

# Cr20Ni35 & Cr20Ni30 RESISTANCE WIRE

## DATASHEET

CHANGSHU IPACE INTERNATIONAL CORP

**Cr20Ni35/Cr20Ni30** is characterized by high resistivity and good oxidation resistance. It has good ductility after use and excellent cold working properties, good weldability. Both Cr20Ni35 and Cr20Ni30 are mature nickel-chromium based heating alloys. Cr20Ni35 is slightly superior in high-temperature stability, corrosion resistance and service life, suitable for high-end applications; Cr20Ni30 offers cost advantages, suitable for large-scale medium-temperature applications. Both have similar resistivity and can be used interchangeably in the 800-1000°C temperature range. Selection should comprehensively consider specific operating temperature, environmental conditions, and cost budget.

**Cr20Ni35** also has the following common names: 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 or Ni35Cr20

**Cr20Ni30** (DIN W.Nr. 1.4860, NiCr 30/20) is a substitute product for C20Ni35. It can be used interchangeably in most application scenarios.

### CHEMICAL COMPOSITION

	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	-	Remainder
Cr20Ni30	0.08	0.02	0.015	1.0	1.0~3.0	18.0~21.0	30.0~34.0	-	Remainder

### PHYSICAL PROPERTIES

Max. Working Temp.	1100°C	Resistivity at 20°C ( $\mu\Omega\cdot m$ )	1.04±0.05
Density	7.90 g/cm <sup>3</sup>	Thermal conductivity (20°C)	13 W/(m·K)
Average linear expansion coefficient(20-1000°C)	19.0×10 <sup>-6</sup> /K	Specific heat capacity	0.50 J/(g·K)
Approx. melting point	1390°C	Elongation after Fracture (A%)	Diameter≤3.0mm: ≥20% Diameter>3.0mm: ≥25%
Tensile strength(R <sub>m</sub> /MPa)	≥600	Accelerated life test	≥80h/1100°C
Micrographic structure	Austenite	Magnetic properties	Non-magnetic

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### TEMPERATURE FACTOR OF RESISTIVITY

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

### TECHNICAL PARAMETERS

Diameter (mm)	Ohm per meter (20°C Ω/m)	Length per kg (m/kg)	Weight per meter (g/m)	Diameter (mm)	Ohm per meter (20°C Ω/m)	Length per kg (m/kg)	Weight per meter (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

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Diameter (mm)	Ohm per meter (20°C Ω/m)	Length per kg (m/kg)	Weight per meter (g/m)	Diameter (mm)	Ohm per meter (20°C Ω/m)	Length per kg (m/kg)	Weight per meter (g/m)
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

Above parameters are based on Chinese National Standard GB/T1234-2012. The tolerance of resistance per meter: 0.03-0.06mm is ±10%; 0.07-0.12mm is ±8%; 0.13-0.17mm is ±7%; 0.18-0.32mm is ±6%; A wire diameter above 0.32mm is ±5%. **We provide various shapes of Nickel-Chromium-Iron alloy products, such as wires, ribbons and rods in the following sizes:**

Bright and soft annealed finish: 0.025 - 1.6mm; Acid-pickled finish or primary color (dark green): 1.0 -12.0mm; Rods: 6.0-150.0mm; Flat wire: width from 0.2 - 6.0mm and thickness from 0.08 - 1.0mm; Heating ribbon: width from 5.0 - 300mm and thickness from 0.05 - 4.0mm

Disclaimer: Recommendations are for guidance only, and the suitability of the materials can only be confirmed once we understand the actual usage conditions. Continuous technological development may result in changes to technical data without notice. Some common names of the alloy are registered trademarks. Their ownership belongs to the registrants. This datasheet was updated on 2019-02-12.