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(JCBA/JSA)

**Copper beryllium alloy, phosphor
bronze and nickel silver rods, bars
and wires**

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Contents

	Page
1 Scope.....	1
2 Normative references	1
3 Terms and definitions	1
4 Grade and designation	1
5 Quality	2
5.1 Appearance	2
5.2 Chemical composition	3
5.3 Mechanical properties	4
5.4 Coilability	10
6 Dimensions and tolerances	10
6.1 Representative dimensions	10
6.2 Dimensional tolerances.....	10
6.3 Maximum permissible bend of bars.....	12
6.4 Maximum value of angular radius	13
7 Tests	13
7.1 Chemical analysis.....	13
7.2 Tensile test	14
7.3 Hardness test	14
7.4 Coiling test	14
7.5 Age-hardening treatment	14
8 Inspection	15
9 Marking.....	15
10 Report.....	15
Annex A (informative) Representative dimensions of bars and wires	16

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Copper and Brass Association (JCBA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS H 3270:2006** is replaced with this Standard.

However, **JIS H 3270:2006** may be applied in the **JIS** mark certification based on the relevant provisions of Article 19 Clause 1, etc. of the Industrial Standardization Law until October 21, 2013.

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Copper beryllium alloy, phosphor bronze and nickel silver rods, bars and wires

1 Scope

This Japanese Industrial Standard specifies expanded copper beryllium alloy, phosphor bronze and nickel silver rods and bars having a round or regular hexagonal section (hereafter referred to as “bars”), and wires having a round, regular hexagonal, square or rectangular section (hereafter referred to as “wires”).

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

- JIS H 0321 *General rules for inspection of non-ferrous metal materials*
- JIS H 0500 *Glossary of terms used in wrought copper and copper alloys*
- JIS H 1051 *Methods for determination of copper in copper and copper alloys*
- JIS H 1052 *Methods for determination of tin in copper and copper alloys*
- JIS H 1053 *Methods for determination of lead in copper and copper alloys*
- JIS H 1054 *Methods for determination of iron in copper and copper alloys*
- JIS H 1055 *Methods for determination of manganese in copper and copper alloys*
- JIS H 1056 *Methods for determination of nickel in copper and copper alloys*
- JIS H 1058 *Methods for determination of phosphorus in copper and copper alloys*
- JIS H 1060 *Methods for determination of cobalt in copper and copper alloys*
- JIS H 1062 *Methods for determination of zinc in copper and copper alloys*
- JIS H 1063 *Methods for determination of beryllium in copper alloys*
- JIS H 1292 *Methods for X-ray fluorescence spectrometric analysis of copper alloys*
- JIS Z 2241 *Metallic materials—Tensile testing—Method of test at room temperature*
- JIS Z 2244 *Vickers hardness test—Test method*
- JIS Z 2245 *Rockwell hardness test—Test method*

3 Terms and definitions

For the purposes of this Standard, the terms and definitions given in **JIS H 0500** apply.

4 Grade and designation

The grade and designation of bars and wires shall be in accordance with table 1. A product designation shall consist of the designation symbol given in table 1 and the symbol of temper grade suffixed to it (see table 3 to table 6).

