

# Material Safety Data Sheet

According to EU Regulation No. 1907/2006

Issued on: 7 January 2016



## AquaSolve™ - PVA

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

- 1.1 Trade name: AquaSolve™
- 1.2 Chemical name: PolyVinyl Alcohol (PVA) 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 VOF  
Groenestraat 215  
6531 HH Nijmegen  
The Netherlands

Phone: +31 (0)85 002 0881

**Emergency phone number: +31 (0)30 274 8888**

### 2. Hazards Identification

- 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 Directives 67/548/EEC, 1999/45/EC, and 1272/2008/EC.
- 2.3 Special advice on hazards: Danger of burns while handling the heated or molten product.  
Hazardous vapours in case of burning.

### 3. Composition / information on ingredients

- 3.1 Chemical nature: Blend of Polyvinyl alcohol (>75%), Aliphatic polyol (<20%), Calcium distearate (<5%) and Methanol (Impurity, <0.5%) enhanced for 3D printing
- 3.2 CAS number: -
- 3.3 Additional information: No harmful substances used.

### 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 eyes, rinse open eyes thoroughly with water and do not rub the eye(s). If irritation develops, seek immediate medical attention.
- 4.4 On ingestion: No effects known. Rinse mouth with water and then drink plenty of water. Seek medical attention if difficulties or discomfort occur. If ingestion of a large amount does occur, call a poison control centre immediately.
- 4.5 Note to the physician: Treat symptomatically

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## 5. Firefighting measures

- 5.1 General fire hazards: The product is not flammable. The product may form dust and can accumulate electrostatic charges, which may cause an electrical spark (ignition source). Use proper grounding procedures.
- 5.2 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.
- 5.3 Specific hazards: During fire, gases hazardous to health may be formed.
- 5.4 Special protective equipment: Full protective clothing and self-contained breathing apparatus.
- 5.5 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. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

## 6. Accidental Release Measures

- 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. 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 (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

- 8.1 Occupational exposure limits: Given suitable ventilation it can be that the threshold limits will not be reached.
- 8.1.1 Aliphatic polyol (-) **Type:** TWA; **Value:** 10 mg/m<sup>3</sup>; **Form:** Mist.
- 8.1.2 Dust (-) **Type:** TWA; **Value:** 4 mg/m<sup>3</sup>; **Form:** Respirable dust.  
10 mg/m<sup>3</sup>; **Form:** Inhalable dust.
- 8.1.3 Methanol (Impurity) (67-56-1) **Type:** STEL; **Value:** 333 mg/m<sup>3</sup>  
**Type:** TWA; **Value:** 250 ppm  
266 mg/m<sup>3</sup>  
200 ppm

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- 8.2 Exposure controls: Provide appropriate exhaust ventilation at places where dust is formed. Avoid electrostatic charge by use of grounding cables.
- 8.3 Personal protective equipment
- 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.
- 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

- 9.1 Form: Granules / Filament
- 9.2 Colour: Natural (yellow to pale yellow)
- 9.3 Odour: Almost odourless
- 9.4 Melting point/range: 190 - 210 °C
- 9.5 Ignition temperature: 440 °C
- 9.6 Auto-ignition temperature: No data available
- 9.7 Explosions limit: No data available
- 9.8 Thermal decomposition: >210 °C
- 9.9 Flash point: >70 °C
- 9.10 Density: 1.23 g/cc
- 9.11 Solubility in water: Unlimited solubility

## 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. Avoid contact with incompatible materials.
- 10.3 Substances to avoid: Strong oxidizing agents and strong acids.
- 10.4 Hazardous reactions: The product is chemically stable.
- 10.4.1 Hazardous decomposition products: Carbon monoxide (CO).

## 11. Toxicological information

- 11.1 Information on toxicological effects: Dusts or powder may irritate the respiratory tract, skin and eyes.
- 11.1.1 Components
- Methanol (Impurity, <0.5%) (67-56-1)
- Acute Dermal LD50 Rabbit: 17100 mg/kg
  - Acute Inhalation LC50 Rat: 128200 mg/m<sup>3</sup> 4 Hours
  - Acute Oral LD50 Rat: 1187 - 2769 mg/kg
- 11.1.2 Acute toxicity
- Inhalation: Dust irritates the respiratory system, and may cause coughing and difficulties in breathing.
- Ingestion: May cause discomfort if swallowed.

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Skin contact: Dust can cause irritation of skin.  
Eye contact: Dust can cause irritation of eyes.

## 11.1.3 Irritation

Skin: Dust can cause irritation of skin.  
Eye: Dust can cause irritation of eyes.

11.1.4 Sensitization: Not expected to be a skin sensitizer.

11.1.5 Repeated dose toxicity: Not expected to cause toxic effects.

11.1.6 Carcinogenicity: No data available.

11.1.7 Mutagenicity: No data available.

11.1.8 Toxicity for reproduction: No data available.

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

### 12.1 Information on eco-toxicity:

12.1.1 Ecological toxicity effects: Methanol (Impurity, <0.5%) (67-56-1)  
• EC50 Algae: 22000 mg/l 96 hours.  
• EC50 Daphnia magna: > 10000 mg/l 48 hours  
• LC50 Fish: 15400 mg/l 96 hours

12.2 Mobility in soil: No data available.

12.3 Persistence and degradability: No data available concerning biodegradation and elimination.

12.4 Bioaccumulation potential: No data available.

## 13. Disposal considerations

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

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 UN, IMO, ADR/RID, ICAO Code: This product is not classified as hazardous.

## 15. Regulatory information

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

## 16. Other information

Company name: Formfutura VOF

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).

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**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.