This product (copper and copper-based alloy products) are solid metal products, and the obligation to submit SDS documents according to the Pollutant Release and Transfer Register (PRTR) law and the Industrial Safety and Health Law (for chemical substances) does not apply.

1. Chemical product and company identification

1-1. Name of chemical substance (product name): See table below.

Alloy group	Corresponding JIS No.	Alloy name	Alloy No.	Shape	Substance classification
Cu-Pb-Zn Group	H 3100 H 3250 H 3260	Free-cutting brass	C3560, C3561, C3710, C3713	Plate Ribbon	Mixture (alloy)
			C3601, C3602, C3603, C3604	Bar Wire	
			C3605	Bar	
		Dezincification resistant free-cutting brass	C3531	Bar	
		Forging brass	C3712, C3771	Bar	
		Brass for nipple	C3501	Wire	

1-2. Company Information

Company name:

Address: (Postal code)

Department.: Supervisors: (Position:)

Tel: , Fax:

Emergency contact: Tel.:

(Created date: DD/MM/YY)

2. Hazards identification

This product (wrought copper and copper alloy) is a molded product, and so is outside the scope of GHS classification. Further, as there is no alloy information, GHS classification information in units of the configuration elements are referenced for the description.

2-1: Copper: GHS classification

Physical hazards:	Explosives:	Outside scope of classification
	Flammable gases:	Outside scope of classification
	Flammable aerosols:	Outside scope of classification
	Oxidizing gases:	Outside scope of classification

	Gases under pressure:	Outside scope of classification
	Flammable liquids:	Outside scope of classification
	Flammable solids:	Cannot classify
	Self-reactive substances and mixtures:	Outside scope of classification
	Pyrophoric liquids:	Outside scope of classification
	Pyrophoric solids:	Cannot classify
	Self-heating substances and mixtures:	Cannot classify
	Substances and mixtures which, in contact with water, emit flammable gases:	Cannot classify
	Oxidizing liquids:	Outside scope of classification
	Oxidizing solids:	Outside scope of classification
	Organic peroxides:	Outside scope of classification
	Corrosive to metals:	Cannot classify
Health hazards:	Acute toxicity (oral):	Cannot classify
	Acute toxicity (dermal):	Cannot classify
	Acute toxicity (inhalation: gases):	Outside scope of classification
	Acute toxicity (inhalation: vapors):	Outside scope of classification
	Acute toxicity (inhalation: dusts):	Cannot classify
	Acute toxicity (inhalation: mists):	Cannot classify
	Skin corrosion/ irritation:	Cannot classify
	Serious eye damage/eye irritation:	Cannot classify
	Respiratory sensitization:	Cannot classify
	Germ-cell mutagenicity:	Cannot classify
	Carcinogenicity:	Outside classification
	Reproductive toxicity:	Cannot classify
	Specific target organ toxicity-single exposure):	Class 3 (airway irritant)
	Specific target organ toxicity-repeated exposure):	Class 1 (liver)
	Aspiration hazard:	Cannot classify
Environment hazards:		
	Acute aquatic toxicity:	Cannot classify
	Chronic aquatic toxicity:	Class 4

Label elements

Pictogram

Signal word: Danger

Hazard statement: Risk of irritation to respiratory organs

Nerve damage due to long-term or repeated exposure

Risk of harm due to long-term effects

Precautionary statement: [Prevention]

Do not inhale the dust.

Avoid discharging into the environment.

[Response]

If inhaled, move to a location with fresh air, and rest in a posture that facilitates breathing.

If feeling unwell, consult a physician to receive diagnosis and treatment.

[Disposal]

Recycling is possible, so if recovering and discarding, entrust the work to a waste disposal specialist who is licensed by the prefectural governor.

2-2. Lead: GHS classification

Physical hazards:	Explosives:	Outside scope of classification
	Flammable gases:	Outside scope of classification
	Flammable aerosols:	Outside scope of classification
	Oxidizing gases:	Outside scope of classification
	Gases under pressure:	Outside scope of classification
	Flammable liquids:	Outside scope of classification
	Flammable solids:	Outside classification
	Self-reactive substances and mixtures:	Outside scope of classification
	Pyrophoric liquids:	Outside scope of classification
	Pyrophoric solids:	Outside classification
	Self-heating substances and mixtures:	Outside classification

	Substances and mixtures which, in contact with water, emit flammable gases:	Outside classification
	Oxidizing liquids:	Outside scope of classification
	Oxidizing solids:	Outside scope of classification
	Organic peroxides:	Outside scope of classification
	Corrosive metals:	Cannot classify
Health hazards:	Acute toxicity (oral):	Cannot classify
	Acute toxicity (dermal):	Cannot classify
	Acute toxicity (inhalation: gases):	Outside scope of classification
	Acute toxicity (inhalation: vapors):	Outside scope of classification
	Acute toxicity (inhalation: dusts):	Cannot classify
	Acute toxicity (inhalation: mists):	Cannot classify
	Skin corrosiveness/irritation:	Cannot classify
	Serious eyes damage/eye irritation:	Cannot classify
	Respiratory sensitization:	Cannot classify
	Germ-cell mutagenicity:	Class 2
	Carcinogenicity:	Class 2
	Reproductive toxicity:	Class 1A
	Specific target organ toxicity-single exposure:	Cannot classify
	Specific target organ toxicity-repeated exposure:	Class 1 (Hematopoietic system, central nervous system, peripheral nervous system, cardiovascular system, immune system)
	Aspiration hazard:	Cannot classify
Environmental hazards:	Acute aquatic toxicity:	Cannot classify
	Chronic aquatic toxicity:	Cannot classify

Label element

Pictogram

Signal word: Danger

Hazard statement: Suspected risk of genetic disease.

Suspected risk of cancer.

Risk of malign influence on reproductive functions or fetus.

Damage to the hematopoietic system, kidneys, central nervous system, peripheral nervous system, cardiovascular system, and immune system due to long-term or repeated exposure.

Precautionary statement: [Prevention]

When using the product, do not eat, drink, or smoke.

Use suitable protective equipment and ventilation equipment to avoid exposure.

Do not inhale the dust.

Wash hands thoroughly after handling.

Avoid discharging into the environment.

[Response]

If exposed or fear exposure, consult a physician and receive diagnosis treatment.

If feeling unwell, consult a physician and receive treatment.

[Storage]

Lock the storage location

[Disposal]

Entrust disposal of containers and contents to a specialist disposal processor who is licensed by the prefectural governor.

2-3.Tin: GHS classification

Physical hazards:	Explosives:	Outside scope of classification
	Flammable gases:	Outside scope of classification
	Flammable aerosols:	Outside scope of classification
	Oxidizing gases:	Outside scope of classification
	Gases under pressure:	Outside scope of classification
	Flammable liquids:	Outside scope of classification
	Flammable solids:	Cannot classify
	Selfe-reactive substances and mixtures:	Outside scope of classification
	Pyrophoric liquids:	Outside scope of classification
	Pyrophoric solids:	Cannot classify
	Self-heating substances and mixtures:	Cannot classify

	Substances and mixtures which, in contact with water, emit flammable gases:	Cannot classify
	Oxidizing liquids:	Outside scope of classification
	Oxidizing solids:	Outside scope of classification
	Organic peroxides:	Outside scope of classification
	Corrosive to metals:	Cannot classify
Health hazards:	Acute toxicity (oral):	Cannot classify
	Acute toxicity (dermal):	Cannot classify
	Acute toxicity (inhalation: gases):	Outside scope of classification
	Acute toxicity (inhalation: vapors):	Cannot classify
	Acute toxicity (inhalation: dusts):	Cannot classify
	Acute toxicity (inhalation: mists):	Outside scope of classification
	Skin corrosion/ irritation:	Cannot classify
	Serious eyes damage/eye irritation:	Cannot classify
	Respiratory sensitization:	Cannot classify
	Germ-cell mutagenicity:	Cannot classify
	Carcinogenicity:	Cannot classify
	Reproductive toxicity:	Cannot classify
	Specific target organ toxicity-single exposure:	Cannot classify
	Specific target organ toxicity-repeated exposure:	Class 1 (Lung)
	Aspiration hazard:	Cannot classify
Environment hazard:	Acute aquatic toxicity:	Cannot classify
	Chronic aquatic toxicity:	Cannot classify

Label elements

Pictogram

Signal word	Danger
Hazard statement:	Damage to the lungs due to long-term or repeated exposure.
Precautionary statement:	[Safety measures]

Do not inhale the dust, vapor, fumes, or spray.

