



# ***First Auto Metals***



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## **Kinmachi introduction**

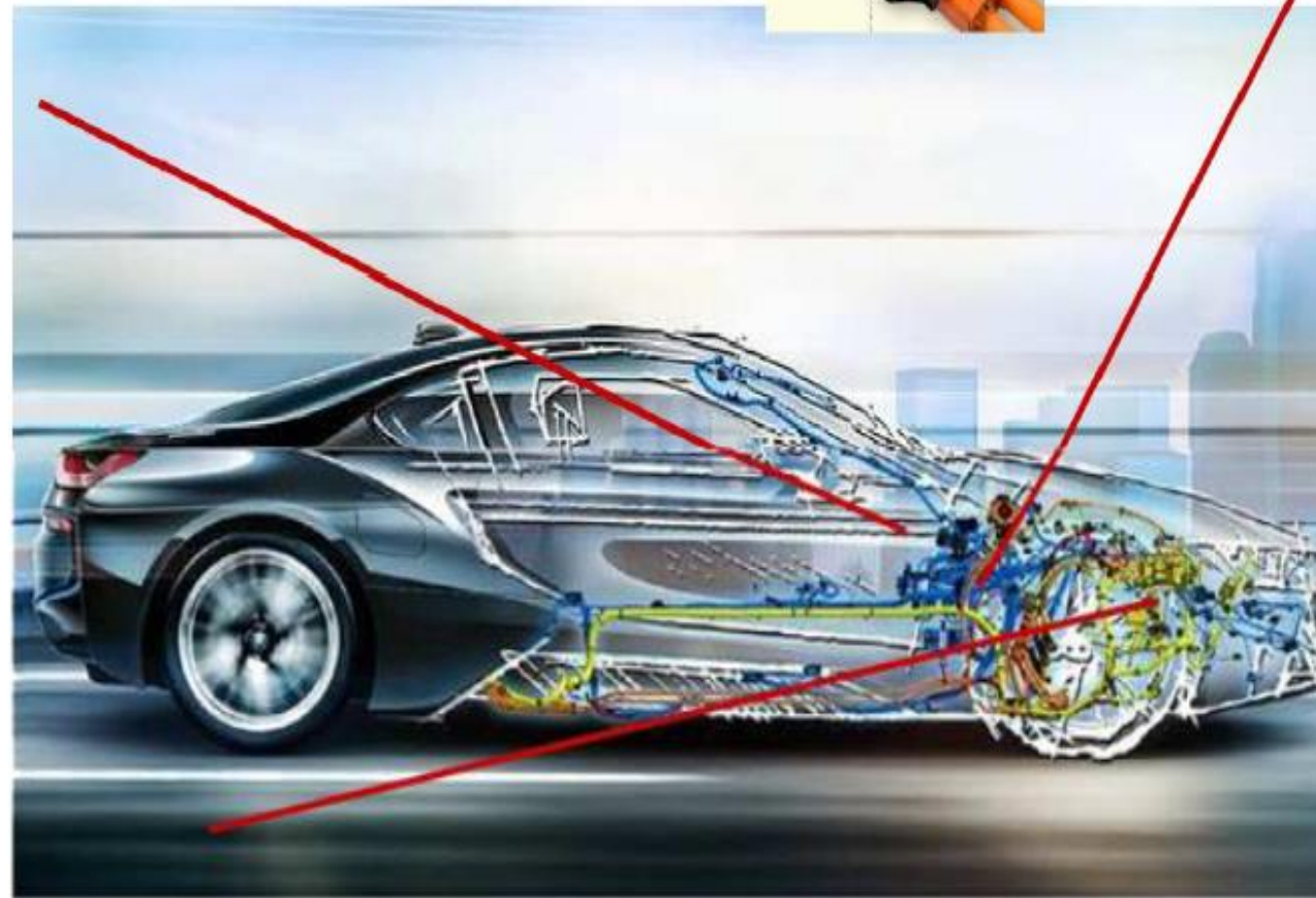
**SHANGHAI KINMACHI NEW MATERIAL TECHNOLOGY CO., LTD. is a professional servicer of providing metal materials and solutions for the automotive electronics, consumer electronics, medical electronics industry.**

**After many years of accumulation and development in the electronics industry, we accumulated rich experience and a large number of professional data, we can provide new material and optimization of high-performance and low-cost, which including raw materials, electroplating, stamping, assembly, injection molding and so on. We have become the first choice as a major service provider for many automotive electronics manufacturers.**

# Main alloy application

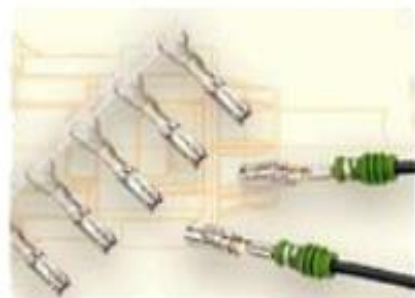
Connectors and busbars for junction boxes

- C19400(CuFe2P)
- C19010(CuNiSiP)
- C14415(CuSn0.15)
- C18665(MSP1)



Connectors for a high number of applications in the engine compartment

- C19010(CuNiSiP)
- C70260(CuNi2Si)



Connectors for HV/ HA connectors(spring-element)/ shielding

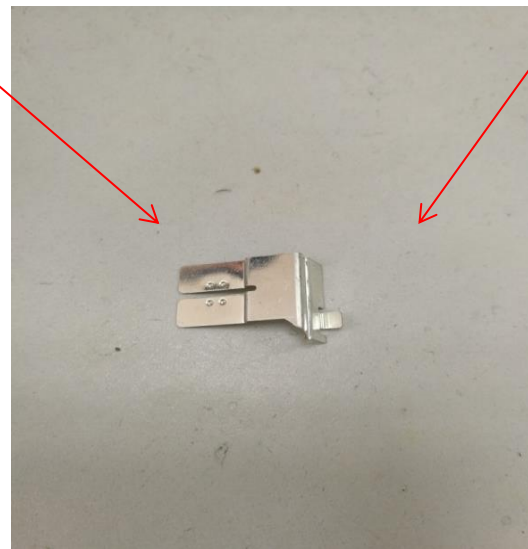
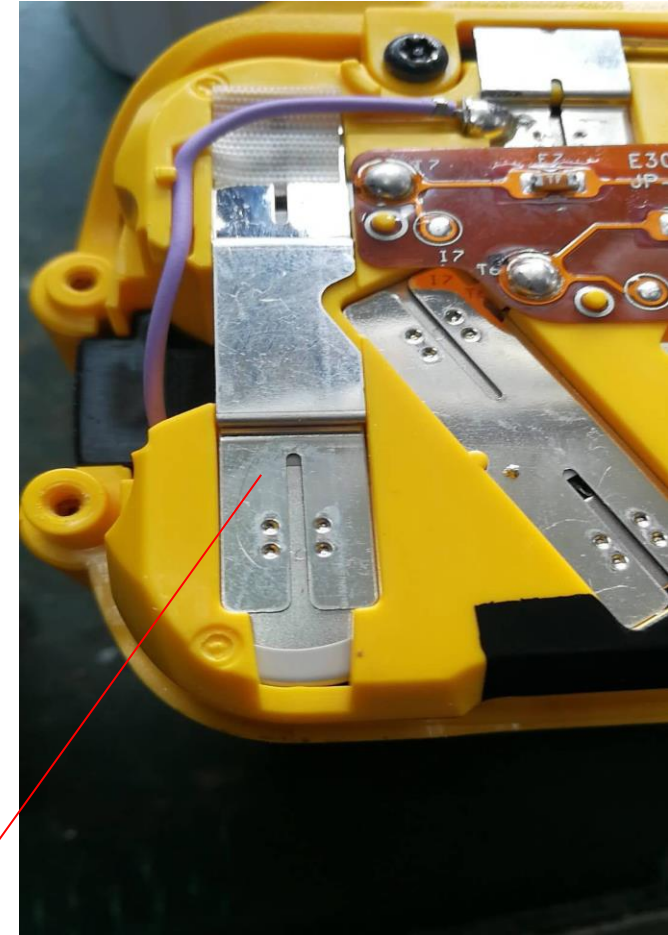
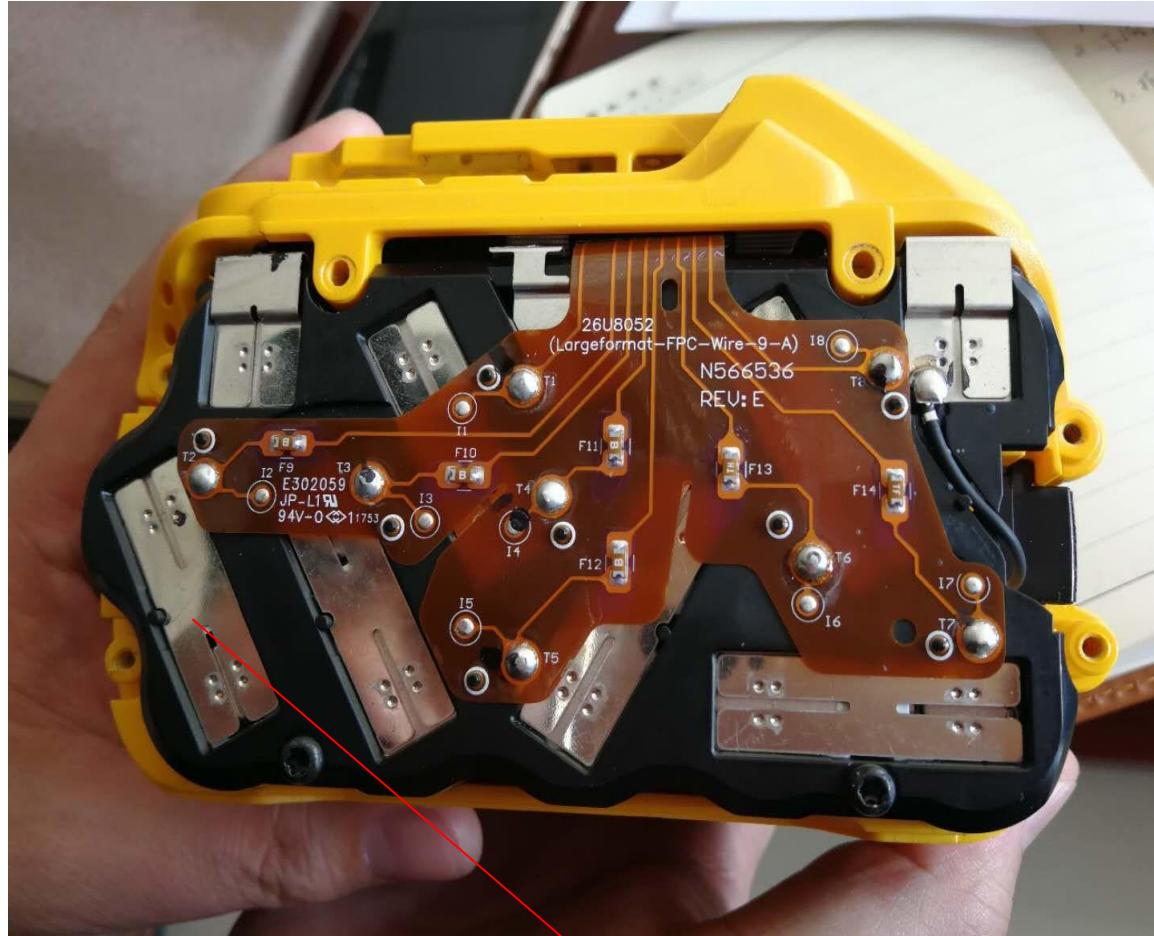
- C18150(CuCrZr)
- C18400
- C15100
- C19010(CuNiSiP)



