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**Material Safety Data Sheet**  
conforms to Regulation EC No. 1907/2006 (REACH)  
Prusament PA11 (Nylon) Carbon Fiber by Prusa Polymers

## 1. Identification of the substance and the company

Product name: **Prusament PA11 (Nylon) Carbon Fiber**

Chemical name: **Polyamide 11 filled with carbon fibers**

Chemical family: **Thermoplastic composite**

Application: **filaments for 3D printing**

Manufacturer/Supplier:

**Prusa Polymers a.s.**

**Partyzánská 188/7a**

**17000 Praha 7**

**Czech Republic**

**IČ: 06593615**

**+420 222 263 718**

[info@prusa3d.cz](mailto:info@prusa3d.cz)

### Emergency contacts:

Toxicology Information Centre address: Na Bojišti 1, Praha 2, Czech Republic

phone number: +420 224 919 293

phone number: +420 224 915 402

## 2. Hazard Identification

### 2.1. Classification of substance or mixture

**Classification according to Regulation (EC) No. 1272/2008 [CLP]**

Not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.

### 2.2. Label elements

**Labeling according to Regulation (EC) No. 1272/2008 [CLP]**

Additional information: No label necessary for this product

### 2.3. Other hazards

#### Potential health effects:

Acute exposure: Contact with the product, when handled at high temperatures, can cause serious burns.

Inhalation: Inhalation of vapours due to thermal decomposition : Risk of irritation of respiratory system Toxic effects cannot be excluded

Dust inhalation: Risk of irritation of respiratory system

Skin contact: At high temperature, products of thermal decomposition can be irritating to skin

Eye contact: At high temperature, products of thermal decomposition can be irritating to eyes

#### Environmental Effects:

Inert polymer not biodegradable on the basis of its structure

#### Physical and chemical hazards:

Thermal decomposition giving toxic and corrosive products.

Decomposition products: See chapter 10

**Other:**  
Results of 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.

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### 3. Composition and information on ingredients

**Chemical name:** Polyamide 11 filled by carbon fibers with additives

**Other standards:** This material can generate Particulates Not Otherwise Classifiable (PNOC). The Occupational Safety and Health Administration (OSHA) PEL/TWA for PNOC is 15 mg/m<sup>3</sup> for total dust and 5 mg/m<sup>3</sup> for the respirable fraction. The American Conference of Governmental Industrial Hygienists (ACGIH) TLV/TWA for PNOC is 10 mg/m<sup>3</sup> for inhalable particulates and 3 mg/m<sup>3</sup> for respirable particulates.

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### 4. First aid measures

Not expected hazards under normal conditions and correct usage.

**Eye contact:** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a doctor if necessary.

**Skin contact:** In case of skin contact Wash off immediately with soap and plenty of water. On contact with hot product : Cool skin rapidly with cold water after contact with molten polymer. In case of adhesion, do not try to remove the product. Treat the affected areas as thermal burns. Consult a physician.

**Inhalation:** Inhalation of vapors due to thermal decomposition : Move to fresh air. Oxygen or artificial respiration if needed. In case of persistent problems : Consult a physician.

**Ingestion:** Call doctor or consider to induce vomiting. Rinse mouth with water. Call a doctor if necessary.

**Protection of first-aiders:** In case of insufficient ventilation, wear suitable respiratory equipment.

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### 5. Firefighting measures

#### 5.1. Extinguishing media:

Suitable extinguishing media: Foam, Water spray, Carbon dioxide (CO<sub>2</sub>).  
Unsuitable extinguishing media: High pressure water jet can spread the fire

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#### 5.2. Special hazards arising from the substance or mixture

300 - 350 °C: possible formation of:  
Monomer and oligomer (white fumes)  
Thermal decomposition giving toxic and corrosive products :  
Carbon monoxide, Ammonia, Amino derivatives  
Temperature exceeding 500 °C :  
Formation of toxic products through combustion:  
Carbon oxides, Hydrogen cyanide (hydrocyanic acid), (traces)

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#### 5.3. Advice 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.

Under fire conditions: Ensure a system for the rapid emptying of containers. In case of fire nearby, remove the bags. Cool containers / tanks with water spray. Water mist may be used to cool closed containers Fine dust dispersed in air may ignite. Risks of ignition followed by flame propagation or secondary explosions shall be prevented by avoiding accumulation of dust, e.g. on floors and ledges.

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## 6. Accidental release measures

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### 6.1. Personal precautions

- Use personal protective equipment as required
- In case of insufficient ventilation, wear suitable respiratory equipment.
- Avoid contact with skin and eyes
- Wear a dust mask and safety glasses/goggles if necessary
- Remove all sources of ignition
- Sweep up to prevent slipping hazard
- Use with recommended personal protective equipment (see Section 8).

