

Date: 7.9.2006

Former date:

1. IDENTIFICATION OF THE CHEMICAL AND OF THE MANUFACTURER, IMPORTER OR OTHER UNDERTAKING**1.1 Identification of the substance or preparation****Trade name**

Oxygen free copper OFE-OK®, OF-OK®
 Outokumpu High purity copper Cu99,995; Cu99,999; Cu99,9999
 Deoxidized copper Cu-DHP
 Nordic Brown™, DHP copper with dark, natural oxide layer
 Silver bearing oxygen free copper CuAg0,045(OF), CuAg0,04(OF), CuAg0,05(OF),
 CuAg0,10(OF), CuAg0,25(OF), CuAg0,45(OF), CuAg0,8(OF), CuAg1,0(OF),
 Silver bearing deoxidized copper CuAg0,10P, CuAg0,04P
 Zirconium bearing copper ZrK
 Tellurium bearing copper TE-OK®
 Aluminium bronzes Ap 105, Ap 106 (CuAl6Ni2), Ap 108, Ap 110, Ap 205
 Cupronickels NK 5, NK 25, NK 102, NK 103, NK 110, NK 130
 Nickel silvers CuNi9Zn10, CuNi12Zn24, CuNi18Zn20, CuNi18Zn17
 Tin bronzes CuSn, CuSn0,7, CuSn4, CuSn5, CuSn6, CuSn6P, CuSn8
 Silicon bronzes Pp103
 Manganese bronzes CuMn10Al2Sn, CuZn15Mn10
 Unalloyed bronzes CuZn15, CuZn17, CuZn20, CuZn28, CuZn30, CuZn36, CuZn37

Nordic Green™, chemical treatment of oxidized DHP-copper to achieve green patina layer on copper surface. (for further information on Nordic Green™ contact the manufacturer)

Code of the preparation**1.2 Use of the chemical****1.2.1 The intended uses of the chemical**

Electrical and architectural industry

1.2.2 Standard industrial classification (SIC)

3351

1.2.3 Use categories (UC62)**1.2.4 The chemical can be used by the general public**x**1.2.5 The chemical is used by the general public only****1.3 Identification of the manufacturer, importer or other undertaking****1.3.1 Manufacturer, importer, other undertaking**

Luvata Pori Oy

1.3.2 Contact information:**Street address**

Kuparitie

Postcode and post office

28101 Pori

Post-office box

P.O. Box 60

Postcode and post office

28101 Pori

Telephone number

+ 358 2 6266111

Telefax

+ 358 2 6265300

Y code

0709554 - 0

1.3.3 Information on foreign manufacturer**1.4 Emergency telephone****1.4.1 Telephone number, name and address**

Myrkytystietokeskus, Stenbäckinkatu 11, 00290 Helsinki
 Tel. +358 9 4711

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2. COMPOSITION AND INFORMATION ON INGREDIENTS			
2.1 Hazardous ingredients			
2.1.1 CAS number or other code	2.1.2 Name of the ingredient	2.1.3 Concentration Wt-%	2.1.4 Warning symbol, R phrases and other data on the ingredient
7440-50-8	Copper	63-99,9999	n.a.
7429-90-5	Aluminium	max 11,0	n.a.
7440-47-3	Chromium	max 0,2	n.a.
	Hydrogen*		n.a.
7439-89-6	Iron	max 4,0	n.a.
7439-96-5	Manganese	max 15	n.a.
	Nitrogen*		n.a.
7440-02-0	Nickel	max 32	Xn, R: 40-43
17778-80-2	Oxygen*		n.a.
7723-14-0	Phosphorus	max 0,06	n.a.
7440-21-3	Silicon	max 0,7	n.a.
7440-22-4	Silver	max 0,95	Xn
	Sulfur*		n.a.
7440-31-5	Tin	max 8,75	n.a.
13494-80-9	Tellurium	max 0,7	Xn (harmful), R: 20/22
7440-66-6	Zinc	max 37	n.a.
7440-67-7	Zirconium	max 0,9	n.a.

n.a. = not applicable
copper

* = in compounds on the surface of prepatinated

- 2.1.5 **There has been a request for confidentiality of a substance according to Annex 3 of the decree**
- 2.1.6 **A substance not dangerous has been indicated as confidential**
- 2.1.7 **Other information**

3. HAZARDS IDENTIFICATION

There is a danger of splashing in handling melt metal especially in case of moist raw material. Copper products in solid state do not present an inhalation ingestion or contact hazard. However, operations such as melting, welding, sawing, brazing and grinding may result in the following effects in the case of overexposure.

