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# NCH1

## Nickel Chrome No 1

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# Alloys : NCH1 (Nickel Chrome Type 1)

[JIS C 2520]

[JIS C 2532]

It has good heat resistance, good oxidation resistance, high strength at high temperatures, and is non-magnetic. Its workability does not become embrittled even after heating at high temperatures, and it has good cold workability. It is suitable for high-temperature heating elements such as electric furnaces and high-resistance resistance materials.

JIS	JIS Code	Electrical Resistivity [ $\mu\Omega\text{m}$ ]	Average TCR [ $\times 10^{-6}/^{\circ}\text{C}$ ]
NCH1	C 2520	1.08 $\pm$ 0.05	* 80
GNC108	C 2532		

(\* )Reference value

Cuprous Electromotive Force Mv/K (0~100°C)	Thermal Expansion Coefficient $\times 10^{-6}/$	Specific Heat J/g·K (20°C)	Thermal Conductivity w/m·K	Density g/cm <sup>3</sup> (20°C)	Melting Point °C	Max Operating Temperature °C
+0.4 ~ +0.7	17.0	0.42	15	8.41	1400	1100

Chemical Composition	C	Si	Mn	Ni	Cr	Fe
(%)	$\leq 0.15$	0.75~1.6	$\leq 2.5$	$\geq 77$	19~21	$\leq 1$

## Resistance increase by temperature

°C	20	100	200	300	400	500	600	700	800	900	1000	1100
Coefficient	1.000	1.009	1.024	1.039	1.056	1.070	1.068	1.062	1.060	1.063	1.070	1.080

Alloys	Type	Diameter (mm)	
NCHW1	Wire	$\phi 6.00 \sim 0.020$	
NCHR1	Ribbon	t=2.90~0.05	w=40~0.2 (Depends on thickness)
NCH1P	Plate	Please consult	
NCH1	Foil	Please consult	

# NCH1 (Nickel Chrome Type 1)

## Resistance·Length·Weight

Wire

Electrical Resistivity (23°CμΩm) 1.08±0.05

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	0.0382	4.21	238
5.50	±0.063	23.76	±5	0.0455	5.00	200
5.00	±0.063	19.64	±5	0.0550	6.06	165
4.50	±0.063	15.90	±5	0.0679	7.48	134
4.00	±0.063	12.57	±5	0.0859	9.46	106
3.50	±0.050	9.621	±5	0.112	12.4	80.9
3.20	±0.050	8.042	±5	0.134	14.8	67.6
2.90	±0.050	6.605	±5	0.164	18.0	55.5
2.60	±0.040	5.309	±5	0.203	22.4	44.7
2.30	±0.040	4.155	±5	0.260	28.6	34.9
2.00	±0.040	3.142	±5	0.344	37.8	26.4
1.80	±0.040	2.545	±5	0.424	46.7	21.4
1.60	±0.032	2.011	±5	0.537	59.1	16.9
1.50	±0.032	1.767	±5	0.611	67.3	14.9
1.40	±0.032	1.539	±5	0.702	77.2	12.9
1.30	±0.032	1.327	±5	0.814	89.6	11.2
1.20	±0.025	1.131	±5	0.955	105	9.51
1.10	±0.025	0.9503	±6	1.14	125	7.99
1.00	±0.025	0.7854	±6	1.38	151	6.61
0.90	±0.025	0.6362	±6	1.70	187	5.35
0.85	±0.025	0.5675	±6	1.90	210	4.77
0.80	±0.020	0.5027	±6	2.15	237	4.23
0.75	±0.020	0.4418	±6	2.44	269	3.72
0.70	±0.020	0.3848	±6	2.81	309	3.24
0.65	±0.020	0.3318	±6	3.25	358	2.79
0.60	±0.020	0.2827	±6	3.82	421	2.38
0.55	±0.016	0.2376	±7	4.55	500	2.00
0.50	±0.016	0.1964	±7	5.50	606	1.65
0.45	±0.016	0.1590	±7	6.79	748	1.34
0.40	±0.016	0.1257	±7	8.59	946	1.06
0.35	±0.013	0.09621	±7	11.2	1236	0.809
0.32	±0.013	0.08042	±7	13.4	1478	0.676
0.29	±0.013	0.06605	±7	16.4	1800	0.555
0.26	±0.010	0.05309	±8	20.3	2240	0.447
0.23	±0.010	0.04155	±8	26.0	2862	0.349
0.20	±0.010	0.03142	±8	34.4	3785	0.264
0.18	±0.008	0.02545	±8	42.4	4673	0.214
0.16	±0.008	0.02011	±8	53.7	5914	0.169
0.15	±0.008	0.01767	±8	61.1	6729	0.149
0.14	±0.008	0.01539	±8	70.2	7724	0.129
0.13	±0.006	0.01327	±9	81.4	8958	0.112
0.12	±0.006	0.01131	±9	95.5	10514	0.0951
0.11	±0.006	0.009503	±9	114	12512	0.0799
0.10	±0.006	0.007854	±9	138	15140	0.0661
0.09	±0.006	0.006362	±10	170	18691	0.0535
0.08	±0.005	0.005027	±10	215	23656	0.0423
0.07	±0.005	0.003848	±10	281	30897	0.0324
0.06	±0.004	0.002827	±11	382	42054	0.0238
0.05	±0.004	0.001964	±11	550	60558	0.0165
0.04	±0.003	0.001257	±12	859	94622	0.0106
0.03	±0.003	0.0007069	±12	1528	168217	0.00594
0.025	±0.0025	0.0004909	±13	2200	242233	0.00413
0.020	±0.0025	0.0003142	±13	3438	378489	0.00264

