SECTION 1: IDENTIFICATION

1.1	**Product identifier used on the label**	
	Product name:	**TPU filament**
1.2	Other means of identification:	
	Alternative names:	not available
1.3	**Recommended use of the chemical and restrictions on use**	
	Recommended uses:	material for 3D-printing
	Uses advised against:	This material should not be used for any other purpose than the intended use in Section 1.3 without expert advice.
1.4	**Name, U.S. address, and U.S. telephone number of the chemical manufacturer, importer, or other responsible party**	
	Distributor: *(responsible for marketing)*	Zemědělské družstvo Haňovice Haňovice 18 783 21 Chudobín Czech Republic tel.: +420 585 100 308 e-mail: info@plastymladec.cz web: www.filament-pm.com
1.5	**Emergency telephone number**	
	For Medical Emergencies (24-H), call: 1-800-222-1222 Product information: X-XXX-XXX-XXX	

SECTION 2: HAZARDS IDENTIFICATION

While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

2.1	**Classification of the substance or mixture**	
	Classification of the chemical in accordance with 29 CFR 1910.1200	not classified as hazardous
2.2	**Label elements**	
	Contains:	not required
	Hazard symbols:	not required
	Signal word:	not required
	Hazard statements:	not required
	Precautionary statements:	not required
	Other required labeling:	not required
2.3	**Hazards not otherwise classified**	
	Important health effects:	No adverse effects for human health are expected for the mixture under normal conditions of usage, the mixture is biologically inert. When melted, it can cause serious burns if contacted with skin and eyes. Ingestion of a small amount should not cause any troubles. Inhaling of loosen dust or potential decomposition products of melted/overheated mixture in high concentration can irritate moderately respiratory system and mucous membranes.

	Important environmental effects:	No adverse effects in the environment are expected for the mixture; the mixture is almost biologically inert.
	Important physico-chemical effects:	Not known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Product based on thermoplastic polyurethane (TPU) with additives.

3.1 Substances
does not apply

3.2 Mixtures
Substances presenting a health / physico-chemical or environmental hazard within the meaning of OSHA Hazard Communication Standard (29 CFR 1910.1200): none

Substance	Content (% w/w)	CAS Number Index Number	Classification		Exposure limits
-	-	-	-	-	-

** For full wording of used classification abbreviations and Hazard Statements (H-phrases) see Section 16.*

Other compounds

Substance	Content (% w/w)	CAS Number Index Number	Classification		Exposure limits
-	-	-	-	-	-

SECTION 4: FIRST AID MEASURES

4.1 Description of necessary first aid measures
Health hazard is no minimal, being neither irritating, corrosive, volatile, nor toxic. Effects of over exposure: There are no hazards under normal use conditions. Observe all user considerations and safety measures stated on the packaging. In case of any health problem or uncertainty seek medical attention and provide information from this Material Safety Data Sheet. Unconscious persons place in the stabilized position and observe the breathing. Never give any fluids to unconscious persons. Be careful when manipulating hot products - danger of skin burns.

Inhalation:	No adverse effects are expected under normal conditions of use. Direct inhalation exposure is not expected. Dust or potential decomposition products of melted/overheated mixture in high concentration can cause airway irritation. In this case remove the affected persons to a fresh air. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation. Call immediately medical emergency.
Skin contact:	No adverse effects are expected under normal conditions of use - no special requirements needed. In case of a skin contact with melted polymer do not remove it from the skin. Cool down the burnt area with a stream of cold water and call the professional medical help.
Eye contact:	No adverse effects are expected under normal conditions of use - no special requirements needed. Dust or potential decomposition products of melted polymer can cause eye irritation. Seek medical advice if the eye irritation persists. Direct contact of eye with melted product can cause serious eye damage. Seek professional medical help immediately.
Ingestion:	No adverse effects are expected under normal conditions of use - no special requirements needed. This type of exposure is not expected.

4.2	**Most important symptoms/effects, acute and delayed** No adverse effects for human health are expected for the mixture under normal conditions of usage, the mixture is biologically inert. When melted, it can cause serious burns if contacted with skin and eyes. Ingestion of a small amount should not cause any troubles. Inhaling of loosen dust or potential decomposition products of melted/overheated mixture in high concentration can irritate moderately respiratory system and mucous membranes.
4.3	**Indication of immediate medical attention and special treatment needed, if necessary** No specific therapy known. Use supportive and symptomatic treatment.

SECTION 5: FIREFIGHTING MEASURES

5.1 Suitable (and unsuitable) extinguishing media

Suitable extinguishing media:	water spray, alcohol resistant foam, dry-powder, carbon dioxide
Unsuitable extinguishing media:	direct water stream - could spread fire

5.2 Special hazards arising from the chemical

Flammable. Incomplete combustion and thermolysis may produce toxic, irritating and flammable decomposition products (such as carbon monoxide, carbon dioxide, sooth, aldehydes and other products of organic compounds decomposition). Do not inhale smokes.