3.1.1 Metal fumes

Inhalation of excessive fume or dust concentrations may result in shiver, metal taste in mouth, headache, respiratory tract irritation and metal fume fever. Smoke is irritating to skin and eyes. Prolonged and repeated exposure may cause hemolysis, raising of the blood pressure and damage to kidney and liver.

3.1.2 Metal dust

Mechanical irritation may result from an accumulation of dust particles in the eye.

4. FIRST AID MEASURES

4.1 Special instructions

4.2 Inhalation

Move victim to fresh air. If not breathing, give artificial respiration or oxygen. Call a physician.

4.3 Skin contact

In case of irritation or sensitisation of the skin, immediately wash skin with copious amounts of water. Wash contaminated clothing before reuse. Wash hands before eating or smoking.

4.4 Eye contact

Flush thoroughly with copious amounts of water for 15 minutes. Call a physician.

4.5 Ingestion

Wash out mouth with water. Induce vomiting if conscious. Call a physician.

4.6 Information to doctor or other trained persons giving first aid

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5. FIRE-FIGHTING MEASURES

Copper is not flammable. However in the form of dust the explosion hazard is slight when exposed to flame.

5.1 Suitable extinguishing media

Foam, carbon dioxide (CO₂), dry chemicals.

5.2 Extinguishing media which must not be used for safety reasons

Water with molten copper.

5.3 Special exposure hazards in a fire

5.4 Special protective equipment for fire-fighters

5.5 Other instructions

Explosion hazards: Molten copper explodes on contact with water. Copper also forms a potentially explosive reaction with the following substances: acetylene compounds, ammonium nitrate, 3-bromopropyne, ethylene oxide and lead acid.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions

Wear gloves and approved respiratory protection if possibility of dust, mist and fume exposure exists.

6.2 Environmental precautions

Copper-containing waste is normally collected to recycle copper. Should waste disposal be deemed necessary, follow Federal, State or Local regulations.

6.3 Methods for cleaning up

Do not use compressed air for cleaning.

6.4 Other instructions

Shut off all sources of ignition. If dust is released sweeping is preferred. Place material in closed containers.

7. HANDLING AND STORAGE

7.1 Handling

Do not breathe dust or smoke. Avoid activities that raise dust or smoke. Avoid contact with the eyes and skin. Wash hands thoroughly after handling.

7.2 Storage

To be stored in normal dry warehouse.

7.3 Specific use(s)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Exposure limit values

Provide sufficient ventilation to maintain the concentration of dust below the admissible limit values.

8.1.1 HTP values

Cu 1 mg/m³ (Dust and Mist "alveolijae")/HTP-arvot vuonna 2005, Sosiaali- ja terveystieteiden ministeriön oppaita 2005:10

8.1.2 Other limit values

OSHA (8h TWA)

Dust and Mist as Cu 1 mg/m³

Copper fume 0,1 mg/m³

Tellurium 0,1 mg/m³

ACGIH (8h TWA)

Dust and Mist as Cu 1 mg/m³

Copper Fume 0,2 mg/m³

Aluminium 10 mg/m³ (dust)

Chromium 0,5 mg/m³

Iron oxide Fe₂O₃ 5 mg/m³ (dust and fumes)

Manganese 0,2 mg/m³

Nickel 0,1 mg/m³

Phosphorus 0,1 mg/m³ (dust)

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Silicon 10 mg/m³
Silver 0,1 mg/m³
Tellurium and compounds 0,1 mg/m³ (dust)
Tin 2 mg/m³
Zinc 5 mg/m³
Zirconium compounds as Zr 5 mg/m³

8.1.3 Limit values in other countries

8.2 Exposure controls

8.2.1 Occupational exposure controls

When handling molten copper, protective clothing against melt splashing, face shield, protective gloves and respirator if needed must be used. Avoid ingestion and inhalation of dust and fumes. Do not eat, drink or smoke during use and wash hands before eating, drinking or smoking.

8.2.1.1 Respiratory protection

NIOSH/MSHA approved respirator for dust, fume and mist.

8.2.1.2 Hand protection

Protective gloves against melt splashing.

8.2.1.3 Eye protection

Safety glasses or face shield in exposure to dust, fume or mist and when handling melt.

8.2.1.4 Skin protection

Protective clothing against melt splashing. Wear trouser legs outside boots to avoid melt entrance in the boots.

8.2.2 Environmental exposure controls

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 General information (physical state, colour and odour)

Solid form, reddish, gold, bronze or silver depending on alloy

9.2 Important health, safety and environmental information

9.2.1 pH

Not applicable for solid metal.

