

# FFF Onyx Filament

## Safety Data Sheet

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Revision Date: 29/05/2017

Date of Issue: 03/04/2017

Version: 1.1

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier

Product form : Mixture  
Product Name : FFF Onyx Filament

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

#### 1.2.1. Relevant identified uses

Use of the substance/mixture : MarkForged 3D printing material

#### 1.2.2. Uses advised against

No additional information available

### 1.3. Details of the supplier of the safety data sheet

#### Company

MarkForged, Inc  
10 Fawcett Street, Suite 1  
Cambridge, MA, 02138  
T: 844-700-1035 (9:00 A.M to 6:00 P.M. EST)  
[support@markforged.com](mailto:support@markforged.com)  
[www.markforged.com](http://www.markforged.com)

### 1.4. Emergency telephone number

Emergency number : 844-700-1035 (9:00 A.M to 6:00 P.M. EST)

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

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

Not classified

### Adverse physicochemical, human health and environmental effects

No additional information available

### 2.2. Label elements

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

EUH-statements : EUH210 - Safety data sheet available on request

### 2.3. Other hazards

Other hazards not contributing to the classification : Exposure may aggravate pre-existing eye, skin, or respiratory conditions. There is the risk of thermal burns on contact with hot or molten material. Irritating fumes may be given off during processing or normal conditions of use, ensure adequate ventilation. Fibers are not expected to be released under normal conditions of use. If the product is altered outside of its intended use, and dust is formed, proper precautions should be taken to ensure material is not respired. Product contains ingredients that are combustible dusts. Under normal conditions of use, this product is not expected to generate dust, however, if dust is generated take appropriate precautions for a combustible dust hazard - do not generate dust during clean-up, use non-sparking tools, vacuum cleanup is preferred however utilize dust suppressants if necessary, do not allow dust to accumulate in the workplace, utilize proper ventilation systems with explosion relief valves. This product and any fibers or dust are electrically conductive and may interfere with electrical systems and processes, use proper precautions.

## SECTION 3: Composition/information on ingredients

### 3.1. Substance

Not applicable

### 3.2. Mixture

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Carbon	(CAS No) 7440-44-0 (EC no) 231-153-3;931-328-0	10-20	Not classified

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Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
.epsilon.-Caprolactam	(CAS No) 105-60-2 (EC no) 203-313-2 (EC index no) 613-069-00-2	2-8	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335

Full text of H-statements: see section 16

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

- First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
- First-aid measures after inhalation : When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.
- First-aid measures after skin contact : Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists. Cool skin rapidly with cold water after contact with molten product. Removal of solidified molten material from skin requires medical assistance.
- First-aid measures after eye contact : Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention. Removal of solidified molten material from the eyes requires medical assistance.
- First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Obtain medical attention.

### 4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use. Prolonged contact with large amounts of dust may cause mechanical irritation.
- Symptoms/injuries after inhalation : Not expected to present a significant inhalation hazard under anticipated conditions of normal use. For particulates and dust: Repeated or prolonged exposure to dust particles may result in fibrosis.
- Symptoms/injuries after skin contact : Prolonged exposure may cause skin irritation. Risk of thermal burns on contact with molten product.
- Symptoms/injuries after eye contact : May cause slight irritation to eyes.
- Symptoms/injuries after ingestion : Ingestion may cause adverse effects. Gastrointestinal irritation.
- Chronic symptoms : None known.

### 4.3. Indication of any immediate medical attention and special treatment needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

- Suitable extinguishing media : Water spray, dry chemical, foam, carbon dioxide.
- Unsuitable extinguishing media : Do not use a heavy water stream. Use of heavy stream of water may spread fire. Application of water stream to hot product may cause frothing and increase fire intensity.

