

MATERIAL SAFETY DATA SHEET

according to Regulation (EU) No. 1907/2006

PPGF 30 by Innofil3D BV

1. IDENTIFICATION OF THE PRODUCT AND OF THE COMPANY

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|----------------------|--------------------------------|
| Trade name | : Innofil3D PPGF 30 |
| Chemical name | : Glass filled Polypropylene |
| Chemical family | : Thermoplastic copolymer |
| Use | : Monofilament for 3D-printing |
| Company | : Innofil3D BV |
| Street address | : Eerste Bokslotweg 17 |
| Postal code and city | : 7821 AT Emmen |
| Country | : The Netherlands |
| Telephone number | : +31 (0) 591 820 389 |

2. HAZARDS IDENTIFICATION

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| OSHA Regulatory Status | : This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). |
| WHMIS Regulatory Status | : This product is not considered hazardous by the Canadian Hazardous Products Regulation SOR/2015-17. |
| EC No. 1272/2008 (CLP) | : This product is not classified hazardous according to European Regulation (EC) No. 1272/2006. |
| Label elements | : The product contains no substances which at their given concentration, are considered to be hazardous to health. No label necessary for this product. |
| Hazards not otherwise classified (HNOC) | : Not applicable |
| Other Information | : Due to the presence of glass fibres, may cause temporary skin and mucous membranes itching due to mechanical abrasion effect of fibres. Due to the presence of polymer powder generated by product abrasion, dust inhalation may cause temporary irritation of respiratory system. At high temperature, thermal decomposition products can be irritating to respiratory tract. |



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| Physical and chemical hazards | : | In the presence of an ignition source: dust may form explosive mixture in air. Thermal decomposition giving toxic and corrosive products/decomposition product see chapter 10. |
| PBT and vPvB assessment | : | Based on the available information, it is not possible to conclude on PBT and vPvB criteria according to REACH Regulation, annex VII. |

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components

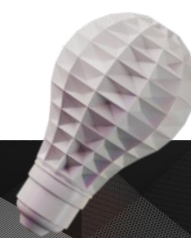
| | | |
|---------------------------------|---------|--------------|
| Polypropylene | : | 65 – 75 % * |
| | CAS no. | : 9003-07-0 |
| Continuous filament glass fiber | : | 25 – 35 % * |
| | CAS No. | : 65997-17-3 |
| Additives | : | 0 – 2 % |

* The exact percentage (concentration) of composition has been withheld as a trade secret or for covering a group of substantially similar products.

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| Comments | : | The remaining components of this product are non-hazardous or are in a small enough quantity as to not meet regulatory thresholds for disclosure. These components contain no substances or impurities which would influence the classification of this product. |
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4. FIRST-AID MEASURES

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| General Advice | : | No hazard which requires special first aid measures. |
| Eye contact | : | Immediately flush with plenty of water also under the use lids. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. DO NOT rub or scratch eye. Consult an ophthalmologist. |
| Skin contact | : | In case of contact with molten product: Immediately drench or immerse area in water to assist in cooling. In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove the solidified product. Removal of solidified molten material from skin requires medical assistance. Do not rub or scratch affected areas. |
| Inhalation | : | Move to fresh air in case of accidental inhalation of vapours or decomposition products. If symptoms persist, call a physician. |
| Ingestion | : | Clean mouth with water. Do not induce vomiting without medical advice. Call a physician. |
| Symptoms | : | No data available. |
| Note to physician | : | No data available. |
| Acute toxicity | : | No data available. |



5. FIRE-FIGHTING MEASURES

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| Flammable properties | : Combustible material. Powdered material may form explosive dust-air mixture. |
| Suitable extinguishing media | : Water spray, dry chemical, foam, carbon dioxide. |
| Unsuitable media | : None known. |
| Specific hazards arising from the chemical | : Thermal decomposition can lead to release of toxic/corrosive products: Carbon monoxide, Ammonia, Amino derivatives. Release of toxic products through combustion: Carbon oxides, Hydrocarbons, Hydrogen cyanide (hydrocyanic acid) (traces), nitrogen oxides. |
| Explosion; Mechanical Impact | : None. |
| Explosion; Static Discharge | : Fine dust dispersed in air, in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. |
| Protective equipment and precautions for firefighters | : As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIO.SH (approved or equivalent) and full protective gear |

6. ACCIDENTAL RELEASE MEASURES

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| Personal precautions | : Avoid contact with eyes and skin. |
| Environmental precautions | : Avoid release to the environment. See Section 12 for ecotoxicology additional information. |
| Methods for cleaning up | : Pick up and transfer to properly labelled containers. |
| Methods for containment | : Break up and remove solidified material. Material may be remelted and reclaimed. Recycling recoverable material is recommended. |

