

Safety Data Sheet

Ultrafuse® 316L metal filament

Revision date : 2022/10/07

Version: 3.0

Page: 1/12

(11123987/SDS_GEN_CA/EN)

1. Identification

Product identifier used on the label

Ultrafuse® 316L metal filament

Recommended use of the chemical and restriction on use

Recommended use*: 3D Printing

Unsuitable for use: Uses other than recommended

* The "Recommended use" identified for this product is provided solely to comply with a Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:

BASF 3D Printing Solutions B.V.
Eerste Bokslootweg 17
7821 AT Emmen, Netherlands

Contact address:

BASF Canada Inc.
5025 Creekbank Road
Building A, Floor 2
Mississauga, ON, L4W 0B6, CANADA
Telephone: +1 289 360-1300

Emergency telephone number

24 Hour Emergency Response Information

CHEMTREC: 1-800-424-9300

BASF HOTLINE: (800) 454-COPE (2673)

Other means of identification

Chemical family: Polymer

2. Hazards Identification

According to Hazardous Products Regulations (HPR) (SOR/2015-17)

Classification of the product

Skin Sens.	1	Skin sensitization
Carc.	2	Carcinogenicity
STOT RE	1	Specific target organ toxicity — repeated exposure

Safety Data Sheet

Ultrafuse® 316L metal filament

Revision date: 2022/10/07
Version: 3.0

Page: 2/12
(11123987/SDS_GEN_CA/EN)

Aquatic Chronic

3

Hazardous to the aquatic environment - chronic

Label elements

Pictogram:



Signal Word:
Danger

Hazard Statement:

H317	May cause an allergic skin reaction.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.

Precautionary Statements (Prevention):

P280	Wear protective gloves, protective clothing and eye protection or face protection.
P201	Obtain special instructions before use.
P260	Do not breathe dust/gas/mist/vapours.
P273	Avoid release to the environment.
P202	Do not handle until all safety precautions have been read and understood.
P270	Do not eat, drink or smoke when using this product.
P264	Wash contaminated body parts thoroughly after handling.
P272	Contaminated work clothing should not be allowed out of the workplace.

Precautionary Statements (Response):

P308 + P313	IF exposed or concerned: Get medical attention.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P333 + P313	If skin irritation or rash occurs: Get medical attention.
P362 + P364	Take off contaminated clothing and wash it before reuse.

Precautionary Statements (Storage):

P405	Store locked up.
------	------------------

Precautionary Statements (Disposal):

P501	Dispose of contents/container in accordance with local regulations.
------	---

Hazards not otherwise classified

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture. Upon mechanical treatment like e.g. cutting, grinding and/or polishing the product can release hazardous substances. Upon thermal and/or chemical treatment the product can release hazardous substances.

Labeling of special preparations (GHS):

This product is capable of releasing formaldehyde into the air. May cause cancer. This product is not combustible in the form in which it is shipped by the manufacturer, but may form a combustible dust through downstream activities (e.g. grinding, pulverizing) that reduce its particle size. UNDER HOT

Safety Data Sheet

Ultrafuse® 316L metal filament

Revision date: 2022/10/07
Version: 3.0

Page: 3/12
(11123987/SDS_GEN_CA/EN)

MELT PROCESSING CONDITIONS, WEAR PERSONAL PROTECTIVE EQUIPMENT TO PREVENT THERMAL BURNS.

3. Composition / Information on Ingredients

According to Hazardous Products Regulations (HPR) (SOR/2015-17)

Nickel

CAS Number: 7440-02-0
Content (W/W): $\geq 7.0 - < 25.0\%$
Synonym: No data available.

chromium

CAS Number: 7440-47-3
Content (W/W): $\geq 7.0 - < 25.0\%$
Synonym: No data available.

ethylene bis(oxyethylene)bis(3-(5-tert-butyl-4-hydroxy-m-tolyl)propionate)

CAS Number: 36443-68-2
Content (W/W): $> 0.0 - < 0.1\%$
Synonym: Benzenepropanoic acid, 3-(1,1-dimethylethyl)-4-hydroxy-5-methyl-, [1,2-ethanediylbis(oxy)]bis(2,1-ethanediyl) ester

molybdenum

CAS Number: 7439-98-7
Content (W/W): $\geq 0.3 - < 10.0\%$
Synonym: No data available.

Formaldehyde

CAS Number: 50-00-0
Content (W/W): $\geq 0.0 - < 10.0\text{PPM}$
Synonym: Formaldehyde; Formalin

4. First-Aid Measures

Description of first aid measures

General advice:

Remove contaminated clothing.