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

- Fire hazard : Not considered flammable but may burn at high temperatures.
- Explosion hazard : Product is not explosive. Contains substances that are combustible dusts. If allowed to accumulate, may form combustible dust concentrations in air that could ignite and cause an explosion. Take appropriate precautions.
- Reactivity : Hazardous reactions will not occur under normal conditions.
- Hazardous decomposition products in case of fire : Thermal decomposition generates: Carbon oxides (CO, CO<sub>2</sub>). Hydrocarbons. Nitrogen oxides. Sulphur oxides. Hydrogen cyanide.

### 5.3. Advice for firefighters

- Precautionary measures fire : Exercise caution when fighting any chemical fire.
- Firefighting instructions : Use water spray or fog for cooling exposed containers. Do not breathe fumes from fires or vapours from decomposition.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

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Other information : Do not allow run-off from fire fighting to enter drains or water courses. Do not add water to molten material as this may cause spattering.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : Avoid prolonged contact with eyes, skin and clothing. Avoid breathing dust. Avoid generating dust.

#### 6.1.1. For non-emergency personnel

Protective equipment : Use appropriate personal protective equipment (PPE).

Emergency procedures : Evacuate unnecessary personnel.

#### 6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

Emergency procedures : Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.

### 6.2. Environmental precautions

Prevent entry to sewers and public waters. This material will sink and disperse along the bottoms of waterways, once in water it is not easily removed, however is non-hazardous to the aquatic environment.

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

For containment : Contain solid spills with appropriate barriers and prevent migration and entry into sewers or streams.

Methods for cleaning up : Clean up spills immediately and dispose of waste safely. Recover the product by vacuuming, shoveling or sweeping. Transfer spilled material to a suitable container for disposal. Avoid generation of dust during clean-up of spills. For particulates and dust: Vacuum clean-up is preferred. If sweeping is required use a dust suppressant. Contact competent authorities after a spill.

### 6.4. Reference to other sections

See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Additional hazards when processed : Contains substances that are combustible dusts. If allowed to accumulate, may form combustible dust concentrations in air that could ignite and cause an explosion. Take appropriate precautions. Risk of thermal burns on contact with molten product.

Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Avoid creating or spreading dust. Avoid breathing dust. Avoid prolonged contact with eyes, skin and clothing. Use appropriate personal protective equipment (PPE).

Hygiene measures : Handle in accordance with good industrial hygiene and safety procedures.

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

Technical measures : Comply with applicable regulations.

Storage conditions : Keep container closed when not in use. Store in a dry, cool and well-ventilated place. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.

Incompatible products : Strong acids, strong bases, strong oxidizers.

### 7.3. Specific end use(s)

MarkForged 3D printing material

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

.epsilon.-Caprolactam (105-60-2)		
EU	IOELV TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (dust and vapour)
EU	IOELV STEL (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (dust and vapour)
Austria	MAK (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (inhalable fraction)
Austria	MAK Short time value (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (inhalable fraction)
Belgium	Limit value (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (dust) 10 mg/m <sup>3</sup> (vapor)

