Cr20Ni35 / Cr20Ni30

GB/T 1234-2012

Nickel-chromium alloy supplied in two grades — Cr20Ni35 and Cr20Ni30 — for 800–1100 °C service, with good ductility and weldability.

1100 °C	1.04 μΩ·m	7.90 g/cm³	≥80 h
MAX. WORKING TEMPERATURE	RESISTIVITY AT 20 °C	DENSITY	ACCELERATED LIFE AT 1100 °C

PRODUCT OVERVIEW

Cr20Ni35 / Cr20Ni30 combines high resistivity with good oxidation resistance, and stays ductile after service. Cold working behaviour and weldability are both good. The two grades are mature nickel-chromium heating alloys: Cr20Ni35 is slightly ahead on high-temperature stability, corrosion resistance and service life and suits demanding duty, while Cr20Ni30 carries a cost advantage and suits large-scale medium-temperature work.

Their resistivities are close enough that the two can be used interchangeably across 800–1100 °C, so the choice is normally made on operating temperature, atmosphere and budget rather than on electrical design.

ALSO KNOWN AS

Chromel D · Nikrothal 40 · N4 · Chromax · HAI-NiCr 40 · Tophet D · Resistohm 40 · Cronifer III · NiCr 3520 · Alloy D · Nikrothal 4 · MWS-610 · Stablohm 610 · CrNi20/35 · Ni35Cr20

CHEMICAL COMPOSITION

Grade	C	P	S	Mn	Si	Cr	Ni	Al	Fe
Cr20Ni35	≤0.08	≤0.02	≤0.015	≤1.0	1.0–3.0	18.0–21.0	34.0–37.0	–	Bal.
Cr20Ni30	≤0.08	≤0.02	≤0.015	≤1.0	1.0–3.0	18.0–21.0	30.0–34.0	–	Bal.

Values in weight %. Balance (Bal.) is iron. Composition based on GB/T 1234-2012.

TYPICAL APPLICATIONS

- Heating elements for 800–1100 °C service
- Large-scale medium-temperature plant
- Elements needing cold forming and welding
- Interchangeable duty with Cr20Ni30
- High-end applications where stability matters

PHYSICAL & MECHANICAL PROPERTIES

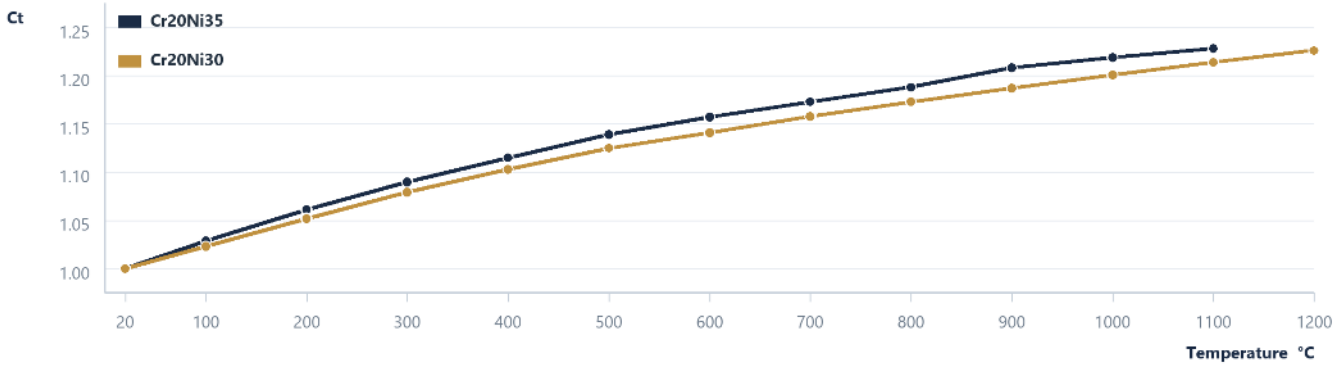
Property	Value	Property	Value
Max. working temperature	1100 °C	Resistivity at 20 °C (μΩ·m)	1.04 ± 0.05
Density	7.90 g/cm³	Thermal conductivity (20 °C)	13 W/(m·K)
Mean linear expansion 20–1000 °C	19.0 × 10^{-6} /K	Specific heat capacity	0.50 J/(g·K)
Approx. melting point	1390 °C	Elongation after fracture A/%	≤3.0 mm: ≥20 % >3.0 mm: ≥25 %
Tensile strength Rm	≥600 MPa	Accelerated life test	≥80 h at 1100 °C
Micrographic structure	Austenite	Magnetic properties	Non-magnetic