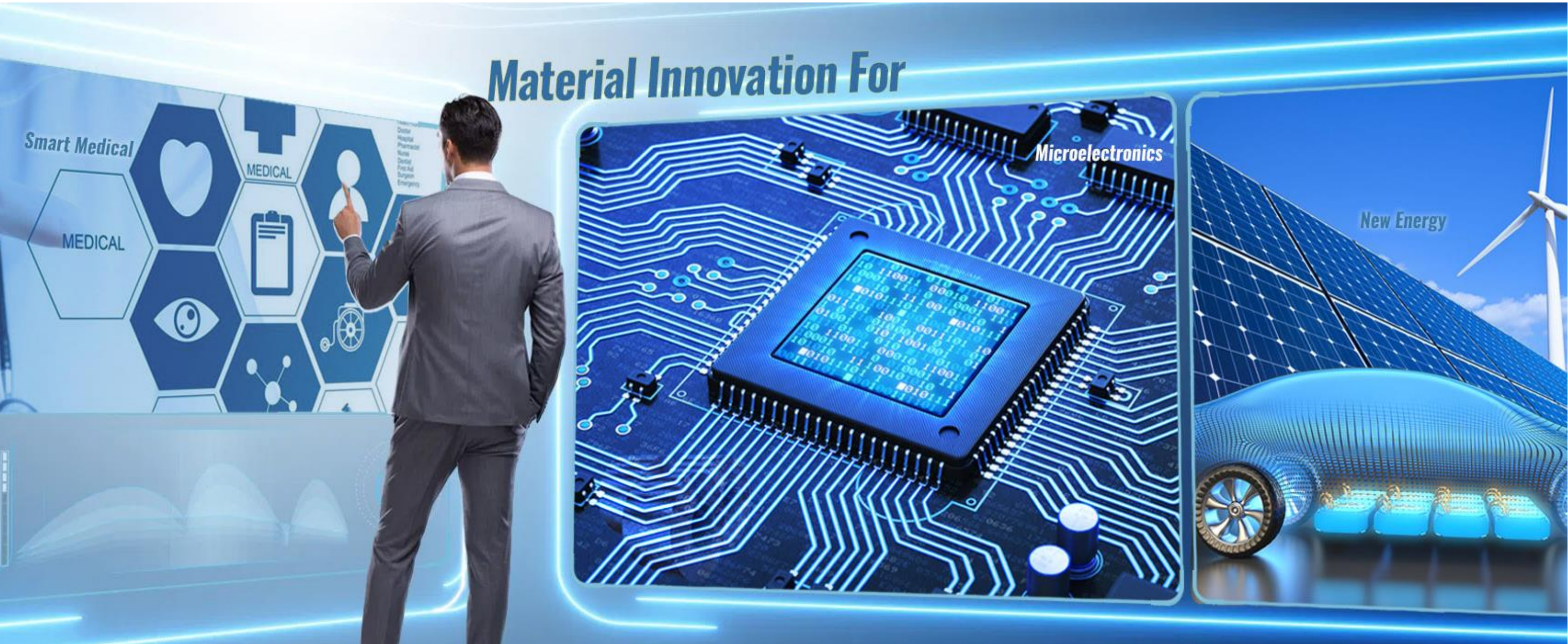
# Main alloy application

Power tool lithium battery cell connection piece

- C50715(KLF5)
- C50710(MF202)
- C19040(CAC5)
- C19025(NB109)



**Service 1: New automotive electronics, semiconductors, smart microelectronics and other upgraded materials and joint development of new materials**



## Development and optimization and upgrading of copper alloys

1. Domestic substitutes for imported many kinds of copper alloy materials

C1100(Cu-ETP)	C10300(Cu-HCP)	C10300(Cu-PHC)
C12200(Cu-DHP)	C1020(Cu-OF CW008A)	
C14415(CuSn0.15)	C18150(CuCrZr)	C15100(CuZr)
C19210(CuFe0.1P)	C19400(CuFe2P)	C18665(CuMg)
C19010(CuNiSiP)	C7026(CuNi2Si)	C7025(CuNi3SiMg)
C64775(C7025-Sn)	C18070(CuCrSiTi)	C64750 (PMC26)
C2600(CuZn30)	C2680(CuZn33)	C2720(CuZn37)
C5111(CuSn4)	C5191(CuSn6)	C5210(CuSn8)
C50710(CuSn2Ni0.3P)	C50715(CuSn2Fe0.1P)	C19025(NB109)
C7521(Cu64Ni18Zn18)	C7701(Cu56Ni18Zn26)	
C17200	C17410	C17300 C17510 C17500

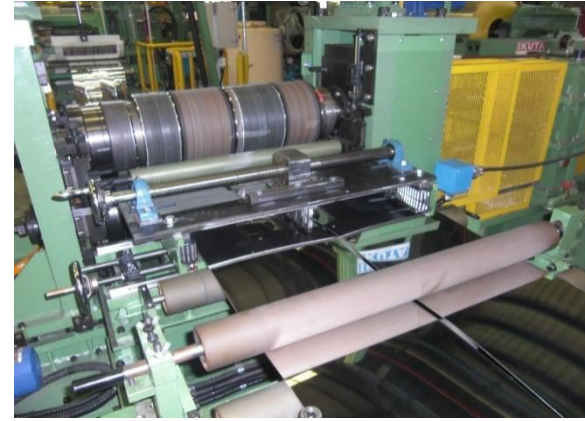
FeNi42 Invar ...