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<b>.epsilon.-Caprolactam (105-60-2)</b>		
Belgium	Limit value (ppm)	2,2 ppm (vapor)
Belgium	Short time value (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup> (dust) 40 mg/m <sup>3</sup> (vapor)
Belgium	Short time value (ppm)	8,7 ppm (vapor)
Bulgaria	OEL TWA (mg/m <sup>3</sup> )	1,0 mg/m <sup>3</sup> (dust and vapor)
Bulgaria	OEL STEL (mg/m <sup>3</sup> )	3,0 mg/m <sup>3</sup> (dust and vapor)
Croatia	GVI (granična vrijednost izloženosti) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (dust and fume)
Croatia	KGVI (kratkotrajna granična vrijednost izloženosti) (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (dust and vapor)
Cyprus	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (dust or vapor)
Cyprus	OEL STEL (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (dust or vapor)
France	VLE (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (indicative limit-powder and vapor)
France	VME (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (indicative limit-powder and vapor)
Germany	TRGS 900 Occupational exposure limit value (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed-inhalable fraction, dust and vapor)
Gibraltar	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (dust and vapour)
Gibraltar	OEL STEL (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (dust and vapour)
Greece	OEL TWA (mg/m <sup>3</sup> )	20 mg/m <sup>3</sup> (vapor) 5 mg/m <sup>3</sup> (dust)
Greece	OEL TWA (ppm)	5 ppm (vapor)
Greece	OEL STEL (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (vapor)
Greece	OEL STEL (ppm)	10 ppm (vapor)
USA ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (inhalable fraction and vapor)
Italy	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (dust and vapor)
Italy	OEL STEL (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (Testing must measure dust and vapor at the same time-dust and vapor)
Latvia	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (dust and vapor)
Spain	VLA-ED (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (indicative limit value-dust and vapor)
Spain	VLA-EC (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (dust and vapor)
Switzerland	VME (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (inhalable dust)
Netherlands	Grenswaarde TGG 8H (mg/m <sup>3</sup> )	20 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust)
United Kingdom	WEL TWA (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (dust only) 10 mg/m <sup>3</sup> (dust and vapour)
United Kingdom	WEL STEL (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup> (dust only) 20 mg/m <sup>3</sup> (dust and vapour)
Czech Republic	Expoziční limity (PEL) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (dust) 10 mg/m <sup>3</sup> (vapor)
Denmark	Grænseværdie (langvarig) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (steam) 1 mg/m <sup>3</sup> (dust and powder)
Denmark	Grænseværdie (langvarig) (ppm)	2 ppm (steam)
Estonia	OEL TWA (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (dust and fume)
Estonia	OEL STEL (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (dust and fume)
Finland	HTP-arvo (8h) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
Finland	HTP-arvo (15 min)	40 mg/m <sup>3</sup>
Hungary	AK-érték	10 mg/m <sup>3</sup>

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<b>.epsilon.-Caprolactam (105-60-2)</b>		
Hungary	CK-érték	40 mg/m <sup>3</sup>
Ireland	OEL (8 hours ref) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
Ireland	OEL (15 min ref) (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup>
Lithuania	IPRV (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (dust and fume)
Lithuania	TPRV (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (dust and fume)
Luxembourg	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (powder and vapor)
Luxembourg	OEL STEL (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (powder and vapor)
Malta	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (dust and vapour)
Malta	OEL STEL (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (dust and vapour)
Norway	Grenseverdier (AN) (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (this norm is based on the sum calculation for the particulate and the gas form of this substance)
Norway	Grenseverdier (AN) (ppm)	10 ppm (this norm is based on the sum calculation for the particulate and the gas form of this substance)
Norway	Grenseverdier (Korttidsverdi) (mg/m <sup>3</sup> )	60 mg/m <sup>3</sup> (this Norm is based on the sum calculation for the particulate and the gas form of this substance, value calculated)
Norway	Grenseverdier (Korttidsverdi) (ppm)	15 ppm (this Norm is based on the sum calculation for the particulate and the gas form of this substance, value calculated)
Poland	NDS (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (vapor and inhalable aerosol fraction)
Poland	NDSCh (mg/m <sup>3</sup> )	15 mg/m <sup>3</sup> (inhalable fraction and vapor)
Romania	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (dust and vapor)
Romania	OEL STEL (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (dust and vapor)
Slovakia	NPHV (priemerná) (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (dust and vapor)
Slovakia	NPHV (Hraničná) (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (dust and vapor)
Slovenia	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (inhalable fraction, dust and vapor)
Slovenia	OEL STEL (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (dust and vapor)
Sweden	nivågränsvärde (NVG) (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (dust and vapor)
Sweden	kortidsvärde (KTV) (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (dust and vapor)
Portugal	OEL TWA (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (indicative limit value-inhalable fraction, dust and vapor)
Portugal	OEL STEL (mg/m <sup>3</sup> )	40 mg/m <sup>3</sup> (indicative limit value-dust and vapor)
Portugal	OEL chemical category (PT)	A5 - Not Suspected as a Human Carcinogen
<b>Carbon (7440-44-0)</b>		
Austria	MAK (mg/m <sup>3</sup> )	5 mg/m <sup>3</sup> (alveolar dust with <1% Quartz, respirable fraction)
Austria	MAK Short time value (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup> (alveolar dust with <1% Quartz, respirable fraction)
Poland	NDS (mg/m <sup>3</sup> )	4,0 mg/m <sup>3</sup> (natural-inhalable fraction) 1,0 mg/m <sup>3</sup> (natural-respirable fraction) 6,0 mg/m <sup>3</sup> (synthetic-inhalable fraction)

