POONGSAN	SDS (SAFETY DATA SHEET)		
Control Number	**Revision number**	**MSDS Submission number**	**Date of issue**
PS-SDS-26	**1**	**AA07087-0000000042**	**2022. 06. 29**
Product name	**P64**		

SECTION 1 Identification of the substance or mixture and of the supplier

A. product name — P64 (Contain : Tin plating material)
* Product Specification — C64850

B. Recommended use of the chemical and restrictions on use
* Recommended use — Lead Frame, Terminal, Electricity, Other Parts
* Restrictions on use — Not available

C. Manufacturer / Importer / Distributor Information
* Company name — Poongsan Ulsan Plant
* Address — 94 Sanam-ro Onsan-eup, Ulju-gun, Ulsan
* Emergency phone number — +82) 52 - 231 - 9114 (representative telephone), FAX: +82) 52 - 231 - 9400
* Department in charge — Quality Assurance Team

※ This products are solid metallic products which do generally constitute a non hazardous materials in solid.
However some hazardous elements contained in these products can be emitted under ceratin processing conditions such as but not limited to: burning, melting, cutting, grinding, machining and welding.
The following information is for the hazardous elements which may be released during processing.

SECTION 2 Hazards identification

A. GHS classification of the substance/mixture
Acute toxicity(Inhalation) : Category 4
Carcinogenicity : Category 2
Mutagenicity : Category 2
Reproductive toxicity : Category 1B
Acute aquatic toxicity : Category 1
Chronic aquatic toxicity : Category 1

B. GHS label elements, including precautionary statements
* Pictogram and symbol

* Signal word — Danger
* Hazard statements
H332 Harmful if inhaled
H341 Suspected of causing genetic defects
H351 Suspected of causing cancer
H360 May damage fertility or the unborn child
H400 Very toxic to aquatic life
H410 Very toxic to aquatic life with long lasting effects
* Precautionary statements
- Precaution
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray
P271 Use only outdoors or in a well-ventilated area
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
- Treatment
P312 Call a POISON CENTER or doctor/physician if you feel unwell
P391 Collect spillage.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P308+P313 IF exposed or concerned: Get medical advice/attention.

- Storage	P405 Store locked up.
- Disposal	P501 Dispose of contents/container to an approved waste disposal plant.

C. GHS label elements, including precautionary statements — In the case of dust, powder, and fine particles, there is a possibility of an explosion when in contact with an ignition source

SECTION 3 Composition/information on ingredients

Alloy no.	Chemical Name	Common Name(Synonyms)	CAS number	Content (%)
C64850	Copper	-	7440-50-8	Balance
	Cobalt	-	7440-48-4	1.5 ~ 1.7

※ The products may contain small amounts of various elements in those specified, and are actually composed of copper, nickel, silicon and unintended impurities.

SECTION 4 First aid measures

A. Eye contact
Call emergency medical service.
In case of contact with substance, wipe from skin immediately; flush skin or eyes with running water for at least 20 minutes.
Get medical advice/attention if you feel unwell.
IF exposed or concerned: Get medical advice/attention.

B. Skin contact
Remove contaminated clothing and shoes and restrict entry to contaminated area.
In case of contact with substance, wipe from skin immediately; flush skin or eyes with running water for at least 20 minutes.

C. Inhalation
Keep victim warm and quiet.
Get medical advice/attention.
Get medical advice/attention if you feel unwell.

D. Ingestion
Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
Get medical advice/attention.
Get medical advice/attention if you feel unwell.

E. Indication of immediate medical attention
Effects of contact or inhalation may be delayed.
Exposures require specialized first aid with contact and medical follow-up .

SECTION 5 Fire fighting measures

A. Suitable (and unsuitable) extinguishing media
Suitable extinguishing media: Covered fire extinguishers and powder fire extinguishers for dry sand, expanded vermiculite, expanded pearlite, water spray etc.
Unsuitable extinguishing media : high pressure water

B. Specific hazards arising from the chemical
May be ignited by heat, sparks or flames.
Containers may explode when heated.
Inhalation of material may be harmful.

C. Special protective equipment and precautions for fire-fighters
Move containers from fire area if you can do it without risk.
Runoff from fire control or dilution water may cause pollution.
Dike fire-control water for later disposal; do not scatter the material.
Fire involving Tanks; Cool containers with flooding quantities of water until well after fire is out.
Fire involving Tanks; Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
In case or fire: Use personal protective equipment as required.
Fire involving Tanks; Always stay away from tanks engulfed in fire.

SECTION 6 Accidental release measures

A. Personal precautions, protective equipment and emergency procedures
Clean up spills immediately, observing precautions in Protective Equipment section.
Keep unnecessary and unprotected personnel from entering.
Do not breathe dust/fume/gas/mist/vapours/spray.
Wear protective gloves/protective clothing/eye protection/face protection.

