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Glossary of terms used in wrought copper and copper alloys

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of International Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law.

This Standard has been made based on **ISO 197/1**, *Copper and copper alloys—Terms and definitions—Part 1 : Materials*, **ISO 197/2**, *Copper and copper alloys—Terms and definitions—Part 2 : Unwrought products (Refinery shapes)*, **ISO 197/3**, *Copper and copper alloys—Terms and definitions—Part 3 : Wrought products*, **ISO 197/4**, *Copper and copper alloys—Terms and definitions—Part 4 : Castings* and **ISO 197/5**, *Copper and copper alloys—Terms and definitions—Part 5 : Methods of processing and treatment*, for the purposes of making easy to compare this Standard with International Standards; to prepare Japanese Industrial Standard conforming with International Standards; and to propose a draft of International Standard which is based on Japanese Industrial Standard.

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Glossary of terms used in wrought copper and copper alloys

Introduction This Japanese Industrial Standard has been prepared based on the first edition of **ISO 197/1**, *Copper and copper alloys—Terms and definitions—Part 1 : Materials*, **ISO 197/2**, *Copper and copper alloys—Terms and definitions—Part 2 : Unwrought products (Refinery shapes)*, **ISO 197/3**, *Copper and copper alloys—Terms and definitions—Part 3 : Wrought products*, **ISO 197/4**, *Copper and copper alloys—Terms and definitions—Part 4 : Castings* and **ISO 197/5**, *Copper and copper alloys—Terms and definitions—Part 5 : Methods of processing and treatment*, published in 1983, in which the corresponding International Standards are adopted for the corresponding parts (terms) in this Standard without any modification in technical contents. The specified items which have not been specified in the corresponding International Standards are additionally included in this Japanese Industrial Standard.

1 Scope This Standard specifies the principal terms and their definitions related to the class, processing, heat treatment, quality, performance, test and the like of wrought copper and copper alloy products.

Remarks 1 The wrought copper and copper alloy products are the generic term of such products as plate, ribbon, tube, bar, wire and the like of copper and copper alloys manufactured by hot or cold plastic deformation processing such as rolling, extruding, drawing, forging and the like.

2 The International Standards corresponding to this Standard are shown as follows:

ISO 197/1 : 1983 *Copper and copper alloys—Terms and definitions—Part 1 : Materials*

ISO 197/2 : 1983 *Copper and copper alloys—Terms and definitions—Part 2 : Unwrought products (Refinery shapes)*

ISO 197/3 : 1983 *Copper and copper alloys—Terms and definitions—Part 3 : Wrought products*

ISO 197/4 : 1983 *Copper and copper alloys—Terms and definitions—Part 4 : Castings*

ISO 197/5 : 1980 *Copper and copper alloys—Terms and definitions—Part 5 : Methods of processing and treatment*

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards indicated below shall be applied.

JIS H 2121 *Electrolytic cathode copper*

JIS H 2501 *Phosphor copper metal*

JIS H 2504 *Copper beryllium master alloy*

JIS H 3100 *Copper and copper alloy sheets, plates and strips*

JIS H 3140 *Copper bus bars*

- JIS H 3401 *Pipe fittings of copper and copper alloys*
JIS Z 2241 *Method of tensile test for metallic materials*
JIS Z 2243 *Brinell hardness test—Test method*
JIS Z 2244 *Vickers hardness test—Test method*
JIS Z 2245 *Rockwell hardness test—Test method*
JIS Z 2246 *Method of Shore hardness test*

3 Classification The classification of terms for wrought copper and copper alloy products shall be as follows:

- a) **Class of wrought copper and copper alloy products**
 - 1) **Class by alloy**
 - 2) **Class by manufacturing method**
 - 3) **Class by product shape**
 - 4) **Class by use**
 - 5) **Others**
- b) **Processing and heat treatment**
 - 1) **Smelting and casting**
 - 2) **Hot working**
 - 3) **Cold working**
 - 4) **Finish working**
 - 5) **Heat treatment**
 - 6) **Jointing and others**
- c) **Quality and performance**
 - 1) **Mechanical characteristics**
 - 2) **Other characteristics**
 - 3) **Dimensions and shape**
 - 4) **Surface quality**
- d) **Tests**
 - 1) **Mechanical and physical characteristic tests**
 - 2) **Other tests**
- e) **Others**
 - 1) **Metal in general**
 - 2) **Corrosion**

- 3) **Pipe fittings**
- 4) **Unrefined copper and refined copper**
- 5) **Castings**
- 6) **Others**

4 Numbers, terms and definitions The numbers, terms and definitions shall be as follows.

Supplementary explanations are shown in the next to definition for reference and English equivalents are shown in the margin.

