MATERIAL SAFETY DATA SHEET (SDS)

1. IDENTIFICATION

Product identifier: BVOH Filament for 3D Printer

Other means of identification: None.

Recommended use: 3D Printer Filament for Material Extrusion type.

Recommended restrictions: None known.

Manufacturer/Importer/Supplier/Distributor information

Company name: Mitsubishi Chemical Media Co., LTD.

Address: Daini Ryumeikan Bldg. 8F 3-20, Kandaogawmachi,

 Chiyoda-ku, Tokyo 101-0052, Japan

Department: Global Quality Engineering Department

Telephone: +81-3-5577-3095

E-mail: MKM-brandsales@m-chemical.co.jp

Reference number: 3DF-160205-01US

2. HAZARDS IDENTIFICATION GHS Classification:

Physical hazards: Not classified

Health hazards: Not classified

Environmental hazards: Not classified

OSHA defined hazards: Not classified

Label elements

Hazard symbol: None.

Signal word: None.

Hazard statement: The mixture does not meet the criteria for classification.

Precautionary statement

Prevention: Observe good industrial hygiene practices.

Response: Wash hands after handling.

Storage: Store away from incompatible materials.

Disposal: Dispose of waste and residues in accordance with local authority requirements.

Hazard(s) not otherwise classified (HNOC): None known.

Supplemental information: None.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixtures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Chemical name | Common name and synonyms | CAS number | Content (%) |
| 1 | Butenediol vinyl alcohol copolymer and Additives |  | Not disclosed | >=99.0 |

4. FIRST AID MEASURES

Inhalation: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.

Skin contact: Rinse skin with water/shower. Get medical attention if irritation develops and persists.

Eye contact: Remove contact lenses, if present and easy to do. Rinse with water. Get medical attention if irritation develops and persists.

Ingestion: Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately. Get medical attention as soon as possible.

If swallowed: Rinse mouth with water. Do not induce vomiting unless instructed by a doctor.

Most important symptoms/effects, acute and delayed:

 Direct contact with eyes may cause temporary irritation.

Indication of immediate medical attention and special treatment needed:

Treat symptomatically.

General information: Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. FIRE-FIGHTING MEASURES

Suitable extinguisher media: Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire. Specific hazards arising from the chemical:

During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters:

Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions: Use water spray to cool unopened containers.

Specific methods: Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards: No unusual fire or explosion hazards noted.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Keep unnecessary personnel away. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up:

Stop the flow of material, if this is without risk. Sweep up scattered materials or vacuum them using a vacuum cleaner. This product becomes pasty with water, careful not to slip. If this product is an aqueous solution, after removing by adsorbing the adsorption material (sawdust, earth, sand, waste cloth, etc.),wipe well the rest with waste cloth, etc.

For waste disposal, see section 13 of the SDS.

Environmental precautions: Avoid discharge into drains, water courses or onto the ground.

7. HANDLING AND STORAGE

Precautions for safe handling: Use care in handling/storage.

Conditions for safe storage, including any incompatibilities:

Keep containers tightly closed in a dry and cool place and protect from moisture.

 Keep away from food, drink and animal feeding stuffs.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limits: No exposure limits noted for ingredient(s).

Biological limit values: No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls: Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection: Wear safety glasses with side shields (or goggles).

Skin protection

 Hand protection: Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

 Other: Wear suitable protective clothing.

 Respiratory protection: In case of insufficient ventilation, wear suitable respiratory equipment.

Thermal hazards: Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. PHYSICAL AND CHEMICAL PROPERTIES Appearance

Physical state: Solid.

Form: Filament Shape.

Color: Pale yellow.

Odor: Slight acetic acid odor.

Odor threshold: No data available.

pH: 5.0 – 7.0.

Melting point/freezing point: 302 to 446 °F (150 to 230 °C)

Initial boiling point and boiling range: Not available.

Flash point: > 464 °F ( > 240 °C) (Seta closed cup).

Evaporation rate: No data available.

Flammability (solid, gas): No data available.

Upper/lower flammability or explosive limits

 Flammability limit - lower(%): No data available.

Flammability limit - upper(%): No data available.

Explosive limit - lower (%): No data available.

Explosive limit - upper (%): No data available.

 Vapor pressure: No data available.

Vapor density: No data available.

Relative density: 1.19 – 1.31 g/cm3.

Solubility(ies)

Solubility (water): Soluble (emulsified)

General solvent: Insoluble or sparingly soluble.

Partition coefficient (n-octanol/water): No data available.

Auto ignition point (ignition point): No data available.

Decomposition temperature: 567 °F / 297 °C

TGA（Thermo Gravimetry Analyzer）

Reference condition: ISO-7111(1987)

Viscosity: No data available.

