



STANFORD

ADVANCED MATERIALS



CuCr1Zr - copper alloy powder for additive processing (3D printing)

Revised at: 06.04.2020

Safety Data Sheet

1. Identification of the product and of the supplier

Supplier/Manufacturer // Application and use of the articles

Stanford Advanced Materials

This safety data sheet provides safety-information for following products:

CuCr1Zr - copper alloy powder for use in additive processing (3D printing)

Safety information and emergency contact:

Frank Otten Stanford Advanced Materials Phone: (949) 407-8904 Fax: (949) 812-6690 E-Mail: sales@samaterials.com	Stanford Advanced Materials 23661 Birtcher Dr., Lake Forest, CA 92630 U.S.A
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2. Hazard identification

Powder from Copper- and Copper alloys are preparations according to Regulation (EC) No.1907/2006 (REACH Regulation).

Signal word	Hazard pictogram	Category	Hazard statement	Precautionary statements
Warning		Aquatic Acute 1 Aquatic Chronic 3	H400: very toxic to aquatic life H412: harmful to aquatic life with long lasting effects	P273: Avoid release to the environment. P391: Collect spillage. P501: Dispose of contents/container to recycling or hazardous waste in accordance with local regulations.

If the product will subsequently processed in any way, which might produce airborne dust or fumes, for instance by handling, decanting, filling from drum into 3D-printing chamber, dry grinding of the produced 3D-part, abrading, electro discharge machining, melting or welding (the material itself) then an inhalation hazard for the worker could arise.

General handling and most machining operations are non-hazardous. Heat treatment in air up to about 400 °C is non-hazardous but higher temperatures may give rise to loss of oxide, which could cause hazardous inhalation. This could be avoid by treatment in inert atmosphere.

3. Composition / information on ingredients

Copper-metal in compact form. The chemical composition is subject to variations within standardized tolerances.

Material code: CuCr1Zr copper alloy powder

KME Material or Trade name	EN Material code (CEN/TS 13388:2013)	EN Material number (CEN/TS 13388:2013)	ASTM UNS-number
CuCr1Zr	CuCr1Zr	CW 106 C	C 18400

The classifications mentioned below reflect the classification of the responding **pure substance**.

CuCr1Zr components (respective to individual composition)

Number	Name of component	Classification	content
CAS: 7440-67-7 EINECS: 231-176-9	Zirconium	-	Max. 0,3 %
CAS: 7440-50-8 EINECS: 231-159-6	Copper	 Aquatic Acute 1 Aquatic Chronic 3	balance
CAS: 7440-47-3 EINECS: 231-157-5	Chromium	-	Max. 1,2 %

4. First aid measures

General information: There is no acute risk associated and no special measures required.

Exposure	Measures
Inhalation	In practice, exposure to powder could arise e.g. from operations while handling the powder to fill the 3D-processor, grinding or abrading the 3D-parts to clean them from loose powder, cleaning the process-chamber of the 3D-printing device,.... Ensure supply of fresh air. In the event of symptoms (e.g. influenza-symptom -> metal fever), refer to medical treatment.
Skin contact	Normally no skin irritation. Cleaning with water and soap and rinse with plenty water.
Eye contact	Rinse thoroughly with plenty of water and seek medical advice. Use normal industrial protection to protect against foreign bodies entering the eyes.
Ingestion	Strictly avoid eating, drinking, smoking at the workplace while handling the product. Use normal industrial hygiene. After ingestion disgorge little pieces, flush the mouth and it is recommended to drink 1 glass (200 ml) of fresh water. Symptoms could occur later -> refer to medical treatment.

5. Firefighting measures

Dispersive metal powder could cause the risk of explosive dust/air mixture.

suitable extinguishing agents	Use fire-extinguishing methods suitable to surrounding conditions. In case of metal powder-fire use class D or dry sand - Avoid using CO2-extinguisher, powder and water.
Protective equipment	Use filter equipment and protective clothing.

