Safety Data Sheet (SDS)	SDS No. BS160726S-E	1/13 Page

These products (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 Information

Product Name: See table below.

Alloys	Equivalent JIS No.	Alloy Name	Equivalent Alloy No.	Shape	Substance Classification
Cu-Zn Group	H3100	Brass		Strip Sheet	Mixture (alloy)
Tin	-	Tin		Plating	metal

Company Information

Company Name
Address
Supervising Dept. : Quality Assurance Section
Tel : , Fax :
Emergency Contact :

(Issued Date: 26/JUL/2016)

2. Hazards Identification

This products (copper-based alloy products) 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.

GHS Classification: Copper

Physical Hazards:

Explosives:	Outside scope of classification
Flammable and combustible gas:	Outside scope of classification
Flammable and combustible aerosol:	Outside scope of classification
Combustion-enhancing and oxidizing gas:	Outside scope of classification
High-pressure gas:	Outside scope of classification
Flammable liquid:	Outside scope of classification
Flammable solid:	Cannot classify
Autoreactive substances and mixtures:	Outside scope of classification
Spontaneously combustible liquids:	Outside scope of classification
Spontaneously combustible solids:	Cannot classify
Self-heating substances and mixtures:	Cannot classify
Hydration-reactive flammable chemicals:	Cannot classify
Oxidizing liquids:	Outside scope of classification
Oxidizing solids:	Outside scope of classification
Organic peroxides:	Outside scope of classification
Metal-corroding substances:	Cannot classify

Health Hazards:

Acute (oral) toxicity:	Cannot classify
Acute (percutaneous) toxicity:	Cannot classify
Acute toxicity (inhaled: gas):	Outside scope of classification
Acute toxicity (inhaled: vapor):	Outside scope of classification
Acute toxicity (inhaled: powder):	Cannot classify
Acute toxicity (inhaled: mist):	Cannot classify
Skin corrosiveness and irritation:	Cannot classify
Critical injury to eyes and eye irritant:	Cannot classify
Respiratory organ sensitization:	Cannot classify
Skin sensitization:	Cannot classify
Germ-cell mutagenicity:	Cannot classify
Carcinogenicity:	Outside classification
Reproductive toxicity:	Cannot classify
Specific marker organ and systemic toxicity (single exposure):	

		Class 3 (airway irritant)
	Specific marker organ and systemic toxicity (repeated exposure):	Class 1 (liver)
	Inhalable respiratory organ harmfulness:	Cannot classify
Environmental Hazards:		
	Aquatic environment harm (acute):	Cannot classify
	Aquatic environment harm (chronic):	Class 4

Label Elements
Pictograms:

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.

[Storage]
Store in a well-ventilated area under lock and key.
Keep in a tightly closed container.

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

GHS Classification: Tin

Physical Hazards:		
	Explosives:	Outside scope of classification
	Flammable and combustible gas:	Outside scope of classification
	Flammable and combustible aerosol:	Outside scope of classification
	Combustion-enhancing and oxidizing gas:	Outside scope of classification
	High-pressure gas:	Outside scope of classification
	Flammable liquid:	Outside scope of classification
	Flammable solid:	Cannot classify
	Autoreactive substances and mixtures:	Outside scope of classification
	Spontaneously combustible liquids:	Outside scope of classification
	Spontaneously combustible solids:	Cannot classify
	Self-heating substances and mixtures:	Cannot classify
	Hydration-reactive flammable chemicals:	Cannot classify
	Oxidizing liquids:	Outside scope of classification
	Oxidizing solids:	Outside scope of classification
	Organic peroxides:	Outside scope of classification
	Metal-corroding substances:	Cannot classify
Health hazards:		
	Acute (oral) toxicity:	Cannot classify
	Acute (percutaneous) toxicity:	Cannot classify
	Acute toxicity (inhaled: gas):	Outside scope of classification
	Acute toxicity (inhaled: vapor):	Outside scope of classification
	Acute toxicity (inhaled: powder):	Cannot classify
	Acute toxicity (inhaled: mist):	Cannot classify
	Skin corrosiveness and irritation:	Cannot classify
	Critical injury to eyes and eye irritant:	Cannot classify