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### 6.2. Environmental precautions

- Do not allow material to contaminate groundwater system
- Do not flush into surface water or sanitary sewer system
- Should not be released into environment

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### 6.3. Methods and material for containment and cleaning up

- Avoid dust formation. Sweep up into a suitable container for disposal.

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## 7. Handling and storage

No smoking, open flames or sources of ignition in the handling and storage area. Good housekeeping and controlling of dust are necessary for safe handling of product. Avoid breathing process fumes. Use with adequate ventilation.

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### 7.1. Precautions for safe handling

- Avoid contact with skin and eyes
- do not exceed the temperature at which decomposition into toxic and corrosive products will occur
- Avoid accumulation of static charges during transfers in metallic systems
- Low hazard for usual industrial or commercial handling
- Users should be protected from the possibility of contact with molten material
- Ventilation on workspace is highly recommended
- If measures for keeping clean air are not in place, suitable closed cover for a 3D printer is recommended
- Flammable product, keep well away from naked flames.

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### 7.2. Conditions for safe storage, including any incompatibilities

Store away from moisture and heat to maintain the technical properties of the product. Remove all sources of ignition. Provide earthing and safe electrical equipment. Do not store above: 60 °C

- Store in the original container protected from excessive heat, direct sunlight, dust and condensed water.
- Protect from moisture, the product can be hygroscopic, Store in a dry place 5-30 °C.
- If you do not need filament for a longer period of time, insert it back into a container with attached silica gel.
- Use within 1 year from manufacture.
- Avoid contact with food.
- Remove all possible sources of ignition.
- Keep locked up and out of reach of children.

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### 7.3. Specific end uses

material for FDM 3D-printing

## 8. Exposure controls/personal protection

### 8.1. Appropriate engineering controls:

General ventilation should be sufficient for most operations. 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.

### 8.2. Personal protection

<b>Eye protection:</b>	not required for 3D printing
<b>Skin protection:</b>	not required for 3D printing
<b>Respiratory protection:</b>	Avoid unventilated closed places
<b>Hand protection:</b>	Avoid contact with molten material
<b>Environmental exposure controls:</b>	Do not allow products to enter water sources or soil.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on basic physical and chemical properties

Physical state (20°C):	solid
Appearance:	black plastic wire
Colour:	colorless
Granulometry:	approximately 2 - 4 mm
Odor:	none
Olfactory threshold:	not relevant
pH:	not applicable
Melting point/range:	183 - 187 °C
Boiling point/boiling range:	not applicable (decomposes on heating)
Flash point:	not applicable
Evaporation rate:	Not applicable

### 9.2. Flammability (solid, gas):

Flammability:	not applicable
Lower flammable limit:	not applicable
Upper flammable limit:	not applicable
Vapour pressure:	not applicable
Vapour density:	not applicable

Relative vapor density:	not applicable
Reference substance:	air = 1
Density:	approximately 1.020 - 1.030 kg/m <sup>3</sup> (ISO 1183)
Relative density (Water = 1):	1.02 - 1.03
Water solubility:	insoluble, (on the basis of its structure) at 20 °C
Partition coefficient: n-octanol/water:	no data available
Auto-ignition temperature:	420 - 450 °C (Standard ASTM D 1929-77 (B))
Decomposition temperature:	> 350 °C
Viscosity, dynamic:	not applicable
Viscosity, kinematic:	not applicable

### 9.3. Explosive properties:

Explosivity:	not relevant (due to physical form)
Oxidizing properties:	not relevant (due to its chemical structure)

### 9.4. Physical and chemical properties:

Solubility in other solvents: Soluble in Phenols, Metacresol, Benzylalcohol, Formic acid (concentrate), Sulphuric acid (concentrate)

## 10. Stability and reactivity

Reactivity:	no data available
Chemical stability:	stable under recommended storage conditions
Possibility of hazardous reactions:	none expected under conditions of normal use
Incompatible materials to avoid:	strong acids and oxidizing agents
Conditions to avoid:	moisture, heat, flames, sparks

### 10.1. Hazardous decomposition products:

Decomposition temperature: > 350 °C

300 - 350 °C: possible formation of: Monomer and oligomer (white fumes)

Thermal decomposition giving toxic and corrosive products: Carbon monoxide, Ammonia, Amino derivatives

Temperature exceeding 500 °C: Formation of toxic products through combustion: Carbon oxides, Hydrogen cyanide (hydrocyanic acid), (traces)

## 11. Toxicological information

All available data on this product and/or the components quoted in section 3 and/or the analogue substances/metabolites have been taken into account for the hazard assessment.