B. Environmental precautions and protective procedures	Prevent entry to waterways
C. The methods of purification and removal	Absorb spills with inert material (e.g., dry sand or earth), then place in a chemical waste container. Absorb the liquid and scrub the area with detergent and water. Avoid release to the environment. Collect spillage.

SECTION 7 Handling and storage

A. Precautions for safe handling	Obtain special instructions before use. Follow all MSDS/label precautions even after container is emptied because they may retain product residues. Avoid release to the environment. Please note that materials and conditions to avoid. Please work with reference to engineering controls and personal protective equipment. Do not handle until all safety precautions have been read and understood. Do not eat, drink or smoke when using this product. Wash the handling area thoroughly after handling.
B. Conditions for safe storage	Store locked up. Store in a closed container. Store in cool and dry place. Empty drums should be completely drained, properly bunged, and promptly returned to a drum control, or properly placed. Keep away from food and drinking water.

SECTION 8 Exposure controls/personal protection

A. Occupational Exposure limits

* Domestic regulations

Copper	TWA 1mg/m^3, STEL 2mg/m^3 (dust and mist) TWA 0.1mg/m^3 (fume)
Cobalt	TWA 0.02mg/m^3

* ACGIH regulation

Copper	TWA 0.2mg/m^3 (fume) TWA 1mg/m^3 (metal dust)
Cobalt	TWA 0.02mg/m^3

* Biological exposure index

Cobalt	15 μg/L, End of shift at end of workweek

B. Appropriate engineering controls: Provide local exhaust ventilation system or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

C. Personal protective equipment

* Respiratory protection: Wear NIOSH or European Standard EN 149 approved full or half face piece (with goggles) respiratory protective equipment when necessary.
In case exposed to particulate material, the respiratory protective equipments as follow are recommended. ; facepiece filtering respirator or air-putifying respirator, high-efficiency particulate air(HEPA) filter media or respirator equipped with powered fan, filter media of use(dust, fume)
In lack of oxygen(< 19.6%), wear the supplied-air respirator or self-contained breathing apparatus.
* Eye protection: Wear safety goggles as follow if eye irritation or other disorder occur.
- In case of gaseous state organic material: enclosed safety goggles
- In case of vapour state organic material: safety goggles or breathable safety goggles
- In case of particulate material: breathable safety goggles
An eye wash unit and safety shower station should be available nearby work place.
* Hand protection: Wear appropriate protective gloves by considering physical and chemical properties of chemicals.
* Body protection: Wear appropriate protective clothing by considering physical and chemical properties of chemicals.

SECTION 9 Physical and chemical properties

A. Appearance	
* Description	Solid
* Color	Red
B. Odor	Odorless
C. Odor threshold	Not available(No Data)
D. pH	Not available(No Data)
E. Melting point/freezing point	1080℃
F. Initial boiling point and boiling range	Not available(No Data)
G. Flash point	Not available(No Data)
H. Evaporation rate	Not available(No Data)
I. Flammability (solid, gas)	Not available(No Data)
J. Upper/lower flammability or explosive limits	Not available(No Data)
K. Vapor pressure	Not available(No Data)
L. Solubility (ies)	Insoluble
M. Vapor density	Not available(No Data)
N. Specific gravity	Not available(No Data)
O. Partition coefficient n-octanol/water	Not available(No Data)
P. Auto ignition temperature	Not available(No Data)
Q. Decomposition temperature	Not available(No Data)
R. Viscosity	Not available(No Data)
S. Molecular weight	Not available(No Data)

SECTION 10 Stability and reactivity

A. Chemical stability and Possibility of hazardous reactions	May decompose at high temperatures into forming toxic gases. Stable at room temperature, normal pressure and normal use. Inhalation of material may be harmful. Containers may explode when heated.
B. Conditions to avoid	Ignition sources (heat, sparks or flames)
C. Incompatible materials	Flammable material, acids, oxidizing agents, alkalis
D. Hazardous decomposition products	Irritating, corrosive and/or toxic gases

SECTION 11 Toxicological information

A. Information of Health Hazardous

* Acute toxicity

- Oral **ATEmix >2000 (mg/kg) → Not classified**

Copper	LD50 >2500mg/kg rat(male)(OECD Guideline 423)(read-aross: Copper oxide)(ECHA)
Cobalt	LD50 ca. 550 mg/kg rat(female)(OECD Guideline 425)(ECHA)

