

SECTION 1 - IDENTIFICATION

COMPANY ADDRESS:

The Virtual Foundry, Inc
211 S Water St
Stoughton, WI 53589
USA

PRODUCT NAME: **Silicon Carbide Filamet™**

PRODUCT USE: Manufacture of metal parts by extrusion, injection-molding, or 3D printing.

SECTION 2 - HAZARDS IDENTIFICATION SUMMARY

(As defined by OSHA Hazard Communication Standard, 29 CFR 1910.1200)

PHYSICAL HAZARDS: Contact with product at elevated temperatures can result in thermal burns. Inhalation of dusts and vapors of melted material from this product may cause irritation of the eyes, nose, throat and respiratory system. May cause coughing or shortness of breath. Mechanical eye irritant. May cause tearing and redness. Mechanical skin irritant. Prolonged contact may cause skin abrasion, redness, itching. Irritating to the respiratory tract. Large overdoses may cause nervous system disturbances, and diarrhea. May cause nausea and vomiting. No long-term health effects are anticipated. No information available.

HAZARD STATEMENTS: Irritating to eyes and respiratory tract. Exposure may include persistent cough, shortness of breath.

OTHER HAZARDS: If small particles are generated during further processing, handling, or by other means, combustible dust concentrations in air may form.

SECTION 3 - COMPOSITION, INFORMATION OF INGREDIENTS

Base Material	CAS No.	%by Weight
Silicon Carbide	409-21-2	66.0 - 68.0
Chemical Name	CAS No.	%by Weight
2-Propenenitrile, polymer with 1,3-butadiene and ethenylbenzene	9003-56-9	trace
Binding Additive	Proprietary	trace
Poly(lactic Acid)	9051-89-2	< 20%

SECTION 4 - FIRST AID MEASURES

IF SWALLOWED: Immediately rinse mouth and drink plenty of water. Keep the person under observation. If a person becomes uncomfortable, seek hospital and bring these instructions.

IF ON SKIN OR CLOTHING: No known significant effects or critical hazards.

IF IN EYES: If irritation occurs during dust-raising work, flush with plenty of water for at least 15 minutes.

IF INHALED: If uncomfortable during dust-raising work: Move into fresh air and keep at rest.

MAIN SYMPTOMS: Redness, coughing and/or wheezing.

NOTE TO PHYSICIAN: Treat symptomatically.

SECTION 5 - FIRE FIGHTING MEASURES**FLAMMABILITY**

AUTOIGNITION TEMPERATURE: 388°C

SUITABLE EXTINGUISHING MEDIA: Use an extinguishing agent suitable for the surrounding fire.

UNSUITABLE EXTINGUISHING MEDIA: No information available.

SPECIFIC HAZARDS ARISING FROM THE CHEMICAL: In case of fire, toxic gasses may be formed.

HAZARDOUS COMBUSTION PRODUCTS:

EXPLOSION DATA

SENSITIVITY TO MECHANICAL IMPACT: Not sensitive.

SENSITIVITY TO STATIC DISCHARGE: No information available.

FIRE FIGHTING INSTRUCTIONS AND FIRE FIGHTING EQUIPMENT: No information available.

ADDITIONAL INFORMATION: Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

PERSONAL PROTECTIVE EQUIPMENT: Full protective clothing and self contained breathing apparatus.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: Avoid inhalation. Sources of ignition should be kept well clear.

ENVIRONMENTAL PRECAUTIONS: Sweep/shovel up. Avoid raising dust. Ensure adequate

ventilation.

METHODS FOR CLEANING UP: Avoid ingress of material into sewer systems.

SECTION 7 - HANDLING AND STORAGE

HANDLING: Processing machines must be fitted with local exhaust ventilation. Earth/ground all equipment. Protection against fire and explosion Avoid dust formation. Dust can form an explosive mixture with air. Provide exhaust ventilation. When the product is ground (chopped), dust explosion regulations should be noted.

STORAGE: Protect against moisture. Store material in dry rooms and always carefully seal again after portions of material have been withdrawn. Store at ambient temperatures. Avoid all sources of ignition: heat, sparks, open flame.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS

Base Material	CAS No.	%by Weight	ACGIH TLV (Mg/M ³)	OSHA PEL (Mg/M ³)
Silicon Carbide	409-21-2	66.0 - 68.0	4.0 (Resp.)	10.0 (Total) 4.0 (Resp.)