7. HANDLING AND STORAGE

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| Safe handling advice | : Handle in accordance with good industrial hygiene and safety practice. Do not breathe dust/fume/gas/mist/vapours/spray. During use and thermal treatment of the product, avoid inhalation of extrusion fume. No smoking. |
| Technical measures | : Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Provide electrical earthing of equipment. |
| Storage conditions | : Store in a well-ventilated place. Keep cool. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. |
| Incompatible materials | : None known |
| Packaging material | : No specific recommendation |



8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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| Exposure guidelines | : As manufactured continuous filament glass fibres are not respirable. Under normal conditions of use, these products may release dust and non-respirable fibres (Particles Not Otherwise Regulated). Under severe process conditions (e.g. shredding, crushing), they may release very small amount of respirable particulate, some of which may be glass shards (see section 11). |
| Continuous filament glass fiber, non-respirable, 65997-17-3 | |
| ACGIH TLV | : TWA: 1 fibre/cm ³ respirable fibres: length >5 µm, aspect ratio >=3:1, as determined by the membrane filter method at 400-450X magnification [4-mm objective], using phase-contrast illumination. TWA: 5 mg/m ³ inhalable particulate matter |
| OSHA PEL | : - |
| NIOSH REL | : - |
| Engineering controls | : Ensure adequate ventilation, especially in confined areas. Provide local exhaust and/or general ventilation to maintain exposure below regulatory and recommended limits especially in transferring, cutting or machining operations or other fumes/dust generating processes |
| <u>Personal protective equipment</u> | |
| Eye/face protection | : Wear safety glasses with side shields (or goggles). |
| Skin and body protection | : Wear protective gloves. Wear long-sleeved shirt and long pants. |
| Respiratory protection | : No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required. In case of insufficient ventilation, wear suitable respiratory equipment |
| Hygiene measures | : Wash hands before breaks and immediately after handling products. Remove and wash contaminated clothing before re-use |

9. PHYSICAL AND CHEMICAL PROPERTIES

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| Appearance | : Filament |
| Colour | : Black |
| Physical state | : Solid |
| Odour | : Odourless |
| Melting point/range | : 130 – 170 °C |
| Boiling point/range | : Not applicable |
| Autoignition temperature | : > 320 °C |
| Density | : 1.4 – 1.5 kg/m ³ |
| pH | : Not applicable |



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| Vapor pressure | : | No information available |
| Water solubility | : | Insoluble in water |
| Softening point | : | > 800 °C (glass) |

10. STABILITY AND REACTIVITY

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| Reactivity | : | No known reactivity. |
| Chemical stability | : | Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. |
| Conditions to avoid | : | Heat, prevent from freezing. |
| Possibility of hazardous reactions | : | No hazardous decomposition under normal conditions of storage and use. |
| Incompatible materials | : | None known. |
| Hazardous decomposition products | : | Thermal decomposition can lead to release of toxic/corrosive products: Carbon monoxide, Ammonia, Amino derivatives. Release of toxic products through combustion: Carbon oxides, Hydrocarbons, Hydrogen cyanide (hydrocyanic acid) (traces), nitrogen oxides. |

11. TOXICOLOGICAL INFORMATION

According to its composition, this product should not be harmful in normal conditions of use.

Toxicological effects : No data available on the mixture.

For the polymer contained in the mixture : The polymer is not considered as an harmful preparation according to directive 1999/45/CE.

Acute toxicity

Inhalation : Dust inhalation may generate irritation of the respiratory tract. Prolonged inhalation at high doses of decomposition product may cause headache and irritation of the respiratory tract.

Ingestion : Not probable.

Dermal : According to its composition, this product should not be harmful in normal conditions of use.

Local effects

Skin contact : Dust and fibers that may be generated by mechanical treatment may cause temporary skin and mucous membranes itching due to the abrasion effect of the fibers. The symptoms disappear when the exposure ceases. Mechanical abrasion is not considered as a health hazard in the meaning of Regulation EC 1272/2008. Continuous filament glass fibers are not classified as irritants under the regulation EC 1272/2008.

Eye contact : May be considered as comparable to a similar product for which experimental data are: Slightly or not irritating to eyes.

Respiratory or skin sensitization

Inhalation : Continuous filament glass fibers are not respirable according to the World Health Organization (WHO) definition. Respirable fibers



have a diameter (d) smaller than 3µm, a length (l) larger than 5µm and a l/d-ratio larger than or equal to 3. Fibers with diameters greater than 3 microns, which is the case for continuous filament glass fibers, do not reach the lower respiratory tract and, therefore have no possibility of causing serious pulmonary disease.

Continuous filament glass fibers do not possess cleavage plans which would allow them to split length-wise into fibers with smaller diameters, rather they break across the fiber, resulting in fibers which are of the same diameter as the original fiber with a shorter length and a small amount of dust.