6. Accidental release measures

Personal Protection	Use filter P2/P3 in case of exposition of dust.
Environmental protection	- Collect spillage - Dispose of contents/container to recycling or hazardous waste in accordance with local regulations

7. Handling and storage

Handling and storage	Measure
Handling	- The floor of the shop-floor area should be sealed (e.g. concrete, tile), without sewer gully and easily to clean. - Ensure supply of fresh air/ exhaust filter system at shopfloor. Never spray the powder against open flame or hot surface. Hold equipment and working area clean and free from dust. - Hold any ignition source apart. Do not smoke.
Protection of personal health and environment	Control are only applicable to any process, which might produce air-borne dust, or fumes, which are subject to Health and Safety Executive Maximum Exposure as shown in chapter 8. Do not clean the equipment or the working area with pressed air (this will produce airborne dust). Use approved industrial vacuum cleaner or alternative: wipe wet.
Storage, Co-storage, maximum storage	- Storage indoor in original closed and labeled drums/container. Floor of the storage area should be sealed (e.g. concrete, tile), without sewer gully and easily to clean. - Storage strictly separated from food, medicine, animal feed, pyrophore, flammable or acut toxic substances, aerosol cans, ammoniumnitrat and ammoniumnitrat-containing preparations, explosive substances, organic peroxide

8. Exposure controls and personal protections

Limitation and control of the exposure at the working place

If breathable dust or smoke occurs, the exposition to workers must minimized with an exhaust filter system to meet the limit values. As an additional measure personal protection as a filter mask (P2,P3) or an independent breathing helmet may be used.

In general, any processing with metal-powder should be proceed in closed cabinets to avoid the exposition to the shop floor of the workers.

Occupational Exposure Limit Values for possible hazards during processing

Personal protective equipment	Recommendation
Respiratory	Use an industrial filter mask (type P2 or P3)
Hands	Protective gloves recommended, depending on the handling. Cleaning hands with soap and water before eating, drinking or smoking.
Eyes	Eye protection recommended, depending on the processing.
Body	Wear suitable protective clothing -> SingleUse-Clothing or professional cleaning of the clothing is obligatory. No cleaning of the clothing in private washing machine at home.

9. Physical and chemical properties

Parameter	description
Colour	copper red
State of aggregation	solid/powder particle size: 36-44 µm
Density	ca. 8,9 g/cm ³ as solid metal (Lit), ca. 4,9 g/cm ³ powder density
Solubility in water	unsoluble
Odour	odourless
Melting point	1075 – 1085 °C (Lit.)
Boiling point / boiling range	undetermined
Flash point	Not applicable
Ignition (solid, gaseous)	Not applicable
Explosion occurrence	- In case of melted metal risk of explosion by contact with water. - risk of explosive air/metal powder atmosphere

10. Stability and reactivity

Conditions to avoid: No decomposition if used to specification.

Contact to mercury, ammonia, ammonium chloride, ammonium hydroxide, ammonium nitrate, acetylene, chlorine-gas, hydrogen peroxide and various acids may be incompatibility.

A corrode reaction with uncontrolled heating effects could occur.

11. Toxicology information

General information:

By using and handling according to specifications, the article does not have any harmful effects to our experience.

Contact to skin: Not harmful. Avoid direct skin contact as preventive measure.

On eye: irritating effect due to dust.

Sensitization: no effect to our experience

12. Ecological information

GHS09: Environment

Signal word	Hazard pictogram	Category	Hazard statement	Precautionary statements
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PBT: not applicable

vPvB: not applicable

13. Disposal considerations / Recycling

KME confirm that the product could and should be recycled by end of life to 100% in accordance with Annex II to Directive 75/422/EEC for the recovery operation R4 (recycling / reclamation of metals). Classification according to the EU Waste Catalogue Ordinance.

KME got the authorization to receive and recover waste from copper and copper alloys each broken down by source:

Origin of the waste in according with EWC	EWC-Waste Code	Description
Waste metal	02 01 10	Waste metal
Slags from primary and secondary production	10 06 01	Slags from primary and secondary production
Other particulates and dust	10 06 04	Other particulates and dust
Furnace slag	10 10 03	Furnace slag
Other particulates other than those mentioned in 10 10 11	10 10 12	Other particulates other than those mentioned in 10 10 11
Wastes from copper hydrometallurgical process other than those mentioned in 11 02 05	10 02 05	Wastes from copper hydrometallurgical process other than those mentioned in 11 02 05
Waste from mechanical design processes	12 01 03	Non-ferrous metal chips
disassemble of old cars	16 01 18	Non-ferrous metal
Metals (including alloys)	17 04 01	copper, bronze, brass
Waste from shredding of metal-containing waste	19 10 02	Non-ferrous metal waste
Wastes from the mechanical processing (e.g. sorting, crushing)	19 12 02	Non-ferrous metal

EU-transboundary shipment of waste Directive

Classification	Waste Code	Description
B1 metals and metal containing waste, in massive form	B1010	Copper scrap

Contact KME or local metal dealer for recycling information.