COMPONENT	OSHA PEL	ACGIH TLV	NIOSH IDLH
2-Propenenitrile, polymer with 1,3-butadiene and ethenylbenzene 9003-56-9	-	-	-

TLV: Threshold Limit Value over 8 hours of work.

PEL: Permissible Exposure Limit

ADDITIONAL PROTECTION: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

ENGINEERING CONTROLS

Engineering Measures:

EXPOSURE MONITORING

Exposure Limits: See table above.

Hygiene Measures: Avoid contact with eyes.

PERSONAL PROTECTIVE EQUIPMENT

Eye protection: Safety glasses with side-shields.

Skin protection: Avoid skin contact with molten polymer. Wear appropriate protective clothing to minimize risk of injury to the skin from contact with dust or physical abrasion. Long sleeved/impervious clothing if contact is probable and skin is sensitive. Protect contact with skin when processing; while material is hot, wear insulated safety gloves; wash hands after handling. Coveralls should be made from fire resistive materials which tend to not accumulate static charges. They should be designed in such a way as to avoid accumulation of dust in cuffs, pockets, etc.

Respiratory protection: No information available.

Hand protection: While material is hot, wear insulated safety gloves; wash hands after handling.

Hygiene measures: Provide regular cleaning of equipment, work area and clothing. Handle in accordance with good industrial hygiene and safety practices. Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product. Avoid contact with eyes. Do not breathe dust. Use personal protective equipment as required.

Special hazard: No information available.

Environmental Protection: No information available.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Appearance:	Filament, Pellets
Color:	ish
Odor:	Slight
Odor Threshold:	No information available.
Melting/Freezing Point:	150-180°C (302- 356°F)
Boiling Point:	No information available.
Flash Point:	No information available.
Evaporation Rate:	No information available.
Flammability:	No information available.
Flammability Limits:	No information available.
Vapor Pressure:	Not applicable
Vapor Density:	Not applicable

Specific gravity:	2.7 - 3.95 (H2O=1)
Relative Density:	No information available.
Water Solubility:	Negligible (<0.1%), Insoluble in cold and hot water
Percent Volatile (v/v):	0%
Chemical Stability:	No information available.
Conditions to avoid:	No information available.
Solubility in other solvents:	Insoluble
Partition Coefficient:	No information available.
Auto-Ignition Temperature:	388°C
Hazardous Decomposition Products:	No information available.
Possibility of Hazardous Reactions:	No information available.
Hazardous Polymerization:	No information available.
Decomposition Temperature:	250°C
Viscosity:	No information available.
Explosive Properties:	No information available.
Oxidizing Properties:	No information available.
Other Information:	
Softening Point:	80-100°C
VOC Content (%)	negligible
Bulk Density:	0.8-1.3 g/cc (50-80 lb/ft ³)
MEC:	45-120 (g/m ³)
MIE:	4-13 (mJ)
KST:	90-300 (bar-m/sec)
MIT (layer):	650°C

SECTION 10 - STABILITY AND REACTIVITY

INCOMPATIBILITY:

CHEMICAL STABILITY: Stable under recommended storage conditions.

HAZARDOUS POLYMERIZATION: Will not undergo hazardous polymerization.

CONDITIONS & MATERIALS TO AVOID: Avoid moisture absorption. Avoid all sources of ignition: heat, sparks, open flame.

HAZARDOUS DECOMPOSITION PRODUCTS: Burning produces noxious and toxic fumes, Carbon monoxide (CO), Carbon Dioxide (CO₂). Exothermic reaction with water, acids, alkalis, to generate hydrogen and heat.

SECTION 11 - TOXICOLOGICAL INFORMATION

Principal routes of exposure: Skin contact.

PRODUCT INFORMATION:

Acute toxicity: None established.

Chronic toxicity: None established.

Specific effects: None established.

Long term toxicity: None established.

Mutagenic effects: None established.

Reproductive toxicity: None established.

Carcinogenic effects: This product contains one or more substances which are classified by IARC as carcinogenic to humans (Group I), probably carcinogenic to humans (Group 2A) or possibly carcinogenic to humans (Group 2B).

COMPONENT	ACGIH	IARC	NTP	OSHA
2-Propenenitrile, polymer with 1,3-butadiene and ethenylbenzene 9003-56-9	-	Group 3	-	--

Target organ effects: Eyes, Respiratory system.

