

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.



IATF16949 certified

IATF16949 is a globally recognised quality management 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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SAN-ETSU METALS CO.,LTD.

Special Copper Alloy series

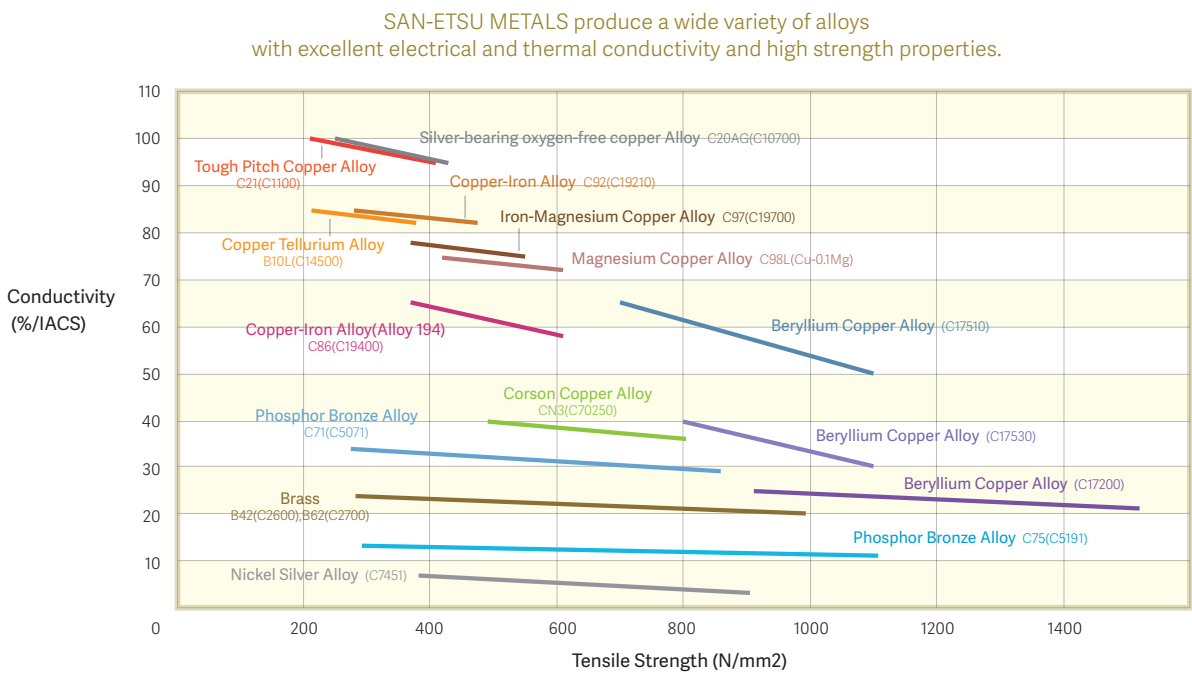
Corson copper Alloy, Copper-iron Alloy, Silver-bearing Oxygen-free copper Alloy, Magnesium copper Alloy, Iron-Magnesium copper Alloy, Copper Tellurium alloy.

〈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



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

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		Specific Gravity	8.82	Hardness	Range (N/mm²)	
	Cu	Rem	Thermal conductivity (20°)	172 W(m·K)	1/2H	490-610	
	Ni	2.2-4.2 %	Young's Modulus	132kN/mm²	3/4H	590-705	
	Si	0.25-1.2 %	Conductivity	40 %IACS	H	685-805	
	Mg	0.05-0.30 %	Volume resistivity ratio	0.043 μΩ·m	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		Specific Gravity	8.94	Hardness	Range (N/mm²)	
	Cu	Rem	Thermal conductivity (20°)	334W(m·K)	O	220-335	
	Fe	0.05-0.15 %	Young's Modulus	126kN/mm²	1/2H	260-440	
	P	0.025-0.04 %	Conductivity	85 %IACS	H	335-510	
			Volume resistivity ratio	0.02 μΩ·m	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		Specific Gravity	8.94	Hardness	Range (N/mm²)	
	Cu	99.95±(Cu+Ag) %	Thermal conductivity (20°)	391W(m·K)	O	220-335	
	Ag	0.085-0.102 %	Young's Modulus	117kN/mm²	1/2H	240-400	
	O²	less than 10ppm	Conductivity	100 %IACS	H	290-450	
			Volume resistivity ratio	0.017 μΩ·m	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		Specific Gravity	8.94	Hardness	Range (N/mm²)	
	Cu	Rem	Thermal conductivity (20°)	297W(m·K)	O	240-420	
	Mg	0.03-0.17 %	Young's Modulus	117kN/mm²	1/2H	420-560	
			Conductivity	75 %IACS	H	560-660	
			Volume resistivity ratio	0.023 μΩ·m	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		Specific Gravity	8.91	Hardness	Range (N/mm²)	
	Cu	97.0 %±	Thermal conductivity (20°)	262W(m·K)	O	270-395	
	Fe	2.1-2.6 %	Young's Modulus	121kN/mm²	1/2H	340-525	
	P	0.015-0.15 %	Conductivity	65 %IACS	H	405-605	
	Zn	0.05-0.20 %	Volume resistivity ratio	0.027μΩ·m	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 ductility •Excellent forging and deep drawability	Cu-0.7Fe-0.2P-0.1 Mg		Specific Gravity	8.90	Hardness	Range (N/mm²)	
	Cu	Rem	Thermal conductivity (20°)	304W(m·K)	O	270-395	
	Fe	0.30-1.2 %	Young's Modulus	119kN/mm²	1/2H	340-525	
	P	0.10-0.40 %	Conductivity	77 %IACS	H	405-605	
	Mg	0.01-0.20 %	Volume resistivity ratio	0.022μΩ·m	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		Specific Gravity	8.94	Hardness	280-380 N/mm²	
	Cu	99.90 %≤Cu+Te+P	Thermal conductivity (20°)	334W(m·K)	Elongation(BD-F)	5-20 %	
	Te	0.04-0.6 %	Young's Modulus	117kN/mm²	Machinability	85 %	
	P	0.004-0.012 (0.05*) %	Conductivity	85 %IACS	*Comparison of Machinability with modified brass rod is shown.		
			Volume resistivity ratio	0.02μΩ·m			

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.