IATF16949 certified

IATF16949 is a globally recognised quality managment system standard specifically designed for automotive industry. The official name is [Quality management systems-Requirements for the application in the automotive industry]. Our Takaoka Works, which carries out integrated production from raw material to finishing, has obtained IATF16949 certification. We are one of the few material suppliers capable of meeting the needs of the automotive industry, which requires a high level of management, it is the largest factory in Japan for copper and copper alloy wire, achieving both overwhelming high quality and production efficiency.

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*This brochure uses enviromentally freindly [waterless printing]and[non-VOC ink]
*Product specifications are subject to change without notice.

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SPECIAL COPPER ALLOY

An Alloy with small amount of Iron, Nickel, Magnesium, Tellurium, Silver, Phosphor and other elements added to copper is called a special copper alloy.

CK SAN-ETSU GROUP

SAN-ETSU METALS CO.,LTD.

Special Copper Alloy series

Corson copper Alloy, Copper-iron Alloy, Silver-bearing Oxygen-free copper Alloy, Magnesium copper Alloy, Iron-Magnesium copper Alloy, Copper Tellurium alloy.

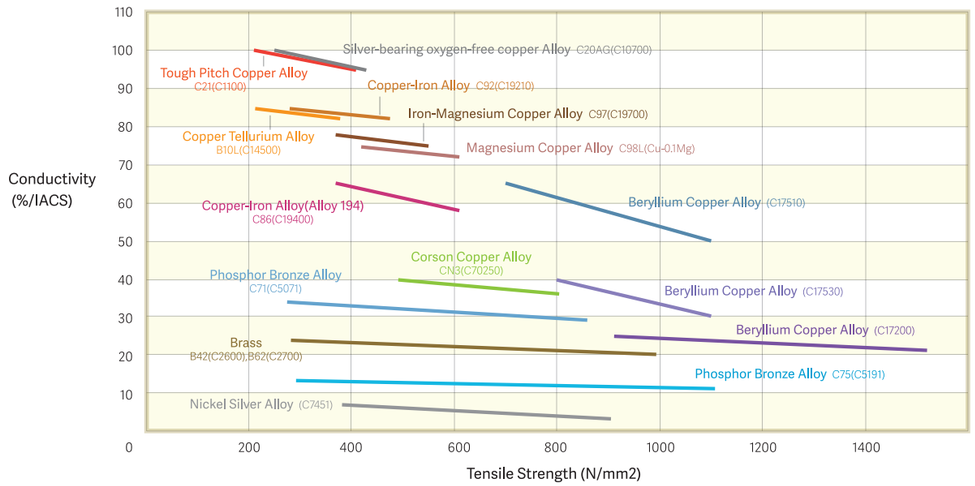
〈IATF16949 certified factory〉 SAN-ETSU METALS CO.,LTD.
TAKAOKA WORKS/Copper and Copper Alloy Wire Production

Integrated production to meet customer needs.

Due to market demands for the miniaturization and enhanced performance of electronic components, there is an increasing demand for higher performance in conventional alloys (pure copper, brass, phosphor bronze) . SAN-ETSU METALS manufactures special copper alloys in-house in an integrated manner to meet the needs of our customers.

Special Copper Alloy Property Map

SAN-ETSU METALS produce a wide variety of alloys
with excellent electrical and thermal conductivity and high strength properties.



Special Copper Alloy Maerial List

Material Name	UNS No.	SAN-ETSU Code	Chemical Component (%,Normal)	Features	Usage example
Corson Copper Alloy	C70250	CN3	Cu-3Ni-0.7Si-0.2Mg	Electrical and thermal Conductivity, High strength	Connector Pin
Silver-bearing oxygen-free copper Alloy	C10700	C20AG	Cu-0.085~0.102Mg	Electrical Conductivity, Malleability	Connector Pin, Lead Pin
Magnesium Copper Alloy	-	C98L	Cu-0.1Mg	Electrical and thermal Conductivity, High strength	Connector Pin
Copper-Iron Alloy	C19400	C86	Cu-2.3Fe-0.1Zn-P	Electrical and thermal Conductivity, High strength, Ductility	Terminal, Connector Pin
	C19210	C92	Cu-0.1Fe-P		
Iron-Magnesium Copper Alloy	C19700	C97	Cu-0.7Fe-0.2P-0.1Mg	Electrical and thermal Conductivity, High strength	Connector Pin
Copper Tellurium Alloy	C14500	B10L	Cu-0.5Te-P	Machinability, Electrical and thermal Conductivity	Connector, Welding Tips, Electrodes for electric discharge machining
	-	B10			Torch crater

Wire Products

High Strength

High Conductivity

Good balance of strength and conductivity

Rod products

Machinability

Features	Chemical Component (%,Nominal)	Physical Properties	Mechanical Properties (Tensile Strength)

Corson Copper Alloy — UNS No./SAN-ETSU Material No C70250/CN3

- Hi Strength
- Excellent electrical conductivity
- Excellenct Heat resistance
- Ideal alternative to beryllium copper