- Remarks
- 1 When two terms are mentioned in parallel in a column of term, they shall be preferentially used in the order mentioned.
 - 2 In the definition, the corresponding alloy numbers specified in the product standard in **JIS** are shown in a sign of () for reference.
 - 3 When the term specified in this Standard appears in the definition, the number is shown for reference by attaching a sign of () in the next of the term.
 - 4 When the specified term is found in **JIS**, the number of **JIS** is shown by attaching a sign of () in the next of definition for reference.

a) Class of wrought copper and copper alloy products

1) Class by alloy

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1100	銅	DŌ	A metal of not less than 99.90 % of copper. Informative reference : Oxygen-free copper (refer to 1101), tough pitch copper (refer to 1102), phosphorous-deoxidized copper (refer to 1103) and the like are typically known.	copper
1101	無酸素銅	MUSANSO-DŌ	A metal (C 1011, C 1020) of not less than 99.96 % of copper (I) oxide [Cu ₂ O] (refer to 5105) or copper without containing residual deoxidizer. Informative reference : That is excellent in electric and thermal conductivity and the hydrogen embrittlement does not occur by heating at high temperatures in a reductive atmosphere.	oxygen-free copper
1102	タフピッチ銅	TAHUPITTI-DŌ	A metal (C 1100) of not less than 99.90 % of copper containing 0.02 % to 0.05 % oxygen in the state of copper (I) oxide [Cu ₂ O] (refer to 5105). Informative reference : That is excellent in electric and thermal conductivity, however, the hydrogen embrittlement occurs sometimes by heating at high temperatures in a reductive atmosphere.	tough pitch copper
1103	りん脱酸銅	RINDATUSAN-DŌ	A metal (C 1201 to C 1221) of not less than 99.90 % of copper which is deoxidized (refer to 2120) by phosphorus and does not contain copper (I) oxide [Cu ₂ O] (refer to 5105). Informative reference : That is classified into high phosphorus-deoxidized copper and low phosphorous-deoxidized copper depending on the residual	phosphorous-deoxidized copper

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1110	すず入り銅	SUZUIRI-DÔ	amount of phosphorus. In the former, there is none of possibility of hydrogen embrittlement, but an electric conductivity will be decreased. In the latter, the decrease of electric conductivity is small, but there is a possibility of hydrogen embrittlement depending on the condition. A high copper alloy (refer to 1191) in which 0.05 % to 0.2 % of tin and not more than 0.04 % of phosphorus are added to copper. Informative reference : That is used for lead frame, radiator fin and the like because the heat resistance has been improved.	tin bearing copper
1111	銀入り銅	GIN'IRI-DÔ	A high copper alloy (refer to 1191) in which 0.08 % to 0.25 % of silver is added to copper. Informative reference : That is used for JIS C 2801 because the heat resistance has been improved.	silver bearing copper
1112	ジルコニウム銅	ZIRUKONIUMU-DÔ	A precipitation-hardening type of high copper alloy (refer to 1191) in which 0.02 % to 0.2 % of zirconium is added to copper. Informative reference : That is excellent in strength, heat resistance and electric conductivity, and is used for lead frame and the like.	copper-zirconium alloys
1113	クロム銅	KUROMU-DÔ	A precipitation-hardening type of high copper alloy (refer to 1191) in which 0.4 % to 1.2 % of chromium is added to copper. Informative reference : That is excellent in heat resistance and electric conductivity, and used in electrode for resistance welding and the like.	copper-chromium alloys