9.2.2 Boiling point/boiling range

Pure copper 2595°C

9.2.3 Melting range of alloys

1051-1083 °C

9.2.4 Flammability (solid, gas)

Finely divided powder may be flammable

9.2.5 Explosive properties

9.2.5.1 Lower explosive limit

9.2.5.2 Upper explosive limit

9.2.6 Oxidising properties

9.2.7 Vapour pressure

9.2.8 Relative density

7,6 - 8,95 g/cm³ depending on copper alloy

9.2.9 Solubility

9.2.9.1 Water solubility

Insoluble in water

9.2.9.2 Fat solubility (solvent-oil to be specified)

9.2.10 Partition coefficient: n-octanol/water

9.2.11 Viscosity

9.2.12 Vapour density

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9.2.13 Evaporation rate

9.3 Other information

10. STABILITY AND REACTIVITY

Copper and copper alloys stable under normal conditions

10.1 Conditions to avoid

10.2 Materials to avoid

Acetylene compounds, ammonia, ammonium chloride, ammonium hydroxide, ammonium nitrate, black liquor, 3-bromopropyne, chlorine (moist), chromic acid, copper chloride, copper nitrate, ethylene oxide, ferric chloride, ferric sulfate, hydrocyanic acid, hydrogen peroxide (>10%), hydrogen sulfide, lead acid, lime sulfur, mercury or its salts, nitric acid, picric acid, potassium cyanide, potassium dichromate, silver salts, sodium cyanide, sodium dichromate, sodium sulfide, sodium thiosulfate, sulfur (molten), sulfur chloride.

10.3 Hazardous decomposition products

Copper and copper alloys may produce an explosive reaction with the following substances: acetylene compounds, ammonium nitrate, 3-bromopropyne, ethylene oxide and lead acid. At temperatures above melting point metallic oxide fumes may be evolved. When welding and brazing, dust and fume may also be emitted. Metal machining and grinding operations may produce fine particles and dust.

11. TOXICOLOGICAL INFORMATION

11.1 Acute toxicity

11.2 Irritation and corrosiveness

Possibility of irritation of the bowels by swallowing, the eyes, skin and mucous membranes.

11.3 Sensitisation

Copper is not classified as a sensitive agent.

11.4 Sub-acute, sub-chronic and prolonged toxicity

Prolonged or repeated exposure to copper fumes or dusts may cause hemolysis, raising of the blood pressure and damage to kidney and liver.

11.5 Empirical data on effects on humans

Copper fumes or dusts may result in respiratory tract irritation, metal fume fever, shivers, metal taste in mouth, headache. Smoke may be irritating to skin and mucous membrane.

Smoke may be irritating to eyes. Ingestion may result in irritation of the bowels.

11.6 Other information on health effects

12. ECOLOGICAL INFORMATION

12.1 Ecotoxicity

12.1.1 Aquatic toxicity

12.1.2 Toxicity to other organisms

12.2 Mobility

12.3 Persistence and degradability

12.3.1 Biodegradation

12.3.2 Chemical degradation

12.4 Bioaccumulative potential

12.5 Other adverse effects

13. DISPOSAL CONSIDERATIONS

The material is 100 % recycleable and must be sent for remelting. The procedure is organised according to Federal, State or Local regulations.

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14.	TRANSPORT INFORMATION
14.1	UN number
14.2	Packing group
14.3	Land transport
14.3.1	Transport class
14.3.2	Risk code
14.3.3	Name according to bill of freight
14.3.4	Other information
14.4	Sea transport
14.4.1	IMDG class
14.4.2	Correct technical name
14.4.3	Other information
14.5	Air transport
14.5.1	ICAO/IATA class
14.5.2	Correct technical name
14.5.3	Other information
15.	REGULATORY INFORMATION
15.1	Information on the warning label
15.1.1	Letter code of the warning symbol and indications of danger for the preparation
15.1.2	Names of the ingredients given on the warning label
15.1.3	R phrases n.a
15.1.4	S phrases n.a
15.1.5	Special regulations on certain preparations
15.2	National regulations
16.	OTHER INFORMATION
16.1	List of the relevant R phrases
16.2	Training advice
16.3	Restrictions on use
16.4	Further information The information given on this data sheet is correct to the best of our knowledge, however, no claim, warranty or guarantee is made as to accuracy, reliability or completeness of this information. Luvata Pori Oy accept no liability whatsoever regarding the use or interpretation of its contents.
16.5	Sources of key data used Material safety data sheets of alloying elements provided by suppliers Copper Development Association Technical Data TN27 High Conductivity Coppers Metals Handbook, Ninth Edition, Vol. 2, the ASM Handbook Committee
16.6	Information which has been added, deleted or revised

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