5.3 Special protective equipment and precautions for fire-fighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of re-ignition has passed. Fight fire from protected location or safe distance. Move container from fire area if this is possible without hazard. If possible, avoid leaked water to enter sewage system or environment.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective firefighting clothing (includes firefighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during firefighting operations. If contact is likely, change to full chemical resistant firefighting clothing with self-contained breathing apparatus. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections 6 and 8.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

No special requirements are needed. Observe all user considerations and safety measures. All unprotected persons should be restraint. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

6.2 Methods and materials for containment and cleaning up

Collect mechanically. All storage vessels have to be labeled. Dispose according to valid legislation (see Section 13); recycle.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Observe all user considerations, safety measures and exposure limits. See Section 8 for advice on the minimum requirements for personal protective equipment. Avoid breathing decomposition products or loosened dust. Use only with adequate ventilation. Observe all fire protection measures (work with open flame is prohibited, remove all possible sources of ignition, smoking is prohibited). During the product's thermal treatment small amounts of volatile organic compounds may be released. Thus suction and discharge of these emissions must be locally secured. Dust from the product represents a potential explosion hazard and as such it must be continuously removed. All devices must be properly grounded.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Observe all fire protection measures (work with open flame is prohibited, remove all possible sources of ignition, smoking is prohibited). Keep away from direct sunlight and heat sources.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Occupational exposure limit (OEL - ACGIH): not set

CAS	*Substance name*	*Occupational exposure limit*
-	-	-

Indicative biological limits: not set

8.2 Exposure controls

Appropriate engineering controls:

Avoid contact with skin, eyes and mucous membranes. Avoid prolonged or repeated contact with skin. 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. Discard contaminated clothing and footwear that cannot be cleaned. Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Individual protection measures, such as personal protective equipment:

a) Eye / face protection
No special requirements are needed under normal conditions of usage. Avoid contact with eyes. If risk of eye contact exists, use safety glasses with side shields.

b) Skin protection:
No special requirements are needed under normal conditions of usage. When manipulating with heated/hot material use heat isolating gloves made of para-aramid/carbon with thermal isolation up to 270°C and forearm protection. Example of recommended gloves: KCL, Karbo TECT with leather forearm cuffs, with thermal isolation up to 350°C.

NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier. Immediately change damaged gloves

c) Respiratory protection:
No special requirements are needed under normal use conditions. Ensure appropriate ventilation or exhaustion at the workplace. Do not inhale decomposition products from overheated product or dust produced by mechanical operations. If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include: half-face particle filter respirator, type N95.

d) Thermal hazards:
No such risk when normally used.

Environmental exposure controls:
Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions. All storage and manipulation areas have to be equipped for the sanation of possible leakage. See information in sections 6 and 12.

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Properties	**value**	**method / condition**
Appearance (physical state, color, etc.):	solid wire, grey	20°C

	Odor:	no odor	-
	Odor threshold:	information not available	-
	pH:	information not available	-
	Melting point/freezing point:	> 120°C	-
	Boiling point/range or initial boiling point:	information not available	-
	Flash point:	> 400°C	-
	Evaporation rate:	information not available	-
	Flammability (solid, gas):	information not available	-
	Upper/lower flammability or explosive limits:	information not available	-
	Vapour pressure:	information not available	-
	Vapour density:	information not available	-
	Relative density:	1,15 g/cm^3	20°C, ISO 1183-1-A
	Solubility:	insoluble in water	water, 20°C
	Partition coefficient: n-octanol/water:	information not available	-
	Auto-ignition temperature:	information not available	-
	Decomposition temperature:	> 230°C	-
	Viscosity:	information not available	-
9.2	**Other information**		
	Explosive properties:	no explosive properties	-
	Oxidising properties:	no oxidative properties	-

SECTION 10: STABILITY AND REACTIVITY

10.1	**Reactivity** Not reactive under normal conditions of storage and manipulation.
10.2	**Chemical stability** Mixture is chemically stable under normal conditions of storage and manipulation. Overheating may cause thermal decomposition.
10.3	**Possibility of hazardous reactions** Not known.
10.4	**Conditions to avoid** Not known.
10.5	**Incompatible materials** Not known.
10.6	**Hazardous decomposition products** Material does not decompose at ambient temperatures. Incomplete combustion and thermolysis may produce toxic, irritating and flammable decomposition products (such as carbon monoxide, carbon dioxide, sooth, aldehydes and other products of hydrocarbons decomposition).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1	**Information on hazard classes as defined in Regulation (EC) No 1272/2008** No adverse effects for human health are expected for the mixture under normal conditions of usage, the mixture is biologically inert.
a)	*Acute toxicity* Based on available data, the classification criteria are not met. Based on composition, the mixture has low acute toxicity and no adverse effects for human health are expected under applicable conditions of exposure.
b)	*Skin corrosion/irritation* Based on available data, the classification criteria are not met. The mixture has no direct corrosive / irritating properties. Melted product may cause serious burns following the contact with the skin.
c)	*Serious eye damage/irritation* Based on available data, the classification criteria are not met. The mixture has no direct corrosive / irritating properties. Melted product may cause serious burns following the contact with the eyes.
d)	*Respiratory or skin sensitisation* Based on available data, the classification criteria are not met.
e)	*Germ cell mutagenicity* Based on available data, the classification criteria are not met.
f)	*Carcinogenicity* Based on available data, the classification criteria are not met.
g)	*Reproductive toxicity* Based on available data, the classification criteria are not met.
h)	*STOT-single exposure* Based on available data, the classification criteria are not met. Inhalation of dust loosened dust during manipulation can mechanically irritate airways. However, these effects do not require classification.
i)	*STOT-repeated exposure* Based on available data, the classification criteria are not met.
j)	*Aspiration hazard* Based on available data, the classification criteria are not met.
11.2	**Information on other hazards** None of the compounds are listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or by OSHA. International Agency for Research on Cancer (IARC) Monographs (latest edition): none