Wash hands thoroughly after handling.

When using the product, do not eat, drink, or smoke.

[Emergency measures]

If inhaled, and respiration is difficult, move to a location with fresh air, and rest in a posture that facilitates respiration.

If feeling unwell, consult a physician and receive treatment.

[Disposal]

Entrust disposal of containers and contents to a specialist disposal processor who is licensed by the prefecture governor.

2-4. Nickel: GHS classification

Physical hazards:	Explosives:	Outside scope of classification
	Flammable gases:	Outside scope of classification
	Flammable aerosols:	Outside scope of classification
	Oxidizing gases:	Outside scope of classification
	Gases under pressure:	Outside scope of classification
	Flammable liquids:	Outside scope of classification
	Flammable solids:	Cannot classify
	Self-reactive substances and mixtures:	Outside scope of classification
	Pyrophoric liquids:	Outside scope of classification
	Pyrophoric solids:	Outside classification
	Self-heating substances and mixtures:	Cannot classify
	Substances and mixtures which, in contact with water, emit flammable gases:	Outside classification
	Oxidizing liquids:	Outside scope of classification
	Oxidizing solids:	Outside scope of classification
	Organic peroxides:	Outside scope of classification
	Corrosive to metals:	Cannot classify
Health hazards:	Acute toxicity (oral):	Outside classification
	Acute toxicity (dermal):	Cannot classify
	Acute toxicity (inhalation: gases):	Outside scope of classification
	Acute toxicity (inhalation: vapors):	Cannot classify

	Acute toxicity (inhalation: dusts):	Cannot classify
	Acute toxicity (inhalation: mists):	Outside scope of classification
	Skin corrosive/irritation:	Cannot classify
	Serious eyes damage/eye irritation:	Cannot classify
	Respiratory organ sensitization:	Class 1
	Skin sensitization:	Class 1
	Germ-cell mutagenicity:	Cannot classify
	Carcinogenicity:	Class 2
	Reproductive toxicity:	Cannot classify
	Specific target organ toxicity-single exposure:	Class 1 (respiratory organs and kidneys)
	Specific target organ toxicity-repeated exposure:	Class 1 (respiratory organs)
	Aspiration hazard:	Cannot classify
Environment hazards:	Aqute aquatic toxicity:	Cannot classify
	Chronic aquatic toxicity:	Class 4

Label elements

Pictogram

Signal word: Danger

Hazard statement: Inhalation risks causing allergies, asthma, or breathing difficulties.

Risk of causing allergic skin reaction

Suspected risk of cancer.

Damage to respiratory organs and kidneys.

Respiratory organ damage due to long-term or repeated exposure.

Risk of harm to aquatic life forms due to long-term effects.

Precautionary statement: [Safety measures]

Wear suitable protective gloves, goggles, and face masks.

When using the product, do not eat, drink, or smoke.

Wash hands thoroughly after handling.

If there is insufficient ventilation, wear suitable protective equipment for respiration.

Wear suitable personal protective equipment.

Avoid discharging into the environment.

Do not remove contaminated clothing from the worksite.

Do not inhale dust, vapor, fumes, or spray.

[Emergency measures]

If the substance adheres to the skin, wash using copious amounts of soap and water.

Wash contaminated clothing before reuse.

If there is adhesion to skin, and if skin irritation or rash occurs, consult a physician for diagnosis and treatment.

If inhaled, and respiration is difficult, move to a location with fresh air, and rest in a posture that facilitates respiration.

If inhaled, or if respiratory symptoms manifest, contact a physician.

If exposed or fear exposure, consult a physician and receive diagnosis treatment.

If exposed, consult a physician.

If feeling unwell, consult a physician and receive treatment.

[Disposal]

Entrust disposal of containers and contents to a specialist disposal processor who is licensed by the prefectural governor.

2-5.Antimony: GHS classification

Physical hazards:	Explosives:	Outside scope of classification
	Flammable gases:	Outside scope of classification
	Flammable aerosols:	Outside scope of classification
	Oxidizing gases:	Outside scope of classification
	Gases under pressure:	Outside scope of classification
	Flammable liquids:	Outside scope of classification
	Flammable solids:	Cannot classify
	Self-reactive substances and mixtures:	Outside scope of classification
	Pyrophonic liquids:	Outside scope of classification
	Pyrophonic solids:	Cannot classify
	Self-heating substances and mixtures:	Cannot classify
	Substances and mixtures which, in contact with water, emit flammable gases:	

		Outside classification
	Oxidizing liquids:	Outside scope of classification
	Oxidizing solids:	Outside scope of classification
	Organic peroxides:	Outside scope of classification
	Corrosive to metals:	Cannot classify
Health hazards:	Acute toxicity (oral):	Cannot classify
	Acute toxicity (dermal):	Cannot classify
	Acute toxicity (inhalation: gases):	Outside scope of classification
	Acute toxicity (inhalation: vapors):	Cannot classify
	Acute toxicity (inhalation: dusts):	Cannot classify
	Acute toxicity (inhalation: mists):	Outside scope of classification
	Skin corrosion/irritation:	Cannot classify
	Serious eye damage/eye irritation:	Cannot classify
	Respiratory sensitization:	Cannot classify
	Skin sensitization:	Cannot classify
	Germ-cell mutagenicity:	Cannot classify
	Carcinogenicity:	Cannot classify
	Reproductive toxicity:	Cannot classify
	Specific target organ toxicity-single exposure:	Cannot classify
	Specific target organ toxicity-repeated exposure:	Class 2 (respiratory organs)
	Aspiration hazard:	Cannot classify
Environment hazards:	Acute aquatic toxicity:	Cannot classify
	Chronic aquatic toxicity:	Cannot classify

Label elements

Pictogram

Signal word: Danger

Hazard statement: Respiratory organ damage due to long-term or repeated exposure.

Precautionary statement: [Safety measures]

Do not inhale dust or fumes.

[Emergency measures]

If feeling unwell, consult a physician and receive treatment.

[Disposa]

Entrust disposal of containers and contents to a specialist disposal processor who is licensed by the prefecture governor.

3. Composition / Information on ingredients

3-1. Substance or mixtures: Mixture (alloy)

3-2. Chemical name: Show alloy group in Clause 1.1.

Chemical composition: See the table below

3-3. Chemical formula or structural formula: None

3-4. Ordinance No. (PRTR Law and Industrial Safety and Health Law): See the table below

3-5. CAS No.: See the table below

3-6. Official publication reference No.: N/A

3-2.Elements	3-2. Composition (mass%) (The detailed contents according to the alloy are shown in the attached document.)	3-4. Ordinance No. (Only substances subject to SDS Publication)				3-5. CAS No.
		PRTR Law		Industrial Safety and Health Law		
		0.1% max.	1% max.	0.1% max.	1% max.	
Copper (Cu)	64.0 max.	—	—	379	—	7440-50-8
Lead (Pb)	4.5 max.	—	304	411	—	7439-92-1
Tin (Sn)	1.2 max	—	—	322	—	7440-31-5
Nickel (Ni)	0.01 to 1.9	—	308	418	—	7440-02-0
Antimony (Sb)	0.01 to 1.9	—	25	38	—	7440-36-0
Zinc (Zn)	Remainder	—	—	—	—	7440-66-6

4. First-aid measures

There is no information for mixtures (alloys), so information in units of the configuration elements are referenced for the description.

4-1.Copper

If inhaled: Move the victim to a location with fresh air, and make sure they rest in a pose that

facilitates respiration.

