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 B.V. Watermolenweg 2 4191 PN, 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	Not applicable
2.3 Other hazards	Not known

3. Composition / information on ingredients

3.1 Composition	Polyvinyl alcohol compound
3.2 Mixture	Not applicable

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. 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

5. Firefighting measures

5.1 General advice	Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or grounding procedures
5.2 Extinguishing media	Foam, carbon dioxide (CO_2), water fog, dry chemical
	Unsuitable extinguishing media: water jet
5.3 Special hazards arising from the substance or mixture	Burning produces unpleasant and toxic fumes: aldehydes, carbon oxides (CO_x)
5.4 Advice for firefighters	Use self-contained breathing apparatus and full protective clothing

6. Accidental release measures

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 according to local regulations
6.4 Reference to other sections	-

7. Handling and storage

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	The regulations for the substances listed below must be observed when processing this product, particularly if processing takes place at elevated temperatures. In our experience printing in a well ventilated area will ensure compliance with the following occupational exposure limits: - Methanol (CAS 67-56-1) < 1% (impurity) : 260 mg/m^3 (TWA) and 325 mg/m^3 (STEL)*
DNEL	No data available
PNEC	No data available

*TWA (Time weighted average) and STEL (Short term exposure limits)

8.2 Exposure controls

Eye protection	Use safety glasses for prolonged staring at printing
Skin and body protection	Good practice suggests 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	163 °C
Density	1.23 g/cm^3
Water solubility	Soluble
Solubility in other solvents	Dimethyl sulfoxide (DMSO)
9.2 Other information	-

10. Stability

	Stable under recommended storage conditions
10.1 Reactivity	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

Principal routes of exposure	Eye contact, skin contact, inhalation, ingestion
Acute toxicity	Oral (LD50; tested in rats; value: 1,187 - 2,769 mg/kg) Inhalation (LC50; tested in rats; value: 128,200 mg/m^3, exposure time 4 h) Dermal (LD50; tested in rats; value: 17,100 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): 22,000 mg/ml; EC-50 (daphnia magna, 48 h): > 10,000 mg/l; LC-50 (fish, 96 h): 15,400 mg/l
12.2 Persistence and degradability	-
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	-

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 EINIECS	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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