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1114	テルル銅	TERURU-DÔ	A high copper alloy (refer to 1191) in which 0.3 % to 2.0 % of tellurium is added to copper. Informative reference : That is excellent in machinability (refer to 3172) and used for cutting material such as electrode for discharge processing, torch hood and the like.	copper-tellurium alloys
1115	チタン銅	TITAN-DÔ	A precipitation-hardening type of high copper alloy (refer to 1191) in which 1.0 % to 4.0 % of titanium is added to copper. Informative reference : The strength matching copper-beryllium alloy (refer to 1116) is obtained by the treatment of cold working (refer to 2300) and age hardening (refer to 2535) and that is used for spring material.	copper-titanium alloys
1116	ベリリウム銅	BERIRIUMU-DÔ	A precipitation-hardening type of high copper alloy (refer to 1191) in which 0.4 % to 2.2 % of beryllium, small amount of cobalt, nickel and iron are added to copper. Informative reference : The strength matching steel is obtained by the treatment of cold working (refer to 2300) and age hardening (refer to 2535), and that is used for spring material.	copper-beryllium alloys
1117	快削ベリリウム銅	KAISAKU-BERIRIUMU-DÔ	A precipitation-hardening type of high copper alloy (refer to 1191) in which 0.4 % to 2.0 % of beryllium, 0.2 % to 1.2 % of lead, small amount of cobalt, nickel and iron are added to copper. Informative reference : The machinability (refer to 3172) of copper-beryllium alloy is improved by adding lead and that is usually supplied as bar and used for connector and the like.	free-cutting copper-beryllium alloys

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1118	鉄入り銅	TETUIRI-DÔ	A precipitation-hardening type of high copper alloy (refer to 1191) in which 0.1 % to 2.6 % of iron and 0.01 % to 0.3 % of phosphorus are added to copper. Informative reference: The strength, heat resistance property and electric conductivity property are enhanced by the treatment of age hardening (refer to 2535), and that is used for lead frame and the like.	copper-iron alloys
1119	含りん銅	GANRIN-DÔ	Copper with the addition of phosphorus of the upper limit (0.040 %) or over for phosphorus in phosphorous-deoxidized copper (refer to 1103). Informative reference: That is used as an anode for copper plating.	high phosphorous copper
1130	丹銅	TANDÔ	Alloy (refer to 5100) (C 2100 to C 2400) composed of 78.5 % to 96.0 % of copper and zinc as the rest. Informative reference: This name is given according to a pink colour assumed and that is used for building materials, accessories and the like.	red brass
1131	黄銅	ÔDÔ	Alloy (refer to 5100) (C 2600 to C 2801) of principal component (59.0 % to 71.5 %) of copper, and zinc. Informative references 1 When elements other than zinc are added, the following shall be totally satisfied. a) The amount of zinc shall be larger than that of any other element. b) The content of nickel shall be not more than 5 %.	copper-zinc alloys; brass

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
			c) The content of tin shall be not more than 3.5 %. 2 That is sometimes called 60/40 brass, 65/35 brass or 70/30 brass according to the rate of copper to zinc.	
1132	快削黄銅	KAISAKU-ÔDÔ	Alloy (refer to 5100) (C 3560 to C 3713) composed of 56.0 % to 63 % of copper, 1.8 % to 4.5 % of lead and zinc as the rest. Informative reference : That is copper-zinc alloy (refer to 1131) of which the machinability (refer to 3172) is improved by adding lead, and has the highest machinability among copper alloys. That is finished to screw, gear and the like by cutting and used for the parts of machine and the like.	free-cutting brass
1133	鍛造用黄銅	TANZÔYÔ-ÔDÔ	Alloy (refer to 5100) (C 3712 to C 3771) composed of 57.0 % to 62.0 % of copper, 0.25 % to 2.5 % of lead and zinc as the rest. Informative reference : Hot forging property (refer to 2240) is given without hindering of machinability (refer to 3172). That is used for valve, parts of machine and the like.	brass for forging; forging brass
1134	高力黄銅	KÔRYOKU-ÔDÔ	Alloy (refer to 5100) (C 6782, C 6783) of copper-zinc alloy (refer to 1131) of 55.0 % to 60.5 % of copper with not more than 2.0 % of aluminium, not more than 3.0 % of manganese and not more than 1.5 % of iron. Informative reference : That is a copper-zinc alloy of high strength added and used for propeller shaft for ship, shaft for pump and the like.	high strength brass