SECTION 12: ECOLOGICAL INFORMATION

	No adverse effects in the environment are expected for the mixture; the mixture is biologically almost inert.
12.1	**Ecotoxicity** No data measured for the mixture. No adverse effects in the environment are expected for the mixture; the mixture is almost biologically inert.
12.2	**Persistence and degradability** Within the environment the mixture underlies very slow degradation, the mixture is biologically almost inert.
12.3	**Bioaccumulative potential** The mixture has no bioaccumulative potential.
12.4	**Mobility in soil** No data for the mixture. Insoluble in water, mobility in soil is not expected.
12.5	**Other adverse effects** Not known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

The generation of waste should be avoided or minimized wherever possible. Incineration or landfill should only be considered when recycling is not feasible.

Substance or mixture disposal methods:

Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Recycle. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled.

SECTION 14: TRANSPORT INFORMATION

The substance **is not** classified as dangerous for transport according to ADR/RID/IMDG/ICAO/IATA.

14.1 UN Number or ID Number: -

14.2 UN proper shipping name

Road transport ADR	*Rail transport RID*	*Int. maritime trans. IMDG*	*Air transport ICAO/IATA*
-	-	-	-

14.3 Transport hazard class(es)

Road transport ADR	*Rail transport RID*	*Int. maritime trans. IMDG*	*Air transport ICAO/IATA*
-	-	-	-
Classification code			
-	-	-	-
Hazard identification number (Kemler)			
-	-	-	-
Labels			
-	-	-	-
Other remarks			
-	-	-	-

14.4 Packing group

Road transport ADR	*Rail transport RID*	*Int. maritime trans. IMDG*	*Air transport ICAO/IATA*
-	-	-	-

14.5 Environmental hazards: no

14.6 Special precautions for user: not required

14.7 Maritime transport in bulk according to IMO instruments: not transported

SECTION 15: REGULATORY INFORMATION

TSCA Chemical Substance Inventory: Not listed

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed

Clean Air Act Section 602 Class I Substances: Not listed

Clean Air Act Section 602 Class II Substances: Not listed

DEA List I Chemicals (Precursor Chemicals): Not listed

DEA List II Chemicals (Essential Chemicals): Not listed

SECTION 16: OTHER INFORMATION

Hazardous Material Information System (U.S.A.)

Health	**0**
Flammability	**1**
Physical hazards	**0**
Personal protection	**B**

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

Changes made to the previous version of the safety data sheet
Not applicable, first edition - version 1.0

Key or legend to abbreviations and acronyms used in the safety data sheet

Exp. lim.	Exposure limit
OEL	Occupational exposure limit
VOC	Volatile organic compound
BW	Body weight
LD50	Median lethal Dose
LC50	Median lethal concentration
EC50	Half maximal effective concentration
IC50	Half maximal inhibitory concentration
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
RID	International Rule for Transport of Dangerous Substances by Railway
IMDG	International Maritime Dangerous Goods Code
ICAO	International Civil Aviation Organization
IATA	International Air Transport Association

Key literature references and sources for data
No information

Full wording of used Hazard Statements (H-phrases)
not used

Advice on any training appropriate for workers
Before handling, storing or using the present substance for the first time, employees must be informed - common training for handling chemicals, occupational safety training.

Other information
Safety Data Sheet (SDS) is compiled in accordance with latest legislation and contains information on safety use, occupational health protection, and environmental protection. The information contained herein is given in good faith and is accurate to the best of knowledge at the date indicated above. This particular information applies on the product as supplied and may not be valid in mixtures with other substances. If used for other purposes as identified in this SDS, the distributor is not liable for any damage.

The information given herein in no way dispenses the user from knowing and applying all provisions regulating his activity. The user bears sole liability for the precautions required when using the product. The regulatory texts indicated herein are intended to aid the user to fulfill his obligations. This list is not to be considered complete and exhaustive. It is the user's responsibility to ensure that he is subject to no other obligations than those mentioned.