

**Copper cathodes**

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

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**1.1 Product identifier:**

Trade name: copper cathodes

IUPAC name: copper

UN No.: not assigned

CAS No.: 7440-50-8

WE No: 231-159-6

Index number: not assigned

REACH registration No.: 01-2119480154-42-0002

**1.2 Relevant identified uses of the substance or mixture and uses advised against**Identified uses: for the production of: pipes, wires, alloys with other metals, heat exchangers, pharmaceuticals, pesticides, dyes, catalysts, wood impregnates.Uses advised against: not known**1.3 Details of the supplier of the material safety data sheet:**

Producer identification: KGHM Polska Miedź S.A.  
"Legnica" Copper Smelter & Refinery  
ul. Złotoryjska 194  
59-220 Legnica

Phone numbers:**Head of Copper Electrorefining Department:** (48 76) 747 53 01 – available: Mon. – Fri. 7<sup>15</sup> – 15<sup>15</sup>,**Head of Customer Service Section and Finished Products Warehouse** (48 76) 747 28 00 – available: Mon. – Fri. 7<sup>15</sup> – 15<sup>15</sup>,

Fax No: (48 76) 747 20 05

Person responsible for preparing the MSDS: phone No.: (+48 76) 747 52 06, e-mail: [karty.charakterystyki@kghm.pl](mailto:karty.charakterystyki@kghm.pl)**1.4. Emergency telephone number**Manufacturer (Poland): **(48 76) 747 50 02** – available 24/7**112** (General Emergency), **998** (Fire Dept.), **999** (Ambulance Service)

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**SECTION 2. Hazards identification**

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**2.1. Classification of the substance or mixture:**Classification according to Regulation No. 1272/2008 (CLP):

Not classified

Classification according to Directive 67/548/EWG:

Not classified

**2.2. Label elements:**

None

**2.3 Other hazards:**

Under normal conditions product is not hazardous for the human health or the environment. Fumes, dust and copper compounds are harmful. The harmfulness of copper for human and animals can manifest itself in changes in certain internal organs, brain tissue, coronary arteries. Symptoms of copper toxicity are relatively rare because of the wide tolerance of organisms. Copper

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dust and fumes cause eyes, nose and respiratory tract irritation and so-called copper fever (flu-like symptoms).

Copper is moderately toxic to aquatic organisms. Copper toxicity to fish is comparable to lead toxicity.

**SECTION 3. Composition/information on ingredients****3.1. Substances:**

<b>Composition</b>	<b>Percentage content</b>	<b>Classification according to Directive No. 67/548/EWG</b>	<b>Classification according to the Regulation No. 1272/2008 (CLP)</b>
<b>Cu</b> CAS No: 7440-50-8 WE No.: 231-159-6 Index No: not assigned	> 99,99 % b. w.	none	none

**3.2. Mixtures**

n/a

**SECTION 4. First Aid measures****4.1 Description of first aid measures:**

n/a

When processing of electrolytic copper in accordance with the law rules in force at the technology used.

General advice:

Get medical attention if you feel unwell.

Show this safety data sheet to the doctor in attendance.

Following inhalation:

In case of exposure to fumes, fine particulates, powders, flakes: move to fresh air, lay patient down, get medical attention if discomfort persists.

Following skin contact:

In case of contact with molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

Following eye contact:

Use general measures if eye irritations occur. Do not rub eyes. Remove any contact lenses.

Flush eyes thoroughly with water, taking care to rinse under eyelids. If discomfort continues, consult a physician.

After ingestion:

In case of significant oral intake (several mg Cu), rinse mouth and give 200-300 ml water to drink.

Do not induce vomiting.

Get medical attention if any discomfort continues.

**4.2. Most important symptoms and effects, both acute and delayed:**

n/a

Gastro-intestinal symptoms are the first symptoms for high oral intakes of soluble copper compounds. Vomiting may occur.

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The most critical organ for delayed effects from "copper" excess is the liver.

Nose-lung irritation may be a symptom occurring after inhalation of copper containing fumes/dusts/mists.

**4.3 Indication of any immediate medical attention and special treatment needed:**

Treat symptomatically.

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**SECTION 5. Firefighting measures**

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**5.1 Extinguishing media:**

Suitable extinguishing media: Non-flammable product. Use firefighting measures appropriate to the surrounding materials. The general fire precautions apply.