- Dermal **ATEmix >2000 (mg/kg) → Not classified**

Copper	LD50 >2000mg/kg rat(OECD Guideline 402)(read-aross: Copper oxide)(ECHA)
Cobalt	LD50 >2000 mg/kg rat(read-across: Cobalt(II) 4-oxopent-2-en-2-olate CAS No. 14024-48-7) (ECHA)

- Inhalation **Dust/mist ATEmix >1 (mg/L) → Categoty 4**

Copper	Dust/mist LC50 >5.11mg/L 4hr rat (OECD Guideline 436)(Coated copper flakes)(ECHA)
Cobalt	Dust/mist LC50 < 0.05mg/L 4hr rat (OECD Guideline 436)(ECHA)

* Skin corrosion/ irritation **Not classified**

Copper	No irritation observed (Species: rabbit) (OECD Guideline 404) (read-aross: Copper oxide) (ECHA)
Cobalt	Not classified as an irritant (EU Method B.46)(ECHA)

* Serious eye damage/ irritation **Not classified**

Copper	No irritation observed (Species: rabbit) (OECD Guideline 405) (read-aross: Copper oxide) (ECHA)
Cobalt	Cobalt powder is considered to be an eye irritant.(OECD Guideline 437, EU method B.47) (ECHA)

* Respiratory sensitization Not available(No Data)

* Skin sensitization **Not classified**

Copper	Not sensitizing (species: guinea pig) (OECD Guideline 406) (analog: Copper oxide) (ECHA)
Cobalt	Not available(No Data)

* Carcinogenicity **Category 2**

- OCCUPATIONAL SAFETY AND HEALTH ACT: Not classified
- Notification of Ministry of Employment and Labor: Cobalt: 2
- IARC: Cobalt: 2B
- OSHA: Not classified
- ACGIH: Cobalt: A3
- NTP: Not classified
- EU CLP: Not classified

* Mutagenicity **Category 2**

Copper	in vitro- gene mutation study in bacteria results : NEGATIVE(Species: S. typhimurium TA 1535, TA 1537, TA 98 and TA 100 and S. typhimurium TA 1538)(OECDGuideline 471)(ECHA)(read-across: Copper sulphate pentahydrate CAS No. 7758-99-8)(ECHA) in vivo- mammalian somatic cell study: cytogenicity / erythrocyte micronucleus results NEGATIVE(Species: mouse)(EU Method B.12)(read-across: Copper sulphate pentahydrate CAS No. 7758-99-8)(ECHA)
Cobalt	in vitro- gene mutation study in bacteria : POSITIVE cobalt showed and increased revertant rate in S. typhimurium strain TA98 in the absence of S9 metabolic activation, but not in the presence of S9 metabolic activation. The responses observed were weak and not well correlated with dose level, hence are of questionable biological relevance(Species: S. typhimurium TA 98)

* Reproductive toxicity **Category 1B**

Copper	As a result of the second generation reproductive toxicity test, no reproductive toxicity was observed at any concentration (species: rat) (OECD Guideline 416) (read-across: Copper sulphate pentahydrate CAS No. 7758-99-8) (ECHA) As a result of the developmental toxicity test, the mean fetal weight was slightly lower and the incidence of skeletal mutation was slightly increased, but was not related to teratogenesis, preimplantation loss, or fetal death 6 mg/kg (Species: rabbit) (OECD Guideline 414) (read-across: copper (1+) hydroxide CAS No. 1344-69-0) (ECHA)
Cobalt	Effects on the reproduction / Effects on the development of the conceptus and the F1-offspring (pups): An increased F1-offspring mortality rate and a slightly decreased viability index were noted from 100 mg cobalt powder/kg bw/day onwards (species: rat) (OECD Guideline 422)(ECHA)

* Specific target organ toxicity (single exposure) **Not classified**

Copper	As a result of the dermal acute toxicity test, no clinical signs indicative of harmful or serious toxicity were observed, no deaths were found (read-across: Copper sulphate pentahydrate) (ECHA)
Cobalt	Not available(No Data)

* Specific target organ toxicity **Not classified**

(repeat exposure)

Copper	Oral (subchronic)- LOAELs for liver damage were 1000 ppm (cancer) and 2000 ppm (male), and results for kidney damage were considered toxicologically insignificant due to their species-specific tendencies (species: rat). (EU Method B.26) (read-across: Copper sulphate pentahydrate CAS No. 7758-99-8) (ECHA) Inhalation (subacute)- Not classified as no serious effects were observed as a result of the test (Species: rat) (OECD Guideline 412) (read-across: Copper oxide) (ECHA)
Cobalt	Oral- NOAEL 3 mg/kg bw/day (species: rat)(OECD Guideline 408)(read-across: Cobalt dichloride CAS No. 7646-79-9)(ECHA)

