

Safety data sheet

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BASF Safety data sheet according to UN GHS 4th rev.

Date / Revised: 14.10.2019

Product: **Ultrafuse 316L**

Version: 2.0

(ID no. 961249/SDS_GEN_00/EN)

Date of print 16.11.2019

1. Identification

Product identifier

Ultrafuse 316L

| Recommended use: 3D Printing

Details of the supplier of the safety data sheet

Company:

BASF 3D Printing Solutions B.V.

Eerste Bokslotweg 17

7821 AT Emmen, Netherlands

Telephone: + 31 591 820 389

E-mail address: sales@basf-3dps.com

Emergency telephone number

National Poisoning Information Centre: +31 30 – 2748888

Information only for professionals in case of acute intoxication

International emergency number:

Telephone: +49 180 2273-112

2. Hazards Identification

Classification of the substance or mixture

According to UN GHS criteria

No need for classification according to GHS criteria for this product.

Label elements

Globally Harmonized System (GHS)

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The product does not require a hazard warning label in accordance with GHS criteria. The dangerous ingredients are fixed in a polymer matrix.

Other hazards

According to UN GHS criteria

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.

3. Composition/Information on Ingredients

Substances

Not applicable

Mixtures

Chemical nature

polymer blend based on: Alloy, metal powder
encapsulated, in a polymer matrix

Hazardous ingredients (GHS)

According to UN GHS criteria

Chromium

Content (W/W): $\geq 0\%$ - $< 25\%$	Acute Tox. 5 (oral)
CAS Number: 7440-47-3	Aquatic Chronic 4
EC-Number: 231-157-5	H413

Cobalt

Content (W/W): $\geq 0\%$ - $< 1\%$	Acute Tox. 4 (oral)
CAS Number: 7440-48-4	Resp. Sens. 1B
EC-Number: 231-158-0	Skin Sens. 1A
	Carc. 1B (by inhalation)
	Repr. 2 (fertility)
	Aquatic Chronic 4
	H302, H334, H317, H361, H350, H413

Nickel

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Content (W/W): $\geq 0\%$ - $< 20\%$	Skin Sens. 1
CAS Number: 7440-02-0	Carc. 2
EC-Number: 231-111-4	STOT RE 1
	Aquatic Acute 3
	Aquatic Chronic 3
	H317, H351, H372, H402, H412

For the classifications not written out in full in this section the full text can be found in section 16.

4. First-Aid Measures

Description of first aid measures

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.

On skin contact:

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

On contact with 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.

On ingestion:

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

Most important symptoms and effects, both acute and delayed

Symptoms: (Further) symptoms and / or effects are not known so far

Hazards: No hazard is expected under intended use and appropriate handling.

Indication of any immediate medical attention and special treatment needed

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

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
water spray, foam, dry powder

Special hazards arising from the substance or mixture

carbon oxides

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| The substances/groups of substances mentioned can be released in case of fire.

Advice for fire-fighters

Special protective equipment:

| Wear a self-contained breathing apparatus.

Further information:

| Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

6. Accidental Release Measures

| Avoid dispersal of dust in the air (i.e., clearing dust 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

| No special precautions necessary.

Environmental precautions

| Discharge into the environment must be avoided.

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.

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:

| The product is not an oxidizer, not self-combustible and not explosive. 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.

Conditions for safe storage, including any incompatibilities

Storage stability:

| Protect against moisture.

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

Protect from temperatures above: 165 °C

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

Specific end use(s)

For the relevant identified use(s) listed in Section 1 the advice mentioned in this section 7 is to be observed.

8. Exposure Controls/Personal Protection

Control parameters

Components with occupational exposure limits

7439-89-6: Iron
7440-02-0: Nickel
7440-47-3: Chromium
7440-48-4: Cobalt
7440-02-0: Nickel

Exposure controls

Personal protective equipment

Respiratory protection:

Breathing protection if breathable aerosols/dust are formed. Wear respiratory protection if ventilation is inadequate. Particle filter with medium efficiency for solid and liquid particles (e.g. EN 143 or 149, Type P2 or FFP2)

Hand protection:

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 (frame goggles) (e.g. EN 166)

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

General safety and hygiene measures

Wear protective clothing to prevent contact during mechanical processing and/or hot melt conditions. Store work clothing separately. Hands and/or face should be washed before breaks and at the end of the shift.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

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Form:	filament
Colour:	grey
Odour:	odourless
Odour threshold:	not applicable
pH value:	not applicable
Melting point:	165 °C
Boiling point:	not applicable
Flash point:	not applicable
Evaporation rate:	The product is a non-volatile solid.
Flammability:	not flammable
Lower explosion limit:	For solids not relevant for classification and labelling.
Upper explosion limit:	For solids not relevant for classification and labelling.
Ignition temperature:	not applicable
Vapour pressure:	not applicable
Density:	5,4 - 5,8 g/cm ³ (20 °C)
Relative vapour density (air):	not applicable
Solubility in water:	insoluble
Partitioning coefficient n-octanol/water (log Kow):	not applicable
Self ignition:	not self-igniting
Thermal decomposition:	No decomposition if stored and handled as prescribed/indicated. 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
Explosion hazard:	not explosive Product is not explosive, however a dust explosion could result from an air / dust mixture.
Fire promoting properties:	not fire-propagating

Other information

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Self heating ability: It is not a substance capable of spontaneous heating.

Radioactivity:

not radioactive for transport purposes

Bulk density: 5 - 6 kg/m³
 Hygroscopy: Non-hygroscopic
 Solids content: > 90 %

Other Information:

If necessary, information on other physical and chemical parameters is indicated in this section.

10. Stability and Reactivity

Reactivity

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

| Corrosion to metals: No corrosive effect on metal.