TEMPERATURE FACTOR OF RESISTIVITY

Ct is applied to the 20 °C resistivity to obtain the value at working temperature:

R (T) = R (20 °C) × Ct

Temp. °C	20	100	200	300	400	500	600	700	800	900	1000	1100	1200
Cr20Ni35	1.000	1.029	1.061	1.09	1.115	1.139	1.157	1.173	1.188	1.208	1.219	1.228	
Cr20Ni30	1.000	1.023	1.052	1.079	1.103	1.125	1.141	1.158	1.173	1.187	1.201	1.214	1.226



AVAILABLE FORMS & SUPPLY RANGE

Form	Surface / finish	Size range
Wire	Bright, soft annealed	0.025 – 1.6 mm
Wire	Acid-pickled or primary colour	1.0 – 12.0 mm
Rod	Oxidized, acid-pickled or bright finish	6.0 – 150.0 mm
Flat wire	Bright & soft annealed	width 0.2 – 6.0 mm · thickness 0.08 – 1.0 mm
Heating ribbon	Oxidized, acid-pickled or bright finish	width 5.0 – 300 mm · thickness 0.05 – 4.0 mm

TECHNICAL PARAMETERS

Standard diameters 0.05 – 9.0 mm: resistance, yield length and weight per metre. Calculated to GB/T 1234-2012.

Ø mm	Ω/m at 20 °C	m/kg	g/m	Ø mm	Ω/m at 20 °C	m/kg	g/m
0.05	529.668	64467.88	0.01551	1.1	1.0944	133.20	7.50761
0.06	367.825	44769.36	0.02234	1.2	0.9196	111.92	8.93468
0.07	270.239	32891.78	0.03040	1.3	0.7835	95.37	10.48584
0.08	206.902	25182.77	0.03971	1.4	0.6756	82.23	12.16109
0.09	163.478	19897.49	0.05026	1.5	0.5885	71.63	13.96044
0.1	132.417	16116.97	0.06205	1.6	0.5173	62.96	15.88388
0.11	109.436	13319.81	0.07508	1.7	0.4582	55.77	17.93141
0.12	91.956	11192.34	0.08935	1.8	0.4087	49.74	20.10303
0.13	78.353	9536.67	0.10486	1.9	0.3668	44.65	22.39875
0.15	58.852	7163.10	0.13960	2.0	0.3310	40.29	24.81856
0.17	45.819	5576.81	0.17931	2.2	0.2736	33.30	30.03046
0.19	36.681	4464.53	0.22399	2.4	0.2299	27.98	35.73873
0.21	30.027	3654.64	0.27362	2.6	0.1959	23.84	41.94337
0.25	21.187	2578.72	0.38779	2.8	0.1689	20.56	48.64438
0.27	18.164	2210.83	0.45232	3.0	0.1471	17.91	55.84176
0.29	15.745	1916.41	0.52181	3.2	0.1293	15.74	63.53552
0.31	13.779	1677.10	0.59627	3.4	0.1145	13.94	71.72564
0.35	10.810	1315.67	0.76007	3.6	0.1022	12.44	80.41214
0.40	8.276	1007.31	0.99274	3.8	0.0917	11.16	89.59501
0.45	6.539	795.90	1.25644	4.0	0.0828	10.07	99.27424
0.50	5.297	644.68	1.55116	4.5	0.0654	7.96	125.64397
0.55	4.377	532.79	1.87690	5.0	0.0530	6.45	155.11601
0.60	3.678	447.69	2.23367	5.5	0.0438	5.33	187.69037
0.65	3.134	381.47	2.62146	6.0	0.0368	4.48	223.36705
0.70	2.702	328.92	3.04027	6.5	0.0313	3.81	262.14605
0.80	2.069	251.83	3.97097	7.0	0.0270	3.29	304.02737
0.85	1.833	223.07	4.48285	7.5	0.0235	2.87	349.01101
0.90	1.635	198.97	5.02576	8.0	0.0207	2.52	397.09698
0.95	1.467	178.58	5.59969	8.5	0.0183	2.23	448.28526
1.00	1.324	161.17	6.20464	9.0	0.0163	1.99	502.57586

TOLERANCE OF RESISTANCE PER METRE

0.03 – 0.06 mm ±10 % · 0.07 – 0.12 mm ±8 % · 0.13 – 0.17 mm ±7 % · 0.18 – 0.32 mm ±6 % · above 0.32 mm ±5 %

Applies to the resistance values listed in the technical parameter table above.

NOTICE

Recommendations are given for guidance only. Suitability of the material can only be confirmed once the actual service conditions are known. Continuous technical development may lead to changes in these data without notice. Some of the common names listed are registered trademarks of their respective owners. Issued October 2026.