2. High-power lithium battery terminal materials, high-voltage contact materials, chip materials, fuse materials.

3. Medical ultra-micro wires, medical metal materials, etc.

## Service 2:Slitting of Kinmachi

Thickness (mm)	Width (mm)	Material
0.005-4.0	0.8-600	stainless steel, copper
0.05-3.5	0.8-600	nickel, aluminum
0.01-4.0	4.0-600	silicon steel, amorphous ribbon

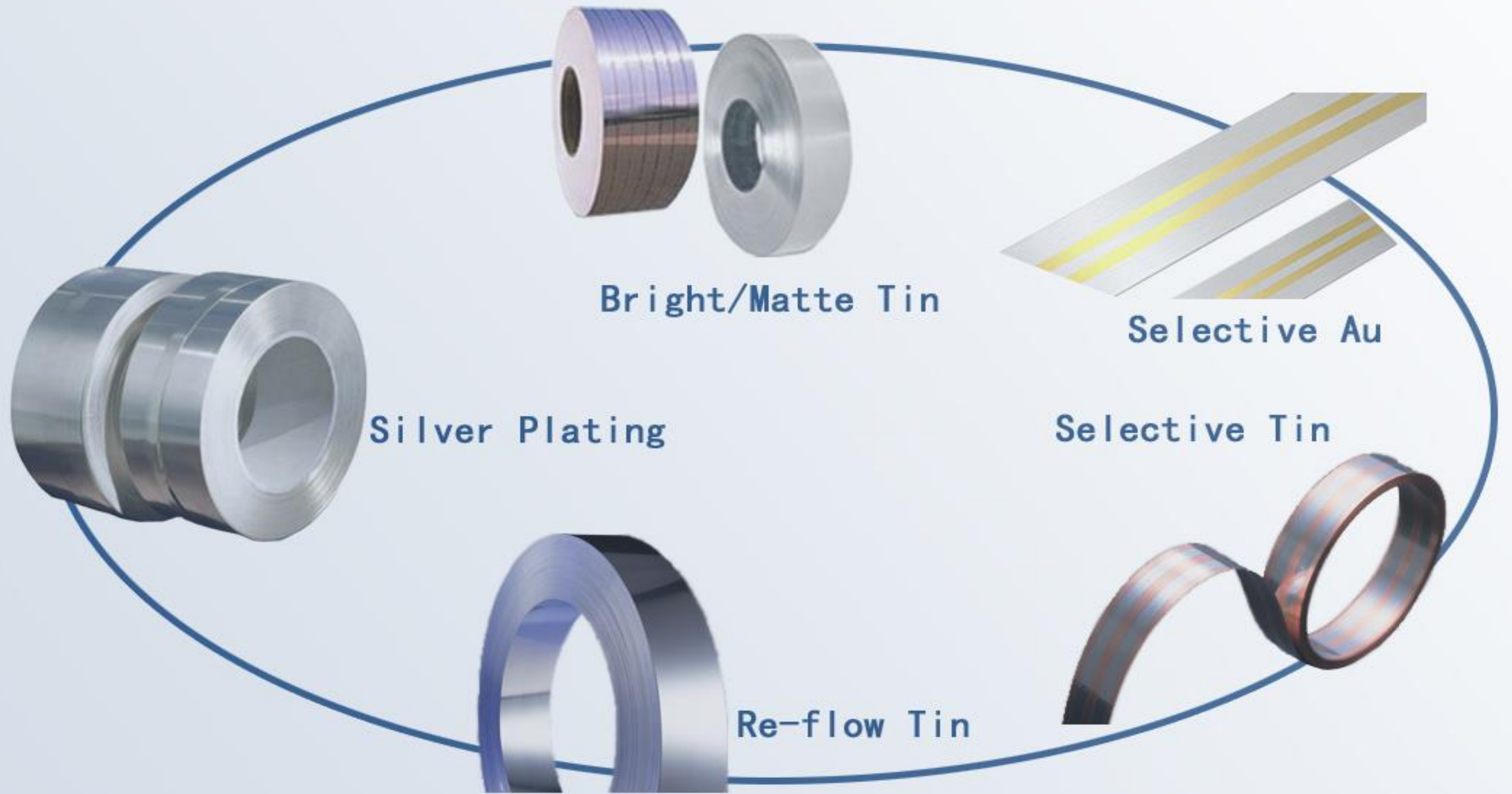


# Service 3:Plating of Kinmachi

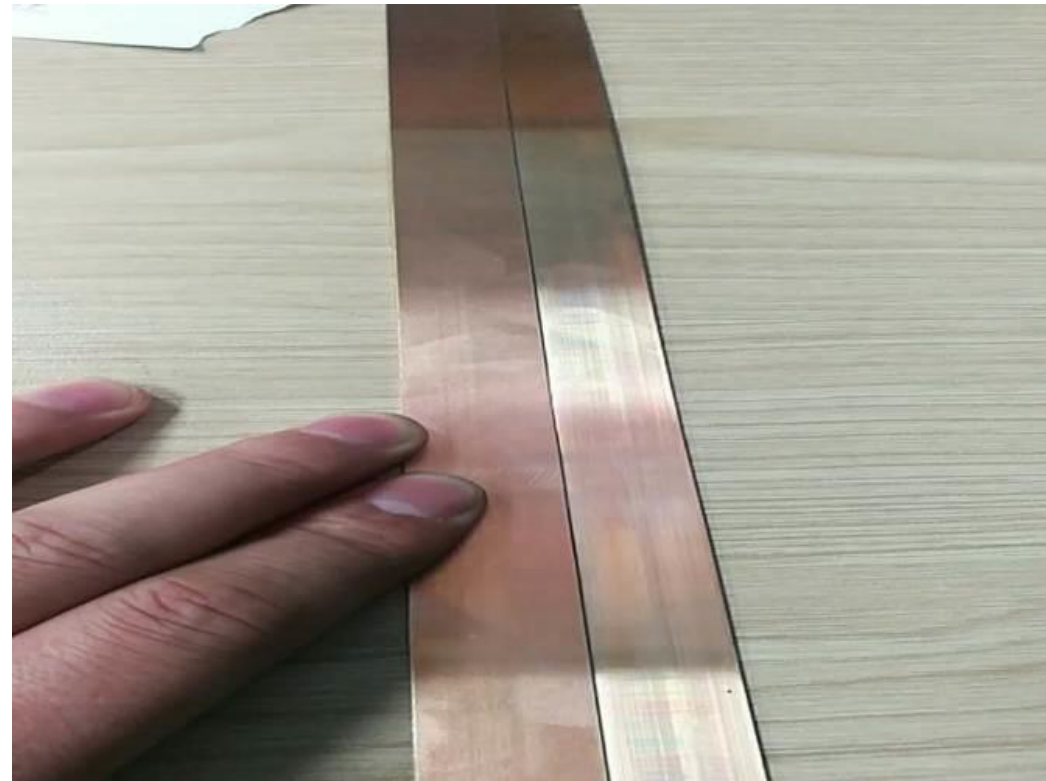
Plating	Type	Coating thickness (um)	Layer thickness (um)	Material Thickness (mm)	Material Width (mm)
Plating Sn	Bright Tin	1.0-10.0	Ni/Cu 1.0-2.5	0.05-3	8-110
	Matte Tin	1.0-10.0	Ni/Cu 1.0-2.5	0.05-3	8-110
	Reflow-Tin	0.8-2.5	Cu 1.5max	0.1-1.0	9.0-610.0
Plating Ni ( Bright /Matte )	Plating Ni	7.0max	Cu 1.5max	0.05-3.0	250.0max
Plating Ag	Plating Ag	0.5-2.0	Ni 1.5max	0.05-3.0	150.0max
Selective Plating Au/Ag	Plating Au/Ag	0.5-2.0	Ni 1.5max	0.05-1.0	8.0-150.0







## Service 4: Shaped copper strip processing



Alloys: CuSn6 (C5191), CuSn8 (C5210), C7025, CuSn0.15, CuZn30..

Skiving Thickness: **0.02-1.0mm**

Skiving Thickness : **0.2mm**, Thickness Tolerance:  **$\pm 0.005\text{mm}$** , Width Tolerance:  **$\pm 0.1\text{mm}$**

Skiving Thickness : **1.0mm**, Thickness Tolerance :  **$\pm 0.03\text{mm}$** , Width Tolerance :  **$\pm 0.15\text{mm}$**