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### 8.2. Exposure controls

- Appropriate engineering controls : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Avoid creating or spreading dust. Ensure adequate ventilation, especially in confined areas. Maintain sufficient mechanical or natural ventilation to assure fiber concentrations remain below PEL/TLV. Use local exhaust if necessary. Power equipment should be equipped with properly designed dust collection devices. Ensure all national/local regulations are observed.
- Personal protective equipment : Not generally required. The use of personal protective equipment may be necessary as conditions warrant. Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection.



- Materials for protective clothing : Chemically resistant materials and fabrics.
- Hand protection : Wear protective gloves.
- Eye protection : Chemical goggles or safety glasses.
- Skin and body protection : Wear suitable protective clothing.
- Respiratory protection : If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.
- Thermal hazard protection : When working with hot material, use suitable thermally protective clothing.
- Other information : When using, do not eat, drink or smoke.

## SECTION 9: Physical and chemical properties

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

- Physical state : Solid
- Colour : No data available
- Odour : No data available
- Odour threshold : No data available
- pH : No data available
- Evaporation rate : No data available
- Melting point : No data available
- Freezing point : No data available
- Boiling point : No data available
- Flash point : No data available
- Auto-ignition temperature : No data available
- Decomposition temperature : No data available
- Flammability (solid, gas) : No data available
- Vapour pressure : No data available
- Relative vapour density at 20 °C : No data available
- Solubility : No data available
- Partition coefficient: n-octanol/water : No data available
- Viscosity : No data available
- Explosive properties : No data available
- Oxidising properties : No data available
- Explosive limits : No data available

### 9.2. Other information

- VOC content : Not applicable

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Hazardous reactions will not occur under normal conditions.

### 10.2. Chemical stability

Stable under recommended handling and storage conditions (see section 7).

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### 10.3. Possibility of hazardous reactions

Hazardous polymerization will not occur.

### 10.4. Conditions to avoid

Direct sunlight, extremely high or low temperatures, and incompatible materials.

### 10.5. Incompatible materials

Strong acids, strong bases, strong oxidizers.

### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Not classified (Based on available data, the classification criteria are not met)

<b>.epsilon.-Caprolactam (105-60-2)</b>	
LD50 oral rat	1210 mg/kg
LD50 dermal rabbit	1438 mg/kg
LC50 inhalation rat (Dust/Mist - mg/l/4h)	8,16 mg/l/4h
ATE CLP (dust,mist)	1,50 mg/l/4h

<b>Carbon (7440-44-0)</b>	
LD50 oral rat	> 10000 mg/kg

Skin corrosion/irritation : Not classified (Based on available data, the classification criteria are not met)

Serious eye damage/irritation : Not classified (Based on available data, the classification criteria are not met)

Respiratory or skin sensitisation : Not classified (Based on available data, the classification criteria are not met)

Germ cell mutagenicity : Not classified (Based on available data, the classification criteria are not met)

Carcinogenicity : Not classified (Based on available data, the classification criteria are not met)

<b>.epsilon.-Caprolactam (105-60-2)</b>	
IARC group	4

Reproductive toxicity : Not classified (Based on available data, the classification criteria are not met)

Specific target organ toxicity (single exposure) : Not classified (Based on available data, the classification criteria are not met)

Specific target organ toxicity (repeated exposure) : Not classified (Based on available data, the classification criteria are not met)

Aspiration hazard : Not classified (Based on available data, the classification criteria are not met)

Symptoms/Injuries After Inhalation : Not expected to present a significant inhalation hazard under anticipated conditions of normal use. For particulates and dust: Repeated or prolonged exposure to dust particles may result in fibrosis.