### 11.1. Information on toxicological effects:

#### Acute toxicity

**Inhalation:** Inhalation of vapours due to thermal decomposition; Risk of irritation of respiratory system, Toxic effects cannot be excluded

**Ingestion:** Polymer: According to its composition, this product should not be harmful in normal conditions of use

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

**Local effects (Corrosion/Irritation/Serious eye damage)**

**Skin contact:** Polymer: According to its composition, can be considered as Slightly or not irritating to skin.

Contact with the product, when handled at high temperatures, can cause serious burns.

At high temperature, products of thermal decomposition can be irritating to skin.

**Eye contact:** Polymer: According to its composition, can be considered as Slightly or not irritating to eyes.

Contact with the product, when handled at high temperatures, can cause serious burns.

At high temperature, products of thermal decomposition can be irritating to eyes.

**Respiratory or skin sensitisation**

**Inhalation:** No data available.

**Skin contact:** According to its composition, can be considered as Not a skin sensitizer No reported effect on man in industry

**CMR effects**

**Mutagenicity:** Polymer: According to its composition, this product should not be harmful in normal conditions of use Contains no ingredient listed as a mutagen

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

**Reproductive toxicity**

**Fertility:** Polymer: According to its composition, this product should not be harmful in normal conditions of use

**Foetal development:** Polymer: According to its composition, this product should not be harmful in normal conditions of use

**Specific target organ toxicity**

**Single exposure**

**Inhalation:** Dust inhalation: Risk of irritation of respiratory system

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

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## 12. Ecological information

**Bioaccumulative potential:** To avoid bioaccumulation plastics should not be disposed in the sea or in other water environments.

**Persistence and degradability:** Inert polymer not biodegradable on the basis of its structure.

**Mobility in soil:** In the terrestrial environment, material is expected to remain in the soil.

**Results of 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.

**Toxicity:** Not expected to be acutely toxic, but material in pellet or bead form may mechanically cause adverse effects if ingested by waterfowl or aquatic life.

**Other adverse effects:** None known.

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## 13. Disposal considerations

**Waste treatment:** Dispose of in accordance with local regulations. Should not be released into the environment. Do not contaminate ponds, waterways or ditches with chemicals or used containers. Do not dispose as a common household waste. Sort out as plastic waste.

**Packaging:** Dispose of in accordance with local regulations.

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## 14. Transport information

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

## 15. Regulatory information

### 15.1. EU-Regulations

Contains no REACH substances with Annex XVII restrictions

Contains no substance on the REACH candidate list

Contains no REACH Annex XIV substances

Contains no substance subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals.

Contains no substance subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

Contains no substance subject to Regulation (EU) 2019/1148 of the European Parliament and of the Council of 20 June 2019 on the marketing and use of explosives precursors.

### 15.2. National regulations

REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling

and packaging of substances and mixtures (CLP)

REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE

RoHS – Directive 2011/65/EU

Prusa Polymers doesn't have any information about the content of hazardous substances in Prusament PA11 Carbon Fiber, these substances aren't used during production of filament. No measurements and analyses have been done, but based on information given by material suppliers, it is not expected any amount of hazardous substances in levels exceeding concentration described in Directive 2011/65/EU.

## 16. Other information

The information presented in this Material Safety Data Sheet (MSDS) is based on our best knowledge in combination with original MSDS provided by manufacturer. MSDS contains information on safety use, storage and disposal.

### Abbreviations:

**REACH:** Registration, Evaluation, Authorisation and restriction of chemical substances

**EC:** European Community

**PBT:** Persistent, Bioaccumulating, Toxic

**vPvB:** very Persistent, very Bioaccumulating

**PNOC:** Particulates Not Otherwise Classifiable Occupational Safety and Health Administration (OSHA)

**PEL:** permissible exposure limit

**TWA:** time-weighted average

**AFFF:** Aqueous film forming foam self-contained breathing apparatus (SCBA)

**IARC:** International Agency for Research on Cancer

**EC50:** Half maximal effective 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

### Disclaimer:

*The information contained herein is given in good faith and is accurate to the best of knowledge at the date indicated above. Users should consider this information only as additional. It is the user's responsibility to ensure that he is subject to no other obligations than those mentioned. No liability can be assumed for accuracy and completeness. It is the responsibility of the user to adapt the warnings to local laws and regulations. Safety information describes the product in terms of safety and can not be considered as technical information about the product.*