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1135	すず入り黄銅	SUZUIRI-ÔDÔ	Alloy (refer to 5100) composed of 80.0 % to 95.0 % of copper, 1.5 % to 3.5 % of tin and zinc as the rest. Informative reference : That is excellent in strength and spring property, and used for connector and the like.	tin bearing brass
1136	アドミラルティ黄銅	ADOMIRARUTĪ-ÔDÔ	Alloy (refer to 5100) (C 4430) composed of 70.0 % to 73.0 % of copper, 0.9 % to 1.2 % of tin, 0.02 % to 0.06 % of arsenic and zinc as the rest. Informative reference : That is used for the pipe of heat exchanger in which fresh water is mainly used as cooling water. That was developed in England and named because of being used for the condenser pipes of warship.	admiralty brass
1137	ネーバル黄銅	NĒBARU-ÔDÔ	Alloy (refer to 5100) (C 4621 to C 4641) composed of 59.0 % to 64.0 % copper, 0.50 % to 1.5 % of tin and zinc as the rest. Informative reference : That is excellent in strength and sea water resistance, and used for tube plate (refer to 1305) and other marine structural materials.	naval brass
1138	アルミニウム黄銅	ARUMINIUMU-ÔDÔ	Alloy (refer to 5100) (C 6870) composed of 76.0 % to 79.0 % of copper, 1.8 % to 2.5 % of aluminium, 0.02 % to 0.06 % of arsenic and zinc as the rest. Informative reference : That is excellent in sea water resistance and used for heat exchanger and heat exchanger tube of condenser. Also, that with small amount of silica, nickel and the like is known (C 6871, C 6872).	aluminium brass

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No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1150	青銅	SEIDŌ	Alloy (refer to 5100) composed of copper as principal component and tin.	copper-tin alloys; bronze
1151	りん青銅	RINSEIDŌ	Alloy (refer to 5100) (C 5102, C 5111, C 5191, C 5210, C 5212) containing copper as the principal component, 3.5 % to 9.0 % of tin and 0.03 % to 0.35 % of phosphorus. Informative reference: That is excellent in spring property and used for spring material for electric machinery. Also the low phosphor bronze containing 1.0 % to 3.5 % of tin is known.	phosphor bronze
1152	快削りん青銅	KAISAKU-RINSEIDŌ	Alloy (refer to 5100) (C 5341, C 5441) containing copper as the principal component, 3.5 % to 5.8 % of tin, 0.01 % to 0.50 % of phosphorus, 0.8 % to 4.5 % of lead and not more than 4.5 % of zinc. Informative reference: That is the alloy of phosphor bronze (refer to 1151) of which the machinability (refer to 3172) is improved by adding lead, and used for connector and the like.	free-cutting phosphor bronze
1153	アルミニウム青銅	ARUMINIUMU-SEIDŌ	Alloy (refer to 5100) (C 6140 to C 6301) composed of 77.0 % to 92.5 % of copper, 6.0 % to 12.0 % of aluminium, 1.5 % to 6.0 % of iron, not more than 7.0 % of nickel and not more than 2.0 % of manganese. Informative reference: That is excellent in strength, corrosion resistance, abrasion resistance, and used for vehicles machine, the parts of ship and the like.	copper-aluminium alloys; aluminium bronze
1170	白銅	HAKUDŌ	Alloy (refer to 5100) (C 7060 to C 7164) containing copper as the principal component, 9.0 % to 33.0 % of nickel, 0.40 % to 2.3 % of iron, 0.20 % to 2.5 % of manganese and not more than 1.0 % of zinc.	copper-nickel alloys; cupronickel

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
			Informative reference : That is excellent in sea water resistance and high-temperature strength, and used for conductive pipe of heat exchanger. Also the alloy for coins of 74.0 % to 76.0 % of copper and 24.0 % to 26.0 % of nickel is known.	
1180	洋白	YÔHAKU	Alloy (refer to 5100) (C 7351 to C 7701) composed of 54.0 % to 75.0 % of copper, not less than 5.0 % of nickel, 0 % to 0.50 % of manganese and zinc as the rest. Informative reference : That assumes silver-white colour and is excellent in fatigue resistance, corrosion resistance, and used for a cap of quartz oscillator, western tableware and the like.	copper-nickel-zinc alloys; nickel silver
1181	快削洋白	KAISAKU-YÔHAKU	Alloy (refer to 5100) (C 7941) composed of 60.0 % to 64.0 % of copper, 16.5 % to 19.5 % of nickel, 0.8 % to 1.8 % of lead, 0 % to 0.50 % of manganese and zinc as the rest. Informative reference : That is the alloy of which the machinability (refer to 3172) is improved by adding lead to copper-nickel-zinc alloy, and used for screw, key and the like.	free-cutting nickel silver
1190	銅合金	DÔGÔKIN	Alloy (refer to 5100) (C 7941) of which the principal component is copper and alloying elements (refer to 5101) are added.	copper alloys
1191	高銅合金	KÔ-DÔGÔKIN	Alloy of which the copper content is not less than 96.0 %, the principal component is copper and alloying elements (refer to 5101) are added, and which does not belong to other system of alloys (refer to 1110 to 1118).	high copper alloys