Extinguishing media which may be used where molten copper is present: sand, sodium chlorite.

Unsuitable extinguishing media where molten copper is present: water or halogenated extinguishing media.

**5.2 Special hazards arising from the substance or mixture:**

Respirable dust.

**5.3 Advice for fire-fighters:**

Personnel participating in extinguishing a fire should wear apparatus isolating respiratory ways.

The removal operations of the substances should be carried out using respiratory protective equipment, face shields and protective clothing.

General advice: Non-flammable substance. Use any means of extinction appropriate for the source of fire.

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**SECTION 6: Accidental release measures**

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During production and some uses, hazardous "copper" may be formed and therefore accidental releases of respirable copper-bearing particles and soluble copper compounds are considered.

**6.1 Personal precautions, protective equipment and emergency procedures:**

Avoid formation of dust.

Ensure adequate ventilation.

Avoid inhalation of dust and fumes.

Wear suitable protective equipment.

**6.2 Environmental precautions:**

Liquids containing powder should be absorbed in vermiculite, dry sand, or earth before putting into a suitable container for recycling or disposal as hazardous waste.

Collect dust, particulates, powders, flakes using a vacuum cleaner with a HEPA filter. Place in a suitable container for recycling or disposal as hazardous waste.

Although the substance is not classified as dangerous to the environment, in the event of an accidental release the product should be prevented from reaching the sewage system or any water course, and from penetrating the ground/soil. Dispose of spilled material in accordance with the relevant local regulations. See Section 13 for disposal considerations.

**6.3 Methods and material for containment and cleaning up:**

Avoid dust formation. Sweep all spilled material or use an appropriate industrial vacuum cleaner. Collect spilled material in suitable containers or closed plastic bags for recovery or disposal.

Dispose spilled material or contaminated material as waste. See section 13 for disposal considerations.

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For more information on exposure controls/personal protection or disposal considerations, check Sections 8 to 13 of this Material Safety Data Sheet.

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**SECTION 7. Handling and storage**

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**7.1 Precautions for safe handling:**

Copper is not classified in massive forms and no protective measures are needed for safe handling. Non-flammable product.

**7.2 Conditions for safe storage, including any incompatibilities:**

Avoid direct contact with strong acids.

**7.3 Specific end use(s):**

Identified uses are listed in section 1.2.

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**SECTION 8. Exposure control/personal protection**

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**8.1 Control parameters:**

The following current national occupational exposure limit values apply (Poland):

Copper and its compounds – calculated to Cu: for fumes (TLV-TWA, TLV-STEL) – TLV-TWA: 0,2 mg/m<sup>3</sup>, TLV-STEL: not assigned

Derived No Effect Levels (DNELs):

DNEL (Long-term – systemic effects) – 0,041 mg Cu/kg b.w./d (oral, dermal)

DNEL (Short-term – systemic effects) – 0,082 mg Cu/kg b.w./d (oral, dermal)

Predicted No Effect Concentrations (PNECs):

PNEC (Freshwater) – 7,8 µg/l

PNEC (Marine water) – 5,2 µg/l

PNEC (Sediment freshwater) – 87 mg/kg dry wt.

PNEC (Sediment marine) – 676 mg/kg dry wt.

PNEC (Soil) – 65,5 mg/kg dry wt.

PNEC (STP) – 230 mg/l

Additional information:

Regulation of the Minister of Labour and Social Policy of November 29th, 2002 on the highest allowable concentrations and intensities of agents harmful for health in the work environment (Official Journal 02.217.1833 with subsequent amendments);

Regulation of the Minister of Health of December 30th, 2004, on Safety at Work related to handling with chemicals in work environment (Official Journal 05.11.86, with subsequent amendments);

Determination in air at the workplace (Poland):

PN-91/Z-04030.05 – Determination of total dust at workplaces according to filtration and gravimetric method within the range 0,05-80,00 mg/m<sup>3</sup>;

PN-91/Z-04030.06 – Determination of respirable dust at workplaces according to filtration and gravimetric method within the range 0,05-80,00 mg/m<sup>3</sup>;

PN-Z-04008-7.2002 – Air purity protection – Sampling – Air sampling principles at occupational place and the interpretation of results;

PN-EN 689:2002 – Air at occupational place – Guidance for the assessment of inhalation exposure on chemical agents by comparison with limit values and measurement strategy;

PN-EN 482:2006 – Air at occupational place – General requirements for measurement procedures;

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PN-ISO 4225/Ak:1999 – Air quality – General issues – Terminology (national paper).