Respiratory organ sensitization: Cannot classify
Skin sensitization: Cannot classify
Germ-cell mutagenicity: Cannot classify
Carcinogenicity: Cannot classify
Reproductive toxicity: Cannot classify
Specific marker organ and systemic toxicity (single exposure): Cannot classify
Specific marker organ and systemic toxicity (repeated exposure): Class 1 (lung)
Inhalable respiratory organ harmfulness: Cannot classify

Environmental Hazards:
Aquatic environment harm (acute): Cannot classify
Aquatic environment harm (chronic): Cannot classify

Label Elements
Pictograms:

Signal word: Danger
Hazard statement: Risk of irritation to lung
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.
[Storage]
Store in a well-ventilated area under lock and key.
Keep in a tightly closed container.
[Disposal]
Recycling is possible, so if recovering and discarding, entrust the work to a waste disposal specialist who is licensed by the prefectural governor.

3. Composition / Information on ingredients

Single Substance and Mixtures Classification: Mixture (alloy)
Chemical Name: See the table of (Name of Chemical Substance)
Components and their Quantities: See the table below
Chemical Formula or Configuration Formula: None
Ordinance No. (PRTR Law and Industrial Safety and Health Law): See the table below
CAS No.: See the table below
Official Publication Reference No.: N/A

Compo-nents	Quantities (%)				Ordinance No. (Only Substances Subject to SDS Publication)				CAS No.
					PRTR Law		Industrial Safety and Health Law		
				Plating	0.1%≤	1%≤	0.1%≤	1%≤	
Copper (Cu)	68.5 to 71.5	64.0 to 68.0	59.0 to 62.0		---	---	379	---	7440-50-8
Iron(Fe)	≦0.05	≦0.05	≦0.05		---	---	---	---	7439-89-6
Lead(Pb)	≦0.05	≦0.05	≦0.05		---	---	---	---	7439-92-1
Zinc (Zn)	remainder	remainder	remainder		---	---	---	---	7440-66-6
Tin(Sn)				≦99.99			322		7440-31-5

4. First-aid measures

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

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.

Adhesion to skin: Remove contaminated clothing.
Wash skin promptly.
If feeling unwell, consult a physician and receive treatment.
Wash contaminated clothing before reuse.

Contact with 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 ingested: Rise out the mouth promptly, and immediately consult a physician for treatment.

Foreseeable Acute Symptoms and Delayed Onset Symptoms:
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 of people implementing emergency measures:
Rescuers should wear suitable protective equipment according to the circumstances.

Special precautions for physicians:
Rest and medical observation over time are indispensable.

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.

Adhesion to skin: Wash skin promptly.
Consult a physician and receive treatment.
Wash contaminated clothing before reuse.

Contact with eyes: Irrigate carefully for several minutes with water.
Consult a physician and receive treatment.

If ingested: Rise out the mouth promptly.
Consult a physician for treatment.

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

5. Fire-fighting measures

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

Copper

Flame retardants: Special powder retardants and dry sand.

Extinguishants that must not be used:
Rod infusers, foam extinguishants, and CO_2.

Characteristic dangers: 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.

Characteristic 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.

Tin

Flame retardants: Special powder retardants and dry sand.

Extinguishants that must not be used:

Rod infusers, foam extinguishants, and CO_2.

Characteristic dangers: 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.

Characteristic 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.

6. Accidental release measures

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

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 controls and personal protection”), 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.

Collection and neutralization:

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

Sealing and Cleaning Methods and Materials:

Stop the leak if there is no danger.

Preventing secondary accidents:

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.

Tin

Personnel precautions, protective equipment, and measures during emergencies:

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

Prohibit admission to all non-essential personnel.

Do not touch or walk through any leaking material.

Workers must wear protective equipment (See “8. Exposure controls and personal protection”), avoid gas and fume inhalation, and contact with the eyes and skin.Stay upwind.

Environmental precautions:

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

Collection and neutralization:

Collect leaks using clean, static-proof tools, and recover in a sealable container before implementing disposal processing.

