form.
2.2 Classification of the substance or mixture:	This substance does not meet the criteria for classification according to Directive 67/548/EEC or Regulation (EC) 1272/2008 as amended.
2.3 Special advice on hazards:	Danger of burns when heated or molten material is handled

3. Composition / information on ingredients

3.1 Chemical nature:	Polymer blend based on alcohols
Hazardous ingredients (GHS)	According to Regulation (EC) No. 1272/2008
Content (W/W): >= 1% - < 3%	Methanol
CAS Number: 67-56-1	Flammable Liquids 2
EC-Number: 200-659-6	Acute Toxicity 3 (inhalation – vapor)
REACH reg. no.: 01-2119433307-44	Acute Toxicity 3 (oral)
	Acute Toxicity 3 (dermal)
	STOT SE (central nervous system, optic nerve)
INDEX-no.: 603-001-00-X	1
	H225, H370, H302 + H311 + H331
	Specific concentration limit:
	STOT SE 2: 3 - < 10%
	STOT SE 1: >= 10%
3.2 Additional information:	See text in section 16

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. 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 molten 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.
- 4.4 On ingestion:** Rinse mouth with water and then drink plenty of water. Seek medical attention if difficulties or discomfort occur.
- 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:** Harmful vapors and carbon dioxides dangerous to health may be formed in case of fire.
- 5.3 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:** Wear gloves when handling hot melt of material. Avoid eye and skin contact. All ignition sources shall be removed. Inhale from dust shall be avoided. If necessary, use dust mask and Goggles.
- 6.2 Environmental precautions:** Prevent entry into drainage systems, or surface water. Do not allow material to contaminate ground water system.
- 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. Keep away from fire ignition sources. Protect against moisture.
7.2 Storage:	Protect from water, moisture and direct sunlight. Stored material in dry rooms and keep material in sealed packaging/container with desiccant when not in use. Store at temperatures between 15-25°C. Avoid all sources of ignition. Avoid freezing.
7.3 Precautions:	No special precautions required.
7.4 Specific end use(s):	Primarily used for 3D printing.

8. Exposure controls / personal protection

8.1 Control parameters	Occupational exposure limits 67-56-1: methanol Skin Designation (OEL (EU)) The substance can be absorbed through the skin. TWA value 260 mg/m ³ ; 200 ppm (OEL (EU)) Indicative
8.2 Occupational exposure limits:	Given suitable ventilation it can be that the threshold limits will not be reached.
8.3 <u>Personal protective equipment</u>	
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 respiratory protection if ventilation is inadequate. Suitable respiratory protection for higher concentrations of long-term effect (particle filter EN 143 P1). 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:	white to yellow
9.3 Odour:	vinegar-like
9.4 Melting point/range:	150 – 300 °C
9.5 Auto-ignition temperature:	> 440 °C
9.6 Explosions limit:	Not specified, for solids not relevant for classification
9.7 Relative density:	1.14 g/cm ³
9.8 Solubility:	Water, N,N-dimethylformamide, methane, sulfinylbis-soluble

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:	Strong oxidizing agents.
10.4 Hazardous reactions:	The product is chemically stable.
10.4.1 Hazardous decomposition products:	Carbon monoxides, carbon dioxides, smoke, oxides of nitrogen may be produced. Flammable vapours.

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: Not a skin sensitizer. Germ cell mutagenicity: No applicable information available.

Carcinogenicity: No applicable information available.
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. 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:** Assessment transport between environmental compartments:
Volatility: Study technically not feasible.
Adsorption in soil: Due to the product characteristics the test is impossible.
- 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.
- 12.5 Other adverse effects:** The product does not contain substances that are listed in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
Adsorbable organically-bound halogen (AOX): This product contains no organically-bound halogen.

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:

Annex XVII of Regulation (EC) No 1907/2006: Number on List: 69

15.2 Chemical safety assessment:

No Chemical Safety Assessment required.

16. Other information

Full text of classification in section 2 or 3:

STOT SE: Specific target organ toxicity — single exposure
H225 Highly flammable liquid and vapour.
H370 Causes damage to organs (Central nervous system, Optic nerve).
H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled

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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