**8.2 Exposure controls:**

Avoid formation of dust. Ensure appropriate local exhaust ventilation with housing in the area of vapours/dust emission to aerial environment and general ventilation of the room.

Any deposit of dust which cannot be avoided should be regularly removed preferably using appropriate industrial vacuum cleaners or central vacuum systems.

Waste air should be released into the atmosphere only after it has passed through suitable dust separators.

Waste water generated during the production process or cleaning operations should be collected and should preferably be treated in an on-site waste water treatment plant which ensures efficient removal of copper.

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**SECTION 9. Physical and chemical properties**

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**9.1 Information on basic physical and chemical properties:**

Appearance: solid, copper colour. The particle size >1mm

Odour: odourless

Odour threshold: n/a

pH: n/a

Melting point: 1059-1069 °C

Initial boiling point: not applicable to a solid that melts > 300 °C

Flash point: not applicable to an inorganic solid

Self-ignition point: n/a

Evaporation rate: not applicable to an inorganic solid

Flammability: n/a

Explosive point: n/a

Vapour pressure: n/a

Vapour density: n/a

Density: about 11340 kg/m<sup>3</sup> (20 °C)

Solubilities:

- in water (20 °C): insoluble
- in acids (20 °C): depends on acid type and concentration
- in bases (20 °C): insoluble
- in organic solvent (20 °C): no data

Partition coefficient n-octanol/water: no data

Viscosity: n/a

Explosive properties: n/a

Oxidising properties: substance does not have an oxidising properties

**9.2 Other information:**

None

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**SECTION 10. Stability and reactivity**

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**10.1. Reactivity:** n/a (see section 9)

**10.2. Chemical stability:** under normal conditions and in absence of chemical agents exposure - the substance is stable.

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**10.3 Possibility of hazardous reactions:** with acids releases soluble copper compounds**10.4 Conditions to avoid:** avoid dust formation and contact with acids.**10.5 Incompatible materials:** strong acids**10.6 Hazardous decomposition products:** the element Cu<sup>0</sup> does not decompose but may be transformed into other metal forms (e.g. Cu<sup>2+</sup>) – see section 10.3.

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**SECTION 11. Toxicological information**

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**11.1 Information on toxicological effects:**Acute toxicity (oral):

On the basis of available data the classification criteria are not met.

Acute toxicity (inhalation):

On the basis of available data the classification criteria are not met.

Skin corrosion/irritation:

On the basis of available data the classification criteria are not met.

Serious eye damage/ eye irritating:

On the basis of available data the classification criteria are not met.

Respiratory tract or skin sensitization:

On the basis of available data the classification criteria are not met.

Germ cell mutagenicity:

On the basis of available data the classification criteria are not met.

Carcinogenicity:

On the basis of available data the classification criteria are not met.

Reproductive toxicity:

On the basis of available data the classification criteria are not met.

STOT-single exposure/ STOT-repeated exposure:

On the basis of available data the classification criteria are not met.

Aspiration hazard:

On the basis of available data the classification criteria are not met.

Concentration and lethal and toxic doses:

Copper: no data for metallic copper

(the following data refer to copper powders and fumes):

- LD<sub>50</sub> (mouse, oral): 0.7 mg/kg
- TDLo (human, oral): 0.12 mg/kg
- TCL<sub>0</sub> (human, inhalation): 0.001 mg/l
- LC<sub>50</sub> (rat, inhalation): no data
- LD<sub>50</sub> (rat, skin): no data

**11.2. Information on likely routes of exposure:**

Routes of absorption for copper: inhalation, ingestion (swallowing).

**11.3. Delayed and immediate effects as well as chronic effects from short and long-term exposure**

Detailed information on symptoms related to the product and the possible effects from exposure are described in Section 4.2.

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**SECTION 12. Ecological information**

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**12.1. Toxicity:** based on an assessment of compliance with the Regulation (EC) No 1272/2008 and Directive 67/548/EEC, copper massive does not meet the criteria for classification of chronic toxicity to aquatic organisms.

**12.2. Persistence and degradability:** cannot be degraded, but may be transformed between different phases, chemical species, and oxidation states.