Microscopic examination of dust from highly chopped and pulverised glass demonstrated the presence of small amount of respirable dust particles. Among these respirable particles, some were fiber-like in terms of l/d ratio (so-called "shards"). It can be clearly observed however that they are not regular shaped fibers but irregular shaped fibers with fiber-like dimensions. To the best of our knowledge, the exposure levels of these fiber-like dust particles measured at our manufacturing plants are at the order of magnitude between 50 to 1000 below existing applicable limits.

Continuous filament glass fibers are not carcinogenic (see section 15)

Skin contact : May be considered as comparable to a similar product for which experimental data are: not a skin sensitizer.

CMR effects

Mutagenicity : Contains no ingredient considered as genotoxic.

Carcinogenicity : According to its composition, this product should not be harmful in normal conditions of use.

Reproductive toxicity : According to its composition, this product should not be harmful in normal conditions of use.

Specific target organ toxicity

Single exposure – inhalation : According to its composition, this product should not be harmful in normal conditions of use.

Repeated exposure : According to its composition, this product should not be harmful in normal conditions of use.

Aspiration hazard : Not relevant due to composition.

12. ECOTOXICOLOGICAL INFORMATION

Information on the product : No data available on the product.

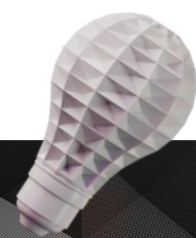
Information on components : The polymer and the glass fibres are not considered as hazardous for the environment.

Acute toxicity : No data available.

Persistence and degradability (in water) : Inert polymer, not biodegradable on the basis of its structure.

Bio accumulative potential : No data available.

Mobility in soil : No data available.



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| PBT and vPvB assessment | : | Based on the available information, it is not possible to conclude on PBT and vPvB criteria according to REACH regulation, annex XIII. |
| Other adverse effects | : | None known. |

13. DISPOSAL CONSIDERATIONS

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| Disposal of product | : | Do not dispose of waste into sewer. Destroy the product by incineration (in accordance with local and national regulations). |
| Disposal of packaging | : | Do not release into the environment. Destroy packaging by incineration at an approved waste disposal site (in accordance with the local and national regulations). |

14. TRANSPORT INFORMATION

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| IMDG | : | Not regulated, not classified as dangerous in the meaning of transport regulations. |
| ICAO/IATA | : | Not regulated, not classified as dangerous in the meaning of transport regulations. |
| RID | : | Not regulated, not classified as dangerous in the meaning of transport regulations. |
| ADR | : | Not regulated, not classified as dangerous in the meaning of transport regulations. |
| DOT | : | Not regulated, not classified as dangerous in the meaning of transport regulations. |
| TDG | : | Not regulated, not classified as dangerous in the meaning of transport regulations. |

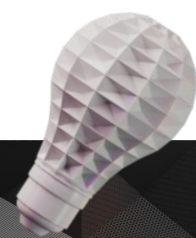
15. REGULATORY INFORMATION

NOTICE: The information herein is presented in good faith and believed to be accurate as of the print date shown above. However, no warranty, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. See other sections for health and safety information.

Safety data sheet: in accordance with annex II of Regulation (EC) N° 1907/2006 and its amendments

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

Information on non-carcinogenicity (glass fibres) : Continuous Filaments glass fibres are not classified as carcinogenic by regulation (EC) 1272/2008 since they are not "fibres with random orientation".
The International Agency for Research on Cancer (IARC) in June 1987 and in October 2001, categorized continuous filament



glass fibres as not classifiable with respect to human carcinogenicity (Group 3). The evidence from human, as well as, animal studies was evaluated by IARC as insufficient to classify continuous filament glass fibres as a confirmed, probable or even possible cancer causing material.

Chemical safety assessment : This information is not required.

INVENTORIES

Continuous Filament Glass fibres : Continuous filament glass fibre products are articles under the following chemical inventories listed hereafter and consequently are exempt from listing under these inventories: EINECS / EILINCS, TSCA, NDSL / DSL, CSCL, AICS, PICCS, (K)ECL, IESCSC.

However, based on the rules enforced with regards to the marketing and use of chemicals in countries where our CFGF products are manufactured, each chemical ingredient of these finished products has to be listed on the National Chemicals Inventory of the specific country where produced.

16. OTHER INFORMATION

- The information in this Material Safety Data Sheet (MSDS) is mainly based on information used from the supplier of the raw materials which are used for production of the filaments.
- The information in this Material Safety Data Sheet (MSDS) is based on current knowledge and experience. No liability can be assumed for the accuracy and completeness of this information.
- Users should consider this information only as additional to other data gathered. Independent determination of suitability and completeness of information from all available sources is essential to ensure proper and safe use and disposal of these materials.
- The information in this MSDS applies for this specific material only. It therefore does not apply for its usage in combination with other materials or ways of processing.