Sealing and Cleaning Methods and Materials:

Stop the leak if there is no danger.

Preventing secondary accidents:

Promptly remove all ignition sources. (Prohibit smoking, fireworks, and naked flames in the vicinity.)
Prevent inflow to drainage ditches, sewers, cellars, or sealed locations.

7. Handling and Storage

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

Copper

<Handling>

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

Local exhaust and General 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”.

Contact avoidance: Refer to “10. Stability and Reactivity”.

<Storage>

Technical measure： Store hazardous materials in their storage location, and install the lighting, illumination, and ventilation necessary for handling.

Contact with hazardous substances:
Refer to “10. Stability and Reactivity”.

Storage conditions: Avoid locations with sudden temperature changes and high humidity when storing.
Keep in a tightly closed container and store in a well-ventilated and cool area under lock and key.
Keep away from heat, sparks and flame.
Keep away from the dangerous substances when mixed.

Container and packaging materials:
Although there are no packing or container regulations, place in a sealable, undamaged container.

Tin

<Handling>

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

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

Precautions for safe handling:
Prohibit the use of high-temperature devices, sparks, and naked flames in the vicinity.
There is a risk that the explosion happens in the case of a fire, make people evacuate according to the area.
Avoid rough handling such as dust, shock and friction.
Handle in well-ventilated or outdoor location.
Avoid eye and skin contact. Do not ingest and inhale.
Do not inhale dust, fume, mist and spray.
Wash hands thoroughly after handling.

Contact avoidance: Refer to “10. Stability and Reactivity”.

<Storage>

Technical measures: Store hazardous materials in their storage location, and install the lighting, illumination, and ventilation necessary for handling.

Contact with hazardous substances:
Refer to “10. Stability and Reactivity”.

Storage conditions: Securely seal the containers, and store in a cool, well-ventilated location.

Store away from heat, sparks, naked flames, and other ignition sources.
No smoking.
Store away from substances that are dangerous when mixed.
Lock the storage location.

Container and packing materials:

Place in a sealable, undamaged container. For powders, however, use a container designated by the United Nations Recommendations on the Transport of Dangerous Goods.

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.

Copper

Control concentration: Not set.
Tolerable Concentration: Not set.
(Exposure limits and biological exposure indices)
Japan Society for Occupational Health (2005 version):
ACGIH (2005 version): TLV-TWA 0.2 mg/m^3 (as fumes)
TLV-TWA 1.0 mg/m^3 (as dust or mist)
Equipment 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 protective equipment:
Wear suitable respirator protective equipment.
Hand protective equipment:
Wear suitable protective gloves.
Eye protective equipment:
Protective goggles (regular glasses, regular glasses with lateral plates, or goggles)
Skin and body protective equipment:
Wear protective equipment such as protective clothing and safety boots, etc.

Tin

Control concentration: Not set.
Tolerable Concentration: Not set.
(Exposure limits and biological exposure indices)
Japan Society for Occupational Health (2005 version)
ACGIH (2005 version): TLV-TWA 2 mg/m^3
Equipment 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 protective equipment:
Wear suitable respirator protective equipment.
Hand protective equipment:
Wear suitable protective gloves.
Eye protective equipment:
Wear suitable eye protective equipment.
Protective goggles (regular glasses, regular glasses with lateral plates, or goggles)
Skin and body protective equipment:
Use suitable protective clothing and masks as necessary.

9. Physical and Chemical Properties

a) Product Nomenclature Characteristics Fields marked with "---" in the table indicates no data.