If feeling unwell, consult a physician and receive treatment.

If on skin: Remove contaminated clothing.

Wash skin promptly.

If feeling unwell, consult a physician and receive treatment.

Wash contaminated clothing before reuse.

If in eyes: Irrigate carefully for several minutes with water. Next, if wearing contact lenses that can be removed easily, remove the contact lenses. Thereafter, continue to wash.

Consult a physician and receive treatment.

If swallowed: Rise out the mouth promptly, and immediately consult a physician for treatment.

Anticipated acute effects and anticipated delayed effects:

If inhaled: Eye and skin reddening, eye pain, cough, headache, shortness of breath, pharyngeal pain, stomach pain, nausea, and vomiting. Delayed onset symptoms: Metal fume fever.

Protection for first-aid providers:

First-aid providers must wear protective equipment appropriate for the circumstances.

Special notes to an attending physician:

Rest and medical observation over time are indispensable.

4-2.Lead

If inhaled: Move the victim to a location with fresh air, and make sure they rest in a pose that facilitates respiration.

If feeling unwell, consult a physician and receive treatment.

If on skin: Remove contaminated clothing.

Wash skin promptly.

If feeling unwell, consult a physician and receive treatment.

Wash contaminated clothing before reuse.

If in eyes: Irrigate carefully for several minutes with water. Next, if wearing contact lenses that can be removed easily, remove the contact lenses. Thereafter, continue to wash.

Consult a physician and receive treatment.

If swallowed: Rise out the mouth promptly, and immediately consult a physician for treatment.

Anticipated acute effects and anticipated delayed effects:

Stomach cramps, drowsiness, headache, nausea, vomiting, fatigue, wheezing, pallor,

hemoglobinuria, and lethargy.

Most important signs and symptoms:

No description.

Protection for first-aid providers:

First-aid providers must wear protective equipment appropriate for the circumstances.

Special notes to an attending physician:

Rest and medical observation over time are indispensable.

4-3.Tin

If inhaled: Move the victim to a location with fresh air, and make sure they rest in a pose that facilitates respiration.

Consult a physician and receive treatment.

Special measures (When the dosage of the antidote is urgently necessary, refer to supplementary emergency measure instructions.)

If on skin: Wash skin promptly.

If feeling unwell, consult a physician and receive treatment.

Wash contaminated clothing before reuse.

If in eyes: Irrigate carefully for several minutes with water.

Consult a physician and receive treatment.

Special measures (When the dosage of the antidote is urgently necessary, refer to supplementary emergency measure instructions.)

If swallowed: Rise out the mouth promptly.

Consult a physician for treatment.

Special measures (When the dosage of the antidote is urgently necessary, refer to supplementary emergency measure instructions.)

Anticipated acute effects and anticipated delayed effects:

If inhaled: Steam and the mist stimulate the lungs and the upper respiratory tract.

If on skin: It stimulates skin.

If in eyes: It stimulates a mucous membrane.

4-4. Nickel

If inhaled: Move the victim to a location with fresh air, and make sure they rest in a pose that facilitates respiration.

If feeling unwell, consult a physician and receive treatment.

If on skin: Remove contaminated clothing.

Wash skin promptly.

Wash away using large quantities of soap and water.

If feeling unwell, consult a physician and receive treatment.

If in eyes: Irrigate carefully for several minutes with water.

If feeling unwell, consult a physician and receive treatment.

If swallowed: Rise out the mouth promptly.

If feeling unwell, consult a physician and receive treatment.

Anticipated acute effects and anticipated delayed effects:

No data.

Most important signs and symptoms:

No data.

Protection for first-aid providers:

No data.

Special notes to an attending physician:

No data.

4-5. Antimony

If inhaled: Move the victim to a location with fresh air, and make sure they rest in a pose that facilitates respiration.

If feeling unwell, consult a physician and receive treatment.

If on skin: Wash skin promptly.

If feeling unwell, consult a physician and receive treatment.

If in eyes: Irrigate carefully for several minutes with water.

If feeling unwell, consult a physician and receive treatment.

If swallowed: Rise out the mouth promptly.

If feeling unwell, consult a physician and receive treatment.

Anticipated acute effects and anticipated delayed effects:

If inhaled: Cough, vomiting. In the case of other symptoms, refer to "the case that you swallowed".

If on skin: Drying of the skin.

If swallowed: Stomachache, burning sensation, diarrhea, vomiting and death.

5. Fire-fighting measures

There is no information for mixtures (alloys), so information in units of the configuration elements are referenced for the description.

5-1. Copper

Extinguishing media: Special powder retardants and dry sand.

Unsuitable extinguishing media:

Water jet, foam extinguisher, and CO_2.

Specific hazards: There is a risk of irritant, poisonous, or corrosive gas or fumes being emitted by fire.

Using water on metal fires may emit hydrogen gas.

Specific extinguishing methods:

Move the container from the region on fire if there is no danger.

Ideally, sealant methods and oxygen starvation methods should be used for metal fires.

Protection of firefighters: When firefighting, wear suitable breathing equipment and (heat-resistant) chemical protective clothing.

5-2. Lead

Extinguishing media: The product itself is not flammable.

Unsuitable extinguishing media:

Rod infusers, foam extinguisher, and CO_2.

Specific hazards: There is a risk of irritant or poisonous gas being emitted due to fire.

Specific extinguishing methods:

Move the container from the region on fire if there is no danger.

Protection of firefighters: When firefighting, wear suitable breathing equipment and (heat-resistant) chemical protective clothing.

5-3.Tin

Extinguishing media: Special powder retardants and dry sand.[1)]

Unsuitable extinguishing media:

Other fire extinguishing drugs are the ban on use. [1)]

Specific hazards: Flammable. [1)] When it is powdered, there is the risk that a dust explosion happens. [1)]

Specific extinguishing methods:

The fire fighting takes enough distance that it is possible effectively, and performs it. Move the container from the region on fire if there is no danger. When you cannot travel the container, you water a container and area around it, and cool it off. After fire extinguishing, cool a container using a large quantity of water enough.

Protection of firefighters: When firefighting, wear suitable breathing equipment and (heat-resistant) chemical protective clothing.

5-4. Nickel

Extinguishing media: Water mist, foam retardant, powder retardant, carbon gas, dry sands.

Unsuitable extinguishing media:

Water jet.

Specific hazards: The substance is not flammable and will not itself burn, but heating may cause degradation and emit corrosive and/or poisonous mist.

Metal nickel is stabilized against oxidation using an ordinary oxidation membrane, but a fresh metal surface without an oxidation membrane will be rapidly oxidized by the air. Consequently, there is a risk that freshly powdered metal nickel will ignite upon contact with air.

Specific extinguishing methods:

Move the container from the region on fire if there is no danger.

Protection of firefighters: Wear suitable respiratory equipment and (flame-resistant) protective clothing.

5-5. Antimony

Extinguishing media: Dry sand, black lead powder, G-1(R) of the retardant which assumes sodium chloride a basis or Met-L-X powder.

Unsuitable extinguishing media:

Water, foam retardant and CO_2.

Specific hazards: There is a risk of irritant or poisonous gas being emitted by fire.

Specific extinguishing methods:

Move the container from the region on fire if there is no danger.

Ideally, sealant methods and oxygen starvation methods should be used for metal fires.

If fire extinguishing is impossible, I protect the outskirts and burn it until materials disappear.

If fire extinguishing is impossible, protect the outskirts and burn it until materials Disappear.

Protection of firefighters: When firefighting, wear suitable breathing equipment and (heat-resistant) chemical protective clothing.

6. Accidental release measures

There is no information for mixtures (alloys), so information in units of the configuration elements are referenced for the description.

6-1. Copper

Personnel precautions, protective equipment, and measures during emergencies:

Prohibit admission to all non-essential personnel.

Do not touch or walk through any leaking material.

Workers must wear protective equipment (See “8. Exposure Prevention and Protection Measures”), avoid gas and fume inhalation, and contact with the eyes and skin.

