
CN30 (CuNi23)

Copper Nickel No 30

TOKYO RESISTANCE WIRE CO., LTD.

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Alloys : CN30 (CuNi23 Copper Nickel)

[JIS C 2532]

Heat-resistant, oxidation-resistant, and can be used up to 300°C.

Non-magnetic and slightly less workable than Type 49.

Used for low-temperature heating elements, heaters for circuit breakers, and other medium-resistance resistance materials.

JIS	JIS Code	Electrical Resistivity [$\mu\Omega\text{m}$]	Average TCR [$\times 10^{-6}/^{\circ}\text{C}$]
GCN30	C 2532	0.30 \pm 0.024	* 180

(*)Reference value

Thermal Expansion Coefficient $\times 10^{-6}/$	Density g/cm ³ (20°C)	Melting Point °C	Max Operating Temperature °C
17.5	8.90	1150	300

Chemical Composition	Mn	Ni	Cu+Ni+Mn
(%)	≤ 1.5	20~25	≥ 99

Alloys	Type	Diameter (mm)	
CN30W	Wire	$\phi 6.00 \sim 0.05$	
CN30R	Ribbon	t=2.90~0.05	w=40~0.4 (Depends on thickness)
CN30P	Plate	Please consult	
CN30	Foil	Please consult	

CN30 (CuNi23 Copper Nickel)

Resistance·Length·Weight

Wire

Electrical Resistivity (23°CμΩm) 0.30±0.024

Diameter (mm)	Tolerance (mm)	Cross section (mm ²)	Resistance Tolerance (%)	DC Resistance (Ω/m)	Length (m/Kg)	Weight (g/m)
6.00	±0.080	28.27	±5	0.0106	3.97	252
5.50	±0.063	23.76	±5	0.0126	4.73	211
5.00	±0.063	19.64	±5	0.0153	5.72	175
4.50	±0.063	15.90	±5	0.0189	7.06	142
4.00	±0.063	12.57	±5	0.0239	8.94	112
3.50	±0.050	9.621	±5	0.0312	11.7	85.6
3.20	±0.050	8.042	±5	0.0373	14.0	71.6
2.90	±0.050	6.605	±5	0.0454	17.0	58.8
2.60	±0.040	5.309	±5	0.0565	21.2	47.3
2.30	±0.040	4.155	±5	0.0722	27.0	37.0
2.00	±0.040	3.142	±5	0.0955	35.8	28.0
1.80	±0.040	2.545	±5	0.118	44.2	22.6
1.60	±0.032	2.011	±5	0.149	55.9	17.9
1.50	±0.032	1.767	±5	0.170	63.6	15.7
1.40	±0.032	1.539	±5	0.195	73.0	13.7
1.30	±0.032	1.327	±5	0.226	84.7	11.8
1.20	±0.025	1.131	±5	0.265	99.3	10.1
1.10	±0.025	0.9503	±6	0.316	118	8.46
1.00	±0.025	0.7854	±6	0.382	143	6.99
0.90	±0.025	0.6362	±6	0.472	177	5.66
0.85	±0.025	0.5675	±6	0.529	198	5.05
0.80	±0.020	0.5027	±6	0.597	224	4.47
0.75	±0.020	0.4418	±6	0.679	254	3.93
0.70	±0.020	0.3848	±6	0.780	292	3.43
0.65	±0.020	0.3318	±6	0.904	339	2.95
0.60	±0.020	0.2827	±6	1.06	397	2.52
0.55	±0.016	0.2376	±7	1.26	473	2.11
0.50	±0.016	0.1964	±7	1.53	572	1.75
0.45	±0.016	0.1590	±7	1.89	706	1.42
0.40	±0.016	0.1257	±7	2.39	894	1.12
0.35	±0.013	0.09621	±7	3.12	1168	0.856
0.32	±0.013	0.08042	±7	3.73	1397	0.716
0.29	±0.013	0.06605	±7	4.54	1701	0.588
0.26	±0.010	0.05309	±8	5.65	2116	0.473
0.23	±0.010	0.04155	±8	7.22	2704	0.370
0.20	±0.010	0.03142	±8	9.55	3577	0.280
0.18	±0.008	0.02545	±8	11.8	4415	0.226
0.16	±0.008	0.02011	±8	14.9	5588	0.179
0.15	±0.008	0.01767	±8	17.0	6358	0.157
0.14	±0.008	0.01539	±8	19.5	7299	0.137
0.13	±0.006	0.01327	±9	22.6	8465	0.118
0.12	±0.006	0.01131	±9	26.5	9935	0.101
0.11	±0.006	0.009503	±9	31.6	11823	0.0846
0.10	±0.006	0.007854	±9	38.2	14306	0.0699
0.09	±0.005	0.006362	±10	47.2	17662	0.0566
0.08	±0.005	0.005027	±10	59.7	22353	0.0447
0.07	±0.005	0.003848	±10	78.0	29196	0.0343
0.06	±0.004	0.002827	±11	106	39739	0.0252
0.05	±0.004	0.001964	±11	153	57224	0.0175