Symptoms/Injuries After Skin Contact : Prolonged exposure may cause skin irritation. Risk of thermal burns on contact with molten product.

Symptoms/Injuries After Eye Contact : May cause slight irritation to eyes.

Symptoms/Injuries After Ingestion : Ingestion may cause adverse effects. Gastrointestinal irritation.

Chronic Symptoms : None known.

Potential adverse human health effects and symptoms : Based on available data, the classification criteria are not met.

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general : Not classified.

<b>.epsilon.-Caprolactam (105-60-2)</b>	
LC50 fish 1	930 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

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<b>.epsilon.-Caprolactam (105-60-2)</b>	
EC50 Daphnia 1	> 500 mg/l (Exposure time: 48 h - Species: Daphnia magna Straus)
LC50 fish 2	1400 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 Daphnia 2	828 - 2920 mg/l (Exposure time: 48 h - Species: Daphnia magna)

### 12.2. Persistence and degradability

<b>FFF Onyx Filament</b>	
Persistence and degradability	Not established.

### 12.3. Bioaccumulative potential

<b>FFF Onyx Filament</b>	
Bioaccumulative potential	Not established.

<b>.epsilon.-Caprolactam (105-60-2)</b>	
BCF fish 1	< 1
Log Pow	-0,02

### 12.4. Mobility in soil

No additional information available

### 12.5. Results of PBT and vPvB assessment

No additional information available

### 12.6. Other adverse effects

Other information : Avoid release to the environment.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local, regional, national, and international regulations. Material should be recycled if possible.

Ecology - waste materials : Avoid release to the environment.

## SECTION 14: Transport information

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued. In accordance with ADR / RID / IMDG / IATA / ADN

<b>ADR</b>	<b>IMDG</b>	<b>IATA</b>	<b>ADN</b>	<b>RID</b>
<b>14.1. UN number</b>				
Not regulated for transport				
<b>14.2. UN proper shipping name</b>				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
<b>14.3. Transport hazard class(es)</b>				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
<b>14.4. Packing group</b>				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
<b>14.5. Environmental hazards</b>				
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No	Dangerous for the environment : No

### 14.6. Special precautions for user

No additional information available

### 14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Not applicable

## SECTION 15: Regulatory information

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

#### 15.1.1. EU-Regulations

Contains no REACH substances with Annex XVII restrictions



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Contains no substance on the REACH candidate list

Contains no REACH Annex XIV substances

### **.epsilon.-Caprolactam (105-60-2)**

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

### **Carbon (7440-44-0)**

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

VOC content : Not applicable

#### **15.1.2. National regulations**

No additional information available

#### **15.2. Chemical safety assessment**

No chemical safety assessment has been carried out

## **SECTION 16: Other information**

Date of Preparation or Latest Revision : 03/04/2017

Data sources : Information and data obtained and used in the authoring of this safety data sheet could come from database subscriptions, official government regulatory body websites, product/ingredient manufacturer or supplier specific information, and/or resources that include substance specific data and classifications according to GHS or their subsequent adoption of GHS.

Other information : According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Full text of H- and EUH-statements:

Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Skin Irrit. 2	Skin corrosion/irritation, Category 2
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation
H302	Harmful if swallowed
H315	Causes skin irritation
H319	Causes serious eye irritation
H332	Harmful if inhaled
H335	May cause respiratory irritation
EUH210	Safety data sheet available on request