Environmental precautions:

Be careful not to discharge into rivers, or to affect the environment.

Recovery and neutralization:

Sweep together any spills and collect in a sealable container before discarding

Methods and materials for containment and cleaning up:

Stop the leak if there is no danger.

Secondary disaster prevention measures:

Promptly remove all ignition sources and flammable substances. (Smoking, fireworks, and naked flames in the vicinity are prohibited.) Prevent inflow to drainage ditches, sewers, basements, or sealed locations.

6-2. Lead

Physical precautions protective equipment, and emergency measures:

Prohibit admission to all non-essential personnel.

Do not touch or walk through any leaking material.

Workers must wear protective equipment (See “8. Exposure Prevention and Protection Measures”), avoid gas, dust and fume inhalation, and contact with the eyes and skin.

Environmental precautions:

Be careful not to discharge into rivers, or to affect the environment.

Recovery and neutralization:

Wipe up any leaks and collect in a sealable empty container before implementing disposal processing.

Methods and materials for containment and cleaning up:

Stop the leak if there is no danger.

Secondary disaster prevention measures:

Residue on the floor risks slipping, so process assiduously.

6-3.Tin

Physical precautions protective equipment, and emergency measures:

Do not touch or walk through any leaking material.

Immediately move to a suitable distance in all directions as a leakage area.

Workers must wear protective equipment (See “8. Exposure Prevention and Protection Measures”), avoid gas and contact with the eyes and skin.

If fire is not occurring with the spillage, wear highly sealed and no-permeable protective clothing.

Stay on the windward side.

Keep away from low grounds.

Broken containers or the spillage must not be touched without wearing appropriate protective clothing.

Environmental precautions:

Be careful not to discharge into rivers, or to affect the environment.

Not release it in environment.

Recovery and neutralization:

If the amount of spillage is small, collect the spillage into a dry, clean container using a clean antistatic equipment, cover the top loosely, and dispose of it afterwards.

If there is a large amount of spillage, wet with water and set up protective fences, then dispose of it afterwards.

Methods and materials for containment and cleaning up:

Stop the leak if there is no danger.

Secondary disaster prevention measures:

Promptly remove all ignition sources and flammable substances. (Smoking, fireworks,

and naked flames in the vicinity are prohibited.)

Residue on the floor risks slipping, so process assiduously.

6-4. Nickel

Personnel precautions, protective equipment, and measures during emergencies:

Remove all ignition sources.

Immediately move to a suitable distance in all directions as a leakage area.

Prohibit admission to all non-essential personnel.

Ventilate before entering a sealed location.

Environmental precautions:

Do not discharge into the environment.

Recovery and neutralization:

Wipe up any leaks and collect in an empty container before implementing disposal processing.

Methods and materials for containment and cleaning up:

Dampen with water, and reduce airborne dust to prevent dispersal.

Secondary disaster prevention measures:

Cover with a plastic sheet to prevent dispersal.

6-5 Antimony

Physical precautions protective equipment, and emergency measures:

Do not touch or walk through any leaking material.

Immediately move to a suitable distance in all directions as a leakage area.

Prohibit admission to all non-essential personnel.

Workers must wear protective equipment (See “8. Exposure Prevention and Protection Measures”), avoid gas and contact with the eyes and skin.

Stay in the wind.

Leave the low land.

Environmental precautions:

Be careful not to discharge into rivers, or to affect the environment.

Do not discharge into the environment.

Recovery and neutralization:

Wipe up any leaks and collect in an empty container.

Methods and materials for containment and cleaning up:

Stop the leak if there is no danger.

Secondary disaster prevention measures:

Promptly remove all ignition sources and flammable substances. (Smoking, fireworks, and naked flames in the vicinity are prohibited.)

Residue on the floor risks slipping, so process assiduously.

7. Handling and storage

There is no information for mixtures (alloys), so information in units of the configuration elements are referenced for the description.

7-1. Copper

<Handling>

Technical measures: Install equipment measures as described in “8. Exposure controls and personal protection”, and wear protective equipment.

Local / total ventilation: Implement local ventilation and total ventilation as described in “8. Exposure controls and personal protection”.

Precautions for safe handling:

Conforming to “2.Hazards identification”.

Prevention of contact: Refer to “10. Stability and Reactivity”.

<Storage>

Incompatible materials: Refer to “10. Stability and Reactivity”.

Storage conditions: Avoid locations with sudden temperature changes and high humidity when storing.

7-2.Lead

<Handling>

Technical measures: Install equipment measures as described in “8. Exposure controls and personal protection ”, and wear protective equipment.

Local / total ventilation: Implement local ventilation and total ventilation as described in “8. Exposure controls and personal protection”.

Precautions for safe handling:

Conforming to 2.

Prevention of contact: Refer to “10. Stability and Reactivity”.

<Storage>

Incompatible materials: Refer to “10. Stability and reactivity”.

Safe storage conditions: Store away from oxidants.

Lock the storage location.

Container and packing materials:

Although there are no packing or container regulations, place in a sealable, undamaged container.

7-3.Tin

<Handling>

Technical measures: Install equipment measures as described in “8. Exposure controls and personal protection ”, and wear protective equipment.

Local / total ventilation: Implement local ventilation and total ventilation as described in “8. Exposure controls and personal protection ”.

Precautions for safe handling:

Conforming to 2.

Prevention of contact: Refer to “10. Stability and reactivity”.

<Storage>

Incompatible materials: Refer to “10. Stability and reactivity”.

Safe storage conditions: Store away from heat, sparks, naked flames, and other ignition sources.

No smoking.

Store away from oxidants.

Store in a cool, well-ventilated location.

Securely seal the containers.

Lock the storage location.

7-4. Nickel

<Handling>

Technical measures: Install equipment measures as described in “8. Exposure controls and personal protection ”, and wear protective equipment.

Local / ventilation: Implement local ventilation and total ventilation as described in “8. Exposure controls and personal protection ”.

Precautions for safe handling:

No data.

Contact avoidance: No data.

<Storage>

Incompatible materials: No data.

Storage conditions: Lock the storage location.

7-5. Antimony

<Handling>

Technical measures: Install equipment measures as described in “8. Exposure controls and personal protection ”, and wear protective equipment.

Local / total ventilation: Implement local ventilation and total ventilation as described in “8. Exposure controls and personal protection ”.

Precautions for safe handling:

Conforming to 2.

Prevention of contact: Refer to “10. Stability and reactivity”.

<Storage>

Incompatible materials: Refer to “10. Stability and reactivity”.

Storage conditions: Store away from oxidants.

8. Exposure controls and personal protection

There is no information for mixtures (alloys), so information in units of the configuration elements are referenced for the description.

8-1. Copper

Administrative level: Not specified.

Permissible limit (Exposure limits and biological exposure indices)

・Japan Society for Occupational Health (2005 version):

Not specified.

・ACGIH (2005 version): TLV-TWA 0.2 mg/m^3 (as fumes)

TLV-TWA 1 mg/m^3 (as dust or mist)

Facility measures: To maintain the concentrations in air at or below the recommended tolerable concentrations, seal all processes, and use local air filters and other equipment countermeasures.

Protective equipment

・Respirator protection: Wear suitable respirator protective equipment.

・Hand protection: Wear suitable protective gloves.

・Eye protection: Protective goggles (regular glasses, regular glasses with lateral plates, or goggles)

・Skin and body protection:

Wear protective equipment such as protective clothing and safety boots, etc.

8-2. Lead

Administrative level: 0.05 mg/m^3 (lead and its compounds, as lead)

Permissible limit (Exposure limits and biological exposure indices)

・Japan Society for Occupational Health (2005 version):

0.1 mg/m^3 lead and its compounds, excluding alkyl lead, as lead.

・ACGIH (2005 version): TLV-TWA 0.05 mg/m^3 (A3; BEI lead and its inorganic compounds, as lead)

Facility measures: Install eyewash containers and safety showers in worksites where the substance is stored and handled.

Implement ventilation to make sure the airborne concentration remains below the recommended tolerable concentration.

