



Home > Product Information > Electric Resistance Materials

Electric Resistance Materials

During the past century since our foundation in 1916, our precision resistance materials have received high evaluations from critics in various fields of the industrial world such as communication tools, automobile parts, precision measurement systems, and home electric products.

We can meet the precise, varied needs of our customers for diverse products with combinations of our processing technologies, such as melting, molding, rolling, wire drawing, and different kinds of advanced coating.

We can supply not only precision resistance wire, ribbon, and bar, but also parts in other forms which our customers need.

We can precisely meet the various needs of our customers by manufacturing precision resistance wire, ribbon, and bar that have a variety of characteristics and functions.

Product List

Electric Resistance Materials

[Copper Nickel Electric resistance materials](#)[Nickel Chromium Electric resistance materials](#)[Precision resistance material Manganin](#)[Precision resistance material Karmalloy](#)[Enameled resistance wire](#)

The Categories of Electric Resistance Wire, Ribbon, and Bar

As shown in Table 1, we supply various kinds of electric resistance materials. Please choose the material that suits your purpose best.

General Resistance Wire, Ribbon, and Bar

1. Copper-Nickel Resistance Wire, Ribbon, Bar
2. Nickel-Chromium Electric Heating Wire, Ribbon, Bar Class 1 / Class 2

Precision Resistance Wire, Ribbon, Bar

1. Manganin Wire, Ribbon, Bar
2. Karmalloy Wire

Categories and Standards of Electric Resistance Materials

Table 1 The features of electric resistance materials

No.	Material alloy	Name	Symbol	Chemical Composition %	Volume resistivity $\mu\Omega \cdot m$	Temperature coefficient $X10^{-6} / ^\circ C$	Tensile strength Mpa	Elongation %	LINK
1	Cu-Ni Alloy	Cu-Ni resistance material	CN49	45Ni, 2Mn, rest Cu	0.49	± 20	410 ~ 540	25 <	Details
		30 micro resistance material	CN30	23Ni, 1.5Mn, rest Cu	0.30	1350	270 ~ 540	20 <	Details
		15 micro resistance material	CN15	10Ni, 1.0Mn, rest Cu	0.15	800	250 ~ 490	20 <	Details
		10 micro resistance material	CN10	6Ni, 1.0Mn, rest Cu	0.10	500	250 ~ 440	20 <	Details
		5 micro resistance material	CN05	2.5Ni, 1.0Mn, rest Cu	0.05	180	200 ~ 390	20 <	Details

2	Cu-Mn-Ni Alloy	Precision resistance material Manganin	CM□	12Mn, 2Ni, rest Cu	0.44	± 10	340 ~ 590	10 <	Details
	Ni-Cr-Al Alloy	Precision resistance wire Karmalloy**1	KMW	76Ni, 19Cr, others	1.33	± 20	880 ~ 1200	20 <	Details
3	Ni-Cr Alloy	Ni-Cr resistance material class 1	NCH□-1	19Cr, 2.5Mn, rest Ni	1.08	160	690 ~ 930	20 <	Details
		Ni-Cr resistance material class 2	NCH□-2	57Ni, 16.5Cr, rest Fe	1.12	40	640 ~ 880	20 <	Details
4	Fe-Cr-Al Alloy	Fe-Cr resistance material class 1	FCH□-1	24.5Cr, 4.5Al, rest Fe	1.42	80	640 ~ 880	10 <	Details
		Fe-Cr resistance material class 2	FCH□-2	19Cr, 3Al, rest Fe	1.23	150	590 ~ 830	10 <	Details

*1 Karmalloy in this table is our registered trademark.

The □'s in the table are to be filled in with P standing for plate, R for ribbon, or W for wire.

Table 2 Required features of precision resistance materials

Features of Alloy	Cu-Ni Alloy CN49W	Cu-Mn-Ni Alloy CMW	Ni-Cr Alloy NCH1,2	Ni-Cr-Al Alloy KMW
Small temp. coefficient	◎	◎	○	◎
Large volume resistivity	△	△	◎	◎
Small amount at the electromotive force against copper	×	◎	○	◎
Fine dia. wires can be drawn excellent mechanical features	○	○	◎	◎
Stable resistance over many years	○	◎	○	◎