Ingestion: May cause gastrointestinal discomfort if consumed in large amounts. Not an expected route of exposure.

Inhalation: Inhalation of dust in high concentration may cause irritation of the respiratory system.

Eye Contact: Dust contact with the eyes can lead to mechanical irritation.

Symptoms related to the physical, chemical, and toxicological characteristics: Redness.

Coughing and/or wheezing.

Delayed and immediate effects and also chronic effects from short and long term exposure:

Irritation: Product dust may be irritating to eyes, skin, and respiratory system.

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity: Pellets may be eaten by wildlife and should be swept up and placed in closed containers. EC50/72h/algae > 1100 mg/L

Persistence and degradability: Not readily biodegradable.

Bioaccumulation: Not expected to bioconcentrate or bioaccumulate.

Mobility: Is not likely mobile in the environment.

Other adverse effects: This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).

Ozone: Not applicable.

SECTION 13 - DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS: Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Incineration or landfill should only be considered when recycling is not feasible. Do not allow the material to enter water courses or the sewage system.

CONTAMINATED PACKAGING: Remove all packaging for recovery or disposal in line with the local authority regulations and EWC.

SECTION 14 - TRANSPORT INFORMATION

DOT: Not regulated.

MEX: Not regulated.

ICAO: Not regulated.

IATA: Not regulated.

IMDG: Not regulated.

UN NUMBER: N/A.

SECTION 15 - REGULATORY INFORMATION

DOT: This product is not regulated by USDOT as a Hazardous Material (49 CFR 172.101). No UN code assigned. No placard required for transportation.

SARA (TITLE III): Under applicable definitions, this material may meet the criteria for a delayed

(chronic) health hazard.

SARA (SECTION 313): Not Listed.

CALIFORNIA PROP. 65: Not Listed.

TSCA: Not Listed.

DSCL (EEC): Listed on the DSCL inventory.

RCRA HAZARDOUS WASTE NUMBER: Not Listed.

COMPONENT	SARA 313 – Threshold Values %
1,3-butadiene 106-99-0	0.1

Electrical equipment must be suitable for use in hazardous atmospheres involving Group E combustible dusts in accordance with 29CFR1910.307. Refer to the National Electrical Code (NFPA 70) for guidance in determining the type and design of equipment and installation which meets this requirement.

CLEAN AIR ACT, TITLE VI (1990): This product does not contain, nor was it manufactured using ozone depleting chemicals.

CALIFORNIA PROPOSITION 65: This product contains the following Proposition 65 chemicals:

COMPONENT	CALIFORNIA Prop. 65
1,3-butadiene	Carcinogen Developmental Female Reproductive

Inventory Status:

TSCA (USA): Listed*

DSL (Canada): Listed*

NDSL (Canada): Not Listed

EINECS (Europe): Listed*

AICS (Australia): Listed*

ENCS (Japan): Not Identified**

IECSC (People’s Republic of China): Listed*

PICCS (Philippines): Listed*

ECL (Korea): Listed*

ECN (Taiwan): Listed*

*"Listed" indicates that all components of this product comply with the inventory requirements administered by the governing country(s).

** Pure metals are not specifically identified by CAS or ENCS number.

SECTION 16 - OTHER INFORMATION, INCLUDING THE DATE OF PREPARATION OF THE LAST REVISION

LABEL REQUIREMENTS: Not expected to produce significant adverse health effects when the recommended instructions for use are followed.

NFPA HAZARD RATINGS	HEALTH	0
	FLAMMABILITY	1
	PHYSICAL HAZARD	0
	INSTABILITY	-
	4=Severe 3=Serious 2=Moderate 1=Slight 0=Minimal	

HMIS HAZARD RATINGS	HEALTH	0
	FLAMMABILITY	1
	PHYSICAL HAZARD	0
	PERSONAL PROTECTION	X
	4=Severe 3=Serious 2=Moderate 1=Slight 0=Minimal	

DISCLAIMER: The information provided in this SDS is based on available data from reliable sources and is correct to the best of The Virtual Foundry, Inc's knowledge. The Virtual Foundry, Inc makes no warranty, express or implied, regarding the accuracy of the data or the results obtained from the use of this product. Nothing herein may be construed as recommending any practice or any product in violation of any law or regulations. The user is solely responsible for determining the suitability of any material or product for a specific purpose and for adopting any appropriate safety precautions. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

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