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# **CN10 (CuNi6)**

## **Copper Nickel No 10**

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# Alloys : CN10 (CuNi6 Copper Nickel)

[JIS C 2532]

Heat and oxidation resistance equal to or higher than that of electrical copper materials.  
It is non-magnetic and has better workability than electrical copper.  
Used in road heaters, floor heaters, electrical fuses, etc.

JIS	JIS Code	Electrical Resistivity [ $\mu\Omega\text{m}$ ]	Average TCR [ $\times 10^{-6}/^{\circ}\text{C}$ ]
GCN10	C 2532	0.10 $\pm$ 0.012	* 710

(\* )Reference value

Thermal Expansion Coefficient $\times 10^{-6}/$	Density g/cm <sup>3</sup> (20°C)	Melting Point °C	Max Operating Temperature °C
17.5	8.90	1090	220

Chemical Composition	Mn	Ni	Cu+Ni+Mn
(%)	$\leq 1.0$	4~7	$\geq 99$

Alloys	Type	Diameter (mm)	
CN10W	Wire	$\phi 6.00 \sim 0.06$	
CN10R	Ribbon	$t=2.90 \sim 0.05$	$w=40 \sim 0.4$ (Depends on thickness)
CN10P	Plate	Please consult	
CN10	Foil	Please consult	

# CN10 (CuNi6 Copper Nickel)

## Resistance·Length·Weight

Wire

Electrical Resistivity (23°CμΩm) 0.10±0.012

Diameter (mm)	Tolerance (mm)	Cross section (mm <sup>2</sup> )	Resistance Tolerance (%)	DC Resistance (Ω/m)	Length (m/Kg)	Weight (g/m)
6.00	±0.080	28.27	±5	0.00354	3.97	252
5.50	±0.080	23.76	±5	0.00421	4.73	211
5.00	±0.080	19.64	±5	0.00509	5.72	175
4.50	±0.080	15.90	±5	0.00629	7.06	142
4.00	±0.080	12.57	±5	0.00796	8.94	112
3.50	±0.080	9.621	±5	0.0104	11.7	85.6
3.20	±0.060	8.042	±5	0.0124	14.0	71.6
2.90	±0.060	6.605	±5	0.0151	17.0	58.8
2.60	±0.060	5.309	±5	0.0188	21.2	47.3
2.30	±0.050	4.155	±5	0.0241	27.0	37.0
2.00	±0.050	3.142	±5	0.0318	35.8	28.0
1.80	±0.050	2.545	±5	0.0393	44.2	22.6
1.60	±0.040	2.011	±5	0.0497	55.9	17.9
1.50	±0.040	1.767	±5	0.0566	63.6	15.7
1.40	±0.040	1.539	±5	0.0650	73.0	13.7
1.30	±0.040	1.327	±5	0.0753	84.7	11.8
1.20	±0.040	1.131	±5	0.0884	99.3	10.1
1.10	±0.030	0.9503	±6	0.105	118	8.46
1.00	±0.030	0.7854	±6	0.127	143	6.99
0.90	±0.030	0.6362	±6	0.157	177	5.66
0.85	±0.030	0.5675	±6	0.176	198	5.05
0.80	±0.030	0.5027	±6	0.199	224	4.47
0.75	±0.025	0.4418	±6	0.226	254	3.93
0.70	±0.025	0.3848	±6	0.260	292	3.43
0.65	±0.025	0.3318	±6	0.301	339	2.95
0.60	±0.025	0.2827	±6	0.354	397	2.52
0.55	±0.020	0.2376	±7	0.421	473	2.11
0.50	±0.020	0.1964	±7	0.509	572	1.75
0.45	±0.020	0.1590	±7	0.629	706	1.42
0.40	±0.015	0.1257	±7	0.796	894	1.12
0.35	±0.015	0.09621	±7	1.04	1168	0.856
0.32	±0.015	0.08042	±7	1.24	1397	0.716
0.29	±0.012	0.06605	±7	1.51	1701	0.588
0.26	±0.012	0.05309	±8	1.88	2116	0.473
0.23	±0.012	0.04155	±8	2.41	2704	0.370
0.20	±0.010	0.03142	±8	3.18	3577	0.280
0.18	±0.010	0.02545	±8	3.93	4415	0.226
0.16	±0.010	0.02011	±8	4.97	5588	0.179
0.15	±0.008	0.01767	±8	5.66	6358	0.157
0.14	±0.008	0.01539	±8	6.50	7299	0.137
0.13	±0.008	0.01327	±9	7.53	8465	0.118
0.12	±0.008	0.01131	±9	8.84	9935	0.101
0.11	±0.006	0.009503	±9	10.5	11823	0.0846
0.10	±0.006	0.007854	±9	12.7	14306	0.0699
0.09	±0.005	0.006362	±10	15.7	17662	0.0566
0.08	±0.005	0.005027	±10	19.9	22353	0.0447
0.07	±0.005	0.003848	±10	26.0	29196	0.0343
0.06	±0.004	0.002827	±11	35.4	39739	0.0252

