



Beryllium copper EU - Safety Data Sheet

EU - Safety Data Sheet Nr. 01 - D

(according to EU safety data sheet directives 91/155/EEC and 2001/58/EC, EU preparations directive 1999/45/EC, TRGS 220 safety data sheet according to parag. 6 GefStoffV (=hazardous materials directive))

High Strength Copper - Beryllium - Alloys

Date: 02.05.1994; last revision 25.08.2004; Version 03

1. Identification of the substance/mixture and of the company/undertaking

Product Detail :

Fingerstrip

Berylco 25	Berylco 165	Berylco 33-25
CuBe2	CuBe1,7	CuBe2Pb

Copper-beryllium alloys (CuBe alloys) are considered to be preparations.

Application of the substance / the preparation:
Relevant Identified uses of the substance or
Manufacturer / supplier:

Copper-beryllium alloys are used and further processed by professional users as semifinished materials/products – see section 7.3.
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2. Composition/information on ingredients

2.1 Chemical characterisation of the preparations

No labelling obligation, within the meaning of EU preparations directive 199/45/EC, exists for copperberyllium alloys in compact form.

2.2 Details of alloying constituents and their concentrations

Material [% by weight]	Berylco 25	Berylco 165	Berylco 33-25
Copper (Cu)	97,6 – 98,1	97,8 – 98,3	97,1 – 97,8
Beryllium (Be)	1,80 – 2,1	1,60 – 1,79	1,80 – 2,0
Cobalt (Co)	≤0,30	≤0,30	≤0,30
Lead (Pb)	-	-	0,20 – 0,60

2.3 Details of alloying constituents and their classification

Material identity	EINECS-No.	CAS-No.	INDEX-No.	Classification: Carcinogenic, Hazard symbol, R-phrases	
Beryllium (Be)	231-159-6	7440-50-8	-	-	-
Beryllium (Be)	231-150-7	7440-41-7	004-001-00-7	Carc. Cat. 1 / K1	R49 / R43 T+; R26 T; R25-48/23 Xi; R36/37/38
Cobalt (Co)	231-158-0	7440-48-4	027-001-00-9	K2	R42/43 R53
Lead (Pb)	231-100-4	7439-92-1	-	Repr.Cat.1/RE1 Repr.Cat3/RF3 (bioavailable)	R61; R62 Xn; R20/22 R33 N; R50-53

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3. Hazards identification

3.1 Classification of preparations

Alloys	Classification: carcinogenic	Classification: Hazard symbol, R-phrases			
Berylco 25	Carc.Cat. 1/K1	R49	T; R23	Xn; R48/20	R43
Berylco 165	Carc.Cat. 1/K1	R49	T; R23	Xn; R48/20	R43
Berylco 33-25	Carc.Cat. 1/K1	R49; R61	T; R23	Xn; R48/20; R33	R43

These preparations are not subject to a labelling obligation within the meaning of EU preparation directive 199/45/EC. Additional information is given under section 15./16.

3.2 Additional danger instructions for humans and the environment

In compact form the alloys are of no direct danger to humans and the environment. If respirable beryllium particles (dust, smoke, vapour) are produced during further processing, e.g. through grinding, spark erosion, welding or melting, there is a danger sensitization and the risk of serious lung disease - chronic beryllium disease (CBD).

- R49: Can cause cancer when inhaled - the classification (Carc.Cat. 1/K1) applies to the alloying element beryllium.
- R23: Also toxic when inhaled - Chronic Beryllium Disease (CBD) and R48/20: Also injurious to health: risk of serious injury to health through inhalation after long exposure - apply to the alloying element beryllium.
- R43: Sensitization through skin contact is possible - applies to the alloying element beryllium.
- R61: Can cause injury to the unborn child in the womb and " R33: Danger of cumulative effects apply to the alloying element lead.

4. First aid measures

4.1 General instructions

There is no direct danger to health in handling these alloys in compact form.

4.1.1 Following inhalation

In case of difficult breathing after inhaling particles (dust, smoke, vapour) - remove or bring the affected person from the working place into the fresh air. If breathing has stopped, carry out artificial respiration and consult a doctor immediately.

4.1.2 Following skin contact

Cuts should be treated by normal first aid. Remove foreign bodies which have penetrated the skin. Inclusions of copper-beryllium in the skin can cause beryllium sensitization. If skin reactions should occur consult a doctor.

