

Safety data sheet PVA

Ultimaker

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

1.1 Trade name	PVA
1.2 Use of the product	3D-Printer filament
1.3 Supplier	Ultimaker (Watermolenweg 2, 4191PN, Geldermalsen, The Netherlands)
Emergency phone number	In case of toxicological emergency contact your doctor

2. Hazards identification according to regulation (EC) No 1272/2008 and GHS

2.1 Classification of the substance or mixture	No risk exists to the health of users if the product is handled and processed properly
2.2 Label elements	
Labelling	Not applicable
2.3 Other hazards	Not known

3. Composition/information on ingredients

3.1 Composition	Polyvinyl alcohol compound
3.2 Mixture	

4. First aid measures

4.1 Description of first aid measures	General advice: If you feel unwell, seek medical advice (show the label where possible). Never give anything by mouth to an unconscious person
Inhalation	In case of inhalation of gases released from molten filament, move person into fresh air
Skin contact	Wash with soap and water. Seek medical attention if symptoms occur. If burned by contact with hot material, cool molten material adhering to skin as quickly as possible with water, do not try to peel it off and seek for medical attention, if necessary, for removal and treatment of the burns

Eye contact	Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lenses. Seek medical attention if symptoms persist. If molten material contacts the eye, immediately flush with plenty of water for at least 15 minutes. Seek medical attention immediately
Ingestion	Not probable. Seek medical advice in case ingestion occurs
Note to physician	Treat symptomatically
4.2 Most important symptoms and effects, both acute and delayed	Burns should be treated as thermal burns. The material will come off as healing occurs; therefore immediate removal from skin is not necessary
4.3 Indication of any immediate medical attention and special treatment needed	No data available
<u>5. Firefighting measures</u>	
5.1 Extinguishing media	Foam, carbon dioxide (CO ₂), water fog, dry chemical Unsuitable extinguishing media: water jet
5.2 Special hazards arising from the substance or mixture	Burning produces obnoxious and toxic fumes: aldehydes, carbon oxides (CO _x)
5.3 Advice for firefighters	Use self-contained breathing apparatus and full protective clothing
<u>6. Accidental release measures</u>	
6.1 Personal precautions, protective equipment and emergency procedures	Avoid breathing gases released from molten filament. Ensure adequate ventilation, especially in confined areas
6.2 Environmental precautions	No data available
6.3 Methods and materials for containment and cleaning up	Allow to solidify molten material. Dispose of waste and residue in accordance with local regulations
6.4 Reference to other sections	-
<u>7. Handling and storage</u>	
7.1 Precautions for safe handling	Avoid contact with molten material
7.2 Conditions for safe storage, including any incompatibilities	Product should be stored in a dry (< 50% relative humidity) and cool place at temperatures between 0 °C to +30 °C. Avoid direct sunlight. Minimize moisture uptake by leaving it in a sealed package with the supplied desiccant. Keep away from oxidising agents and strongly acid or alkaline materials. Keep away from food, drink and animal feeding stuffs.
7.3 Specific end use(s)	Filament for 3D printing

8. Exposure controls/personal protection

8.1 Control parameters (*)

DNEL:	No data available
PNEC:	No data available

8.2 Exposure controls

Eye protection	Use safety glasses for prolonged stare at printing
Skin and body protection	Good practices suggest to minimize skin contact. When material is heated, wear gloves to protect against thermal burns
Respiratory protection	If engineering controls do not maintain airborne concentrations below recommended exposure limits (when applicable) or to an acceptable level (in countries where exposure limits have not been established) an approved respirator must be worn. Respirator type: air-purifying respirator with an appropriate government approved (where applicable) air purifying filter, cartridge or canister. Contact a health and safety professional or manufacturer for specific information
Hand protection	Follow good industrial hygiene practices
Hygiene measures	Follow good industrial hygiene practices
Engineering measures	Good general ventilation (typically 10 air changes per hour) is recommended. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation or other engineering controls that maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	Filament
Color	Natural
Odor	Slight
Flash point	> 70 °C
Ignition temperature	440 °C
Thermal decomposition	> 210 °C
Auto-ignition temperature	-
Melting point/range	190-210 °C
Density	1.23 g/cm ³
Water solubility	Soluble
Solubility in other solvents	Dimethyl sulfoxide (DMSO)

9.2 Other information

(*)TWA (Time Weighted Average) and STEL (Short Term Exposure Limits)

10. Stability

10.1 Reactivity

Stable under recommended storage conditions

No data available

10.2 Chemical stability

Chemically stable

10.3 Possibility of hazardous reactions

No decomposition or hazardous reactions if stored and applied as directed

10.4 Conditions to avoid

Print temperatures above 230 °C (at standard printing speeds). While printing, keep away from sparks and open flame

10.5 Incompatible materials

Oxidizing agents, acids, bases

10.6 Hazardous decomposition products

See 5.2

11. Toxicological information

11.1 Information on toxicological effects

Principle routes of exposure

Eye contact, skin contact, inhalation, ingestion

Acute toxicity

Oral (LD50; tested in rats; value: 1187-2769 mg/kg)

Inhalation (LC50; tested in rats; value: 128200 mg/m³, exposure time 4 h)

Dermal (LD50; tested in rats; value: 17100 mg/kg)

Skin corrosion/irritation

No data available, but prolonged skin contact may cause temporary irritation

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

No data available

Reproductive toxicity

No data available

Carcinogenicity

Not classified as carcinogenic to humans

12. Ecological information

12.1 Toxicity

Not classified as environmental hazardous

Methanol (CAS 67-56-1) < 1% impurity: EC-50 (algae, 96 h): 22000 mg/ml;

EC-50 (daphnia magna, 48 h): >10000 mg/l; LC-50 (fish, 96 h): 15400 mg/l

12.2 Persistence and degradability

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12.3 Bio accumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

No data available

12.6 Other adverse effects

If PVA is dissolved in water, the PVA solution can be disposed through the drain only if the waste water distribution network is connected to a waste water treatment plant

13. Disposal considerations

13.1 Waste treatment methods

In accordance with local and national regulations

14. Transport information

ADR	Not regulated
RID	Not regulated
IATA	Not regulated
IMDG	Not regulated
Special precautions for user	Not regulated

15. Regulatory information

Not meant to be all inclusive - selected regulations represented

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

US Regulations:

Sara 313 title III	-
TSCA inventory list	-
OSHA hazard category	-
CERCLA	-
WHMIS	-
State right-to-know requirements	-

Other inventories:

Canada DSL inventory list	-
REACH/EU EINECS	Not listed
NEHAPS	-
Japan (ECL/MITI)	-
Australia (AICS)	-
Korean toxic substances control act (ECL)	-
Philippines inventory (PICCS)	-
Chinese chemical inventory (IECSC)	-

15.2 Chemical safety assessment

No data available

16. Other information

The information provided in this Safety Data Sheet (SDS) is based on current knowledge and experience. This information is provided without warranty. This information should help to make an independent determination of the methods to ensure proper and safe use and disposal of the filament

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Ultimaker