# CN10 (CuNi6 Copper Nickel)

## Temperature Current Characteristics · Diameter · Temperature · Current

Wire Electrical Resistivity (23°CμΩm) 0.10±0.012 [Unit: Ampere]

Diameter (mm)	50 (°C)	100 (°C)	150 (°C)	200 (°C)	250 (°C)	300 (°C)	350 (°C)	400 (°C)
6.00	113	162	292	368	442	519	593	676
5.50	101	186	257	323	389	457	524	598
5.00	87.2	161	223	281	338	397	455	515
4.50	75.0	138	191	241	290	341	390	443
4.00	65.2	121	168	210	251	295	337	381
3.50	53.9	99.5	138	173	207	243	277	314
3.20	47.0	86.7	120	152	181	212	242	275
2.90	40.8	77.4	105	131	157	184	210	239
2.60	36.6	67.1	92.1	116	138	162	185	208
2.30	30.6	55.9	77.9	97.0	116	135	155	174
2.00	25.0	45.9	63.2	79.4	94.6	111	126	143
1.80	22.8	41.5	56.8	71.1	84.8	98.5	112	127
1.60	19.3	35.1	48.4	60.3	71.5	83.8	95.1	107
1.50	17.5	31.9	44.0	54.9	65.2	76.4	86.2	97.5
1.40	15.9	29.0	39.9	50.0	59.3	69.1	78.9	88.2
1.30	15.0	27.3	37.6	47.0	55.4	64.7	73.5	81.8
1.20	13.3	24.5	33.4	41.8	49.5	57.3	65.2	73.0
1.10	12.3	21.7	29.6	36.9	43.8	51.0	57.3	64.7
1.00	10.4	19.0	26.0	32.4	38.5	44.5	50.5	56.8
0.90	8.82	16.2	22.6	27.6	32.7	37.9	42.9	48.1
0.80	7.99	14.7	20.0	25.0	29.5	34.0	38.5	41.9
0.70	6.62	12.2	16.6	20.7	24.5	28.2	31.9	34.7
0.65	5.93	11.0	14.9	18.6	22.1	25.4	28.8	31.3
0.60	5.59	10.4	14.2	17.6	20.8	23.8	26.9	29.7
0.55	5.00	9.21	12.5	15.6	18.4	21.2	23.9	26.4
0.50	4.36	8.13	11.0	13.7	16.2	19.5	21.0	23.1
0.45	3.59	7.01	9.56	12.0	14.1	16.1	18.1	20.1
0.40	3.43	6.37	8.67	10.7	12.6	14.5	16.3	18.0
0.35	2.88	5.34	7.30	8.97	10.6	12.1	13.7	15.1
0.32	2.56	4.75	6.47	8.04	9.46	10.8	12.1	13.5
0.29	2.25	4.17	5.68	7.01	8.28	9.51	10.6	11.8
0.26	2.09	3.85	5.24	6.47	7.60	8.67	9.65	10.7
0.23	1.79	3.29	4.48	5.54	6.52	7.40	8.33	9.16
0.20	1.48	2.73	3.71	4.62	5.39	6.13	6.86	7.35
0.18	1.33	2.46	3.35	4.13	4.84	5.54	6.17	6.96
0.16	1.13	2.09	2.81	3.51	4.23	4.68	5.24	5.88
0.15	1.05	1.94	2.63	3.25	3.80	4.35	4.85	5.44
0.14	0.956	1.76	2.40	2.96	3.46	3.96	4.41	4.95
0.13	0.907	1.65	2.25	2.78	3.24	3.75	4.13	4.54
0.12	0.799	1.48	2.02	2.49	2.91	3.32	3.68	4.08
0.11	0.711	1.32	1.80	2.25	2.59	2.95	3.28	3.62
0.10	0.617	1.14	1.55	1.92	2.24	2.56	2.86	3.16
0.09	0.549	1.01	1.38	1.70	1.99	2.27	2.53	2.78
0.08	0.478	0.887	1.21	1.49	1.73	1.97	2.21	2.39
0.07	0.399	0.740	1.08	1.25	1.43	1.66	1.84	2.02
0.06	0.336	0.622	0.843	0.985	1.21	1.38	1.53	1.69
0.05	0.261	0.337	0.657	0.804	0.941	1.07	1.20	1.31
0.04	0.195	0.364	0.490	0.603	0.706	0.804	0.892	0.985
0.03	0.132	0.246	0.333	0.409	0.479	0.544	0.603	0.666
0.025	0.106	0.197	0.266	0.327	0.383	0.434	0.481	0.529