**12.3. Bioaccumulative potential:** danger of cumulative effects in living organisms.

**12.4. Mobility in soil:** product poorly mobile in soil and in aquatic environment.

**12.5. Results of PBT and vPvB assessment:** do not apply to inorganic substances.

**12.6. Other adverse effects:** copper is not expected to contribute to ozone depletion, ozone formation, global warming or acidification.

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**SECTION 13: Disposal considerations**

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**13.1. Waste treatment methods**

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility.

Waste classification (waste catalogue – Official Journal No. 112, item 1206):

17 04 01 Copper, bronze, brass

17 04 07 Mixed metals

10 06 01 Sags from primary and secondary production

Legal basis: Act of April 27<sup>th</sup>, 2001 on waste (Official Journal No. 62, item 628 with subsequent amendments).

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**SECTION 14: Transport information**

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The general transport regulations apply. Covered transportation is recommended.

**14.1. UN number:** n/a

**14.2. UN proper shipping name:** n/a

**14.3. Transport hazard class(es):** n/a

**14.4. Packing group:** n/a

**14.5. Environmental hazards:** n/a

**14.6. Special precautions for user:** secure packages against displacement during transport

**14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:** n/a

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**SECTION 15: Regulatory information**

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

The substance is not covered by the regulations of the Regulation (EC) No. 2037/2000 of the European Parliament and Council of 29<sup>th</sup> June, 2000 on substances depleting ozone layer (Official Journal L 244 of 29.09.2000, with subsequent amendments) or the Regulation (EC) No. 850/2004 of the European Parliament and Council of April 29<sup>th</sup>, 2004, on permanent organic contamination and changing the Directive 79/117/EEC (Official Journal L 158 of 30.4.2004, with subsequent amendments).

The substance is not subject to regulations of the Regulation of the European Parliament and Council (EC) No. 689/2008 of June 17<sup>th</sup>, 2008 on export and import of hazardous chemicals (Official Journal L 204 of 31.07.2008, with subsequent amendments).



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Regulation (EC) No. 1907/2006 of the European Parliament and Council of December 18<sup>th</sup>, 2006 on Registration, Evaluation, Authorisation and Restriction of Chemical substances (REACH), creating European Chemicals Agency, changing the Directive 1999/45/EC as well as revoking the Council (EC) decree No 793/93 as well as the Commission Directive (EC) No. 1488/94 as well as the Council Directive 76/769/EWG and Council Directive 91/155/EEC, 93/67/EEC, 93/105/EC and 2006/21/EC.

Regulation of the European Parliament and Council (EC) No. 1272/2008 dated December 16<sup>th</sup>, 2008 on classification, marking and packing hazardous substances and mixtures, changing and revoking the Directive 67/548/EEC and 1999/45/EEC as well as changing the Regulation (EC) No. 1907/2006.

Regulation of the Commission (EC) No. 453/2010 of May 20<sup>th</sup>, 2010, changing the Regulation (EC) No. 1907/2007 of the European Parliament and Council on Registration, Evaluation, Authorisation and Restriction of Chemical substances (REACH) (Official Journal L 133 with subsequent amendments).

Act of April 27<sup>th</sup>, 2001, Environmental Protection Law (Official Journal 01.62.627 with subsequent amendments);

Act of April 27<sup>th</sup>, 2001, on waste (Official Journal No. 62, item 628, with subsequent amendments);

Regulation of the Minister of Environment of September 27<sup>th</sup>, 2001 on the waste catalogue (Official Journal No. 112, item 1206);

Act of May 11<sup>th</sup>, 2001, on packages and packages waste (Official Journal No. 63, item 638 with subsequent amendments);

Regulation of the Minister of Labour and Social Policy of November 29<sup>th</sup>, 2002 on the highest allowable concentrations and intensities of substances harmful for health in the work environment (Official Journal No. 217, item 1833, with subsequent amendments);

Regulation of the Board of Ministers of August 24<sup>th</sup>, 2004, on the list of works banned for adolescents and conditions of their employing for some works. (Official Journal No. 200, item 2047, with subsequent amendments);

Act of October 28<sup>th</sup>, 2002, on road transportation of hazardous goods (Official Journal No. 199, item 1671, with subsequent amendments);

Act of March 31<sup>st</sup>, 2004, on railway transportation of hazardous goods (Official Journal No. 97, item 962);

Regulation of the Minister of Economy of December 21<sup>st</sup>, 2005 on the essential requirements for personal protective equipment (Official Journal No. 259, item 2173);

