

Cr30Ni70 NICHROME RESISTANCE WIRE

DATASHEET

CHANGSHU IPACE INTERNATIONAL CORP

Cr30Ni70 (DIN W.Nr. 2.4658) forms a denser and more stable Cr₂O₃ protective oxide layer with approximately 30% chromium content(compared to 20% in Cr20Ni80). At 1000°C, the oxidation rate is only 0.003 mg/cm²·h, providing superior protection against high-temperature oxidation. At 800°C, tensile strength remains at 480 MPa with yield strength of 340 MPa, maintaining structural integrity under extreme heating conditions. Resistivity at 20°C is approximately 1.18-1.20 μΩ·m (compared to 1.09-1.14 μΩ·m for Cr20Ni80), providing higher resistance per unit length. This allows for more compact heating element designs with reduced material usage. Demonstrates outstanding corrosion resistance in acidic (such as 10% HCl), alkaline, and sulfide environments. The high chromium content enhances protection against chemical attack in harsh industrial conditions.Cr30Ni70 exhibits superior thermal fatigue characteristics under long-term high-temperature cyclic loading. The alloy maintains stable microstructure during repeated heating and cooling cycles, extending service life. At room temperature, the alloy demonstrates good elongation and cold working capabilities. This facilitates manufacturing of various forms including wires, ribbons, and complex-shaped heating elements. Suitable for aerospace, automotive, chemical, and energy industries. Applications include heat exchangers in power plants, thermocouples, high-temperature resistors, and premium heating elements for periodic heat treatment furnaces below 1050°C.

Cr30Ni70 also has the following common names: Nikrothal 70, Chromel 70/30, N7, Hytemco, HAI-NiCr 70, Balco, Tophet 30, Resistohm 70, Cronix 70, Stablohm 710,70/30 Nichrome or NiCr 70/30.

CHEMICAL COMPOSITION

C	P	S	Mn	Si	Cr	Ni	Al	Fe
≤								
0.08	0.02	0.015	0.6	0.75~1.6	28.0~31.0	Remainder	≤0.5	≤1.0

PHYSICAL PROPERTIES

Max. Working Temp.	1250°C	Resistivity at 20°C (μΩ·m)	<0.50mm 1.18±0.05 ≥0.50mm 1.20±0.05
Density	8.10 g/cm ³	Thermal conductivity (20°C)	14 W/(m·K)
Average linear expansion coefficient(20-1000°C)	17.0×10 ⁻⁶ /K	Specific heat capacity	0.46 J/(g·K)
Approx. melting point	1380°C	Elongation after Fracture (A%)	Diameter≤3.0mm: ≥20% Diameter>3.0mm: ≥25%
Tensile strength(R _m /MPa)	≥650	Accelerated life test	≥50h/1250°C
Micrographic structure	Austenite	Magnetic properties	Nonmagnetic

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TEMPERATURE FACTOR OF RESISTIVITY

Temp(° C)	100	200	300	400	500	600	700	800	900	1000	1100	1200
Ct	1.007	1.016	1.028	1.038	1.044	1.036	1.03	1.028	1.029	1.033	1.037	1.043

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	600.970	62876.08	0.01590	1.1	1.2627	129.91	7.69768
0.06	417.340	43663.94	0.02290	1.2	1.0610	109.16	9.16088
0.07	306.617	32079.63	0.03117	1.3	0.9041	93.01	10.75131
0.08	234.754	24560.97	0.04072	1.4	0.7795	80.20	12.46897
0.09	185.484	19406.20	0.05153	1.5	0.6791	69.86	14.31387
0.1	150.242	15719.02	0.06362	1.6	0.5968	61.40	16.28600
0.11	124.167	12990.93	0.07698	1.7	0.5287	54.39	18.38537
0.12	104.335	10915.99	0.09161	1.8	0.4716	48.52	20.61197
0.13	88.901	9301.20	0.10751	1.9	0.4232	43.54	22.96581
0.15	66.774	6986.23	0.14314	2.0	0.3820	39.30	25.44688
0.17	51.987	5439.11	0.18385	2.2	0.3157	32.48	30.79072
0.19	41.618	4354.30	0.22966	2.4	0.2653	27.29	36.64351
0.21	34.069	3564.40	0.28055	2.6	0.2260	23.25	43.00523
0.25	24.039	2515.04	0.39761	2.8	0.1949	20.05	49.87588
0.27	20.609	2156.24	0.46377	3.0	0.1698	17.47	57.25548
0.29	17.865	1869.09	0.53502	3.2	0.1492	15.35	65.14401
0.31	15.634	1635.69	0.61136	3.4	0.1322	13.60	73.54148
0.35	12.265	1283.19	0.77931	3.6	0.1179	12.13	82.44789
0.40	9.390	982.44	1.01788	3.8	0.1058	10.89	91.86323
0.45	7.419	776.25	1.28825	4.0	0.0955	9.82	101.78752
0.50	6.112	628.76	1.59043	4.5	0.0755	7.76	128.82482
0.55	5.051	519.64	1.92442	5.0	0.0611	6.29	159.04299
0.60	4.244	436.64	2.29022	5.5	0.0505	5.20	192.44202

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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)
0.65	3.616	372.05	2.68783	6.0	0.0424	4.37	229.02191
0.70	3.118	320.80	3.11724	6.5	0.0362	3.72	268.78266
0.80	2.387	245.61	4.07150	7.0	0.0312	3.21	311.72427
0.85	2.115	217.56	4.59634	7.5	0.0272	2.79	357.84674
0.90	1.886	194.06	5.15299	8.0	0.0239	2.46	407.15006
0.95	1.693	174.17	5.74145	8.5	0.0211	2.18	459.63425
1.00	1.528	157.19	6.36172	9.0	0.0189	1.94	515.29930

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 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.