Protective equipment

・Respirator protection: Wear suitable respirator protective equipment.

・Hand protection: Wear suitable protective gloves.

・Eye protection: Wear protective equipment for eyes and face.

・Skin and body protection:

Wear protective equipment such as protective clothing and safety boots, etc.

Hygiene measures: Wash hands thoroughly after handling.

8-3.Tin

Administrative level: Not specified.

Permissible limit (Exposure limits and biological exposure indices)

・Japan Society for Occupational Health (2005 version):

Not specified.

・ACGIH (2005 version): TLV-TWA 2 mg/m^3

Facility measures: Use explosion-proof electrical, ventilation, and lighting equipment.

Install eyewash containers and safety showers in worksites where the substance is stored and handled.

Implement ventilation to make sure the airborne concentration remains below the

recommended tolerable concentration.

Implement ventilation to make sure the airborne concentration remains below the recommended tolerable concentration if dust or fumes are caused during high-temperature processes.

Protective equipment

・Respirator protection: Wear specified respirator protective equipment.

・Hand protection: Wear suitable protective gloves.

・Eye protection: Wear protective equipment for eyes and face.

Wear protective equipment for eyes and face. Wear safety glasses. If there is a risk that the substance may come in contact with the eyes or face due to scattering or spraying, general chemical splash goggles and face shields must be worn.

・Skin and body protection

Wear protective equipment such as protective clothing and boots, etc.

8-4. Nickel

Administrative level: Not specified.

Permissible limit (Exposure limits and biological exposure indices)

・Japan Society for Occupational Health (2009 version):

1 mg/m^3

・ACGIH (2009 version): TLV-TWA 1.5 mg/m^3 (inhalable particles)

Facility measures: Install eyewash containers and safety showers in worksites where the substance is stored and handled.

To prevent exposure, install sealable devices or localized ventilators.

Protective equipment

・Respiratory protection : Wear suitable respirator protective equipment.

・Hand protection: Wear suitable protective gloves.

・Eye protection: Wear suitable eye protective equipment.

・Skin and body protection:

Wear suitable protective clothes.

Hygiene measures: Wash hands thoroughly after handling.

8-5. Antimony

Administrative level: Not specified.

Permissible limit (Exposure limits and biological exposure indices)

・Japan Society for Occupational Health (2006 version):

0.1 mg/m^3

・ACGIH (2006 version): TLV-TWA 0.5 mg/m^3

Facility measures: Install eyewash containers and safety showers in worksites where the substance is stored and handled.

Implement ventilation to make sure the airborne concentration remains below the recommended tolerable concentration if dust or fumes are caused during high-temperature processes.

Protective equipment

・Respiratory protection: Wear suitable respirator protective equipment.

・Hand protection: Wear suitable protective gloves.

・Eye protection: Wear suitable eye protective equipment.

・Skin and body protection:

Wear suitable protective clothes.

9. Physical and chemical properties: Fields marked with "---" in the table indicates no data.

a) Product nomenclature characteristics

	Free-cutting brass	Forging brass	Brass for nipple	Dezincification resistant free-cutting brass
9-1.Appearance of a chemical product, ・physical state and color	Lustrous golden solid	Lustrous golden solid	Lustrous golden solid	Lustrous golden solid
・form	Depends on product shape	Depends on product shape	Depends on product shape	Depends on product shape
・odor	None	None	None	None
9-2.pH,with indication of the concentration	—	—	—	—
9-4.Dissolution temperature	—	—	—	—
9-5. Ignition Point	—	—	—	—
9-6. Flash point	—	—	—	—
9-7.Explosion limits	—	—	—	—
9-11.Solubility	—	—	—	—
9-12.N-octanol /water partition coefficient	—	—	—	—
9-13.Other data (Radioactivity,bulk density, etc.)	—	—	—	—

b) Alloy characteristics

	Free-cutting brass						
	C3560	C3561	C3710	C3713	C3601	C3602	C3603
9-3. Melting point (ºC)	885	885	885	885	885	885	885
9-10. Relative density	8.50	8.50	8.41	8.41	8.50	8.50	8.50

	Free-cutting brass		Forging brass		Brass for nipple	Dezincification resistant free-cutting brass
	C3604	C3605	C3712	C3771	C3501	C3531
9-3. Melting point (ºC)	885	—	885	880	895	—
9-10. Relative density	8.50	—	8.41	8.44	8.44	—

c) Configuration element characteristics

	Cu	Pb	Sn	Zn	Al	Ni	P	Si	Sb
9-8. Vapor pressure (Pa)	—	—	—	—	—	—	—	—	—
9-9. Boiling point (ºC)	2582	1750	2625	907	2520	2910	280	3270	1590

10.Stability and reactivity

There is no information for mixtures (alloys), so information in units of the configuration elements are referenced for the description.

10-1. Copper

Stability: Turns green when exposed to damp air.
Compounds sensitive to shock are formed by acetylene compounds, ethylene oxides, and azides.

Possibility of hazardous reactions:
Reacts with oxides (chlorates, bromates, and iodates, etc.), so there is a risk of explosion.

Conditions to avoid: Contact with humidity and hazardous mixtures.

Incompatible materials: Acetylene compounds, ethylene oxides, azides, oxides (chlorates, bromates, and iodates, etc.)

Hazardous decomposition products:

CO, CO_2, and copper fumes when burned.

10-2. Lead

Stability: Reacts with pure water and weak organic acids in the presence of oxygen.

Possibility of hazardous reactions:

No dangerous or harmful reactions under normal conditions.

Reacts with concentrated nitric acid at high temperatures, boiling concentrated chlorine, and concentrated sulfuric acid.

Reacts with fluorine and chlorine at room temperature.

Conditions to avoid: Mixing powder or granules with air may cause dust explosions.

Incompatible materials: Oxidants.

Hazardous decomposition products:

May emit poisonous fumes or gas when heated.

10-3.Tin

Stability: Stable a room temperature and in air.

The affinity to oxygen is low, and the color of the substance does not change in dry air at room temperature.

Not oxidized is or below 200℃. In higher temperature, SnO_2 membrane is formed on the surface.

Possibility of hazardous reactions:

Reacts with strong oxidizers , acids, strong bases , halogens ,sulfur, etc.

Reacts quickly with halogens to produce tin halide.

Reacts slowly with alkali at low temperature, and rapidly at high temperature.

Conditions to avoid: Scattering of dust.

Incompatible materials: Strong oxidizers, acids, strong bases halogens ,sulfur ,etc.

Hazardous decomposition products:

Not applicable (Element).

10-4. Nickel

Stability: Thought to be stable when stored and handled according to the laws and regulations.

Possibility of hazardous reactions:

Metal nickel is stable against oxidation using an ordinary oxidation membrane, but a fresh metal surface without an oxidation membrane will be rapidly oxidized by the air.

Consequently, there is a risk that freshly powdered metal nickel will ignite upon contact with air.

Conditions to avoid: No data.

Incompatible materials: No data.

Hazardous decomposition products:

No data.

10-5. Antimony

Stability: Ignition by the high temperature surface, a spark or the naked light.

Possibility of hazardous reactions:

When it comes in contact with chlorine or mix, a very intense reaction takes place with a flame, and harmful chlorination antimony (V) occurs.

When it comes in contact with high temperature strong sulfuric acid, react, and corrosive sulphur dioxide (gas) occurs with harm.

It reacts with oxidants (e.g., halogen, permanganic acid alkali, nitric) and metal powder intensely and poses the danger of a fire and the explosion.

When it contacts with acid, may produce harmful gas (stibine).

Conditions to avoid: High temperature. Dust outbreak.

Incompatible materials: Chlorine, high temperature concentrated nitric acid, metal powder, oxidizer (halogen, alkali permanganate, nitric,etc.).

Hazardous decomposition products:

Not applicable (Element).

When it burns, it generates harmful fume (antimonial oxide).

11. Harmfulness Information

There is no information for mixtures (alloys), so information in units of the configuration elements are referenced for the description.