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1192	合金番号	GÓKIN-BANGÓ	A number to express the class of material. Informative reference : The symbols of material for wrought copper and copper alloy products (refer to 1201) are expressed by C and a four-digit number. The first place The second place The third place The fourth place The fifth place C x x x x The first place C to express copper and copper alloy. The second place The system of alloy depending on principal element added is expressed. 1: Alloy of Cu and high Cu system 2: Alloy of Cu-Zn system 3: Alloy of Cu-Zn-Pb system 4: Alloy of Cu-Zn-Sn system 5: Alloy of Cu-Sn system and alloy of Cu-Sn-Pb system 6: Alloy of Cu-Al system, alloy of Cu-Si system and alloy of special Cu-Zn system 7: Alloy of Cu-Ni system and alloy of Cu-Ni-Zn system The third place to the fifth place The distinction of each alloy in alloy system is expressed (in principle, according to the order from higher content of copper).	alloy number

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1193	形状記号	KEIZYÔ-KIGÔ	Symbols which designate the shape such as plate, ribbon, tube, bar, wire and the like according to the first letter of English name. P: Plate, T: Tube, W: Wire, R: Ribbon, B: Bar	shape designation

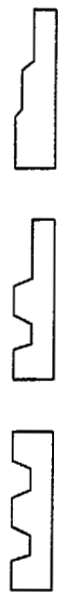
2) Class by manufacturing method

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1200	展伸材	TENSIN-ZAI	General term of products such as plate, ribbon, tube, bar, wire and the like manufactured by hot or cold plastic processing such as rolling (refer to 2201 and 2301), extrusion (refer to 2220), drawing (refer to 2320), forging (refer to 2240 and 2340) and the like.	wrought products
1201	伸銅品	SINDÔ-HIN	General term of products such as plate, ribbon, tube, bar, wire and the like of copper and copper alloys manufactured by hot or cold plastic processing such as rolling (refer to 2201 and 2301), extrusion (refer to 2220), drawing (refer to 2320), forging (refer to 2240 and 2340) and the like.	wrought copper and copper alloy products
1202	ミルハードン材	MIRUHÂDON-ZAI	Materials to which the specified mechanical property is given by proper treatment of cold working (refer to 2300) and age hardening (refer to 2535). Informative reference : That is applied to copper-beryllium alloys (refer to 1116).	mill-hardened materials
1220	押出棒	OSIDASIBÔ	A bar which is finished to the final dimensions by extrusion (refer to 2220).	extruded rod/bar

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
			Informative reference : In the JIS for wrought copper and copper alloy products (refer to 1201), the symbol of [B (Bar) E (Extruded)] is attached behind the alloy number (refer to 1192).	
1221	引抜棒	HIKINUKIBÔ	A bar which is finished to the final dimensions by drawing (refer to 2320). Informative reference : In the JIS for wrought copper and copper alloy products (refer to 1201), the symbol of [B (Bar) D (Drawing)] is attached behind the alloy number (refer to 1192).	drawn rod/bar
1222	鍛造棒	TANZÔBÔ	A bar which is finished to the final dimensions by forging. Informative reference : In the JIS for wrought copper and copper alloy products (refer to 1201), the symbol of [B (Bar) F (Forging)] is attached behind the alloy number (refer to 1192).	forged rod/bar
1240	継目無管	TUNAGIMENASIKAN	A seamless tube which is manufactured from ingots (refer to 2160) by such processing as extrusion (refer to 2220), rolling, drawing (refer to 2320) and the like. Informative reference : The designation distinguished from welded tube (refer to 1241).	seamless tube
1241	溶接管	YÔSETU-KAN	A tube manufactured by forming plate or ribbon into a tube and by welding in the direction of pipe axis. Informative reference : For the wrought copper and copper alloy products (refer to 1201), the welding method by high frequency induction heating is mainly used. The symbol of [T (Tube) W (Welded)] is attached behind the alloy number (refer to 1192) in the JIS for wrought copper and copper alloy products (refer to 1201).	welded tube