# Production process

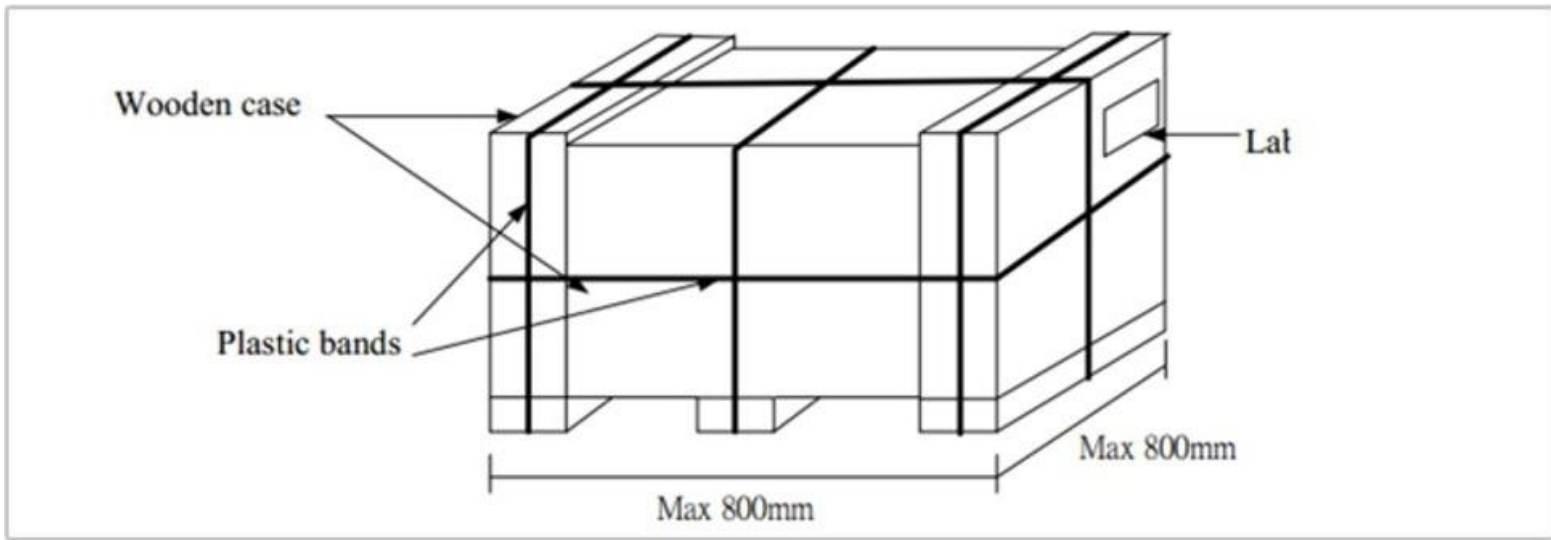
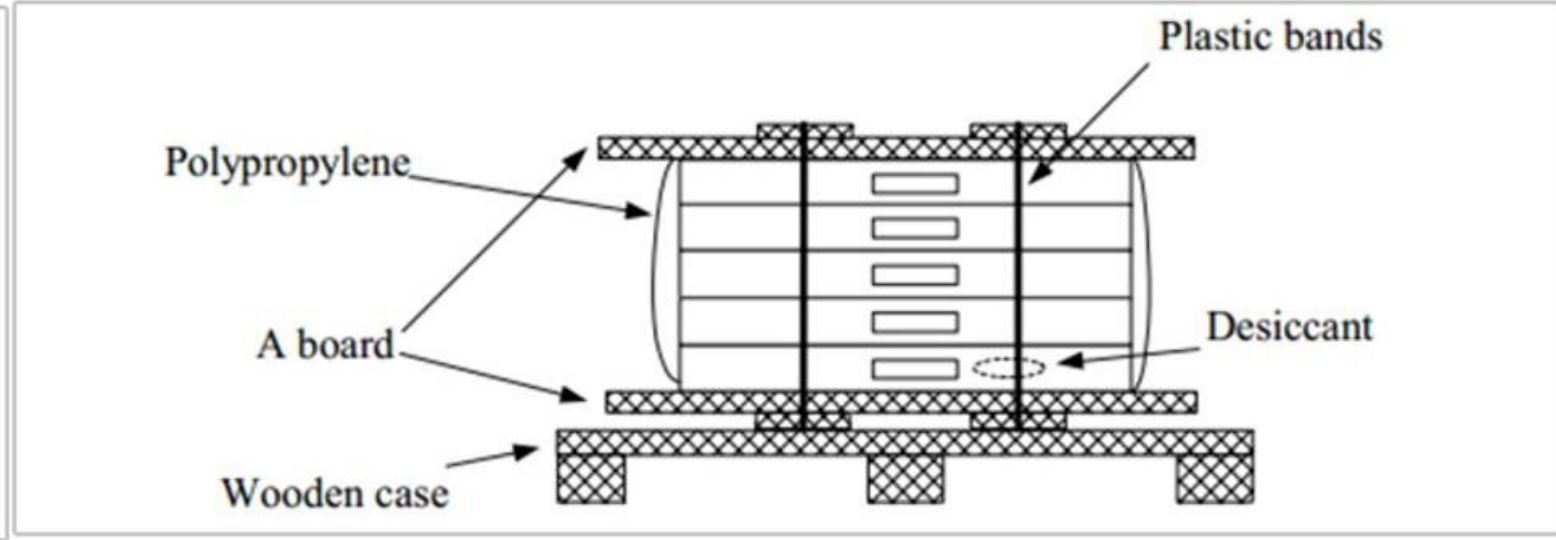
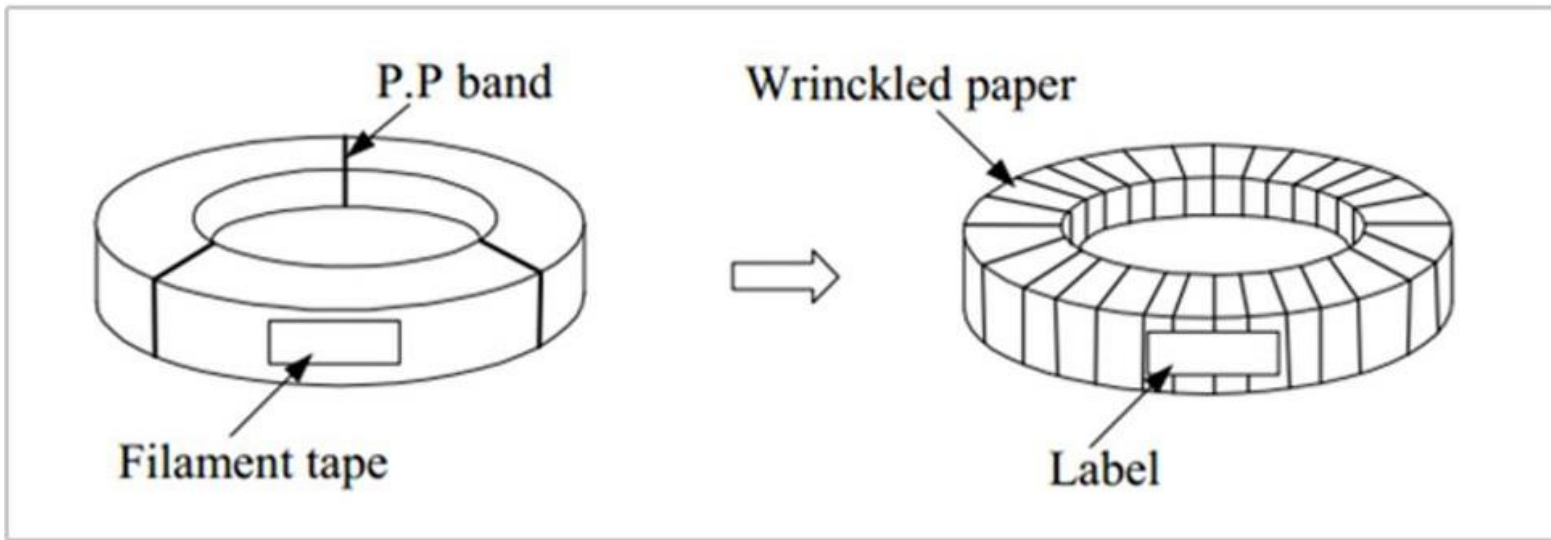


# Laboratory



TOP QUALITY LAB,  
TOP QUALITY PRODUCTS

# Packing & Shipping



# Certification: ISO9001

INGEER CERTIFICATION ASSESSMENT SERVICES



## QUALITY MANAGEMENT SYSTEM CERTIFICATE

Certification No. 117 21 QU 0235-06 ROS

This is to certify that **Shanghai Kinmachi New Material Technology Co., Ltd.**

Unified social credit code 91310112588707559A

Registered Address Room C635, Building 1, No. 5500, Yuanjiang Road, Minhang District, Shanghai, China

Business Address Room 2115, Gold Source Center, No. 28, Yuanwen Road, Minhang District, Shanghai, China

has been assessed and registered as meeting the requirements of **GB/T19001-2016/ISO9001:2015**

Scope of approval Sales of Metal Materials, Metal Products, Machinery Equipment and Accessories

Signed by: 

First Certification: 22 Jun. 2021  
Expiry Date: 21 Jun. 2024

Shanghai Ingeer Certification Assessment Co., Ltd.  
Certification and Accreditation Administration of PRC: CNCA-R-2003-117  
Tel: 400-182-9001/86 21-51114700  
Web: www.icas.org.cn  
Add: Room 801, HuaDing Mansion, 2368# West Zhongshan Rd., Xuhui District, Shanghai, China, 200235



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## Alloy Type-High performance alloy

Alloy Type		High performance alloy									
		C15100	C19210	C19400	C19025	C19040	C14410	C14415	C18141 (MZC1)	C18150/C1840 0	C72500
Chemical Composition (%)		Cu: $\geq 99.82$	Cu:Bal	Cu:Bal	Cu: Bal.	Cu: Bal.	Cu: Bal.	Cu+Sn $\geq 99.96$	Cu: Bal.	Cu: Bal.	Cu: Bal.
		Zr:0.05~0.15	Fe:0.05~0.15	Fe:2.1~2.6	Sn: 0.7~1.1	Ni:0.8	Sn:0.10~0.20	Sn:0.1~0.15	Cr:0.20~0.40	Cr:0.50~1.50	Ni:8.5~10.5
			P:0.025~0.04	Zn:0.05-0.2	P: 0.03~0.07	Sn:1.2	P:0.003~0.024		Zr:0.07~0.13	Zr:0.02~0.20	Sn:1.8~2.80
				Others: <0.2	Ni:0.8-1.2	P:0.07			Zn:0.01~0.03		
standard	GB/T			QFe2.5					TCr1-0.15		
	DIN	CuZr	CuFe0.1P	CuFe2P			CuSn0.1	CuSn0.15	CuCrZr	CuNi9Sn2 2.0875	
	EN	CuZr	CuFe0.1P	CuFe2P CW107C				CuSn0.15 CW117C		CuNi9Sn2 CW351H	
	ASTM/UNS/C DA	C15100	C19210	C19400	C19025	C19040		C14415		C18150	C72500
	JIS	C1510	KFC	C19400	NB109		C14410		MITUBISHI MZC1		
	CDA No.										
Density(g/cm <sup>3</sup> )		8.94	8.94	8.91	8.9	8.9	8.91	8.93	8.9	8.89	8.89
Coefficient of thermal expansion (10 <sup>-6</sup> /°C)		17.6	17	17.6	17	17.7	17.3	18	17.1	18.6	16.5
Thermal conductivity W/(m.k)		360	350	280	161	166	330	350	316	316	54
Electr.conductivity (%IACS, 20°C)		$\geq 95$	$\geq 85$	$\geq 61$	40	35	$\geq 76$	$\geq 85$	$\geq 80$	$\geq 80$	11
Softening temperature (°C)		500°C	450°C	1/2H SH700 390	--	--	390°C	--	--	--	
Modulus of elasticity ( KN/mm <sup>2</sup> )		121	125	123	130	130	120	130	137	137	134