Indication of Changes **No additional information available**

### Abbreviations and Acronyms

ACGIH – American Conference of Governmental Industrial Hygienists  
ADN – European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways  
ADR – European Agreement Concerning the International Carriage of Dangerous Goods by Road  
ATE - Acute Toxicity Estimate  
BCF - Bioconcentration Factor  
BEI - Biological Exposure Indices (BEI)  
BOD – Biochemical Oxygen Demand  
CAS No. - Chemical Abstracts Service Number  
CLP – Classification, Labeling and Packaging Regulation (EC) No 1272/2008  
COD – Chemical Oxygen Demand  
EC – European Community  
EC50 - Median Effective Concentration  
EEC – European Economic Community  
EINECS – European Inventory of Existing Commercial Chemical Substances  
EmS-No. (Fire) - IMDG Emergency Schedule Fire  
EmS-No. (Spillage) - IMDG Emergency Schedule Spillage  
EU – European Union  
ErC50 - EC50 in Terms of Reduction Growth Rate  
GHS – Globally Harmonized System of Classification and Labeling of Chemicals  
IARC - International Agency for Research on Cancer  
IATA - International Air Transport Association  
IBC Code - International Bulk Chemical Code  
IMDG - International Maritime Dangerous Goods

MARPOL - International Convention for the Prevention of Pollution  
NDS - Najwyższe Dopuszczalne Stezenie  
NDSch - Najwyższe Dopuszczalne Stezenie Chwilowe  
NDSP - Najwyższe Dopuszczalne Stezenie Pulapowe  
NOAEL - No-Observed Adverse Effect Level  
NOEC - No-Observed Effect Concentration  
NRD - Nevirsytinas Ribinis Dydis  
NTP – National Toxicology Program  
OEL - Occupational Exposure Limits  
PBT - Persistent, Bioaccumulative and Toxic  
PEL - Permissible Exposure Limit  
pH – Potential Hydrogen  
REACH – Registration, Evaluation, Authorisation, and Restriction of Chemicals  
RID – Regulations Concerning the International Carriage of Dangerous Goods by Rail  
SADT - Self Accelerating Decomposition Temperature  
SDS - Safety Data Sheet  
STEL - Short Term Exposure Limit  
TA-Luft - Technische Anleitung zur Reinhaltung der Luft  
TEL TRK – Technical Guidance Concentrations  
ThOD – Theoretical Oxygen Demand  
TLM - Median Tolerance Limit  
TLV - Threshold Limit Value  
TPRD - Trumpalaikio Poveikio Ribinis Dydis  
TRGS 510 - Technische Regel für Gefahrstoffe 510 - Lagerung von

# FFF Onyx Filament

## Safety Data Sheet

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

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IPRV - Ilgalaikio Poveikio Ribinis Dydis	Gefahrstoffen in ortsbeweglichen Behältern
IOELV – Indicative Occupational Exposure Limit Value	TRGS 552 – Technische Regeln für Gefahrstoffe - N-Nitrosamine
LC50 - Median Lethal Concentration	TRGS 900 - Technische Regel für Gefahrstoffe 900 – Arbeitsplatzgrenzwerte
LD50 - Median Lethal Dose	TRGS 903 - Technische Regel für Gefahrstoffe 903 - Biologische Grenzwerte
LOAEL - Lowest Observed Adverse Effect Level	TSCA - Toxic Substances Control Act
LOEC - Lowest-Observed-Effect Concentration	TWA - Time Weighted Average
Log Koc - Soil Organic Carbon-water Partitioning Coefficient	VOC – Volatile Organic Compounds
Log Kow - Octanol/water Partition Coefficient	VLA-EC - Valor Límite Ambiental Exposición de Corta Duración
Log Pow - Ratio of the equilibrium concentration (C) of a dissolved substance in a two-phase system consisting of two largely immiscible solvents, in this case octanol and water	VLA-ED - Valor Límite Ambiental Exposición Diaria
MAK – Maximum Workplace Concentration/Maximum Permissible Concentration	VLE – Valeur Limite D'exposition
	VME – Valeur Limite De Moyenne Exposition
	vPvB - Very Persistent and Very Bioaccumulative
	WEL – Workplace Exposure Limit
	WGK - Wassergefährdungsklasse

EU GHS SDS

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*