If inhaled:

Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. If symptoms persist, seek medical advice.

If on skin:

Wash thoroughly with soap and water Burns caused by molten material require hospital treatment. If irritation develops, seek medical attention.

If in eyes:

In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. If irritation develops, seek medical attention.

If swallowed:

Keep patient calm, remove to fresh air. Immediate medical attention required.

Safety Data Sheet

Ultrafuse® 316L metal filament

Revision date: 2022/10/07
Version: 3.0

Page: 4/12
(11123987/SDS_GEN_CA/EN)

Most important symptoms and effects, both acute and delayed

Symptoms: No applicable information available.

Information on: Nickel

Symptoms: Overexposure may cause: allergic contact dermatitis, nausea, headache, vomiting, dizziness, diarrhea, abdominal cramps

Information on: chromium

Symptoms: Overexposure may cause: asthma, circulatory collapse, gastrointestinal complaints, metal fume fever, shock

Indication of any immediate medical attention and special treatment needed

Note to physician

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Suitable extinguishing media:
water spray, foam, dry powder

Unsuitable extinguishing media for safety reasons:
No data available.

Special hazards arising from the substance or mixture

Hazards during fire-fighting:
Vapors/fumes may contain traces of combustible substances.

Advice for fire-fighters

Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:

Dusty conditions may ignite explosively in the presence of an ignition source causing flash fire.

6. Accidental release measures

Further accidental release measures:

Avoid dispersal of dust in the air (e.g. by clearing dusty surfaces with compressed air). Avoid the formation and build-up of dust - danger of dust explosion. Dust in sufficient concentration can result in an explosive mixture in air. Handle to minimize dusting and eliminate open flame and other sources of ignition.

Personal precautions, protective equipment and emergency procedures

Wear suitable personal protective clothing and equipment. Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice.

Safety Data Sheet

Ultrafuse® 316L metal filament

Revision date: 2022/10/07
Version: 3.0

Page: 5/12
(11123987/SDS_GEN_CA/EN)

Environmental precautions

Do not discharge into drains/surface waters/groundwater.

Dispose of in compliance with the environmental protection requirements.

Methods and material for containment and cleaning up

For small amounts: Sweep/shovel up.

For large amounts: Sweep/shovel up. Vacuum up spilled product.

Reclaim for processing if possible. Ensure adequate ventilation. Avoid raising dust.

Nonsparking tools should be used. After decontamination, spill area can be washed with water.

7. Handling and Storage

Precautions for safe handling

Avoid inhalation of dusts/mists/vapours. Ensure adequate ventilation. Provide suitable exhaust ventilation at the drying process and in the area surrounding the melt outlet of processing machines. Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges. Avoid the formation and deposition of dust.

Protection against fire and explosion:

Avoid dust formation. Dust in sufficient concentration can result in an explosive mixture in air. Handle to minimize dusting and eliminate open flame and other sources of ignition. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Refer to NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids (2013 Edition) for safe handling.

Conditions for safe storage, including any incompatibilities

Segregate from oxidizing agents.

Further information on storage conditions: Avoid extreme heat. Avoid deposition of dust.

Storage stability:

Protect against moisture.

The packed product is not damaged by low temperatures or by frost.

Protect from temperatures above: 165 °C

Changes in the properties of the product may occur if substance/product is stored above indicated temperature for extended periods of time.

8. Exposure Controls/Personal Protection

Components with occupational exposure limits

Safety Data Sheet

Ultrafuse® 316L metal filament

Revision date: 2022/10/07
Version: 3.0

Page: 6/12
(11123987/SDS_GEN_CA/EN)

molybdenum	OSHA Z1:	PEL 15 mg/m3 Total dust (molybdenum (Mo));
	ACGIH, US:	TWA value 3 mg/m3 Respirable particles ;
	ACGIH, US:	TWA value 10 mg/m3 Inhalable particles ;
	OSHA Z3:	TWA value 50 millions of particles per cubic foot of air Total dust ;
	OSHA Z3:	TWA value 15 mg/m3 Total dust ;
	OSHA Z3:	TWA value 5 mg/m3 Respirable fraction ;
chromium	OSHA Z1:	PEL 1 mg/m3 (Chromium (Cr));
	ACGIH, US:	TWA value 0.5 mg/m3 Inhalable fraction (Cr (0));
Nickel	ACGIH, US:	TWA value 1.5 mg/m3 Inhalable fraction ;
	OSHA Z1:	PEL 1 mg/m3 (nickel (Ni));

Advice on system design:

It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). Use only appropriately classified electrical equipment and powered industrial trucks.