## Alloy Type-Corrosion resistant alloy

Alloy Type		Corrosion resistant alloy					
		C70250	C70260	C64750 (PMC26)	C64775	C19010	C19002
Chemical Composition (%)		Cu: Bal.	Cu: Bal.	Cu: Bal.	Cu: Bal.	Cu: Bal.	Cu: Bal.
		Ni:2.2~4.2	Ni:1.0~3.0	Ni:1.7-2.0	Ni:2.0~2.8	Ni:0.8~1.8	Ni: 1.4-1.7
		Si:0.25~1.20	Si:0.20~0.70	Si: 0.25-0.40	Si:0.45~0.8	Si:0.15~0.35	Si:0.20~0.35
		Mg:0.05~0.30	Mg:0.05~0.30	Sn:0.25-0.40	Sn:0.1-0.60	Other:<0.8	Sn: 0.02~0.3
					Mg:0.05-0.2		Zn:0.2~0.7
					Cr:0.05-0.4		Other:<0.5
Standard	GB/T		Qsi0.6-2.1				
	DIN	CuNi3SiMg	CuNi2Si			CuNiSiP	
	EN	CuNi3SiMg	CuNi2Si				
	ASTM/UNS	C70250	C70260	C64750 (PMC26)		C19010	
	JIS	C7025			EFTEC 820		
	CDA No.				C64775		
Density(g/cm <sup>3</sup> )		8.82	8.9	8.91	8.8	8.9	8.9
Coefficient of thermal expansion (10 <sup>-6</sup> /°C)		17.6	17	16.4	17.5	16.8	16.8
Thermal conductivity W/(m.k)		190	200	184	157	260	260
Electr.conductivity (%IACS, 20°C)		≧43	≧45	≧45	≧38	≧50	≧47
Softening temperature (°C)		--	--	--		--	--
Modulus of elasticity (KN/mm <sup>2</sup> )		130	130	135	132	135	135

## Alloy Type-bronze & Beryllium copper

Alloy Type		Bronze			Beryllium copper	
		C5050	C50710	C50715	C1720	C17410
Chemical Composition (%)		Cu: Bal.	Cu: Bal.	Cu: Bal.	Be:1.80-2.00	Cu: Bal.
		Sn: 0.8~1.3	Sn: 1.7~2.3	Sn: 1.7~2.3	Ni+Co:0.20min	Co:0.35-0.60
		P: ≤0.15	P:≤0.15	P: 0.025~0.04	Ni+Co+Fe:0.6max	Be:0.15-0.50
		Cu+Sn+P≥99.7	Ni:0.1-0.4	Fe: 0.05~0.15	Cu+Be+Ni+Co+Fe:99.5min	
		QSn1.5-0.2				
Standard	GB/T					
	DIN					
	EN					
	ASTM UNS	C50500	C50710	C50715	C17200	C17410
	CDA No.				C17200	C1410
	JIS		C5071 MF202		C1720	C17410
Density(g/cm <sup>3</sup> )		8.89	8.88	8.9	8.28	8.8
Coefficient of thermal expansion (10 <sup>-6</sup> /°C)		17.8	17	17.6	17.8	17.6
Thermal conductivity W/(m.k)		205	155	150	83.7-130	235
Electr.conductivity (%IACS, 20°C)		≥40	≥32	≥35	15-19	45-60
Softening temperature (°C)						
Modulus of elasticity (KN/mm <sup>2</sup> )		110	115	123	127	138

## Alloy Type-Phosphor bronze & nickel silver

Alloy Type		Phosphor bronze			Nickel silver			
		C5111	C5191	C5210	C7451	C7541	C7521	C7701
Chemical Composition (%)		Cu: Bal.	Cu: Bal.	Cu: Bal.	Cu: 63.5~66.5	Cu: 60~64	Cu: 62.0~66.0	Cu: 54.0~58.0
		Sn: 3.5~4.9	Sn: 5.0~7.0	Sn: 7.0~9.0	Ni: 9.0~11.0	Ni: 12.5~155	Ni: 16.5~19.5	Ni: 16.5~19.5
		P: 0.03~0.35	P: 0.03~0.35	P: 0.03~0.35	Mn ≤ 0.5	Mn ≤ 0.5	Mn ≤ 0.5	Mn ≤ 0.5
		Fe: ≤ 0.1	Fe: ≤ 0.10	Fe: ≤ 0.10	Zn: Bal..	Zn: Bal..	Zn: Bal.	Zn: Bal.
Standard	GB/T	QSn4-0.3		QSn8-0.3				
	DIN	CuSn4 2.1016	CuSn6	CuSn8				
	EN	CuSn4 CW450K	CuSn6 CW452K	CuSn8 CW453K			Cu64Ni18Zn18	Cu56Ni18Zn26
	ASTM UNS	C51100	C51900	C52100				
	CDA No.	C51100	C51900					
	JIS	C5111	C5191	C5212				
Density(g/cm <sup>3</sup> )		8.85	8.8	8.8	8.7	8.7	8.73	8.7
Coefficient of thermal expansion (10 <sup>-6</sup> /°C)		18	18.5	18.5	16.4	16.2	16.2	16.7
Thermal conductivity W/(m.k)		100	75	67	0.089	0.09	0.08	0.09
Electr.conductivity (%IACS, 20°C)		≥ 21	≥ 16	≥ 13	≥ 9	≥ 7	≥ 6	≥ 5.5
Softening temperature (°C)								
Modulus of elasticity ( KN/mm <sup>2</sup> )		120	118	115	121	121	125	127

## Alloy Type-brass

Alloy Type		Brass							Sn-brass			
		C2100	C2200	C2300	C2400	C2600	C2680	C2720	C2801	C4250	C425M	C4450
Chemical Composition (%)		Cu:94.0~96.0	Cu:89.0~91.0	Cu:84.0~86.0	Cu:78.5~81.5	Cu:68.5~71.5	Cu:64.0~68.5	Cu:62.0~64.0	Cu:59.0~62.0	Cu:87~90.0	Cu:87.0~90.0	Cu:73.5-77.0
		Zn:Bal.	Zn:Bal.	Zn:Bal.	Zn:Bal.	Zn:Bal.	Zn:Bal.	Zn:Bal.	Zn:Bal.	Zn:Bal.	Zn:Bal.	Zn:Bal.
											Zn:Bal..	Zn:Bal.
												Other:≤0.3
Standard	GB/T	H95	H90	H85	H80	H70	H65	H63	H62			
	DIN	CuZn5 2.022	CuZn10 2.023	CuZn15 2.024	CuZn20 2.025	CuZn30 2.0265	CuZn33 2.028	CuZn37 2.0321		CuSn3Zn9 CW454K	CuSn2Zn10	CuSn1Zn24
	EN	CuZn5 CW500L	CuZn10 CW501L	CuZn15 CW502L	CuZn20 CW503L	CuZn30 CW505L	CuZn33 CW506L	CuZn37 CW508L		CuSn3Zn9 CW454K	CuSn2Zn10	CuSn1Zn26
	ASTM (UNS)	C21000	C22000	C23000	C24000	C26000	C26800	C27200		C42500	C42500M	
	JIS	C2100	C2200	C2300	C2400	C2600	C2680	C2720	C2801	C4250	C42500M	AD442
Density(g/cm <sup>3</sup> )		8.86	8.8	8.75	8.67	8.55	8.5	8.44	8.39	8.75	8.75	8.6
Coefficient of thermal expansion (10 <sup>-6</sup> /°C)		18	18.2	18.5	18.8	19.7	19.9	20.2	20.8	18.4	18.4	20.2
Thermal conductivity W/(m.k)		243	184	159	142	126	121	120		120	120	109
Electr.conductivity (%IACS, 20°C)		≧57	≧43	≧36	≧33	≧28	≧28	≧25	≧23	≧25	≧24	≧23
Softening temperature (°C)												
Modulus of elasticity (KN/mm <sup>2</sup> )		127	124	122	119	114	112	110	103	126	126	110