4.1.3 Following contact with the eyes

No special protective measures are necessary. Do not allow particles from hand contact to get into the eyes since this may cause injury to the eyes or tissue. Remove foreign bodies by washing out with plenty of pure water. Consult a doctor immediately.

4.1.4 After swallowing

The alloys are not toxic, but swallowing of particles should be avoided. This applies particularly to hand-to-mouth contact during eating, drinking or smoking. Following accidental swallowing of dust or powder bring about vomiting immediately, following medical instructions. Under no circumstances should anything be poured down the throat of an unconscious person - in such cases consult a doctor.

4.2 Instructions for the doctor

- Beryllium: Sensitization, chronic beryllium disease (CBD); BK 1110.
- Lead: TRGS 505 (=Technical Rules for Hazardous Materials) Principles of Industrial, Preventive Medical Examinations of the (German) employer's liability insurance Association G2/G40.
- Cobalt: Sensitization/Copper: Metal smoke fever, For additional information - see section 11.1



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5. Firefighting measures

The alloys are not combustible. When fighting fires of molten metal do not use water to extinguish (danger of explosion) - but only suitable extinguishers for metal fires, such as dry sand or extinguishing powder.

6. Accidental release measures

Not relevant for alloys in compact form.

7. Handling and storage

7.1 Handling

No particular protective measures are necessary when handling these alloys in compact form. If particles (dust, smoke, vapour) occur, use a local dust extraction appliance - see section 8.2.1. However, wearing of protective gloves to protect against cuts, also in the presence of particles as protection against sensitization is recommended. Wear disposable protective gloves of nitrile or vinyl under the industrial protective gloves to eliminate mechanical risk - see 8.2.1.2.

7.2 Storage

No special protective measures are required; storage of the product together is not prohibited.

7.3 Certain applications

Copper-beryllium alloys are supplied by the firm Holland Shielding Systems BV as semifinished products, e.g. in the form of strips, rods, and plates. These alloys are used mainly in electromechanical components, e.g. as plug contacts, switch spring and relay springs.

8. Exposure controls/personal protection

8.1 Exposure limit values (air limit values)

Constituent (pure substance)	EINECS-No. CAS-No. Index-No.	Limit value [mg/m ³]	Dust content E	Dust content A	Working process/exposure equivalents for carcinogenic working substances (EKA) / Biological workplace tolerance values (BAT)
Copper (Cu) Copper smoke	231-159-6 7440-50-8	1E TLV*	Class M	-	
	-	0,1A TLV	-	Class H	
Beryllium (Be)	231-150-7 7440-41-7	0,005E TGC*	Class H	-	- Grinding of beryllium metal and alloys
	004-001-00-7	0,002E TGC	Class H	-	- Other applications
Cobalt (Co)	231-158-0 7440-48-4	0,5E TLV	Class H	-	- During mechanical processing - Other applications
	027-001-00-9	0,1E TLV EKA*)	Class H	-	- *) EKA (500µg/m ³ = 25µg/l whole blood)
Lead (Pb)	231-100-4 7439-92-1	0,1E TLV BAT*)	Class H	-	- *) BAT - details B = whole blood - 400µg/l (applies to men and women over the age 45) - 300µg/l (applies to men and women under the age 45)

*TLV = Threshold Limit Value *TGC = Technical Guide Concentration

According to European Standard EN 481 the following particle size fractions are defined:

L (light hazard): Dusts with limit value > 1 mg/m³

M (medium hazard): Dusts with limit value > 0.1 mg/m³

H (high hazard): All dusts with the limit value including carcinogenic substances and pathogens

TLV / TGC particle fraction **E** = breathable fraction and **A** = fraction passing into alveolar

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8.2 Limitation and monitoring of exposure