Personal protective equipment

Respiratory protection:

Wear respiratory protection if ventilation is inadequate. Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator.

Hand protection:

Wear gloves to prevent contact during mechanical processing and/or hot melt conditions.

Use additional heat protection gloves when handling hot molten masses (EN 407), e.g. of textile or leather.

Eye protection:

Safety glasses with side-shields. Wear splash goggles to protect from hot molten substance/product.

Body protection:

Standard work clothes and shoes.

General safety and hygiene measures:

Avoid inhalation of dust. Wear protective clothing to prevent contact during mechanical processing and/or hot melt conditions. Wash soiled clothing immediately.

9. Physical and Chemical Properties

Form:	filament
Odour:	odourless
Odour threshold:	not applicable

Safety Data Sheet

Ultrafuse® 316L metal filament

Revision date: 2022/10/07
Version: 3.0

Page: 7/12
(11123987/SDS_GEN_CA/EN)

Colour:	grey
pH value:	not applicable, substance/mixture is non-soluble (in water)
Melting point:	165 °C
Boiling point:	not applicable
Flash point:	not applicable
Flammability:	Not a flammable solid according to UN transport regulations division 4.1 and GHS chapter 2.7. Based on the structure or composition there is no indication of flammability
Lower explosion limit:	For solids not relevant for classification and labelling.
Upper explosion limit:	For solids not relevant for classification and labelling.
Autoignition:	not applicable
Vapour pressure:	not applicable
Density:	5.4 - 5.8 g/cm ³ (20 °C)
Bulk density:	5 - 6 kg/m ³
Vapour density:	not applicable
Partitioning coefficient n-octanol/water (log Pow):	not applicable
Self-ignition temperature:	not self-igniting
Thermal decomposition:	> 300 °C No decomposition if stored and handled as prescribed/indicated. Thermal decomposition above the indicated temperature is possible. Prolonged thermal loading can result in products of degradation being given off.
Viscosity, dynamic:	not applicable
Viscosity, kinematic:	not applicable, the product is a solid
Solubility in water:	insoluble
Evaporation rate:	The product is a non-volatile solid.

10. Stability and Reactivity

Reactivity

Corrosion to metals:
No corrosive effect on metal.

Oxidizing properties:
Not an oxidizer.

Reactions with water/air:	Reaction with:	air
	Flammable gases:	no
	Toxic gases:	no
	Corrosive gases:	no
	Smoke or fog:	no
	Peroxides:	no

Safety Data Sheet

Ultrafuse® 316L metal filament

Revision date: 2022/10/07
Version: 3.0

Page: 8/12
(11123987/SDS_GEN_CA/EN)

Reaction with:	water
Flammable gases:	no
Toxic gases:	no
Corrosive gases:	no
Smoke or fog:	no
Peroxides:	no

Formation of flammable gases:	Remarks:	Forms no flammable gases in the presence of water.
-------------------------------	----------	--

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

The product is chemically stable.

No hazardous reactions if stored and handled as prescribed/indicated.

Conditions to avoid

Temperature: > 300 degrees Celsius

Prolonged exposure to elevated temperatures may result in exothermic decomposition accompanied by a pressure build-up in sealed containers. Avoid all sources of ignition: heat, sparks, open flame.

Incompatible materials

oxidizing agents

Hazardous decomposition products

Decomposition products:

Hazardous decomposition products: monomers, gases/vapours, oxides, hydrocarbons, cyclic low molecular weight oligomers, Gaseous products of degradation can be given off if the product is greatly overheated.

Hazardous decomposition products: monomers, gases/vapours, oxides, hydrocarbons

Thermal decomposition:

> 300 °C

No decomposition if stored and handled as prescribed/indicated. Thermal decomposition above the indicated temperature is possible. Prolonged thermal loading can result in products of degradation being given off.

11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: Inhalation of particulates may cause respiratory tract irritation.

Ingestion may cause gastrointestinal disturbances. Contact with molten product may cause thermal burns. The resin in pelleted form poses a low hazard.

Safety Data Sheet

Ultrafuse® 316L metal filament

Revision date: 2022/10/07
Version: 3.0

Page: 9/12
(11123987/SDS_GEN_CA/EN)

Oral

Type of value: ATE
Value: > 5,000 mg/kg

Inhalation

Type of value: ATE
Value: > 5 mg/l
Determined for dust

Assessment other acute effects

Based on available data, the classification criteria are not met.