## Beryllium Copper Rod & Wire-1

	Be	Ni	Cu	Type	Temper	Heat Treatment	Tensile Strength (Mpa)	Yield Strength (Mpa min)	Elongation (% Min)	Hardness		Conductivity IACS,%	Diameter(mm)	
										HV0.5	HR			
C17200 (CuBe2)	1.8-2.1	0.2-0.5	Rem	Wire	A(TB00)		420-550	140-220	30-60			15-19	1.3-12.7	
					1/4H(TD01)		630-810	520-740	3—25			15-19	1.3-12.7	
					1/2H(TD02)		770-950	630-880	2—25			15-19	1.3-12.7	
					3/4H(TD03)		910-1090	800-1060	2—8			15-19	1.3-2.0	
					H(TD04)		980-1170	910-1130	1—6			15-19	1.3-2.0	
					AT(TF00)	315-330°C 3hr	1120-1140	1010-1270	>3			22-28	1.3-12.7	
					1/4HT(TH01)	315-330°C 2hr	1230-1480	1160-1410	>2			22-28	1.3-12.7	
					1/2HT(TH02)	315-330°C 2hr	1300-1520	1190-1480	>2			22-28	1.3-12.7	
					3/4HT(TH03)	315-330°C 1hr	1330-1620	1230-1550	>2			22-28	1.3-2.0	
					HT(TH04)	315-330°C 1hr	1370-1620	1260-1550	>1			22-28	1.3-2.0	
				Rod	TB00		410-590	140	20-60	159-162	B45-B85	15-19	Full size	
					TD04		620-900	520	8—30	184-257	B88-B102		5-9.5	
							620-880	520	8—20	175-260	B88-B101	15-19	9.5-25.4	
							590-850	520	8—20	175-260	B88-B101		25.4-76	
					AT(TF00)	315-330°C 3hr	1160-1410	910-1240	3—10		C36-41	22-28	Full size	
					TH04	315-330°C 2-3hr		1300-1590	1120-1410	2—9		C39-45	22-28	<9.5
								1260-1550	1080-1380	2—9		C38-44	22-28	9.5-25.4
								1230-1520	1050-1340	4—9		C37-44	22-28	25.4-51
								1230-1520	1010-1310	4—9		C37-44	22-28	51-76

## Beryllium Copper Rod & Wire-2

	Be	Ni+Co	Ni+Co+Fe	Pb	Cu	Type	Temper	Heat treatment	Tensile strength	Yield Strength	Elongation	Hardness		Conductivity	Diameter (mm)
									(MPa)	(MPa)	(% Min)	(HRB)	IACS,%		
<b>C17300 (CuBe2Pb)</b>	1.8-2.0	≥0.2	≤0.6	0.2-0.6	Rem	Rod	A(TB00)		420-550	140-220	30-60			15-19	1.3-12.7
							1/4H(TD01)		630-810	520-740	3—25			15-19	1.3-12.7
							1/2H(TD02)		770-950	630-880	2—25			15-19	1.3-12.7
							3/4H(TD03)		910-1090	800-1060	2—8			15-19	1.3-2.0
							H(TD04)		980-1170	910-1130	1—6			15-19	1.3-2.0
							AT(TF00)	315-330°C 3hr	1120-1140	1010-1270	>3			22-28	1.3-12.7
							1/4HT(TH01)	315-330°C 2hr	1230-1480	1160-1410	>2			22-28	1.3-12.7
							1/2HT(TH02)	315-330°C 1.5hr	1300-1520	1190-1480	>2			22-28	1.3-12.7
							3/4HT(TH03)	315-330°C 1hr	1330-1620	1230-1550	>2			22-28	1.3-2.0
							HT(TH04)	315-330°C 1hr	1370-1620	1260-1550	>1			22-28	1.3-2.0
						Wire	TB00	775°C-800°C	410-590	140	20	159-162	B45-B85	15-19	Full size
						TD04	775°C-800°C Solution + Cold Work Hardening	620-860	520	8	184-257	B88-B102	15-19	8—20	
								620-900	520	8	175-260	B88-B103		0.6—8	
						TH04	315°C 1-2hr	1140-1380	930	2	345-406	C27-C44	23-28	8—20	
	1210-1450	1000	4	354-415	C38-C45	0.6—8									

## Beryllium Copper Rod & Wire-3

	Be	Ni+Co	Ni+Co+Fe	Te	Pb	Cu	Type	Temper	Heat treatment	Tensile strength	Yield strength	Elongation	Hardness		Conductivity IACS,%	Diameter (mm)						
										(MPa)	(MPa)		(% Min)	(HRB)								
<b>SM173 (CuBe2PbT)</b>	1.8-2.0	≥0.2	≤0.6	0.2-0.4	0.2-0.6	Rem	Rod	TB00	775°C-800°C	410-590	140	20	159-162	B45-B85	15-19	Full size						
								TD04	775°C-800°C Solution + Cold Work Hardening	620-860	520	8	184-257	B88-B102	15-19	8—20						
										620-900	520	8	175-260	B88-B103		0.6—8						
								TH04	315°C x1-2hr	1140-1380	930	2	345-406	C27-C44	23-28	8—20						
1210-1450	1000	4	354-415	C38-C45	0.6—8																	
<b>C17500 (CuCoBe)</b>	0.4-0.7	Co	Ni	Fe	Al	Si	Cu	Type	Temper	Heat treatment	Tensile strength	Yield strength	Elongation	Hardness		Conductivity IACS,%	Diameter (mm)					
											(MPa)	(MPa)		(% Min)	(HRB)							
											A(TB00)			240-390	70-220			20-60			20-30	1.3-12.7
											H(TD04)			450-570	380-530			2—20			20-30	1.3-12.7
											AT(TF00)	480-495°C 3hr		700-920	560-780			10以上			45-60	1.3-12.7
														HT(TH04)	480-495°C 3hr			770-990	660-880	10以上		45-60
											Rod	TB00		Solution (A)	240-380			70-220	20-35	20-50	20-30	Full size
												TD01		Solution + Cold Work Hardening (H)	450-550			350-530	10—15	60-80	20-30	<76mm
															TF00			Precipitation heat treatment (AT)	690-895	560-710	10—25	92-100
TH01	Hard and precipitation heat treatment (HT)	760-965	660-880	5—25	95-102	48-60	<76mm															

## Beryllium Copper Rod & Wire-4

	Be	Co	Ni	Fe	Al	Si	Cu	Type	Temper	Heat treatment	Tensile strength	Yield strength	Elongation	Hardness	Conductivity IACS,%	Diameter (mm)
											(MPa)	(MPa)	(% Min)	(HRB)		
<b>C17510 (CuNiBe)</b>	0.2-0.6	≤0.3	1.4-2.2	≤0.1	≤0.20	≤0.20	Rem	Wire	A(TB00)		240-390	70-220	20-60		20-30	1.3-12.7
									H(TD04)		450-570	380-530	2—20		20-30	1.3-12.7
									AT(TF00)	480-495℃ 3hr	700-920	560-780	10以上		45-60	1.3-12.7
									HT(TH04)	480-495℃ 3hr	770-990	660-880	10以上		45-60	1.3-12.7
								Rod	TB00	Solution	240-380	70-220	20-35	20-50	20-30	Full size
									TD01	Solution + Cold Work Hardening	450-550	350-530	10—15	60~80	20-30	<76mm
										(H)						
									TF00	Precipitation heat treatment (AT)	690-895	560-710	10—25	92~100	45-60	Full size
TH01	Hard and precipitation heat treatment (HT)	760-965	660-880	5—25	95~102	48-60	<76mm									



# Physical properties of Tinned copper-clad steel(CP) round wires

Temper class (H)								Temper class (3/4H)							
Diameter (mm)	0.4	0.5	0.6	0.7	0.8	0.98 1	1.6	Diameter (mm)	0.4	0.5	0.6	0.7	0.8	0.98 1	1.6
Tolerance (mm)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	Tolerance (mm)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01
Plating Thickness (µm)	4-10	4-10	4-10	4-10	4-10	4-10	4-10	Plating Thickness (µm)	4-10	4-10	4-10	4-10	4-10	4-10	4-10
Tensile strength (Kg/mm <sup>2</sup> )	110±10	110±10	110±10	95±10	90±10	85±10	60±10	Tensile strength (Kg/mm <sup>2</sup> )	100±10	95±10	90±10	80±10	80±10	70±10	50±10
Elongation (%)	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4	Elongation (%)	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4
Electronic conductivity (%)	20±2	20±2	20±2	20±2	20±2	20±2	20±2	Electronic conductivity (%)	20±2	20±2	20±2	20±2	20±2	20±2	20±2
Bending (times)	≥2	≥2	≥2	≥2	≥2	≥2	≥2	Bending (times)	≥3	≥3	≥3	≥3	≥3	≥3	≥3
Temper class (1/2H)								Temper class (1/4H)							
Diameter (mm)	0.4	0.5	0.6	0.7	0.8	1	1.6	Diameter (mm)	0.4	0.5	0.6	0.70/0.80	1	1.2	2
Tolerance (mm)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	Tolerance (mm)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.02
Plating Thickness (µm)	4-10	4-10	4-10	4-10	4-10	4-10	4-10	Plating Thickness (µm)	4-10	4-10	4-10	4-10	4-10	4-10	4-10
Tensile strength (Kg/mm <sup>2</sup> )	90±15	80±15	80±15	75±10	75±10	60±10	40±10	Tensile strength (Kg/mm <sup>2</sup> )	40-60	40-60	40-60	40-60	40-60	40-60	40-60
Elongation (%)	>0.4	>0.4	>0.4	>0.4	0.8	1	1.2	Elongation (%)	>2	>2	>2	>2	>2	>2	>2
Electronic conductivity (%)	20±2	20±2	20±2	20±2	20±2	20±2	20±2	Electronic conductivity (%)	20±2	20±2	20±2	20±2	20±2	20±2	20±2
Bending (times)	≥3	≥3	≥3	≥3	≥3	≥3	≥3	Bending (times)	≥3	≥3	≥3	≥3	≥3	≥3	≥3