Cu-3Ni-0.7Si-0.2Mg	
Cu	Rem
Ni	2.2-4.2 %
Si	0.25-1.2 %
Mg	0.05-0.30 %

Specific Gravity	8.82
Thermal conductivity (20°)	172 W(m·K)
Young`s Modulus	132kN/mm²
Conductivity	40 %IACS
Volume resistivity ratio	0.043 μΩ·m

Hardness	Range (N/mm²)
1/2H	490-610
3/4H	590-705
H	685-805
EH	785-

Copper-Iron Alloy (C19210) — UNS No./SAN-ETSU Material No C19210/C92

- Excellent electrical conductivity
- Higher heat resistance than pure copper
- Higher strength than pure copper
- Excellent workability and ductility

Cu-0.1Fe-P	
Cu	Rem
Fe	0.05-0.15 %
P	0.025-0.04 %

Specific Gravity	8.94
Thermal conductivity (20°)	334W(m·K)
Young`s Modulus	126kN/mm²
Conductivity	85 %IACS
Volume resistivity ratio	0.02 μΩ·m

Hardness	Range (N/mm²)
O	220-335
1/2H	260-440
H	335-510
EH	440-

Silver-bearing oxygen-free copper Alloy — UNS No./SAN-ETSU Material No C10700/C20AG

- Electrical conductivity equivalent to pure copper
- Higher strength than pure copper
- Higher heat resistance than pure copper
- Excellent workability and ductility

Cu-0.085~0.102Ag	
Cu	99.95≦(Cu+Ag) %
Ag	0.085-0.102 %
O²	less than 10ppm

Specific Gravity	8.94
Thermal conductivity (20°)	391W(m·K)
Young`s Modulus	117kN/mm²
Conductivity	100 %IACS
Volume resistivity ratio	0.017 μΩ·m

Hardness	Range (N/mm²)
O	220-335
1/2H	240-400
H	290-450
EH	420-

Magnesium Copper Alloy — UNS No./SAN-ETSU Material No -/C98L

- Higher strength than pure copper
- Excellent electrical conductivity
- Excellent bend formability
- Higher heat resistance than pure copper

Cu-0.1Mg	
Cu	Rem
Mg	0.03-0.17 %

Specific Gravity	8.94
Thermal conductivity (20°)	297W(m·K)
Young`s Modulus	117kN/mm²
Conductivity	75 %IACS
Volume resistivity ratio	0.023 μΩ·m

Hardness	Range (N/mm²)
O	240-420
1/2H	420-560
H	560-660
EH	650-

Copper-Iron Alloy (Alloy194) — UNS No./SAN-ETSU Material No C19400/C86

- Higher strength and heat resistance than pure copper
- Excellent electrical and thermal conductivity
- Excellent ductility and corrosion resistance
- Excellent forging and deep drawability

Cu-2.3Fe-0.1Zn-P	
Cu	97.0 %≦
Fe	2.1-2.6 %
P	0.015-0.15 %
Zn	0.05-0.20 %

Specific Gravity	8.91
Thermal conductivity (20°)	262W(m·K)
Young`s Modulus	121kN/mm²
Conductivity	65 %IACS
Volume resistivity ratio	0.027μΩ·m

Hardness	Range (N/mm²)
O	270-395
1/2H	340-525
H	405-605
EH	525-

Iron-Magnesium Copper Alloy — UNS No./SAN-ETSU Material No C19700/C97

- Higher strength and heat resistance than pure copper
- Excellent electrical and thermal conductivity
- Excellent ductiliy
- Excellent forging and deep drawability

Cu-0.7Fe-0.2P-0.1 Mg	
Cu	Rem
Fe	0.30-1.2 %
P	0.10-0.40 %
Mg	0.01-0.20 %

Specific Gravity	8.90
Thermal conductivity (20°)	304W(m·K)
Young`s Modulus	119kN/mm²
Conductivity	77 %IACS
Volume resistivity ratio	0.022μΩ·m

Hardness	Range (N/mm²)
O	270-395
1/2H	340-525
H	405-605
EH	525-

Copper Tellurium Alloy — UNS No./SAN-ETSU Material No C14500/B10L

- Excellent Machinability
- Excellent electrical and thermal conductivity
- Higher heat resistance than pure copper
- Excellent hot and cold workability

Cu-0.5Te-P	
Cu	99.90 %≦Cu+Te+P
Te	0.04-0.6 %
P	0.004-0.012 (0.05*) %

Specific Gravity	8.94
Thermal conductivity (20°)	334W(m·K)
Young`s Modulus	117kN/mm²
Conductivity	85 %IACS
Volume resistivity ratio	0.02μΩ·m

Hardness	280-380 N/mm²
Elongation(BD-F)	5-20 %
Machinability	85 %

*Comparison of Machinability with modified brass rod is shown.

We also offer tellurium copper rods (Material Name: B10 Cu-0.5Te-P: Not Corresponding to C14500) with an increased phosphorus content to further suppress hydrogen embrittlement, making them suitable for use in high-temperature environments.