8.2.1 Limitation and monitoring of exposure at place of work

- All further processing work on these alloys which can liberate particles (dust, smoke, vapour) must be monitored and safeguarded. Possible exposure is to be minimised in such a way that the values in air at the place of work are as far as possible below the limit values – see section 8.1.
- The limit values in air are to be guaranteed by the use of an approved local dust extraction system, with a filter of application category K1 – see section 8.1. If it cannot be guaranteed that the limit values in air are maintained during working processes (e.g during repairs and maintenance or filter changing of the dust extraction system, melting and casting) suitable respiratory equipment (filter mask / isolating apparatus) and protective clothing must be used. Contaminated working clothes must be treated/cleaned in such a way that no secondary emission can occur (for protection of workers involved and other persons).
- The installation of local dust extraction systems (dust removal machines and appliances), and work with respiratory equipment (filter masks) must be inspected and released by the safety engineer. Protective measures are necessary for processes involving abrasive machining or cutting, grinding, polishing, spark erosion, welding, melting and casting. Further working processes which normally do not necessitate protective measures (assessment of danger potential required) are, e.g. stamping and bending, milling, turning, normal handling and heat treatment processes in air below approx. 400°C. Above this temperature the oxide layer can peel off, through which particles can be liberated. This can be minimised by heat treatment (hardening under protective gas).

8.2.1.1 Breathing protection

Filter respiratory equipment:

1.

Particle filter P2	Particle filter P3	In combination with: BIA-recommendation*)
10 times the limit value (GW)	30 times the limit value(GW)	Half/quarter mask or particle filtering half mask (FFP2/FFP3)
15 times the limit value	400 times the limit value	Full mask / mouthpiece set

2.

Particle filter apparatus with ventilator and full mask: BIA recommendation*)		Particle filter apparatus with ventilator and helmet or hood: BIA recommendation*)	
Apparatus class	Many times the GW	Apparatus class	Many times the GW
TH2P	20	TM1P	10
TH3P	100	TM2P	100
Isolating apparatus: BIA recommendation*)		TM2P	500

*) BIA recommendation (Institute for working safety of the German employer's Liability insurance association)

See also BGR 190 „Rules for the use of respiratory equipment” and “parag. 19, section 5, of GefStoffV (= Hazardous materials directive) - Limitation of wearing times.

- Filter type: particle filter P2 or P3, according to EN 141/143.
- Half mask, according to EN 140; or full mask according to EN 136.

8.2.1.2 Hand protection

Normal hygiene at the place of work should be observed. Gloves to protect against particles and cuts, e.g.:

- disposable protective gloves (EN 374/388/455) of Nitrile.
- disposable protective gloves (EN 455) of Vinyl.
- disposable protective gloves (EN 420) of Vinyl.
- disposable protective gloves for protection against particles, which may be worn under industrial working gloves as protection against cuts, e.g. leather protective gloves against mechanical danger (EN 388).



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8.2.1.3 Eye protection

Choice of eye safety glasses depends on particular further working processes involved, e.g. glasses with frames and side protection, basket/cage-type glasses or eye shields, according to EN 166.

9. Physical and chemical properties

9.1 General information

Appearance:

State of aggregation: solid

Colour: brass colour (gold)

9.2 Important information on health and environmental protection and safety

Density: 8.3 g/cm³ (all alloys).

Further characteristic data are not applicable for these alloys.

9.3 Other information

Melting point:

Alloys Berylco 25 and Berylco 33-25 = 866°C | Alloy Berylco 165 = 888°C

Further characteristic data are not applicable for these alloys.

10. Stability and reactivity

The alloys are stable. When used correctly for the intended purpose no decomposition takes place. Contact with acids can cause liberation of explosive hydrogen.

11. Toxicological information

In compact form the alloys are not hazardous for the environment. Water endangering class: not hazardous for water, according to appendix 1 VxVxS (= administrative regulations for water endangering materials).

12. Ecological information

12.1 Inhalation and skin contact

- Based on animal experiments with beryllium-containing materials the alloys are classified as possibly carcinogenic for humans when inhaled (Carc Cat. 1/K1 - T; R49). Cobalt is not classified as possibly carcinogenic in category 2 (K2) in the EU.
- Inhalation of particles (dust, smoke, vapour) of these alloys can cause the chronic beryllium disease (CBD) (T; R23 - Xn; R48/20)
- Inhalation of smoke can cause metal smoke fever.
- Through the beryllium content these alloys are classified as possibly sensitizing through skin contact (Xi; R43).
- Applies only to the alloy Berylco 33-25: Lead dust is ingested through swallowing and/or inhaling. Bioavailable metallic lead is considered to be a danger for reproduction -impairment of reproductiveness/fertility (RF3) and embryotoxic/risk to development of unborn child (RE1) - additional information: TGGS 505 (= Technical Rules for Hazardous Materials).