# Physical properties of Tinned copper-clad steel(CP) square wires

Temper class (H)							Temper class (3/4H)								
Diameter (mm)	□0.40	□0.50	□0.60	□0.70	□0.80	□0.90	Diameter (mm)	□0.40	□0.50	□0.60	□0.70	□0.80	□0.90	□1.00	□1.20
	□0.45		□0.64			□1.00		□0.45		□0.64					
Tolerance (mm)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	Tolerance (mm)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01
Plating Thickness (µm)	4-10	4-10	4-10	4-10	4-10	4-10	Plating Thickness (µm)	4-10	4-10	4-10	4-10	4-10	4-10	4-10	4-10
Tensile strength (Kg/mm <sup>2</sup> )	100±10	100±10	90±10	80±10	80±10	70±10	Tensile strength (Kg/mm <sup>2</sup> )	90±10	90±10	80±10	70±10	70±10	60±10	60±10	55±10
Elongation (%)	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4	Elongation (%)	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4
Electronic conductivity (%)	20±2	20±2	20±2	20±2	20±2	20±2	Electronic conductivity (%)	20±2	20±2	20±2	20±2	20±2	20±2	20±2	20±2
Bending (times)	≥2	≥2	≥2	≥2	≥2	≥2	Bending (times)	≥3	≥3	≥3	≥3	≥3	≥3	≥3	≥3
Temper class (1/2H)							Temper class (1/4H)								
Diameter (mm)	□0.40	□0.50	□0.60	□0.70	□0.80	Diameter (mm)	□0.40	□0.50	□0.60	□0.70	□0.80	□0.90	□1.00		
	□0.45		□0.64				□0.45		□0.64						
Tolerance (mm)	±0.01	±0.01	±0.01	±0.01	±0.01	Tolerance (mm)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01		
Plating Thickness (µm)	4-10	4-10	4-10	4-10	4-10	Plating Thickness (µm)	4-10	4-10	4-10	4-10	4-10	4-10	4-10		
Tensile strength (Kg/mm <sup>2</sup> )	85±10	80±10	75±10	60±10	60±10	Tensile strength (Kg/mm <sup>2</sup> )	40-60	40-60	40-60	40-60	40-60	40-60	40-60		
Elongation (%)	>0.4	>0.4	>0.4	>0.4	>0.4	Elongation (%)	>2	>2	>2	>2	>2	>2	>2		
Electronic conductivity (%)	20±2	20±2	20±2	20±2	20±2	Electronic conductivity (%)	20±2	20±2	20±2	20±2	20±2	20±2	20±2		
Bending (times)	≥3	≥3	≥3	≥3	≥3	Bending (times)	≥3	≥3	≥3	≥3	≥3	≥3	≥3		

# Physical properties of Tinned copper-clad steel(CP) flat wires

Temper class (H)								Temper class (3/4H)							
Dimension (mm)	0.3×0.5	0.5×0.8	0.6×0.8	0.4×0.6	0.4×0.7	0.6×0.8	0.75×1.1	Dimension (mm)	0.3×0.5	0.5×0.8	0.6×0.8	0.4×0.6	0.4×0.7	0.6×0.8	0.75×1.1
	0.3×0.4								0.3×0.4						
Tolerance (mm)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	Tolerance (mm)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01
Plating Thickness (μm)	4-10	4-10	4-10	4-10	4-10	4-10	4-10	Plating Thickness (μm)	4-10	4-10	4-10	4-10	4-10	4-10	4-10
Tensile strength (Kg/mm <sup>2</sup> )	90±10	85±10	85±10	85±10	85±10	85±10	80±10	Tensile strength (Kg/mm <sup>2</sup> )	80±10	75±10	75±10	75±10	75±10	75±10	70±10
Elongation (%)	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4	Elongation (%)	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4
Electronic conductivity (%)	20±2	20±2	20±2	20±2	20±2	20±2	20±2	Electronic conductivity (%)	20±2	20±2	20±2	20±2	20±2	20±2	20±2
Bending (times)	≥2	≥2	≥2	≥2	≥2	≥2	≥2	Bending (times)	≥3	≥3	≥3	≥3	≥3	≥3	≥3
Temper class (1/2H)								Temper class (1/4H)							
Dimension (mm)	0.3×0.5	0.5×0.8	0.6×0.8	0.4×0.6	0.4×0.7	0.6×0.8	0.75×1.1	Dimension (mm)	0.3×0.5	0.5×0.8	0.6×0.8	0.4×0.6	0.4×0.7	0.6×0.8	0.75×1.1
	0.3×0.4								0.3×0.4						
Tolerance (mm)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	Tolerance (mm)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01
Plating Thickness (μm)	4-10	4-10	4-10	4-10	4-10	4-10	4-10	Plating Thickness (μm)	4-10	4-10	4-10	4-10	4-10	4-10	4-10
Tensile strength (Kg/mm <sup>2</sup> )	70±10	65±10	65±10	65±10	65±10	65±10	60±10	Tensile strength (Kg/mm <sup>2</sup> )	40-60	40-60	40-60	40-60	40-60	40-60	40-60
Elongation (%)	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4	>0.4	Elongation (%)	>2	>2	>2	>2	>2	>2	>2
Electronic conductivity (%)	20±2	20±2	20±2	20±2	20±2	20±2	20±2	Electronic conductivity (%)	20±2	20±2	20±2	20±2	20±2	20±2	20±2
Bending (times)	≥3	≥3	≥3	≥3	≥3	≥3	≥3	Bending (times)	≥3	≥3	≥3	≥3	≥3	≥3	≥3

# Copper alloy wire performance for PIN-1

		Brass wire				Copper-iron alloy wire					
Alloy Name		C2600		C2700		C19400		C19210		C19700	
Chemical Composition (%)		Cu: 68.5-71.5 Zn: Bal Fe: 0.02max Pb:0.02max Ni: 0.02max Mn:0.02max Al:0.02max		Cu: 63-67 Zn: Bal Fe: 0.02max Pb:0.02max Ni: 0.02max Mn:0.02max Al:0.02max		Cu:97min Fe: 2.1-2.6 P:0.015-0.15 Zn: 0.05-0.2		Cu:Bal Fe:0.05~0.15 P:0.025~0.04		Cu:Bal Fe:0.3~1.2 P:0.01~0.4 Mg:0.01-0.2	
Specific Gravity (gm/cm <sup>3</sup> )		8.53		8.47		8.9		8.94		8.84	
Expansion Coefficient (10 <sup>-6</sup> /°C)		19.7		19.9		16.3		16.9		17.3	
Thermal Conductivity W(m*K)		126		112		260		350		320	
Electrical Conductivity (%IACS, 20°C)		26		23.5		60		85		80	
Tensile Strength (N/mm <sup>2</sup> )	O	0.4-1.6mm	275min	0.4-1.6mm	295min	0.4-1.6mm	270-395	0.4-1.6mm	220-335	0.4-1.6mm	270-395
	1/8H	0.4-1.6mm	345-440	0.4-1.6mm	345-440	--	--	--	--	--	--
	1/4H	0.4-1.6mm	390-510	0.4-1.6mm	390-510	--	--	--	--	--	--
	1/2H	0.4-1.6mm	490-610	0.4-1.6mm	490-610	0.4-1.6mm	340-525	0.4-1.6mm	260-440	0.4-1.6mm	340-525
	3/4H	0.4-1.6mm	590-705	0.4-1.6mm	590-705	--	--	--	--	--	--
	H	0.4-1.0mm	685-805	0.4-1.0mm	685-805	0.4-1.0mm	405-605	0.4-1.0mm	335-510	0.4-1.0mm	405-605
	EH	0.4-0.8mm	785min	0.4-0.8mm	785min			0.4-0.8mm	440min	0.4-0.8mm	525min
Elongation (%)	O	0.4-1.6mm	20min	0.4-1.6mm	20min		--		--		--
	1/8H	0.4-1.6mm	10min	0.4-1.6mm	10min		--		--		--
	1/4H	0.4-1.6mm	5min	0.4-1.6mm	5min		--		--		--
	1/2H	0.4-1.6mm	--	0.4-1.6mm	--		--		--		--
	3/4H	0.4-1.6mm	--	0.4-1.6mm	--		--		--		--
	H	0.4-1.0mm	--	0.4-1.0mm	--		--		--		--
	EH	0.4-0.8mm	--	0.4-0.8mm	--		--		--		--
Plating	Nickel layer min. 0.5µm, Reflow Tin 0.7-1.5µm										
	Copper layer min. 0.5µm, Reflow Tin 0.7-1.5µm										
	Bright Tin 0.7-3.0µm										