CN30 (CuNi23 Copper Nickel)

Temperature Current Characteristics · Diameter · Temperature · Current

Wire Electrical Resistivity (23°CμΩm) 0.30±0.024 [Unit: Ampere]

Diameter (mm)	50 (°C)	100 (°C)	150 (°C)	200 (°C)	250 (°C)	300 (°C)	350 (°C)	400 (°C)
6.00	37.5	53.8	97.1	122	147	173	197	225
5.50	33.6	61.8	85.4	108	129	152	174	199
5.00	29.0	53.5	74.2	93.6	112	132	151	171
4.50	24.9	46.0	63.6	80.2	96.3	113	130	148
4.00	21.7	40.1	55.7	69.8	83.5	98.1	112	127
3.50	17.9	33.1	45.8	57.5	68.8	80.7	92.3	104
3.20	15.6	28.9	39.9	50.5	60.3	70.6	80.5	91.6
2.90	13.6	25.8	34.9	43.7	52.2	61.3	69.9	79.4
2.60	12.2	22.3	30.6	38.6	46.0	53.8	61.6	69.3
2.30	10.2	18.6	25.9	32.3	38.6	45.0	51.5	57.9
2.00	8.31	15.3	21.0	26.4	31.5	36.8	42.1	47.4
1.80	7.58	13.8	18.9	23.6	28.2	32.8	37.3	42.2
1.60	6.42	11.7	16.1	20.0	23.8	27.9	31.6	35.5
1.50	5.84	10.6	14.6	18.3	21.7	25.4	28.7	32.4
1.40	5.30	9.63	13.3	16.6	19.7	23.0	26.2	29.3
1.30	4.99	9.08	12.5	15.6	18.4	21.5	24.5	27.2
1.20	4.43	8.15	11.1	13.9	16.5	19.1	21.7	24.3
1.10	4.08	7.20	9.86	12.3	14.6	17.0	19.1	21.5
1.00	3.46	6.32	8.64	10.8	12.8	14.8	16.8	18.9
0.90	2.93	5.38	7.51	9.18	10.9	12.6	14.3	16.0
0.80	2.66	4.89	6.67	8.31	9.83	11.3	12.8	13.9
0.70	2.20	4.06	5.51	6.88	8.17	9.39	10.6	11.6
0.65	1.97	3.65	4.97	6.19	7.34	8.44	9.57	10.4
0.60	1.86	3.46	4.71	5.85	6.91	7.92	8.93	9.89
0.55	1.66	3.06	4.17	5.20	6.13	7.04	7.94	8.77
0.50	1.45	2.71	3.67	4.55	5.38	6.47	6.98	7.69
0.45	1.19	2.33	3.18	3.98	4.68	5.36	6.03	6.68
0.40	1.14	2.12	2.89	3.57	4.21	4.81	5.41	6.00
0.35	0.957	1.78	2.43	2.98	3.54	4.03	4.55	5.04
0.32	0.851	1.58	2.15	2.67	3.15	3.59	4.03	4.48
0.29	0.748	1.39	1.89	2.33	2.75	3.16	3.54	3.91
0.26	0.694	1.28	1.74	2.15	2.53	2.89	3.21	3.57
0.23	0.597	1.10	1.49	1.84	2.17	2.46	2.77	3.05
0.20	0.494	0.908	1.23	1.54	1.79	2.04	2.28	2.45
0.18	0.443	0.820	1.11	1.37	1.61	1.84	2.05	2.31
0.16	0.375	0.696	0.936	1.17	1.41	1.56	1.74	1.96
0.15	0.349	0.645	0.875	1.08	1.26	1.45	1.61	1.81
0.14	0.318	0.587	0.799	0.985	1.15	1.32	1.47	1.65
0.13	0.302	0.549	0.748	0.924	1.08	1.25	1.37	1.51
0.12	0.266	0.492	0.673	0.830	0.968	1.11	1.22	1.36
0.11	0.236	0.440	0.598	0.748	0.861	0.981	1.09	1.20
0.10	0.205	0.380	0.517	0.639	0.747	0.852	0.950	1.05
0.09	0.183	0.337	0.458	0.566	0.662	0.755	0.841	0.924
0.08	0.159	0.295	0.403	0.497	0.575	0.657	0.734	0.795
0.07	0.133	0.246	0.359	0.417	0.474	0.551	0.613	0.672
0.06	0.112	0.207	0.280	0.328	0.401	0.460	0.509	0.561
0.05	0.0869	0.112	0.218	0.267	0.313	0.357	0.398	0.437
0.04	0.0649	0.121	0.163	0.200	0.235	0.267	0.297	0.328
0.03	0.0438	0.0818	0.111	0.136	0.159	0.181	0.200	0.222
0.025	0.0354	0.0655	0.0885	0.109	0.127	0.144	0.160	0.176