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13. Disposal considerations

- Non-contaminated and pure types of production waste of copper-beryllium allows can be reused. With regard to return deliveries of scrap metal, please contact Holland Shielding Systems BV.
- Mixed intermediate products, e.g. electrical/electronic scrap, should be returned to material circulation via the electronic scrap recycling chain. In this connection contact your responsible recycling partner/authority.
- Waste material list directive - AVV: e.g.. 120 103 (non-ferrous metal filings and turnings), 160 118 (non-ferrous metal), 191 203 (non-ferrous waste material) and 191 203 (non-ferrous metals). The regulations of AVV, parag. 3, sections 2 (Waste material classified as necessitating special monitoring) do not apply to pure metal alloys, as long as these are not contaminated with hazardous materials.
- According to the Basel Convention and OECD non-contaminated copper-beryllium alloys in compact form are subject to the „Green Control Mechanism“ as waste materials to be used for recycling - see appendix IX of the Basel Convention: B 1020 (Pure, non contaminated metal scrap, including alloys in solid, machinable form - beryllium scrap metal); B 1110 (Waste materials and scrap metal - beryllium): GA 120 (Waste materials and scrap metal - copper) : GC 010 (Electrical components consisting only of metal or alloys) and GC 020 (Electronic scrap metal, e.g. printed circuit boards, electronic components, wire etc and processed electronic components for reclaiming base metals and precious metals). No labelling obligation as hazardous materials is required.

14. Transport information

No national or international restrictions. No labelling obligation.

15. Regulatory information

15.1 Labelling

- Despite their classification as injurious to health (legal classification) these alloys are not a direct health risk in compact form. Therefore, according to EU directives 1999/45/EC and 67/548/EEC they are not subject to a labelling obligation if the labelling information is made available to the user in the safety data sheet.
- Labelling - see also section 3.1 and 16.1.

Copper-beryllium alloys: Berylco 25/Berylco 165 T-Toxic R: 49-23-43-48/20 S:63-45	Only for professional users. Metals and alloys in compact form are not subject to a labelling obligation
R - phrases: R49: Can cause cancer when inhaled. R23: Also toxic when inhaled. R43: Sensitization possible through skin contact. R48/20: Also injurious to health: risk of serious injury to health through inhalation after long exposure. Additional for alloy Berylco 33-25 R33: Danger of cumulative effects. R61: Can cause injury to the unborn child in the womb.	S - phrases: S53: Avoid exposure - obtain special instructions before using. S45: In case of an accident or indisposition consult a doctor immediately - if possible shown him/her this label.

15.2 National and international regulations

- Copper - beryllium alloys are not subject to any national or international restrictions in sale or application.
- TRGS 900 - applies to limit values in air at the place of work.
- TRGS 905 (Appendix 1 of directive 67/548/EWG) - List of carcinogenic, genetic changing or reproduction - endangering materials.
- Directive concerning the European waste materials list (Water material list directive - AVV).
- Water endangering class: Non hazardous to water according to appendix 1 VwVwS (= Administrative Regulations for Water Endangering Materials).
- Beryllium and beryllium-containing alloys are not included in the following EU directives on avoidance or prohibition: directives 200/53/EC (18.09.2000, 21.10.2000) and 2002/525/EC (27.06.2002, 29.06.2002) for used vehicles, directive 2002/95/EC (27.01.2003, 13.02.2003) on restriction of the use of certain hazardous materials in electrical and electronic appliances, directive 2002/96/EC (27.01.2003, 13.02.2003) on used electrical and electronic appliances.



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16. Other information

16.1 Complete wording of all R - phrases relating to sections 2 and 3

R - phrases	
R20	Injurious to health when inhaled.
R20/22	Injurious to health when inhaled and swallowed.
R23	Toxic when inhaled.
R25	Toxic when swallowed.
R26	Very toxic when inhaled.
R33	Danger of cumulative effects.
R36/37/38	Irritates the eyes, respiratory organs and skin.
R42/43	Sensitization possible through inhalation and skin contact.
R43	Sensitization possible through skin contact.
R48/20:	Injurious to health: Risk of serious injury to health through inhalation after long exposure.
R48/23:	Toxic: Risk of serious injury to health through inhalation after long exposure.
R49:	Can cause cancer when inhaled.
R50:	Very toxic for water organisms.
R53:	Can have long - term damaging effects in natural waters.
R61	Can injure the unborn child in the womb.
R62	Can possibly impair reproductiveness.