11-1. Copper

Acute toxicity Oral: Rabbits LDL_0 120 μg/kg [3)]

Skin irritation / corrosion: Contact with skin causes reddening symptoms. [14)]

Eye damage / irritation: Contact with eyes causes reddening. Causes painful symptoms. [14)]

Acts as an irritant. [10)]

Respiratory or skin sensitization:

Respiratory organ sensitization:

No data.

Skin sensitivity:

The Japan Society for occupational health classified this as skin sensitization group 2 (a substance thought probably to sensitize humans), but The Japanese Society for Dermatoallergology and Contact Dermatitis has no classification.

Reproductive cell mutagenicity:

No data.

Carcinogenicity: EPA classifies this as group D (substance that cannot be classified as carcinogenic to humans).

Reproductive toxicity: No data.

Specific target organ toxicity (single exposure):

Fumes irritate the upper airway. [13)]

Thought to be an airway irritant.

Risk of irritation to the respiratory organs (class 3)

Specific target organ toxicity (repeated exposure):

Hepatomegaly identified in workers exposed to high airborne concentrations (estimated ingestion 200 mg/day). [11)]

Nerve damage due to long-term or repeated exposure (class 1)

Aspiration hazard: No data.

11-2. Lead

Acute toxicity: Oral: No information.

Dermal: No information.

Inhalation (dust): No information.

Skin irritation / corrosion: No information.

Eye damage / irritation: No information.

Respiratory or skin sensitization:

Respiratory organ sensitivity:

No information.

Skin sensitivity: No information.

Reproductive cell mutagenicity:

Results have been obtained that contradict the chromosome abnormalities in the

peripheral blood lymphocytes of people who work with lead, but as there are reports of chromosome abnormalities and micronucleus induction effects in lead itself [23), 37), 20), 10)], the substance was designated class 2.

Carcinogenicity: Classified as B [23), 30)] and A3 [10)], and as B2 by the EPA.

Suspected risk of carcinogenesis (class 2)

IARC group 2 (might be carcinogenic in humans)

Reproductive toxicity: Designated class 1A as there are reports of cases of human exposure affecting spermatogenesis [37), 20), 8), 23)], and reports that ovulation function failure has been observed in cases of exposure among female EHC workers.

Although there are reports of connections to cognitive function development impairment in newborns [10), 20), 8), 23)], and connections to increased spontaneous abortions [20), 8)], no clear conclusions have been obtained.

Risk of malign influence on reproductive functions or fetus (class 1A)

Specific target organ toxicity (single exposure):

Despite reports of cases in which renal function failure has been identified in humans with acute poisoning [20)], the same source also reports that there was no renal failure in subsequent epidemiological surveys.

Specific target organ toxicity (repeated exposure):

From reports that the marker organs are the hematopoietic system, nervous system, and the kidneys and the cardiovascular system[20)], reports that heme synthesis impairment, nephropathy, and encephalopathy have been observed in cases of human exposure [37), 10), 8), 23)], reports of the peripheral nerves and central nervous functions have been affected in cases of human exposure [37), 10), 8)], reports of effects such as hypertension on the cardiovascular system in cases of human exposure [37), 10)], and reports that immunosuppressive actions have been observed in cases of human exposure [8)], the marker organs are thought to be the hematopoietic system, liver, CNS, peripheral nervous system, cardiovascular system, and immune system, all of which have been designated class 1.

Although there are descriptions of case reports of reduced thyroid gland and adrenal functions in EHC, both these case reports are from before 1970, and there have been no similar reports subsequently, and as DFGOT describes no effects on the thyroid gland [20)], the thyroid and adrenal glands are not thought to be marker organs.

Impairment of the hematopoietic system, kidneys, CNS, peripheral nervous system,

cardiovascular system, and immune system due to long-term or repeated exposure (class 1)

Aspiration hazard: No data.

11-3.Tin

Acute toxicity: Oral: No information.

Dermal: No information.

Inhalation (gas): Solid according to GHS definitions.

Inhalation (vapor): No data.

Inhalation (dust, mist): No data.

Skin irritation / corrosion: No information.

Eye damage / irritation: No information.

Respiratory or skin sensitization:

Respiratory organ sensitivity:

No information.

Skin sensitivity: No information.

Reproductive cell mutagenicity:

No information.

Carcinogenicity: Cannot evaluate due to insufficient data.

Reproductive toxicity: No information.

Specific target organ toxicity (single exposure):

No definite date available.

Specific target organ toxicity (repeated exposure):

Coniosis was observed in workers handling metallic tin.

Long-term exposure to this substance may cause being coniosis (stannosis).

Organ damage from long-term or repeated exposure (Class 1)(Lungs)

Long-term or repeated exposure cause renal disorders.

Long-term or repeated exposure cause lung disorders.

Aspiration hazard: No data.

11-4. Nickel

Acute toxicity: Oral: Rat LD_{50}>9000 mg/kg

(ECETOC TR No. 33 (1989)) is outside classification.

Dermal: No data.

Inhalation (gas): Solid according to GHS definitions.

Inhalation (vapor): No data.

Inhalation (dust): Deemed unclassifiable as there is no test data using animals. Nevertheless, cases have been reported of death due to respiratory distress syndrome after 13 days inhalation exposure that was estimated to have a concentration of 382 mg Ni/m^3 for 90 minutes (ATSDR (2005)).

Inhalation (mist): Solid according to GHS definitions.

Skin irritation / corrosion: No data.

Eye damage / irritation: No data.

Respiratory or skin sensitization:

Respiratory organ sensitivity:

(One) case of rhinitis has been identified in humans, and an irritation reaction has been observed in the trachea. (NITE initial risk evaluations ver. 1.0, No. 69 (2008)). Further, as this was classified as an airway sensitizer (group 2) in the tolerable concentration recommendations from the Japan Society for Occupational Health (2008), and as an airway sensitizer by the Japanese Society of Occupational and Environmental Allergy (2004) and DFG (MAK/BAT No. 43 (2007)), the substance was designated as class 1.

Skin sensitivity:

There are reports of hives (NITE initial risk evaluations ver. 1.0, No. 69 (2008); EHC No. 108 (1991)), contact dermatitis (NITE initial risk evaluations ver. 1.0, No. 69 (2008); EHC No. 108 (1991); IARC vol. 49 (1990)), and positive reactions (NITE initial risk evaluations ver. 1.0, No. 69 (2008); EHC No. 108 (1991)) in batch tests. Further, as this was classified as a skin sensitizer (group 1) in the tolerable concentration recommendations from the Japan Society for Occupational Health (2008), and as a skin sensitizer by the Japanese Society of Occupational and Environmental Allergy (2004) and DFG (MAK/BAT No. 43 (2007)), the substance was designated as class 1.

Reproductive cell mutagenicity:

Although the results of chromosome abnormalities in alveolar macrophages due to inhalation exposure in rats is positive (NITE initial risk evaluations ver. 1.0, No. 69 (2008)), this was a special testing system. In addition, this as deemed unclassifiable

as there is no *in vivo* test data. Further, in vitro mutagenicity tests: Chromosome abnormality tests using human lymphocytes (IARC vol. 49 (1990)) and sudden mutation tests using the human lymphoblast TK6 (detailed risk evaluation series 19 (2006)) were negative.

Carcinogenicity: As the existing classification are as follows: IARC is 2B (IARC), NTP is R (NTP (2005)), and EU is Carcinoma category 3; R40 (EU (2007)), the substance was classified as class 2. Further, the occurrence of either cancer or sarcoma can be seen in carcinogenesis tests using inhalation, subcutaneous, intramuscular, intrathoracic, and intraperitoneal administration in rats. (NITE initial risk evaluations ver. 1.0, No. 69 (2008), IARC vol. 49 (1990); detailed risk evaluation series 19 (2006).)

Reproductive toxicity: From descriptions that birthweight is reduced and stillborn births in the last trimester of pregnancy increase at concentrations up to 250 ppm through oral administration in rats (Teratogenic (12^{th}, 2007)), and deaths increase and a number of cases of teratogenicity were observed before implantation (Teratogenic (12^{th}, 2007)), it is thought that there are occurrence toxicity effects at does that do not reveal general toxicity in the parent animals, and so this substance was classified as class 1B.

