



Support for ULTEM(TM) 9085 Filament

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations And According To The Hazardous Products Regulation (February 11, 2015)
Date of Issue: August 02, 2021 Version: 1.0

1. IDENTIFICATION OF THE SUBSTANCE AND COMPANY

Product Name: Support for ULTEM(TM) 9085 Filament

Synonym Names: None

Product Form: Mixture

Intended Use: Markforged 3D printing material

Uses Advised Against: No additional information available

Company: Markforged, Inc.
85 School Street
Watertown MA 02472
T: 866-496-1805 (9:00 A.M. to 6:00 P.M. EST)
support@markforged.com
www.markforged.com

Emergency Telephone Number: +1 703-527-3887/ 1-800-424-9300 (Chemtrec)

2. HAZARDS IDENTIFICATION

The additives in this product (if any) are bound in a thermoplastic resin matrix. In accordance with GHS for the classification of the product, the hazard potential may be assessed with respect to the physico-chemical form and/or bioavailability of the individual components in the thermoplastic resin. UN GHS says, that even if adverse effects are seen in animal studies or in-vitro tests, no classification is needed if the mechanism or mode of action is not relevant to humans. The European CLP Regulation also mentions, that no classification is indicated if the mechanism is not relevant to humans.

Where GHS classifications are shown below, these are based on the individual components in the thermoplastic resin matrix. Under the typical use conditions for the resin, these hazardous components are unlikely to contribute to workplace exposure. Please read the entire safety data sheet and/or consult an EHS professional for a complete understanding.

Classification

OSHA Regulatory Status

This product is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

GHS-Labeling

No labeling applicable according to 29 CFR 1910.1200 and the Hazardous Products Regulations (HPR) SOR/2015-17.

Hazards not otherwise classified (HNOC)

Not applicable.

Other hazards which do not result in classification:

Emergency Overview

- Filaments with slight or no odor.
- Spilled material may create slipping hazard.
- Can burn in a fire creating dense, toxic smoke.

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- Molten plastic can cause severe thermal burns.
- Fumes produced during melt processing may cause eye, skin, and respiratory tract irritation. Severe over-exposure may result in nausea, headache, chills, and fever.
- Secondary operations, such as grinding, sanding, or sawing can produce dust which may present an explosion or respiratory hazard.

Other Information

OSHA, IARC and/or NTP have listed carbon black, titanium dioxide, crystalline silica (quartz), respirable glass and certain heavy metals, present in some colorants and fillers, as carcinogens. If these materials are present in this product at significant quantities, they are shown in Section 2/3. These materials are essentially bound to the plastic matrix and are unlikely to contribute to workplace exposure under recommended processing conditions.

Processing Issues

Processing vapors may cause irritation to the eyes, skin, and respiratory tract. In cases of severe exposure, nausea and headache can also occur. Grease-like processing vapor condensates on ventilation ductwork, molds, and other surfaces can cause irritation and injury to skin.

Aggravated Medical Condition

MEDICAL RESTRICTIONS: There are no known health effects aggravated by exposure to this product. However, certain sensitive individuals and individuals with respiratory impairments may be affected by exposure to components in the processing vapors.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Product Type: Mixture

Hazardous components

Ingredient	Identifiers	Concentration	GHS Ingredient Classification
None			

Components which are considered potential hazards to health or the environment, if present above minimum concentrations, are listed above. Any concentration shown as a range is to protect confidentiality and/or is due to batch variation. Any non-hazardous components are being withheld as a trade secret. This product consists primarily of high molecular weight polymers which are not expected to be hazardous. Furthermore, any additives in this product are present within the polymer matrix and are not expected to be hazardous under recommended use conditions. Occupational exposure limits, if available, are listed in Section 8.

4. FIRST AID MEASURES

If Inhaled:	Move to fresh air in case of accidental inhalation of dust or fumes from overheating or combustion. If symptoms persist, call a physician.
In Case of Skin Contact:	Immediately cool the skin by rinsing with cold water after contact with hot material. Wash off immediately with soap and plenty of water. Consult a physician. If skin irritation persists, call a physician.
In case of Eye Contact:	Immediately flush eye(s) with plenty of water. Remove contact lenses, if present and easy to do. If eye irritation persists, consult a specialist.
If swallowed:	Not probable due to nature of the product. If accidentally swallowed, obtain immediate medical attention.
General advice:	Thermal decomposition can lead to release of irritating gases and vapors. Move the victim to fresh air. Obtain medical attention.