	Brass	Tin
Physical Condition and Color	Lustrous Yellow product	Lustrous silver-white solid
Shape	Depends on product shape	Depends on product shape
Odor	None	None
pH and its Concentrations	---	---
Dissolution Temperature	---	---
Ignition Point	---	---
Flash Point	---	---
Explosion Characteristics	---	---
Solubility in Solvent	---	---
n-Octanol / Water Partition Coefficient	---	---
Other Data (Radiation, Bulk Density, Etc.)	---	---

b) Alloy Characteristics

	Brass			Tin
				(Sn)
Melting Point(ºC)	955	930	905	232
Specific Gravity	8.53	8.47	8.39	7.3

c) Configuration Element Characteristics

	Cu	Fe	Pb	Zn	Sn
Vapor Pressure (Pa)	---	---	---	---	---
Vapor Temperature (Boiling Point) (ºC)	2582	2860	1750	907	2480

10. Stability and Reactivity

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

Copper

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

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

Conditions to be avoided: Contact with humidity and hazardous mixtures.

Contact with hazardous substances: Acetylene compounds, ethylene oxides, azides, oxides (chlorates, bromates, and iodates, etc.)

Dangerous and harmful degradation products:
CO, CO_2, and copper fumes when burned.

Tin

Stability: Stable at constant temperature.
Oxygen affinity is small.
Not affair discoloration within dry air at constant temperature.
Not oxidize under 200℃. Make SnO^2 film on the surface over 200℃.

Possibility of harmful reactions: React with strong oxidizing compound, acids, strong base, halogen, sulfur. etc.
React rapidly with halogen and response to generate the halogenated tin.
React with alkali gradually on the low temperature, rapidly

on the the high temperature.
Conditions to be avoided: Proliferation of dust.
Contact with hazardous substances: Strong oxidizing compound, acids, strong base, halogen, sulfur. etc.
Dangerous and harmful degradation products:
Not set.

11. Toxicological information

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

Copper

Acute (oral) toxicity: Rabbits LDL_0 120 μg/kg[3)]
Skin corrosiveness and irritation: Contact with skin causes reddening symptoms.[14)]
Critical injury to eyes and eye irritant: Contact with eyes causes reddening. Causes painful symptoms.[14)]
Acts as an irritant.[10)]
Respiratory organ and skin sensitivity: Respiratory organ sensitization: no data.
Skin sensitization: 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.
Germ-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 marker organ and systemic 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 marker organ and systemic 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)
Inhalable respiratory organ harmfulness: No data.

Tin

Acute Toxicity: Oral: No information
Percutaneous: No information
Inhalation (dust): No information
Skin Corrosion and Irritability: No information
Critical Injury and Irritability to Eyes: No verifiable information
Respiratory Organ Sensitization: No information
Skin Sensitization: No information
Reproductive Cell Mutagenicity: No data
Carcinogenicity: No verifiable information
Reproductive Toxicity: No information
Specific Marker Organs and Systemic Toxicity (Single Exposure):
No verifiable information
Specific Marker Organs and Systemic Toxicity (Repeated Exposure):
Pneumoconiosis has been observed in workers handling metal tin[33)].
There is a risk of long-term exposure to this substance causing benign pneumoconiosis (stannosis) in the lungs[1)].
Damage to lungs due to long-term or repeated exposure (class 1) (lungs)

Long-term or repeated exposure causes kidney failure.
Long-term or repeated exposure causes pulmonary failure.

Absorptive Respiratory Organ Harmfulness: 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.

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.

Tin

No data

13. Disposal considerations

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

Copper

Residual waste: 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.

Dirty containers and 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.

Tin

Residual waste: 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.

Dirty containers and 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.

Copper

<International Regulations>

Marine regulations information: Harmless substance.
UN number: Not applicable
Aviation regulations information: Harmless substance.
UN number: Not applicable

<Japanese Regulations>

Land regulations information: No special regulations.

Marine regulations information: Harmless substance.
Aviation regulations information: Harmless substance.

Tin

<International Regulations>
Marine regulations information: Harmless substance.
UN number: Not applicable
Aviation regulations information: Harmless substance.
UN number: Not applicable
<Japanese Regulations>
Land regulations information: No special regulations.
Marine regulations information: Harmless substance.
Aviation regulations information: Harmless substance.

15. Regulatory information

This product (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.