CN30 (CuNi23 Copper Nickel)

Conductor resistance

Ribbon

Electrical Resistivity (23°CμΩm) 0.30 ± 0.024

[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	0.00264	0.00330	0.00422	0.00528	0.00660	0.00812	0.0106							
2.60	0.00294	0.00368	0.00471	0.00589	0.00736	0.00906	0.0118	0.0185						
2.30	0.00333	0.00416	0.00532	0.00665	0.00832	0.0102	0.0133	0.0209	0.0272					
2.00	0.00383	0.00478	0.00612	0.00765	0.00957	0.0118	0.0153	0.0240	0.0313					
1.80	0.00425	0.00531	0.00680	0.00850	0.0106	0.0131	0.0170	0.0267	0.0347					
1.60	0.00478	0.00598	0.00765	0.00957	0.0120	0.0147	0.0191	0.0300	0.0391					
1.40	0.00547	0.00683	0.00875	0.0109	0.0137	0.0168	0.0219	0.0343	0.0446					
1.20	0.00638	0.00797	0.0102	0.0128	0.0159	0.0196	0.0255	0.0401	0.0521					
1.00	0.00765	0.00957	0.0122	0.0153	0.0191	0.0235	0.0306	0.0481	0.0625					
0.90		0.0106	0.0136	0.0170	0.0213	0.0262	0.0340	0.0534	0.0694	0.109	0.145			
0.80		0.0120	0.0153	0.0191	0.0239	0.0294	0.0383	0.0601	0.0781	0.122	0.163			
0.70			0.0175	0.0219	0.0273	0.0336	0.0437	0.0687	0.0893	0.140	0.186			
0.60			0.0204	0.0255	0.0319	0.0392	0.0510	0.0801	0.104	0.163	0.217			
0.50			0.0245	0.0306	0.0383	0.0471	0.0612	0.0962	0.125	0.195	0.260			
0.45			0.0272	0.0340	0.0425	0.0523	0.0680	0.107	0.139	0.217	0.289	0.434		
0.40					0.0478	0.0589	0.0765	0.120	0.156	0.244	0.326	0.488		
0.35						0.0673	0.0875	0.137	0.179	0.279	0.372	0.558		
0.32						0.0736	0.0957	0.150	0.195	0.305	0.407	0.610		
0.29							0.106	0.166	0.216	0.337	0.449	0.673	1.35	
0.26							0.118	0.185	0.240	0.376	0.501	0.751	1.50	3.00
0.23								0.209	0.272	0.425	0.566	0.849	1.70	3.40
0.20								0.240	0.313	0.488	0.651	0.977	1.95	3.91
0.18								0.267	0.347	0.543	0.723	1.09	2.17	4.34
0.16										0.610	0.814	1.22	2.44	4.88
0.14										0.698	0.930	1.40	2.79	5.58
0.12											1.085	1.63	3.26	6.51
0.10												1.95	3.91	7.81
0.08												2.44	4.88	9.77

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

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.