Irritation / corrosion

Assessment of irritating effects: May cause mechanical irritation.

Skin

May cause mechanical irritation.

Eye

May cause mechanical irritation.

Sensitization

Assessment of sensitization: Sensitization after skin contact possible.

Information on: Nickel

Assessment of sensitization:

Sensitization after skin contact possible.

Aspiration Hazard

No aspiration hazard expected.

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: Repeated exposure may affect certain organs.

Information on: Nickel

Assessment of repeated dose toxicity: The substance may cause damage to the lung after repeated inhalation.

Genetic toxicity

Assessment of mutagenicity: The chemical structure does not suggest a specific alert for such an effect. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Carcinogenicity

Assessment of carcinogenicity: Contains a suspect carcinogen.

Information on: Nickel

Assessment of carcinogenicity: IARC (International Agency for Research on Cancer) has classified this substance as group 2B (The agent is possibly carcinogenic to humans). NTP listed carcinogen The American Conference of Governmental Industrial Hygienists (ACGIH) has classified this substance as Group A5 - not suspected as a human carcinogen.

Safety Data Sheet

Ultrafuse® 316L metal filament

Revision date: 2022/10/07
Version: 3.0

Page: 10/12
(11123987/SDS_GEN_CA/EN)

Reproductive toxicity

Assessment of reproduction toxicity: The chemical structure does not suggest a specific alert for such an effect. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Teratogenicity

Assessment of teratogenicity: The chemical structure does not suggest a specific alert for such an effect. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Other Information

The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

12. Ecological Information

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

Harmful to aquatic life with long lasting effects.

The product has not been tested. The statement has been derived from the properties of the individual components.

Aquatic toxicity

Information on: ethylene bis(oxyethylene)bis(3-(5-tert-butyl-4-hydroxy-m-tolyl)propionate)

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations. Very toxic to aquatic life with long lasting effects.

Persistence and degradability

Assessment biodegradation and elimination (H₂O)

The product is not very soluble in water and can thus be removed from water mechanically in suitable effluent treatment plants.

Assessment biodegradation and elimination (H₂O)

Information on: chromium

Not applicable for inorganic substances.

Information on: ethylene bis(oxyethylene)bis(3-(5-tert-butyl-4-hydroxy-m-tolyl)propionate)

Not readily biodegradable (by OECD criteria). The product can be virtually eliminated from water by abiotic processes e.g. adsorption onto activated sludge.

Safety Data Sheet

Ultrafuse® 316L metal filament

Revision date: 2022/10/07
Version: 3.0

Page: 11/12
(11123987/SDS_GEN_CA/EN)

Bioaccumulative potential

Assessment bioaccumulation potential

Information on: chromium

Does not significantly accumulate in organisms.

Information on: ethylene bis(oxyethylene)bis(3-(5-tert-butyl-4-hydroxy-m-tolyl)propionate)

Significant accumulation in organisms is not to be expected.

Additional information

The product contains:

The product contains the heavy metals listed in Section 3 and/or Section 8, which are fixed in a polymer matrix.

Add. remarks environm. fate & pathway:

The product has not been tested. The statements on environmental fate and pathway have been derived from the properties of the individual components.

Other ecotoxicological advice:

The product has been assessed on the basis of the components' available data. To some extent data gaps exist for individual components. According to our present knowledge and experience dangers which are not covered by the current labeling are not to be expected.

13. Disposal considerations

Waste disposal of substance:

Incinerate in a licensed facility. Do not discharge substance/product into sewer system.

Container disposal:

Dispose of in accordance with national, state and local regulations.

14. Transport Information

Land transport

TDG

Not classified as a dangerous good under transport regulations

Sea transport

IMDG

Not classified as a dangerous good under transport regulations

Air transport

IATA/ICAO

Not classified as a dangerous good under transport regulations

Safety Data Sheet

Ultrafuse® 316L metal filament

Revision date: 2022/10/07
Version: 3.0

Page: 12/12
(11123987/SDS_GEN_CA/EN)

15. Regulatory Information

Federal Regulations

Registration status:

Chemical DSL, CA released; restriction on quantity / not listed

NFPA Hazard codes:

Health: 2 Fire: 1 Reactivity: 0 Special:

16. Other Information

SDS Prepared by:

BASF 3D Printing NA Product Regulations

SDS Prepared on: 2022/10/07

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

Ultrafuse ® 316L metal filament END OF DATA SHEET