Copper

Occupational Health and Safety Law (OHSL):
Materials to Be Notified
(Law Paragraph 57, and edict Paragraph 18.2 Table 9)
(Edict No. 379)

Tin

Occupational Health and Safety Law (OHSL):
Materials to Be Notified
(Law Paragraph 57, and edict Paragraph 18.2 Table 9)
(Edict No. 322)

16. Other Information

Copper

<References>

1) Ullmanns (E) (5th edition, 1995)
2) Contamination Dangers Handbook (2nd edition, 1997)
3) RTECS (2005)
4) ICSC (J) (1993)
5) Sax (8th edition, 1992)
6) Lange (14th edition 1992)
7) Gangolli (1st edition 1993) vol. 2
8) Lide (85th edition, 2004-2005)
9) SRC (Access on Jul 2005)
10) PATTY (4th edition, 1994)
11) EHC200 (1998)
12) EPA (IRIS (Access on Jul 2005))
13) ACGIH (7th edition, 2001)
14) Handbook of Danger and Harmful Chemical Substances, Japan Industrial Safety and Health Association (1992)
15) Booklet of the Threshold Limit Values and Biological Exposure Indices, 6th edition; Japan Chemical Industry Ecology-Toxicology & Information Center (2004)
16) GHS Classification Results (Sumika Technical Information Service, Inc.)
17) Japan Chemical Industry Association, "Emergency Measures and Policies, Container Yellow Card (Labeling)"
18) Japan Chemical Industry Association, "Chemical Substances Control Law Regulations Search System" (CD-ROM) (2005)
19) Japan Chemical Database Ltd., "Comprehensive Chemicals Database" (2005)

20) Safety Database (revised and expanded supplementary edition, 1997)
21) JETOC, “Collection of Existing Chemical Substance Safety Inspection Data for the Chemical Substances Control Law”
22) Ministry of the Environment, “Chemical Substances Ecological Impact Tests”

Tin

<References>

1) ICSC (2004)
2) Hommel (1991)
3) Weiss (2nd, 1985)
4) HSDB (2003)
5) Hazardous material DB (2nd, 1993)
6) ESC SYRESS
7) ACGIH (2001)
8) DFGOT vol. 6 (1994)
9) RTECS (2004)
10) ACGIH-TLV (2005)
11) NTP (11th, 2005)
12) Howard (1997)
13) UNRTDG (13th,2004)
14) SIDS (2002)
15) ECETOC TR4 (1982)
16) SRC (2005)
17) GESTIS (2005)
18) PATTY (5th, 2001)
19) AQUIRE (2003)
20) Merck (13th, 2001)
21) CERI hazard database (1998)
22) BUA68 (1991)
23) TOXCENTER (Access on Feb 2005)
24) Sax (11th, 2004)
25) ECETOC TR48 (1998)
26) IUCLID (2000)
27) IARC Vol.71 (1999)
28) ACGIH (2003)
29) RTECS (VZ200000) HSDB Full record
30) Japan Society for Occupational Health recommendations (2005)
31) IARC39 (1986)
32) IRIS (1998)
33) EHC 15 (1980)
34) EHC(J) 134 (1997)
35) Renzo (3rd, 1986)
36) Fluxing material pocketbook (1997)
37) Lange (16th, 2005)
38) Chapman (2005)
39) Ministry of the Environment Risk Evaluations Vol. 3 (2002)
40) Contact avoidance handbook (Ver2. 1997)
41) ATSDR (1997)
42) BSDB (2005)
43) CAMD (Access on May 2005)
44) J Occup Health 45: 137 – 139 (2003)
45) Eur Resper J. 25 (1): 201 – 204 (2005)
46) DFGOT Vol.12 (1999)
47) NICNAS (1999)
48) EU Annex Ⅰ (2005)
49) Lide (85th, 2004)
50) EU – RAR (2005)
51) HSDB (2005)
52) ICSC (1999)

53) Report of Ministry of Health, Labour and Welfare (2005)
54) ESIS Data Base (2005)

The Safety Data Sheet is supplied to workers handling hazardous chemical products as reference information to assure safe handling. Make sure the workers engaged in handling understand the importance of suitable measures depending the on individual handling circumstances, etc., and that they are themselves responsible for referencing the SDS before use. Consequently, this datasheet is not a guarantee of safety.