# CN10 (CuNi6 Copper Nickel)

## Conductor resistance

Ribbon

Electrical Resistivity (23°CμΩm) 0.10±0.012

[Unit: Ω/m]

Thickness (mm)	Width mm)													
	40.0	32.0	25.0	20.0	16.0	13.0	10.0	6.5	5.0	3.2	2.4	1.6	0.8	0.4
2.90	0.00088	0.00110	0.00141	0.00176	0.00220	0.00271	0.00352							
2.60	0.00098	0.00123	0.00157	0.00196	0.00245	0.00302	0.00392	0.00616						
2.30	0.00111	0.00139	0.00177	0.00222	0.00277	0.00341	0.00444	0.00697	0.00906					
2.00	0.00128	0.00159	0.00204	0.00255	0.00319	0.00392	0.00510	0.00801	0.0104					
1.80	0.00142	0.00177	0.00227	0.00283	0.00354	0.00436	0.00567	0.00890	0.0116					
1.60	0.00159	0.00199	0.00255	0.00319	0.00399	0.00491	0.00638	0.0100	0.0130					
1.40	0.00182	0.00228	0.00292	0.00364	0.00456	0.00561	0.00729	0.0114	0.0149					
1.20	0.00213	0.00266	0.00340	0.00425	0.00531	0.00654	0.0085	0.0134	0.0174					
1.00	0.00255	0.00319	0.00408	0.00510	0.00638	0.00785	0.0102	0.0160	0.0208					
0.90		0.00354	0.00454	0.00567	0.00709	0.00872	0.0113	0.0178	0.0231	0.0362	0.0482			
0.80		0.00399	0.00510	0.00638	0.00797	0.00981	0.0128	0.0200	0.0260	0.0407	0.0543			
0.70			0.00583	0.00729	0.00911	0.0112	0.0146	0.0229	0.0298	0.0465	0.0620			
0.60			0.00680	0.00850	0.0106	0.0131	0.0170	0.0267	0.0347	0.0543	0.0723			
0.50			0.00816	0.0102	0.0128	0.0157	0.0204	0.0321	0.0417	0.0651	0.0868			
0.45			0.00907	0.0113	0.0142	0.0174	0.0227	0.0356	0.0463	0.0723	0.0965	0.145		
0.40					0.0159	0.0196	0.0255	0.0401	0.0521	0.0814	0.109	0.163		
0.35						0.0224	0.0292	0.0458	0.0595	0.093	0.124	0.186		
0.32						0.0245	0.0319	0.0501	0.0651	0.102	0.136	0.203		
0.29							0.0352	0.0553	0.0718	0.112	0.150	0.224	0.449	
0.26							0.0392	0.0616	0.0801	0.125	0.167	0.250	0.501	1.00
0.23								0.0697	0.0906	0.142	0.189	0.283	0.566	1.13
0.20								0.0801	0.104	0.163	0.217	0.326	0.651	1.30
0.18								0.0890	0.116	0.181	0.241	0.362	0.723	1.45
0.16										0.203	0.271	0.407	0.814	1.63
0.14										0.233	0.310	0.465	0.930	1.86
0.12											0.362	0.543	1.09	2.17
0.10												0.651	1.30	2.60
0.08												0.814	1.63	3.26

\*Allowable tolerance of conductor resistance : Width 10mm or more ±7% , Width 10mm or less ±8%

## Conductor Resistance Tolerance of Ribbon

Thickness [mm]	Width [mm]	Resistance Tolerance [%]
0.08above 3.15below	10below	±8
	10above	±7

\*We can manufacture products other than the standard (size and tolerance), so please contact us.