Specific target organ toxicity (single exposure):

Failure of the alveolar epithelial cells occurred at doses of 0.5 mg or greater with inhalation exposure tests in male rats (single tracheal administration. (NITE initial risk evaluations ver. 1.0, No. 69 (2008).) Further, as there are descriptions that “inhalation exposure in humans causes “Failure and edema in the alveoli walls in the alveolar regions, and conspicuous renal tubular necrosis in the kidneys” (ATSDR(2005)), this substance was designated class 1 (respiratory organs and kidneys).

Specific target organ toxicity (repeated exposure):

Pulmonary alveolar proteinosis (PAP) and pulmonary granulomatous inflammation were observed in females, and wet lung mononuclear cells were observed in males, at doses of 1 mg/m^3 (0.001 mg/L) or greater, which is equivalent to class 1 of the inhalation exposure tests (OECD TG 413) for 13 weeks using rats. (NITE initial risk evaluations ver. 1.0, No. 69 (2008).) Further, as pleurisy, pneumonia, pulmonary congestion, and edema were observed in inhalation exposure tests for 21 months in rats (CaPSAR (1994)) at doses of 15 mg/m^3 (0.015 mg/L), which is equivalent to class 1 in the guidance, and pneumonia was caused at 1 mg/m^3 (0.001 mg/L) in

inhalation exposure tests for six months using rabbits, this substance was designated class 1 (respiratory organs). Meanwhile, changes such as ataxia, irregular breathing, a fall in body temperature, salivation, and limb discoloration were observed with doses of 100 mg/kg/day in 90-day forced oral tests in rats, and although comparatively mild, the symptoms were also observed at 35 mg/kg/day. In addition, as there are reports of 100% fatalities at concentrations of 100 mg/kg/day (IRIS 1996), the substance was designated class 2 (CNS).Further, the EU classification is T; R48/23.

Aspiration hazard: No data.

11-5. Antimony

Acute toxicity Oral: It is more likely to be outside classification from LD_{50}7000 mg/kg [11] of the oral administration examination using the rats. However, it is data of Priority 2 and cannot classify it.

Dermal: No data.

Inhalation (dust): No data.

Skin irritation / corrosion:

As for it is irritating from the reason "why it has acridity for skin" [6]; there may be it. However, it is data of Priority 2 and cannot classify it.

Eye damage / irritation: As for it is irritating from the reason "why it has acridity for eyes" [6];; there may be it. However, it is data of Priority 2 and cannot classify it.

Respiratory or skin sensitization:

Respiratory organ sensitivity:

No data.

Skin sensitivity: No data.

Reproductive cell mutagenicity:

No data.

Carcinogenicity: Because there are not toxic information and an existing classification, cannot classify it based on the judgment of the expert.

Reproductive toxicity: Cannot classify due to insufficient data.

Specific target organ toxicity (single exposure):

No data.

Specific target organ toxicity (repeated exposure):

There is a description, "the long-term exposure of metal steam and the metal oxide powder induces a pulmonary obstacle" [6] about the humans.

However, respiratory organs were thought about with a target organ because there was a description of "the change in quality formation of interstitial fibrosis, the enlargement of the alveolus wall and a hyperplasia, the cube of the lungs and the cylinder epithelium" [6] in the laboratory animals.

In addition, the influence on laboratory animal was seen in the range of a guidance level equivalent to division 2. The classification assumed it division 2 (respiratory organs) by the above-mentioned reason.

As for it, there might be the respiratory obstacle by a long term or the repeated exposure.

Aspiration hazard: No data.

12. Ecological Information

There is no information for mixtures (alloys), so information in units of the configuration elements are referenced for the description.

12-1. Copper

Acute aquatic environmental harm:

Cannot classify due to insufficient data.

Chronic aquatic environmental harm:

Despite the existence of L(E)C_{50}≦100 mg/L data, as this is a metal and its actions in water are unknown, it was designated class 4.

12-2. Lead

Acute aquatic environmental harm:

No information.

Chronic aquatic environmental harm:

No information.

12-3.Tin

Acute aquatic environmental harm:

Cannot classify due to insufficient data.

Chronic aquatic environmental harm:

Cannot classify due to insufficient data.

12-4. Nickel

Acute aquatic environmental harm:

Cannot classify due to insufficient data.

Chronic aquatic environmental harm:

Despite the existence of $L(E)C_{50} \leq 100$ mg/L data, as this is a metal and its actions in water are unknown, it was designated class 4.

12-5. Antimony

Acute aquatic environmental harm:

Cannot classify due to insufficient data.

Chronic aquatic environmental harm:

Cannot classify due to insufficient data.

13. Disposal consideration

There is no information for mixtures (alloys), so information in units of the configuration elements are referenced for the description.

13-1. Copper

Waste from residual: Follow the relevant laws and local government standards for waste disposal. Entrust disposal to and industrial waste contractor or local public body that is authorized by the prefectural governor where available. If outsourcing waste disposal, thoroughly notify the contractors of the dangers and harmfulness before outsourcing.

Contaminated container and contaminated packaging:

Either clean and recycle the containers, or dispose of them suitably according to the relevant laws and regulations, and local government standards.

When disposing of empty containers, make sure to discard the contents completely.

13-2. Lead

Waste from residual: Follow the relevant laws and local government standards for waste disposal. Entrust disposal to and industrial waste contractor or local public body that is authorized by the prefectural governor where available. If outsourcing waste disposal, thoroughly notify the contractors of the dangers and harmfulness before outsourcing. Substances in an

elemental state can be reused, so recover them.

Contaminated container and contaminated packaging:

Either clean and recycle the containers, or dispose of them suitably according to the relevant laws and regulations, and local government standards.

When disposing of empty containers, make sure to discard the contents completely.

13-3.Tin

Waste from residual: Follow the relevant laws and local disposal regulation. Entrust disposal to and industrial waste contractor or local public body that is authorized by the prefectural governor where available. If outsourcing waste disposal, thoroughly notify the contractors of the dangers and harmfulness before outsourcing. Substances in an elemental state can be reused, so recover them. Do not discharge the waste liquid containing this substance and waste liquid after washing directy into waterways or bury or dispose of the unprosessed products.

Contaminated container and contaminated packaging:

Either clean and recycle the containers, or dispose of them suitably according to the relevant laws and regulations, and local government standards.

When disposing of empty containers, make sure to discard the contents completely.

The method of disposing of spray cans differ for each local government. Disposal must be conducted according to the regulations of the relevant local government.

13-4. Nickel

Waste from residual: Before disposal, render as harmless and stable as possible, and neutralize, etc., to reduce to a low hazard level. Follow the relevant laws and local government standards for waste disposal.

Contaminated container and contaminated packaging:

Either clean and recycle the containers, or dispose of them suitably according to the relevant laws and regulations, and local government standards.When disposing of empty containers, make sure to discard the contents completely.

13-5. Antimony

Waste from residual: Follow the relevant laws and local government standards for waste disposal. Entrust disposal to and industrial waste contractor or local public body that is authorized by

the prefectural governor where available. If outsourcing waste disposal, thoroughly notify the contractors of the dangers and harmfulness before outsourcing. Substances in an elemental state can be reused, so recover them.

Contaminated container and contaminated packaging:

Either clean and recycle the containers, or dispose of them suitably according to the relevant laws and regulations, and local government standards.

When disposing of empty containers, make sure to discard the contents completely.

14. Transport information

There is no information for mixtures (alloys), so information in units of the configuration elements are referenced for the description.

14-1. Copper

<International regulations>

Information on marine transport regulation: Non-dangerous substance.

・UN number: Not applicable.

Information on air transport regulation: Non-dangerous substance.

・UN number: Not applicable.

<Japanese regulations>

Information on road transport regulation: No special regulations.

Information on marine transport regulation: Non-dangerous substance.