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5. FIRE-FIGHTING MEASURES

Autoignition Temperature	No information available.
Explosive Properties:	Not applicable.
Suitable Extinguishing Media:	Use dry chemical, CO ₂ , water spray or "alcohol" foam. Water is the best extinguishing medium. Carbon dioxide and dry chemical are not generally recommended because their lack of cooling capacity may permit re-ignition on larger resin fires (blobs, drools, etc.).
Unsuitable Extinguishing Media:	Do not use a solid water stream as it may scatter and spread fire.
Specific hazards during firefighting:	Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Material is not sensitive to mechanical impact.
Hazardous Combustion Products:	Fire will produce dense black smoke containing hazardous combustion products, carbon oxides, hydrocarbon fragments. If present, certain hazardous additives can also liberate halogenated hydrocarbons.
Further information:	Take precautionary measures against static discharges. During processing, dust may form explosive mixture in air. Thermal decomposition can lead to release of irritating gases and vapors.
Special protective equipment for firefighters:	Wear self-contained breathing apparatus for firefighting if necessary. Stay upwind/ keep distance from source.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Methods and materials for containment and cleaning up:	Sweep up and shovel into suitable containers for disposal. Do not create a powder cloud by using a brush or compressed air.
Personal Precautions:	Take precautionary measures against static discharges.
Environmental Precautions:	Do not flush into surface water or sanitary sewer system. Should not be released into the environment.

7. HANDLING & STORAGE

Advice on safe handling:	Handle in accordance with good industrial hygiene and safety practice. Provide for appropriate exhaust ventilation and dust collection at machinery. Avoid dust formation. All metal parts of the mixing and processing equipment must be earthed. Open containers only in well-ventilated area.
Conditions for safe storage:	Keep tightly closed in a dry and cool place. Keep away from heat and

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sources of ignition. Residual monomer vapors can accumulate in the headspace of closed containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits: Contains no substances with occupational exposure limit values.

Engineering Measures: Handle in accordance with good industrial hygiene and safety practice. Provide appropriate exhaust ventilation at machinery. Processing fume condensate may be a fire hazard and toxic; remove periodically from exhaust hoods, ductwork, and other surfaces using appropriate personal protection

Personal protective equipment

Eye Protection: Safety glasses with side-shields or chemical resistant goggles must be worn.

Hand Protection: Wear protective gloves.

Skin and Body Protection: Long-sleeved clothing.

Respiratory Protection: Use adequate ventilation and/or engineering controls in high temperature processing to prevent exposure to vapors. If dust or powder are produced from secondary operations such as sawing or grinding, use a respirator approved for protection from dust.

Protective measures: Wear suitable protective equipment.

Hygiene Measures: Do not eat, drink or smoke when using this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Filament
Physical State:	Solid
Colour:	Natural
Odour:	None or slight
Odour Threshold:	No information available
pH:	No data available
Melting point/range:	This product does not exhibit a sharp melting point but softens gradually over a wide range of temperatures.
Boiling point/boiling range:	Not determined
Flash point:	Not applicable
Flammability:	No information available
Upper explosion limit:	Not determined
Lower explosion limit:	Not determined
Vapor pressure:	Negligible
Vapour density:	Not determined
Relative density:	>1; (water = 1)
Density:	Not determined
Water solubility:	Insoluble
Solubility in other solvents:	Not determined
Partition coefficient: n-octanol/water:	No information available
Auto-ignition temperature:	630 °C estimated
Decomposition temperature (°C):	Not determined
Viscosity, dynamic:	Not applicable

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Viscosity, kinematic:

Not applicable

10. STABILITY AND REACTIVITY

Reactivity:	Stable under recommended storage conditions.
Chemical Stability:	Stable at normal ambient temperature and pressure. Hazardous polymerization does not occur.
Possibility of hazardous reactions:	No dangerous reaction known under conditions of normal use.
Conditions to avoid:	To avoid thermal decomposition, do not overheat. Heating can release hazardous gases. Do not exceed melt temperature recommendations in product literature. Purgings of hot material should be collected in small, flat, thin shapes and quenched with water to allow for rapid cooling. Do not allow product to remain in barrel at elevated temperatures for extended periods of time.
Incompatible Products:	No special restrictions on storage with other products.
Hazardous decomposition products:	Process vapors under recommended processing conditions may include trace levels of hydrocarbons, phenols, alkyphenols, diarylcarbonates, if present, certain hazardous additives can also liberate halogens, hydrohalogen acids or halogenated hydrocarbons.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product:

Acute oral toxicity:	>5000 mg/kg (estimated)
Acute dermal toxicity:	>2000 mg/kg (estimated)
Carcinogenicity:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC. No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA. No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Experience with human exposure

Product:

Inhalation:	Remarks: Inhalation unlikely due to physical form. Processing fumes evolved at recommended conditions may contain trace amounts of hazardous chemicals. Extreme processing conditions or temperatures may result in higher levels. Processing vapors may cause irritation to the eyes, skin, and respiratory tract. In cases of severe exposure, nausea and headache can also occur. Grease-like processing vapor condensates on ventilation duct work, molds, and other surfaces can cause irritation and injury to skin.
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Skin Contact:	Remarks: Not a hazard during normal industrial use. If present, some additives (like glass fiber or flame retardants) may cause skin irritation in susceptible persons.
Eye Contact:	Resin particles, like other inert materials, are mechanically irritating to eyes.
Ingestion:	Ingestion unlikely due to physical form.

Further information

Product:

Special Studies: The toxicological data has been taken from products of similar composition.

12. ECOLOGICAL INFORMATION

Ecotoxicity

No data available

Persistence and Degradability

No data available

Bioaccumulative Potential

No data available

Mobility in Soil

No data available

Other adverse effects

Product:

Additional ecological information: Do not flush into surface water or sanitary sewer system. Ecological injuries are not known or expected under normal use.

13. DISPOSAL CONSIDERATIONS

Waste from residues:	Where possible recycling is preferred to disposal or incineration. Empty containers should be taken to an approved waste handling site for recycling or disposal.
Contaminated Packaging:	Where possible recycling is preferred to disposal or incineration. Can be landfilled or incinerated, when in compliance with local regulations.

14. TRANSPORT INFORMATION

ADR: Not regulated as a dangerous good

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IMDG-Code: Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable for product as supplied.

IATA-DGR: Not regulated as a dangerous good

UNRTDG: Not regulated as a dangerous good

National Regulations

49 CFR (DOT): Not regulated as a dangerous good

15. REGULATORY INFORMATION

Chemical Inventories:

TSCA (USA): On TSCA Inventory

DSL (Canada): All components of this product are on the Canadian DSL

Other applicable national regulatory information

TSCA list

TSCA -5(a) Significant New Use Rule List of Chemicals

Not relevant

TSCA – 12(b) Export Notification List of Chemicals

Not relevant

EPCRA – Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS No.	Component RQ (lbs)	Calculated product RQ (lbs)
Methylene Chloride	75-09-2	1000	*

*Note: Calculated RQ exceeds reasonably attainable upper limit.

SARA 302 Extremely Hazardous Substance

This material does not contain any components with a SARA 302 RQ

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ

SARA 311/312 Hazards: No SARA Hazards

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302

SARA 313: This product does not contain any chemicals components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

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This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

California Proposition 65:

This product may contain the following components, known to the State of California to cause cancer and/or reproductive effects, as residual impurities:

Chemical Name	CAS No.	Concentration (%)
Methylene chloride	75-09-2	<=0.001
Quartz (Crystalline Silica)	14808-60-7	<=0.001
Bisphenol-A	80-05-7	<=0.01

Canadian National Pollutant Release Inventory (NPRI)

Chemical Name	CAS No.	Concentration (%)
Methylene chloride	75-09-2	<=0.001
Bisphenol-A	80-05-7	<=0.01

PBT

This product contains the following components listed in DSL which are classified as Persistent, Bioaccumulative and Toxic (PBT) in CEPA:

Chemical Name	CAS No.
Dodecamethylcyclhexasiloxane	540-97-36

WHMIS Classification: Not controlled.

This product has been classified according to the risk criteria of the CPR and the SDS contains all the information required by the CPP.

HMIS Rating

Health: 0

Flammability: 1

Physical Hazard: 0

16. OTHER INFORMATION

SDS Scope:

USA: Conforms to 29 CFR 1910.1200 (2012 OSHA Hazard Communication Standard) and The Hazardous Products Regulation (February 11, 2015).

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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End of Safety Data Sheet