Other information

 Density: 0.6 to 0.9 g/cm3

 Explosive properties: Not explosive.

 Oxidizing properties: Not oxidizing.

10. STABILITY AND REACTIVITY

Reactivity: The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability: Stable at room temperature. Decomposition becomes noticeable at high temperature of 392 °F / 200 °C or more.

Possibility of hazardous reactions: Stability: No decomposition if store and applied as directed. Dust can form an explosive mixture in air.

Conditions to avoid: High- temperature and humidity.

Incompatible materials: Keep away oxidizing agent, acids and bases.

Hazardous decomposition products: In case of fire, toxic decomposition products (carbon monoxide) may be generated.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

 Inhalation: No adverse effects due to inhalation are expected.

 Skin contact: No adverse effects due to skin contact are expected.

Eye contact: Direct contact with eyes may cause temporary irritation.

Ingestion: Expected to be a low ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics:

Direct contact with eyes may cause temporary irritation.

Information on toxicological effects

Acute toxicity: Butenediol-Vinyl Alcohol copolymer　Acute oral toxicity:

　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　Rat LD50 > 2,000 mg/kg.

Skin corrosion/irritation: Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation: Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Respiratory sensitization: No data available.

Skin sensitization: This product is not expected to cause skin sensitization.

Germ cell mutagenicity: Genotoxicity in vitro:　 No data available.

Genotoxicity in vivo:　 No data available.

Carcinogenicity: IARC: Not listed.

OSHA: Not listed.

US. National Toxicology Program (NTP) Report: Not listed.

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: Aspiration toxicity No data available.

Neurological effects: No data available.

Toxicology Assessment: Toxicology, Metabolism, Distribution No data available.

Acute effects No data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Information on product: Fishes: Danio rerio, Short-term toxicity test on embryo and fish larval stage, 9d-NOEC >= 200mg/L

Crustacean: Ceriodaphnia dubia, Reproductive inhibition test, 6d-NOEC >= 50 mg/L

Algae: Pseudokirchneriella subcapitata, Growth inhibition test, 72hr-NOEC >= 200mg/L

Persistence and degradability:

Information on product: Note: Inherently biodegradable.

Information on ingredients: Butenediol-Vinyl Alcohol copolymer

Biodegraded by sludge containing such as Pseudomon.

Bioaccumulative potential:

Information on product: No data available.

Information on ingredients:: Butenediol-Vinyl Alcohol copolymer

Not or low bioaccumulative.

Mobility in soil: No data available.

Results of PBT and vPvB assessment: No data available.

Other adverse effects: This product does not contain the ingredients that are listed in the Annex to the Montreal Protocol.

13. DISPOSAL CONSIDERATIONS

Disposal instructions(Filament): Do not dump into sewers, on the ground or into any body of water. Burn in an adequate incinerator or bury in landfill in accordance with applicable local, state, and federal regulations.

Disposal instructions(water Filament solved): Do not exceed 1mg/L in a river which the waste liquid flow into when it is disposed of from a drain as water solution. Also, it should be diluted with water by at least 20 times when disposed of. It can be disposed of as water solution in a day with maximum 2kg as itself.

Local disposal regulations: Dispose in accordance with all applicable regulations.

Hazardous waste code: The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products: Dispose of in accordance with local regulations.

14. TRANSPORT INFORMATION

UN number: Not applicable.

UN proper shipping name: Not applicable.

Transport hazard class(es): Not applicable.

Packing group: Not applicable.

Environmental hazards: Not applicable.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable.

Special precautions for user: When transporting, avoid direct sunlight. Confirm no leakage to containers. When loading, prevent containers from falling, dropping off or damaging. Take preventive measures of collapse.

15. REGURATORY INFORMATION

OSHA: Not Hazardous chemical.

TSCA inventory: All components are listed on the TSCA Inventory.

TSCA SNUR: Not listed.

SARA Title III: Section 302 (Extremely Hazardous Substances): Not listed.

Section 304 (Hazardous Substances): Not listed.

Section 313 (TRI Chemicals): Methanol(< 0.1%).

Clean Air Act: This product does not contain any substances regulated as hazardous air pollutants under Section 112 of the Clean Air Act.

Clean Air Act: This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act.

16. OTHER INFORMATION ,including date of preparation or last revision

Issue date: Jul. 27, 2017

Version #: 5b

Disclaimer : This safety data sheet (SDS) is issued based on the latest reference, data etc. currently available. The information in this SDS has been carefully assessed, but no guarantee is given for its accuracy. We cannot anticipate all conditions under which this product may be used. It is the user’s responsibility to take appropriate safety measures for handling. Mitsubishi Chemical Media Corporation cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user’s responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.