# Copper alloy wire performance for PIN-2

Alloy Name	Bronze wire								Special alloy wire				
	C5111		C5102		C5191		C5210		C7025		C15100		
<b>Chemical Composition (%)</b>	Cu: Bal Sn: 3.5-4.5 Fe: 0.1max Pb:0.02max Zn: 0.2max P:0.03-0.35 Cu+Sn+P:99.5min		Cu: Bal Sn: 4.5-5.5 Fe: 0.1max Pb:0.02max Zn: 0.2max P:0.03-0.35 Cu+Sn+P:99.5min		Cu: Bal Sn: 5.5-7.0 Fe: 0.1max Pb:0.02max Zn: 0.2max P:0.03-0.35 Cu+Sn+P:99.5min		Cu: Bal Sn: 7.0-9.0 Fe: 0.1max Pb:0.02max Zn: 0.2max P:0.03-0.35 Cu+Sn+P:99.5min		Cu: Bal Ni: 2.2-4.2 Si:0.25-1.2 Mg:0.05-0.3		Cu:Bal Zr:0.05-0.15		
<b>Specific Gravity (gm/cm<sup>3</sup>)</b>	8.86		8.86		8.83		8.8		8.82		8.9		
<b>Expansion Coefficient (10<sup>-6</sup>/°C)</b>	17.8		17.8		18		18.2		17.6		17.1		
<b>Thermal Conductivity W(m*K)</b>	84		71		67		63		180		347		
<b>Electrical Conductivity (%IACS, 20°C)</b>	20		15		13		12		40		90		
<b>Tensile Strength (N/mm<sup>2</sup>)</b>	O	0.4-1.6mm	255-410	0.4-1.6mm	305-420	0.4-1.6mm	315-460	0.4-1.6mm	345-490	--	--	0.025-3.25mm	230-275
	1/8H	--	--	--	--	0.4-1.6mm	435-585	--	--	--	--	0.025-3.25mm	--
	1/4H	--	--	--	--	0.4-1.6mm	535-685	--	--	--	--	0.025-3.25mm	275-380
	1/2H	--	--	--	--	0.4-1.6mm	635-785	0.4-1.6mm	685-835	0.4-1.6mm	450-610	0.025-3.25mm	345-425
	3/4H	--	--	--	--	0.4-1.6mm	735-885	--	--	--	--	0.025-3.25mm	
	H	0.4-1.0mm	490min	0.4-1.0mm	635min	0.4-1.0mm	835min	0.4-1.0mm	930min	0.4-1.0mm	685-805	0.025-3.25mm	415-495
	EH	--	--	--	--	--	--	--	--	--	--	--	0.025-3.25mm
<b>Plating</b>	Nickel layer min. 0.5µm, Reflow Tin 0.7-1.5µm												
	Copper layer min. 0.5µm, Reflow Tin 0.7-1.5µm												
	Bright Tin 0.7-3.0µm												

# High Conductivity Copper Rod

Alloy	Cu	Pb	Bi	O <sub>2</sub>	Ag	Conductivity	Type	Temper	Tensile Strength (Mpa, min)	Elongation	Hardness	Diameter(mm)
						IACS,%				(%, min)	HBW, min	
C10100 CW009A/ Cu-OFE C1010	≥99.97	≤0.0005	≤0.0002	≤0.0005	≤0.0025	99	Rod	H04	290*	8.0*	≥80	3.0≤φ<10
									270	8.0	80-110	10≤φ≤45
									O60	200	40.0	35
C10200 CW008A/ Cu-OF C1020	Cu+Ag ≥99.95	≤0.005	≤0.0005	≤0.001	/	98.3	Rod	H04	290*	8.0*	≥80	3.0≤φ<10
									270	8.0	80-110	10≤φ≤45
									O60	200	40.0	35
C11000 CW004A/ Cu-ETP C1100	Cu+Ag ≥99.90	≤0.005	≤0.0005	≤0.04	/	98.3	Rod	H04	290*	8.0*	≥80	3.0≤φ<10
									270	8.0	80-110	10≤φ≤45
									O60	200	40.0	35

## High Conductivity Copper Rod

Alloy	Cu	Cr	Zr	Fe	Te	P	Conductivity	Type	Temper	Tensile Strength (Mpa, min)	Yield Strength (Mpa, min)	Elongation	Hardness	Diameter(mm)
							IACS,%					(%, min)	HRB, min	
C18150 CW106C/ CuCr1Zr	Rem.	0.5-1.5	0.02-0.2	<0.1	/	/	75	Rod	TH04	500	450	10	80	5.0≤φ≤16
										500	450	10	80	16<φ≤25
										450	380	10	78	25<φ≤42.5
										410	350	10	72	42.5<φ≤51
										380	310	10	70	51<φ≤61
C14500 CW118C/ CuTeP	≥99.9	/	/	/	0.4-0.7	0.003-0.012	85	Rod	H02	260	205	8	HV 80	1.5≤φ<6.5
										260	205	12	HV 80	6.5≤φ<76
									H04	330	275	4	HV 90	1.5≤φ<6.5
										305	260	8	HV 90	6.5≤φ<32
										275	240	8	HV 90	32≤φ<76

# High wear-resistant and corrosion-resistant copper-nickel-tin alloy Rod

Alloy	Cu	Ni	Sn	Conductivity	Modulus of elasticity	Type	Temper	Tensile Strength (Mpa, min)	Yield Strength (Mpa, min)	Elongation	Hardness	Diameter(mm)
				IACS,%	Gpa					(%, min)	HRC, min	
C72900 CuNi15Sn8	Rem.	14.5-15.5	7.5-8.5	9	128	Rod	TX00	910	738*	5	30	16≤φ<92
							TS02	965	895	5	24	20≤φ<40
							TS04	1105*	1035*	3	34	25<φ≤42.5



# Aluminum Bronze Rod-1

Alloy No.	Cu incl silver	Al	Fe	Ni incl cobalt	Mn	Si	Sn	Zn	Pb	As	P	Type	Temper	Diameter (mm)	Tensile strength	Yield strength	Elogation
														(Mpa,min)	(Mpa,min)	(%,min)	
<b>C61400</b> (CuAl8Fe3)	Rem.	8.5-10	1.5-3.5	-	≤1.0	-	-	-	≤0.01	-	≤0.015	Rod (round only)	HR50	≤12	550	275	30
														12<D≤25	515	240	30
														25<D≤50	485	220	30
														50<D≤80	485	205	30
<b>C62300</b> (CuAl10Fe3)	Rem.	8.5-10	2.0-4.0	≤1.0	≤0.5	≤0.25	≤0.6	-	-	-	-	Rod (round only)	HR50	≤12	620	345	12
														12<D≤25	605	305	15
														25<D≤50	580	275	15
														50<D≤80	525	255	20
												Rod(hexagonal and octagonal) and bar	HR50	≤25	550	240	15
														25<D≤50	540	220	15
														M20	>50	515	205
												Shapes	M20 M30 O20 O25 O30 HR50	all sizes	515	205	20

# Aluminum Bronze Rod-2

Alloy No.	Cu incl silver	Al	Fe	Ni incl cobalt	Mn	Si	Sn	Zn	Pb	As	P	Type	Temper	Diameter (mm)	Tensile strength (Mpa,min)	Yield strength (Mpa,min)	Elongation (%,min)				
C63000 (CuAl10Ni5Fe4)	Rem.	9.0-11	2.0-4.0	4.0-5.5	≤0.5	≤0.25	≤0.2	≤0.3	-	-	-	Rod	HR50	12<D≤25	690	345	5				
														25<D≤50	620	310	6				
														50<D≤80	585	295	10				
													M20 M30 O20 O25 O30 HR50	80<D≤100	585	295	10				
																		>100	550	275	12
												Bar	HR50	12<D≤25	690	345	5				
														25<D≤50	620	310	6				
													M20 M30 O20 O25 O30 HR50	50<D≤100	585	295	10				
																		>100	550	275	12
												Shapes	M20 M30 O20 O25 O30 HR50	all sizes	585	295	10				
												High strength Rod	HR50	≤25	760	470	10				
														25<D≤50	760	415	10				
													HR50 O26	50<D≤80	725	380	10				
TQ50 O32 O26	20<D≤125	690	345	10																	

## Aluminum Bronze Rod-3

Alloy No.	Cu incl silver	Al	Fe	Ni incl cobalt	Mn	Si	Sn	Zn	Pb	As	P	Type	Temper	Diameter (mm)	Tensile strength	Yield strength	Elongation
															(Mpa,min)	(Mpa,min)	(%,min)
C63200 (CuAl9Fe4Ni4)	Rem.	8.7-9.5	3.5-4.3	4.0-4.8	1.2-2.0	≤0.1	-	-	≤0.02	-	-	Rod & Bar	TQ50 TQ55	≤80	620	345	15
														80<D≤125	620	310	15
														125<D≤300	620	275	15
														All sizes	620	275	15
												Bar and shapes	O20 O25	All sizes	620	275	15
C64200 (CuAl7Si2)	Rem.	6.3-7.6	≤0.3	≤0.25	≤0.1	1.5-2.2	≤0.2	≤0.5	≤0.05	≤0.15	-	Rod & Bar	HR50	≤12	620	310	9
														12<D≤25	585	310	12
														25<D≤50	550	290	12
														50<D≤80	550	290	12
														80<D≤100	485	205	15
														>100	485	170	15
												Shapes	M30	All sizes	485	205	15

## **New alloy**

**High precision and high strength FeNi42(4J42), FeNi36(4J36), FeNi29(4J29)**

**Copper-iron alloy CFA95 CFA90**

**CuMn25Ni10, CuMn12Ni2, CuMn7Sn3**

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and win the future together  
with our customers.**