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1260	鍛造品	TANZÔ-HIN	Wrought products (refer to 1200) which are forged and formed by compressing or hammering material partially or totally by using of tool, mould and the like. Informative reference: The forging is classified into hot forging (refer to 2240), warm forging and cold forging (refer to 2340) according to heating temperature of material.	forging
1261	熱処理形合金	NETUSYORIGATA-GÔKIN	Alloys which are able to enhance the strength by the heat treatment of age hardening. Informative reference: In the JIS for wrought copper and copper alloy products (refer to 1201), copper-beryllium alloys (C 1700, C 1720) are known.	heat-treatable alloys
1262	非熱処理形合金	HI-NETUSYORIGATA-GÔKIN	Alloys which are essentially unable to enhance the strength by the heat treatment of age hardening and able to enhance the strength only by cold working (refer to 2300). Informative reference: In the JIS for wrought copper and copper alloy products (refer to 1201), the alloys other than copper-beryllium alloys (C 1700, C 1720) are applicable.	non-heat-treatable alloys

3) Class by product shape

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1300	板 ⁽¹⁾	ITA	Rolled products which are supplied as the flat plate cut by shear or saw, having a uniform thickness of not less than 0.1 mm and rectangular cross-section.	sheet; plate
1301	条 ⁽¹⁾	ZYÔ	Rolled products which are supplied as the slit coil shape having a uniform thickness of not less than 0.1 mm and rectangular cross-section.	strip; ribbon
1302	はく(箔) ⁽¹⁾	HAKU	Rolled products which are supplied as the slit coil shape having a uniform thickness of under 0.1 mm and rectangular cross-section.	foil
1303	円板	ENBAN	Blanks (refer to 1307) of circular shape.	circles
1304	円形 (えんぎょう)	ENGYÔ	Materials for coins which are manufactured by punching the rolled plate to circular shape.	coin blanks
1305	管板	KAN-ITA	Plates to which a large number of pipes are fixed by welding, expander and the like in heat exchanger and the like.	tube plate
1306	異形条	IKEIZYÔ	A ribbon which has the difference in level in the direction of width. Informative reference: Examples of shape are shown as follows. 	contour strip; multi gage strip
1307	ブランク	BURANKU	Various shapes of metallic piece which are taken out from plate for such processing as bending, punching, deep drawing and the like.	blanks

Note (1) Caution shall be required because the definitions in wrought copper and copper alloy products are sometimes different from the others.

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1320	棒	BÔ	A solid wrought product (refer to 1200) which has a uniform cross-section in overall length and is supplied in the straight state and of which the shape of cross-section is round, regular hexagonal, square and rectangular.	rod/bar
1321	異形棒	IKEIBÔ	A solid wrought product (refer to 1200) which has a uniform cross-section in overall length and is supplied in the straight state and is a bar of which the cross-section is not round, regular hexagonal, square nor rectangular.	deformed rod/bar
1322	線	SEN	A solid wrought product (refer to 1200) which has a uniform cross-section in overall length and is supplied in a coil shape, and of which the shape of cross-section is round, regular hexagonal, square and rectangular.	wire
1323	異形線	IKEI-SEN	A solid wrought product (refer to 1200) which has a uniform cross-section in overall length and is supplied in a coil shape, and is the wire of which the shape of cross-section is not round, regular hexagonal, square nor rectangular.	deformed wire
1324	平角線	HIRAKAKU-SEN	A kind of wire (refer to 1322) of which the cross-section is finished to be rectangular by drawing (refer to 2320) or rolling. Informative reference : That is supplied in a coil shape and mainly used for rotor coil and stator coil of a large size of motor.	flat wire
1325	荒引線	ARABIKI-SEN	A solid intermediate wrought product which has a uniform cross-section in overall length and is supplied in a coil shape, and is the wire of not less than 6 mm in diameter of which the cross-section is approximately round, triangular and polygonal.	drawing stock; wire rod