14. Transport information

IMDG/ADR/IATA

This product is not regulated as a dangerous good when transported in sizes of less 5 L or less 5 kg, provides the packagings meet the general provisions of UN 3H1.

Public transport in original drum/container with class UN 3H1 or UN 1H2.

Labelling

UN 3077, Cargoes / Environmentally hazardous substance, solid, n.o.s



Apply suitable measures concerning load securing in due consideration to dimension and mass of the articles.

15. regulatory information

Labelling in accordance to the EC-regulations and SVHC candidate list

The product is not classified according to Regulation (EC) No. 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP regulation).

The product do not contain any of the particularly alarming substances (SVHC) mentioned in the candidate list in concentrations of more than 0.1% (w/w), at the time of the revision date of this information sheet.

(SVHC-candidate list for authorization updated by ECHA)

The product has a chemical composition in accordance with the below listed Directives of the European Parliament and of the Council and Council/Commission Decisions and mentioned regulations:

Item	Regulation
ELV	DIRECTIVE 2000/53/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 September 2000 on end-of life vehicles (so-called ELV) according amendment of Annex II (2008/689/EG)
GADSL	VDA 232-101 Global Automotive Declarable Substance List (GADSL)
RoHS-3 (assessment based on DIN EN 50581)	DIRECTIVE 2011/65/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 08 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. COMMISSION DELEGATED DIRECTIVE (EU) 2015/863 of 31 March 2015 amending Annex II to Directive 2011/65/EU (RoHS 3) COMMISSION DELEGATED DIRECTIVE (EU) 2017/2102 of 15 November 2017 amending Directive 2011/65/EU COMMISSION DELEGATED DIRECTIVE (EU) 2018/741 of 01 March 2018 amending Annex III to Directive 2011/65/EU <u>In case of lead-containing alloy applied exemption according annex III:</u> 6c) Copper alloy containing up to 4 % lead (w/w) (exemption extend until 21. July 2021)
DecaBDE	China-RoHS SJ/T 11363-2006)
WEEE	DIRECTIVE 2005/717/EG of 1st July 2008 Flame retardant DecaBDE in electrical and electronic appliances. For KME articles (semi-finished products), this directive is not applicable.
POP Stockholm Convention	POP-Directive REGULATION (EU) 2019/1021 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 June 2019 on persistent organic pollutants to recast and repealing EG/850/2004 and associated amendments
PFOS	Directive 2003/11/EG (Pentabromdiphenylether, Octabromdiphenylether) and 2006/122 EG (PFOS) of the EUROPEAN PARLIAMENT AND OF THE COUNCIL to change 76/769/EG for the use of dangerous substances and dangerous products. The products are free from PAH.
Ozone-Layer	Regulation (EC)1005/2009: Substances that Deplete the Ozone Layer
Packaging material	Directive 94/62/EC (packaging and packaging waste)
Siloxane	The products are free from Octamethylcyclotetrasiloxane (D4) (EC No: 209-136-7, CAS No: 556-67-2) and Decamethylcyclopentasiloxane (D5) (EC No. 208-764-9, CAS No. 541-02-6)
- Cr VI - asbestos - mercury, sulphur	The products are free from hexavalent chromium (CrVI) and asbestos. There is no use of mercury or sulphur as raw material in the manufacture of the products.

Seveso Directive

Annex	Number	Classification	amount lower category	Amount upper category
I	1.3.1	E1 aqua-toxic category: acute 1 or chronic 1	100 t	200 t

US State Regulations

TSCA	All alloy-components are listed on the TSCA (Toxic Substance Control Act) list or are exempt from. All alloy-components are listed on SARA Section 313
SARA Section 312	Reporting and/or labelling requirements may be applicable for the components (including unintentional trace elements) of as-supplied alloy bar-stock; check your State and Local Regulatory Requirements for any reporting and labelling requirements.

16. Disclaimer

We confirm that the information involved in the drawing up of this document are checked to the best of our knowledge for completeness, correctness and current relevance for a safe and proper use of our articles. These given data do not have the meaning of warranted characteristics of the specific delivered articles.

We shall inform our customers about mistakes, which transpire to exist in information included in this information sheet, as well as about amendments about which we become aware prior to a delivery.