Table 1 Grade and designation of bars and wires

Grade		Designation	Informative	
Alloy No.	Shape		Name	Characteristics and application examples
C 1720	Bar	C 1720 B	Copper beryllium alloy	Good corrosion resistance, high workability before age-hardening treatment, and increased fatigue endurance and electric conductivity after age-hardening treatment. Age-hardening treatment shall be given after the forming process.
	Wire	C 1720 W		Bars are applicable to aircraft engine parts, propellers, bolts, cams, gears, bearings, electrodes for spot welding, etc. Wires are applicable to coil springs, spiral springs, brushes, etc.
C 5071	Wire	C 5071 W	Phosphor bronze	Good fatigue endurance, corrosion resistance and wear resistance. Bars are applicable to gears, cams, joints, shafts, bearings, machine screws, bolts, nuts, sliding parts, connectors, hangers for trolley-wires, etc. Wires are applicable to coil springs, spiral springs, snap buttons, binding wires for electric machines, wire nettings, header materials, washers, etc.
C 5111	Bar	C 5111 B		
	Wire	C 5111 W		
C 5102	Bar	C 5102 B		
	Wire	C 5102 W		
C 5191	Bar	C 5191 B		
	Wire	C 5191 W		
C 5212	Bar	C 5212 B		
	Wire	C 5212 W		
C 5341	Bar	C 5341 B	Free-cutting phosphor bronze	Good machinability. Applicable to machine screws, bearings, bushes, bolts, nuts and parts for ball-point pens, etc.
C 5441	Bar	C 5441 B		
C 7451	Wire	C 7451 W	Nickel silver	Fine gloss, good fatigue endurance and corrosion resistance. Bars are applicable to machine screws, bolts, nuts, parts for electric machines, musical instruments, medical apparatus, watch and clock parts, etc. Wires are suitable for special spring materials used for straight springs, coil springs of relays, measuring instruments, medical apparatus, decoratives, spectacles parts, header materials, etc.
C 7521	Bar	C 7521 B		
	Wire	C 7521 W		
C 7541	Bar	C 7541 B		
	Wire	C 7541 W		
C 7701	Bar	C 7701 B		
	Wire	C 7701 W		
C 7941	Bar	C 7941 B	Free-cutting nickel silver	Good machinability. Applicable to machine screws, bearings, parts for ball-point pens, spectacles parts, etc.

5 Quality

5.1 Appearance

Bars and wires shall have a workmanlike finish, homogeneity, and be free from defects detrimental to practical use. Judgement of defects detrimental to practical use shall be subject to the agreement between the purchaser and the manufacturer.

5.2 Chemical composition

The chemical composition of bars and wires, when tested by 7.1, shall satisfy the requirements given in table 2.

Table 2 Chemical composition of bars and wires

Unit: %

Alloy No.	Cu	Pb	Fe	Sn	Zn	Be	Mn	Ni	Ni+ Co	Ni+ Co+ Fe	P	Others
C 1720	—	—	—	—	—	1.80 to 2.00	—	—	0.20 min.	0.6 max.	—	Cu+Be+Ni+ Co+Fe 99.5 min.
C 5071	—	0.02 max.	0.10 max.	1.7 to 2.3	0.20 max.	—	—	0.10 to 0.40	—	—	0.15 max.	Cu+Sn+Ni+P 99.5 min.
C 5111	—	0.02 max.	0.10 max.	3.5 to 4.5	0.20 max.	—	—	—	—	—	0.03 to 0.35	Cu+Sn+P 99.5 min.
C 5102	—	0.02 max.	0.10 max.	4.5 to 5.5	0.20 max.	—	—	—	—	—	0.03 to 0.35	Cu+Sn+P 99.5 min.
C 5191	—	0.02 max.	0.10 max.	5.5 to 7.0	0.20 max.	—	—	—	—	—	0.03 to 0.35	Cu+Sn+P 99.5 min.
C 5212	—	0.02 max.	0.10 max.	7.0 to 9.0	0.20 max.	—	—	—	—	—	0.03 to 0.35	Cu+Sn+P 99.5 min.
C 5341	—	0.8 to 1.5	—	3.5 to 5.8	—	—	—	—	—	—	0.03 to 0.35	Cu+Sn+Pb+P 99.5 min.
C 5441	—	3.5 to 4.0	—	3.0 to 4.5	1.5 to 4.5	—	—	—	—	—	0.01 to 0.50	Cu+Sn+Pb+ Zn+P 99.5 min.
C 7451	63.0 to 67.0	0.03 max.	0.25 max.	—	Residual	—	0.50 max.	8.5 to 11.0	—	—	—	—
C 7521	62.0 to 66.0	0.03 max.	0.25 max.	—	Residual	—	0.50 max.	16.5 to 19.5	—	—	—	—
C 7541	60.0 to 64.0	0.03 max.	0.25 max.	—	Residual	—	0.50 max.	12.5 to 15.5	—	—	—	—
C 7701	54.0 to 58.0	0.03 max.	0.25 max.	—	Residual	—	0.50 max.	16.5 to 19.5	—	—	—	—
C 7941	60.0 to 64.0	0.8 to 1.8	0.25 max.	—	Residual	—	0.50 max.	16.5 to 19.5	—	—	—	—