Reactions with water/air: Reaction with: air

Flammable gases: no
 Toxic gases: no
 Corrosive gases: no
 Smoke or fog: no
 Peroxides: no

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

| No hazardous reactions when stored and handled according to instructions.

Conditions to avoid

| Avoid dust formation. Avoid deposition of dust.

Incompatible materials

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Substances to avoid:
| oxidizing agents

Hazardous decomposition products

| Thermal decomposition products:
| Prolonged thermal loading can result in products of degradation being given off.

11. Toxicological Information

Information on toxicological effects

Acute toxicity

Assessment of acute toxicity:
| Contact with molten product may cause thermal burns.

Experimental/calculated data:
| (oral):No applicable information available.

| (by inhalation):The inhalation of dusts represents a potential acute hazard.

| (dermal):No applicable information available.

Information on: Iron

Assessment of acute toxicity:

Virtually nontoxic after a single ingestion. Virtually nontoxic by inhalation. The product has not been fully tested. The statements have been derived in parts from products of a similar structure or composition.

Irritation

Assessment of irritating effects:
May cause mechanical irritation.

Experimental/calculated data:
| Skin corrosion/irritation: May cause mechanical irritation.

| Serious eye damage/irritation: May cause mechanical irritation.

Information on: Iron

Assessment of irritating effects:

Not irritating to the skin. Not irritating to the eyes. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Respiratory/Skin sensitization

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Assessment of sensitization:

The chemical structure does not suggest a sensitizing effect. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Information on: Nickel

Assessment of sensitization:

Sensitization after skin contact possible.

Information on: Cobalt

Assessment of sensitization:

May cause sensitization by inhalation. May cause sensitization by skin contact.

Germ cell mutagenicity

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.

Information on: Iron

Assessment of mutagenicity:

Most of the results from the available studies show no evidence of a mutagenic effect.

Carcinogenicity

Assessment of carcinogenicity:

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.

Information on: Nickel

Assessment of carcinogenicity:

The results of various animal studies gave no indication of a carcinogenic effect. IARC (International Agency for Research on Cancer) has classified this substance as group 2B (The agent is possibly carcinogenic to humans).

Information on: Cobalt

Assessment of carcinogenicity:

In long-term studies in rats and mice in which the substance was given by inhalation, a carcinogenic effect was observed. IARC (International Agency for Research on Cancer) has classified this substance as group 2B (The agent is possibly carcinogenic to humans).

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.

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Information on: Cobalt

Assessment of reproduction toxicity:

The results of animal studies suggest a fertility impairing effect.

Developmental toxicity

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.

Information on: Cobalt

Assessment of teratogenicity:

Tests underway; results are still not available.

Specific target organ toxicity (single exposure)

Remarks: Based on available Data, the classification criteria are not met.

Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:

Repeated exposure to the substance by dermal administration leads to effects similar to those found after single exposure. Repeated exposure to the substance by inhalative administration leads to effects similar to those found after single exposure. Repeated exposure to the substance by oral administration leads to effects similar to those found after single exposure. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Information on: Nickel

Assessment of repeated dose toxicity:

The substance may cause damage to the lung after repeated inhalation.

Information on: Manganese

Assessment of repeated dose toxicity:

The substance may cause damage to the central nervous system after repeated inhalation of high doses.

Information on: Cobalt

Assessment of repeated dose toxicity:

The substance may cause increase in lung mass and lung tissue changes after repeated inhalation.

Aspiration hazard

| No aspiration hazard expected.

Other relevant toxicity 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

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Information on: Chromium

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms.

No toxic effects occur within the range of solubility.

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.

Information on: Chromium

Assessment biodegradation and elimination (H₂O):

Not applicable for inorganic substances.

Bioaccumulative potential

Bioaccumulation potential:

The product has not been tested. Because of the product's consistency and low water solubility, bioavailability is improbable.

Information on: Chromium

Assessment bioaccumulation potential:

May be accumulated in organisms.

Mobility in soil

Assessment transport between environmental compartments:

Adsorption in soil: Adsorption to solid soil phase is possible.

Other adverse effects

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The product does not contain substances that are listed in Regulation (EC) 1005/2009 on substances that deplete the ozone layer.

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 not been tested. The statements on ecotoxicology have been derived from the properties of the individual components.

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 treatment methods

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

Contaminated packaging:

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

14. Transport Information

Land transport

ADR

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

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	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

Inland waterway transport

ADN

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user:	None known

Transport in inland waterway vessel

Not evaluated

Sea transport

IMDG

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

Air transport

IATA/ICAO

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable

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Environmental hazards:	Not applicable
Special precautions for user	None known

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

Regulation:	Not evaluated
Shipment approved:	Not evaluated
Pollution name:	Not evaluated
Pollution category:	Not evaluated
Ship Type:	Not evaluated

15. Regulatory Information

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

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

16. Other Information

Full text of classifications, hazard symbols and hazard statements, if mentioned in section 2 or 3:

Acute Tox.	Acute toxicity
Aquatic Chronic	Hazardous to the aquatic environment - chronic
Resp. Sens.	Respiratory sensitization
Skin Sens.	Skin sensitization
Carc.	Carcinogenicity
Repr.	Reproductive toxicity
STOT RE	Specific target organ toxicity — repeated exposure
Aquatic Acute	Hazardous to the aquatic environment - acute
H413	May cause long lasting harmful effects to aquatic life.
H302	Harmful if swallowed.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.
H361	Suspected of damaging fertility.
H350	May cause cancer by inhalation.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure.
H402	Harmful to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification agreement. Identified uses in this safety data sheet do neither represent an agreement on the corresponding contractual quality of the substance/mixture nor a contractually designated use. It is the

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responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.

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