* Aspiration Hazard — Not available(No Data)

SECTION 12 Ecological information

A. Ecological toxicity

* Fish

Copper	LC50 38.4~256.2μg/L 96hr Pimephales promelas (read-across: copper sulfate CAS No. 7758-98-7)(ECHA)
Cobalt	NOEC 2 mg/L 96hr Danio rerio (ECHA)

* Crustacean

Copper	EC50 31.8μg/L 48hr Ceriodaphnia dubia(ECHA)
Cobalt	EC50 > 100 mg/L 48hr (Daphnia magna)(OECD Guideline 202, EU Method C.2)(ECHA)

* Algae

Copper	EC50 32~245μg/L 72hr Pseudokirchneriella subcapitata (read-across: Copper sulphate pentahydrate CAS No. 7758-99-8)(ECHA)
Cobalt	EC50 20, 270 μg/L 70hr Pseudokirchneriella subcapitata(OECD Guideline 201, EU Method C.3) (ECHA)

B. Persistence and degradability

* Persistence — Not available(No Data)
* Degradability — Not available(No Data)

C. Bioaccumulative potential

* Bioaccumulation — Not available(No Data)
* Biodegradation — Not available(No Data)

D. Mobility in soil — Not available(No Data)

E. Other hazardous effect

Copper	Fish: NOEC 57.8, 109μg/L 96hr 32day Cyprinodon variegatus (OECD Guideline 210) (read-across: Copper (II) chloride dihydrate CAS No. 10125-13-0)(ECHA) Crustacean: NOEC 21.5~181μg/L 21day Daphnia magna (OECD Guideline 211) (read-across: Copper sulphate CAS No. 7758-98-7)(ECHA) Algae: NOEC 37.6~170.8μg/L 72hr Pseudokirchneriella subcapitata (read-across: copper chloride)(OECD Guideline 201)(ECHA)

SECTION 13 Disposal considerations

A. Disposal method — Waste must be disposed of in accordance with federal, state and local environmental control regulations.

B. Disposal precaution — Dispose of contents/container in accordance with relevant regulation.
Refer to manufacturer or supplier for information on recovery or recycling.

SECTION 14 Transport information

A. UN Number — Not regulated

B. UN Proper shipping name — Not regulated

C. Transport Hazard class — Not regulated

D. Packing group — Not regulated

E. Environmental hazards — Not regulated

F. Special precautions	Not regulated
* in case of fire	
* in case of leakage	

SECTION 15 Regulatory information

A. U.S.A Regulatory information & Other regulations	
* U.S.A Regulatory information	
- U.S.A management information (CERCLA Regulation)	Copper(2270 kg (5000 lb))
- U.S.A management information (EPCRA 302 Regulation)	Not regulated
- U.S.A management information (EPCRA 304 Regulation)	Not regulated
- U.S.A management information (EPCRA 313 Regulation)	Copper(regulated)
* Other regulations	
- Substance of Rotterdam Convention	Not regulated
- Substance of Stockholm Convention	Not regulated
- Substance of Montreal Protocol	Not regulated
- Harmonised classification	Copper(Aquatic Chronic 2(H411))
- Annex VI of Regulation (EC) No 1272/2008 (CLP Regulation)	Cobalt(Resp. Sens. 1, Muta. 2, Carc. 1B Skin Sens. 1, Aquatic Chronic 4, Repr. 1B)

SECTION 16 Other information

A. Information source and references	CAMEO Chemicals (steam pressure) ECHA (Generative toxicity, crustaceans, epigrams, percutaneous, other harmful effects, melting points/fish points, reproductive cell mutation, severe eye damage or irritation, fish, spontaneous combustion temperature, algae, specific target organ toxicity (repetitive exposure), dermatologic toxicity, skin corrosion or irritation, inhalation) ECHA Registered substances(Weight, characteristics) EPISUITE(Partition coefficient n-octanol / water (kow)) HSDB(Odor, color, initial boiling point and boiling point range)) ICSC(solubility) pubchem(molecular weight) Self test analysis data (Ulsan site Quality Assurance Team)
B. Issuing date	March 25, 2022
C. Revision number and date	
* revision number	Ver. 1
* date of the latest revision	June 29, 2022
D. Others	This Material Safety Data Sheet (SDS) is prepared according to the GHS (Globally Harmonized System of Classification and Labeling of Chemicals) standards of Korea. This data does not guarantee product quality, but describes safety, health and environmental issues for handling under normal conditions. If the properties of the product are changed due to heating or processing according to the usage method, please check the additional safety and health information before use. In addition, this information may be revised without prior notice, and materials can be provided through our website (www.poongsan.co.kr). For other details, please contact our Safety Environment Team or Quality Assurance Team.