# NCH1 (Nickel Chrome Type 1)

## Temperature Current Characteristics · Diameter · Temperature · Current

Wire Electrical Resistivity (23°CμΩm) 1.08±0.05 [Unit: Ampere]

Diameter (mm)	200 (°C)	300 (°C)	400 (°C)	500 (°C)	600 (°C)	700 (°C)	800 (°C)	900 (°C)	1000 (°C)	1100 (°C)
6.00	56.0	78.0	98.0	119	147	175	210	250	290	325
5.50	49.0	69.0	97.0	105	130	155	190	220	255	290
5.00	43.0	59.0	75.0	90.0	112	135	164	190	220	250
4.50	36.0	50.0	64.0	77.0	94.0	115	140	160	190	215
4.00	31.0	42.0	54.0	65.0	80.0	94.0	113	133	159	180
3.50	25.0	34.0	44.0	53.0	66.0	78.0	96.0	113	130	150
3.20	22.0	30.0	39.0	46.0	57.0	68.0	83.0	98.0	114	130
2.90	18.8	26.0	34.0	40.0	49.0	59.0	72.0	84.0	98.0	111
2.60	15.5	22.0	28.0	34.0	42.0	50.0	62.0	72.0	83.0	93.0
2.30	13.2	18.1	24.0	29.0	35.0	42.0	52.0	60.0	69.0	79.0
2.00	11.0	15.0	20.0	24.0	29.0	35.0	41.0	49.0	56.0	64.0
1.80	9.70	13.2	17.3	21.0	25.0	30.0	33.0	42.0	48.0	55.0
1.60	8.20	11.3	15.0	17.5	21.0	26.0	31.0	35.0	41.0	46.0
1.50	7.60	10.4	13.6	16.0	19.5	23.0	28.0	32.0	37.0	42.0
1.40	7.00	9.50	12.5	14.6	18.0	21.0	26.0	29.0	34.0	39.0
1.30	6.40	8.70	11.3	13.3	16.2	19.0	23.0	26.0	30.0	35.0
1.20	5.90	7.80	10.5	11.8	14.0	16.1	20.0	23.0	27.0	31.0
1.10	5.20	7.00	9.00	10.8	13.0	15.4	18.2	21.0	24.0	27.0
1.00	4.70	6.10	8.00	9.40	11.5	13.5	15.5	17.5	20.0	23.0
0.90	4.10	5.50	7.10	8.20	10.0	11.8	14.0	16.0	18.2	21.0
0.85	3.90	5.10	6.60	7.70	9.30	10.8	12.8	14.8	17.0	19.3
0.80	3.50	4.70	6.10	7.00	8.50	10.0	11.8	13.5	15.5	17.5
0.75	3.30	4.30	5.60	6.50	7.80	9.00	10.7	12.4	14.0	16.0
0.70	3.00	3.90	5.10	5.90	7.10	8.30	9.70	11.0	12.9	14.7
0.65	2.80	3.60	4.70	5.40	6.50	7.50	8.70	10.0	11.6	13.2
0.60	2.50	3.20	4.20	4.80	5.80	6.80	7.80	9.00	10.3	12.0
0.55	2.30	2.90	3.80	4.30	5.20	6.00	7.00	8.00	9.20	10.5
0.50	2.00	2.60	3.40	3.80	4.60	5.30	6.30	7.10	8.20	9.20
0.45	1.80	2.30	2.90	3.30	4.00	4.60	5.20	5.90	6.70	7.60
0.40	1.50	1.90	2.50	2.90	3.40	3.90	4.50	5.20	5.90	6.70
0.35	1.26	1.60	2.10	2.50	2.90	3.30	3.70	4.30	4.80	5.50
0.32	1.13	1.45	1.86	2.20	2.60	2.90	3.40	3.90	4.40	4.90
0.29	1.00	1.30	1.65	1.90	2.30	2.60	3.00	3.40	3.80	4.30
0.26	0.88	1.13	1.45	1.70	2.00	2.30	2.60	2.90	3.30	3.70
0.23	0.76	1.00	1.25	1.45	1.70	1.90	2.20	2.50	2.80	3.20
0.20	0.64	0.84	1.05	1.21	1.42	1.63	1.85	2.10	2.40	2.60
0.18	0.56	0.74	0.92	1.06	1.25	1.42	1.62	1.85	2.00	2.30
0.16	0.49	0.64	0.79	0.91	1.06	1.23	1.40	1.60	1.79	1.98
0.15	0.45	0.59	0.73	0.84	0.98	1.12	1.30	1.46	1.63	1.80
0.14	0.42	0.55	0.67	0.78	0.90	1.05	1.20	1.34	1.50	1.65
0.13	0.38	0.50	0.61	0.71	0.82	0.95	1.09	1.22	1.38	1.50
0.12	0.35	0.46	0.56	0.64	0.74	0.86	1.00	1.10	1.23	1.35
0.11	0.31	0.42	0.50	0.58	0.67	0.77	0.88	1.00	1.10	1.20
0.10	0.28	0.37	0.45	0.52	0.59	0.68	0.78	0.88	0.98	1.07
0.09	0.23	0.31	0.37	0.44	0.51	0.57	0.64	0.77	0.78	0.86
0.08	0.20	0.27	0.32	0.38	0.44	0.49	0.55	0.61	0.67	0.73
0.07	0.17	0.22	0.27	0.32	0.37	0.41	0.46	0.51	0.56	0.61
0.06	0.14	0.19	0.23	0.26	0.30	0.40	0.38	0.42	0.46	0.50
0.05	0.11	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.39
0.04	0.08	0.11	0.13	0.15	0.18	0.20	0.22	0.24	0.26	0.29
0.03	0.06	0.07	0.09	0.10	0.12	0.13	0.15	0.16	0.18	0.19