Information on air transport regulation: Non-dangerous substance.

14-2. Lead

<International regulations>

Information on marine transport regulation: Non-dangerous substance.

・UN number: Not applicable.

Information on air transport regulation: Non-dangerous substance.

・UN number: Not applicable.

<Japanese regulations>

Information on road transport regulation: Not applicable.

Information on marine transport regulation: Non-dangerous substance.

Information on air transport regulation: Non-dangerous substance.

14-3Tin

<International regulations>

Information on marine transport regulation:	Non-dangerous substance.
・Marine pollutants:	Not applicable.
・UN number:	Not applicable.
Information on air transport regulation:	Non-dangerous substance.
・UN number:	Not applicable.

<Japanese regulations>

Information on road transport regulation:	Not applicable.
Information on marine transport regulation:	Non-dangerous substance.
・Marine pollutants:	Not applicable.
Information on air transport regulation:	Non-dangerous substance.

14-4. Nickel

<International regulations>

Information on marine transport regulation:	As according to IMO (International Maritime Organization) regulation.
・UN number:	3089
・Product name:	Metallic powder (flammable)
・Class:	4.1
・Packing group:	Ⅱ,Ⅲ
・Marine pollutants:	Not applicable
Information on air transport regulation:	As according to ICAO (International Civil Aviation Organization)/IATA (International Air Transport Association) regulation.
・UN number:	3089
・Product name:	Metallic powder (flammable)
・Class:	4.1
・Packing group:	Ⅱ,Ⅲ

<Japanese regulations>

Information on road transport regulation:	Not applicable
Information on marine transport regulation:	As according to the regulations of the Ship Safety Act.
・UN number:	3089

・Product name:	Metallic powder (flammable substances)
・Class:	4.1
・Packing group:	Ⅱ,Ⅲ
・Marine pollutants:	Not applicable.
Information on air transport regulation:	As according to the regulations of the Civil Aeronautics Act.
・UN number:	3089
・Product name:	Metallic powder (flammable)
・Class:	4.1
・Packing group:	Ⅱ,Ⅲ

14-5. Antimony

<International regulations>

Information on marine transport regulation:	As according to IMO (International Maritime.Organization) regulation.
・UN number:	2871
・Product name:	Antimony powder
・Class:	6.1
・Packing group:	Ⅲ
・Marine pollutants:	Not applicable.
Information on air transport regulation:	As according to ICAO (International Civil Aviation Organization)/IATA (International Air Transport Association) regulation.
・UN number:	2871
・Product name:	Antimony powder
・Class:	6.1
・Packing group:	Ⅲ

<Japanese Regulations>

Information on road transport regulation:	Not applicable.
Information on marine transport regulation:	As according to the regulations of the Ship Safety Act.
・UN number:	2871
・Product name:	Antimony powder
・Class:	6.1
・Packing group:	Ⅲ

・Marine pollutants:	Not applicable.
Information on air transport regulation:	As according to the regulations of the Civil Aeronautics Act.
・UN number:	2871
・Product name:	Antimony powder
・Class:	6.1
・Packing group:	Ⅲ

15. Regulation information

This product (wrought copper and copper-based alloy products) are solid metal products, and the obligation to submit SDS documents according to the Pollutant Release and Transfer Register (PRTR) law and the Industrial Safety and Health Law (for chemical substances) does not apply. The configuration element unit information is described below for reference.

15-1. Copper

Occupational Health and Safety Law (OHSL):

Materials to be notified.

(Law Paragraph 57, and edict Paragraph 18.2 Table 9)

(Edict No. 379)

15-2. Lead

Occupational Health and Safety Law (OHSL):

Materials to be notified.

(Law paragraph 57, and edict paragraph 18.2 table 9)

(Edict No. 411)

Lead (Edict table No. 4 and lead poisoning prevention regulations paragraph 1.1)

Law Concerning Reporting, etc., of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in their Management:

Type 1 designated chemical substance.

Pollutant Release and Transfer (PRTR) Law:

(Law paragraph 2.2, edict paragraph 1, appendix table 1)

(Edict No. 304)

Labor Standards Law: Toxic chemicals

(Law paragraph 75.2, edict paragraph 35 table 1.2.4)

Air Pollution Control Act: Harmful substance

(Edict paragraph 1)

Water Pollution Prevention Act: Harmful substance

(Edict paragraph 2, Ministerial Ordinance for Sewage Standards Paragraph 1)

Soil Contamination Countermeasures Act:

Special harmful substance

(Law paragraph 2.1, edict paragraph 1)

15-3.Tin

Occupational Health and Safety Law (OHSL):

Materials to be notified.

(Law paragraph 57, and edict paragraph 18.2 table 9)

(Edict No. 322)

15-4. Nickel

Occupational Health and Safety Law (OHSL):

Materials to be notified.

(Law paragraph 57, and edict paragraph 18.2 table 9)

(Edict No. 418)

Law Concerning Reporting, etc., of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in their Management: type 1 designated chemical substance

Pollutant Release and Transfer (PRTR) Law:

(Law paragraph 2.2, edict paragraph 1, appendix table 1)

(Edict No. 308)

Labor Standards Law: Carcinogenic chemical substances

(Law paragraph 75.2, edict paragraph 35 table 1.2.7)

The Ship Safety Law Flammable substance・pyrophoric substance

（Hazard regulation No.3, separate hazard report table 1）

The Civil Aeronautics Law Flammable substance・pyrophoric substance

（Hazard regulation 194 separate hazard report table 1）

15-5. Antimony

Occupational Health and Safety Law (OHSL):

Materials to be notified.

(Law paragraph 57, and edict paragraph 18.2 table 9)

(Edict No. 38)

Law Concerning Reporting, etc., of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in their Management:

Type 1 designated chemical substance.

Pollutant Release and Transfer (PRTR) Law:

(Law paragraph 2.2, edict paragraph 1, appendix table 1)

(Edict No. 25)

Labor Standards Law: Toxic chemicals

(Law paragraph 75.2, edict paragraph 35 table 1.2.4)

The Ship Safety Law Poison（Hazard regulation No.2, paragraph 3, separate hazard report table 1）

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【Attached document】

The list shows the kind of an alloy targeted for the MSDS publication and a chemical ingredient based on Clause 3.2.

Alloy No.	Shape				Chemical Composition（mass%）						
	P	R	B	W	Cu	Pb	Fe	Fe+Sn	Sn	P,Ni,Al,Si,Sb	Zn
C3501				○	60.0 to 64.0	0.7 to 1.7	0.20 max.	0.40 max.	－	－	Remainder
C3560	○	○			61.0 to 64.0	2.0 to 3.0	0.10 max.	－	－	－	Remainder
C3561	○	○			57.0 to 61.0	2.0 to 3.0	0.10 max.	－	－	－	Remainder
C3601			○	○	59.0 to 63.0	1.8 to 3.7	0.30 max.	0.50 max.	－	－	Remainder
C3602			○	○	59.0 to 63.0	1.8 to 3.7	0.50 max.	1.0 max.	－	－	Remainder
C3603			○	○	57.0 to 61.0	1.8 to 3.7	0.35 max.	0.6 max.	－	－	Remainder
C3604			○	○	57.0 to 61.0	1.8 to 3.7	0.50 max.	1.0 max.	－	－	Remainder
C3605			○		56.0 to 60.0	3.5 to 4.5	0.50 max.	1.0 max.	－	－	Remainder
C3710	○	○			58.0 to 62.0	0.6 to 1.2	0.10 max.	－	－	－	Remainder
C3712			○		58.0 to 62.0	0.25to 1.2	－	0.80 max.	－	－	Remainder
C3713	○	○			58.0 to 62.0	1.0 to 2.0	0.10 max.	－	－	－	Remainder
C3771			○		57.0 to 61.0	1.0 to 2.5	－	1.0 max.	－	－	Remainder
C3531			○		59.0 to 64.0	1.0 to 4.0	0.8 max.	－	2.3 max.	0.01 to 1.9	Remainder