Regulation of the Minister of Health of April 20<sup>th</sup>, 2005 on the testing and measurements of harmful factors at the work place (Official Journal No. 73, item 645);

Regulation of the Minister of Environment of August 20<sup>th</sup>, 2008 on classification methods of surface water bodies condition (Official Journal No 162, item 008);

Regulation of the Minister of the Environment of January 28<sup>th</sup>, 2009, amending the regulation on conditions to be met when sewage into water or soil and on substances particularly harmful to the aquatic environment (Official Journal No. 27, item 169);

Act of February 25<sup>th</sup>, 2011 on chemical substances and their mixtures (Official Journal No. 63, item 322);

**15.2. Chemical safety assessment**

Chemical safety assessment of the substance has been carried out. Copper Chemical Safety Report is available at KGHM Polska Miedź S.A. "Legnica" Copper Smelter & Refinery.

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**SECTION 16: Other information**

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Explanations of abbreviations and acronyms used in the MSDS:

**CAS number** – means numerical identification assigned to chemical substance by the American organization named Chemical Abstract Service (CAS), enabling substance identification.



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**WE number** – the number assigned to chemical substance in EINECS -. European Inventory of Existing Chemical Substances, or the number assigned to chemical substance in ELINCS – European List of Notified Chemical Substances or the number in chemical substances inventory included in “No-longer polymers” document.

**Index number** – it is an identification code given in part 3 of the annex VI to the Regulation of the European Parliament and Council (EC) No. 1272/2008 dated December 16th, 2008, on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006;

**Registration number** – number given by ECHA after substance/intermediate registration by the manufacturer/importer according to REACH Regulation.

**UN number** – unequivocal marking of hazardous substances and goods assigned by United Nations Central Committee to provide international recognition and use.

Name according to IUPAC – name of a substance given by IUPAC - International Union of Pure and Applied Chemistry Committee

**LD<sub>50</sub>** – lethal dose - dose of toxic substance expressed in milligrams per kilogram of body mass necessary to kill 50% of the examined population within specified time.

**LC<sub>50</sub>** – lethal concentration - concentration of a substance in the inhaled air, expressed in milligrams per litre, which causes death of 50% of the examined population after specified period of exposure.

**EC<sub>10</sub>** – effect concentration - substance concentration expressed in milligrams per litre causing the given pharmacological effect (e.g. inhibition of growth) at 10% of the examined population within specified time.

**TDL<sub>0</sub>** – Total Dose Low - lowest known dose of a substance that has produced any toxic, carcinogenic effects.

**TCL<sub>0</sub>** – Toxic Concentration Low - lowest concentration of a substance that is reported to have produced any toxic effect.

**NOEC** – no effect concentration - concentration of the substance expressed in milligrams per litre, at which no toxic effects can be observed.

**TLV-TWA** – the highest admissible concentration/threshold limit value – weighted average value – concentration of toxic chemical whose impact on a worker during 8-hour daily shift and average weekly time of work provided in the Labour Code during the period of his occupational activity should not cause negative changes of his health condition and of health condition of his next generations.

**TLV-STEL** – the highest admissible short term concentration/short term exposure limit – weighted average of concentration of the specified, toxic chemical compound which should not cause negative changes of a worker’s health if present in the work environment for not longer than 15 minutes and not more often than twice per shift with occurrences separated by more than 1 hour.

**DNEL** – derived no-effect level (DNEL) is the level of exposure to a substance above which humans should not be exposed.

**PNEC** – predicted no-effect concentration is the concentration of a chemical which has no predicted effect on the environment.

Necessary training: Post-related training within the scope of safe use of a substance considering its hazardous properties for humans and the environment.

Sources of information used during preparation of the MSDS:

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- Own results of qualitative and quantitative analyses of the substance;
- Hazardous Substances – Practical Guide, ALFA-WEKA;
- European Chemical Substance Information System;
- Encyclopedia of Technology CHEMISTRY - WNT
- CHEMISTRY – structure and reactions, Milton K. Snyder;
- Chemical Safety Report for the substance.

The data herein are based on our latest knowledge. Recipients of our product must take into account existing laws and other regulations.

This MSDS is the property of KGHM Polska Miedź S.A. and features only our product.

Further information can be obtained under the telephone numbers given in section 1.

Prepared by: Process Safety Deputy Head Specialist, Hubert Opaczewski M.Sc. Eng.