# NCH1 (Nickel Chrome Type 1)

## Conductor resistance

Ribbon

Electrical Resistivity (23°CμΩm) 1.08±0.05

[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	0.2
2.90	0.0095	0.0119	0.0152	0.0190	0.0238	0.0292	0.0380								
2.60	0.0106	0.0132	0.0170	0.0212	0.0265	0.0326	0.0424	0.0666							
2.30	0.0120	0.0150	0.0192	0.0240	0.0299	0.0369	0.0479	0.0753	0.10						
2.00	0.0138	0.0172	0.0220	0.0276	0.0344	0.0424	0.0551	0.0865	0.11						
1.80	0.0153	0.0191	0.0245	0.0306	0.0383	0.0471	0.0612	0.0962	0.13						
1.60	0.0172	0.0215	0.0276	0.0344	0.0430	0.0530	0.0689	0.108	0.14						
1.40	0.0197	0.0246	0.0315	0.0394	0.0492	0.0606	0.0787	0.124	0.16						
1.20	0.0230	0.0287	0.0367	0.0459	0.0574	0.0706	0.0918	0.144	0.19						
1.00	0.0276	0.0344	0.0441	0.0551	0.0689	0.0848	0.110	0.173	0.23						
0.90		0.0383	0.0490	0.0612	0.0765	0.0942	0.122	0.192	0.25	0.391	0.521				
0.80		0.0430	0.0551	0.0689	0.0861	0.106	0.138	0.216	0.28	0.439	0.586				
0.70			0.0630	0.0787	0.0984	0.121	0.157	0.247	0.32	0.502	0.670				
0.60			0.0735	0.0918	0.115	0.141	0.184	0.288	0.38	0.586	0.781				
0.50			0.0882	0.110	0.138	0.170	0.220	0.346	0.45	0.703	0.938				
0.45			0.0980	0.122	0.153	0.188	0.245	0.385	0.50	0.781	1.04	1.56			
0.40					0.172	0.212	0.276	0.433	0.56	0.879	1.17	1.76			
0.35						0.242	0.315	0.495	0.64	1.00	1.34	2.01			
0.32						0.265	0.344	0.541	0.70	1.10	1.46	2.20			
0.29							0.380	0.597	0.78	1.21	1.62	2.42	4.85		
0.26							0.424	0.666	0.87	1.35	1.80	2.70	5.41	10.8	
0.23								0.753	0.98	1.53	2.04	3.06	6.11	12.2	
0.20								0.865	1.13	1.76	2.34	3.52	7.03	14.1	
0.18								0.962	1.25	1.95	2.60	3.91	7.81	15.6	
0.16										2.20	2.93	4.39	8.79	17.6	
0.14										2.51	3.35	5.02	10.0	20.1	
0.12											3.91	5.86	11.7	23.4	
0.10												7.03	14.1	28.1	
0.08												8.79	17.6	35.2	70.3
0.07													20.1	40.2	80.4
0.06														46.9	93.8
0.05														56.3	

\*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.