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1340	管	KAN	A hollow wrought product (refer to 1200) which has a uniform shape of cross-section and thickness and is supplied in the straight state or a coil shape.	tube; pipe
1341	異形管	IKEIKAN	A hollow wrought product (refer to 1200) which has a uniform shape of cross-section and thickness and is supplied in the straight state or a coil shape, and is the pipe of which the shape of cross-section is other than round.	deformed tube
1342	角管	KAKU-KAN	A kind of deformed tube (refer to 1341) which has a square or rectangular shape of cross-section.	rectangular or square tube
1343	へん平管	HENPEI-KAN	A kind of deformed tube (refer to 1341) which has a flattened shape of cross-section. Informative reference : That is used for heat exchanger and the like.	flattened tube
1344	フィンチューブ	HINTYŪBU	A pipe of which the inside/outside surface or both surfaces have various types of fins in order to enhance thermal conductive performance by increasing the effective surface area.	finned tube
1345	UベンD管	U-BENDO-KAN	A pipe which is manufactured by bending a straight tube to U-figure shape. Informative reference : That is used for heat exchanger.	U-bent tube
1346	内面溝付管	NAIMEN-MIZOTUKI-KAN	A pipe of which the thermal conductivity is enhanced by providing a large number of helical grooves with some torsional angle to the axial direction of pipe in the inside surface of pipe. Informative reference : That is mainly used for the heat exchanger of air conditioning machinery.	inner helically grooved tube

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1347	キャピラリーチューブ	KYAPIRARI-TYÔBU	A very fine tube which is used for piping of refrigerant and the like in air conditioning machinery and refrigerator.	capillary tube
1348	コルゲートチューブ	KORUGÊTO-TYÔBU	A pipe which is processed to a shape of twisted rope by attaching injection streak with some torsional angle to the axial direction of pipe. Informative reference : The improvement of thermal conductivity is obtained by turbulent flow effect, and that is used for heat exchanger and the like.	corrugated tube
1349	フレキシブルチューブ	HUREKISIBURU-TYÔBU	A flexible pipe which is adapted to the expansion and contraction in the axial direction of pipe, the displacement in the width direction, the bending displacement and the like in piping system.	flexible tube
1350	二重管	NIZYÛ-KAN	A pipe to which a different kind of metallic pipe is mechanically bonded by cold drawing, hydraulic expansion of pipe or the like. Informative reference : When a single pipe is unable to be adopted to the corrosive environment in inside and outside of pipe, that is used.	duplex tube

4) Class by use

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1400	電子管用無酸素銅	DENSIKAN-YÔ- MUSANSO-DÔ	A high purity copper (C 1011) in which the amount of impurities is especially restricted for electron tube. Informative reference : That has such characteristics as excellent thermal conductivity, well glass-sealing, excellent maintenance of vacuum.	oxygen-free copper for electron devices
1401	印刷用銅	INSATU-YÔ-DÔ	Copper (C 1100, C 1221, C 1401) which is used for gravure printing and photo letterpress. Informative reference : A system of pure copper such as tough pitch copper (refer to 1102), phosphorous-deoxidized copper (refer to 1103) and the like is used for gravure printing and that containing small amount of nickel for enhancing heat resistance is used for letterpress printing. That is finished so as to obtain a specially smooth surface with higher hardness and used for plate.	copper for printing
1402	ばね用ベリリウム銅	BANE-YÔ- BERIRIUMU-DÔ	Copper-beryllium alloy (refer to 1116) (C 1700, C 1720) for which the treatment condition of age hardening (refer to 2535) and the spring bending elastic limit (refer to 3170) are especially specified for spring materials. Informative reference : That is used for connector, switch, relay, contact point and the like as plate and ribbon.	copper-beryllium alloy for spring
1403	ばね用りん青銅	BANE-YÔ-RINSEIDÔ	Phosphor bronze (refer to 1151) (C 5210) containing 7.0 % to 9.0 % of tin of which the spring bending elastic limit (refer to 3170) is specified for spring material. Informative reference : That is used for connector, switch, relay, contact point and the like as plate and ribbon.	phosphor bronze for spring