Cr30Ni70

DIN W.Nr. 2.4658

High-chromium nickel alloy whose denser Cr_2O_3 film gives an oxidation rate of only 0.003 mg/cm²·h at 1000 °C.

1250 °C	1.18–1.20 μΩ·m	8.10 g/cm³	≥50 h
MAX. WORKING TEMPERATURE	RESISTIVITY AT 20 °C	DENSITY	ACCELERATED LIFE AT 1250 °C

PRODUCT OVERVIEW

Cr30Ni70 (DIN W.Nr. 2.4658) carries about 30 % chromium instead of the 20 % of Cr20Ni80, and the resulting Cr_2O_3 film is denser and more stable. At 1000 °C the oxidation rate is only 0.003 mg/cm²·h. Corrosion resistance in acid, alkali and sulphide environments is correspondingly strong, which is why the alloy appears in severe chemical duty.

Resistivity at 20 °C is about 1.18–1.20 μΩ·m, higher than the 1.09–1.14 μΩ·m of Cr20Ni80, so more resistance is obtained per unit length and elements can be built more compactly with less material. At 800 °C tensile strength is still 480 MPa with a yield strength of 340 MPa, so shape is retained under load at temperature.

Thermal-fatigue behaviour under long-term cyclic loading is strong and the microstructure stays stable through repeated heating and cooling, extending life where the temperature swings. Room-temperature elongation and cold workability are good, so wire, ribbon and complex shapes all run without difficulty. Typical users are aerospace, automotive, chemical and energy plant — heat exchangers in power stations, thermocouples, high-temperature resistors and premium elements for periodic heat-treatment furnaces below 1050 °C.

ALSO KNOWN AS

Nikrothal 70 · Chromel 70/30 · N7 · Hytemco · HAI-NiCr 70 · Balco · Tophet 30 · Resistohm 70 · Cronix 70 · Stablohm 710 · 70/30 Nichrome · 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	Bal.	≤0.5	≤1.0

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

TYPICAL APPLICATIONS

- Heat exchangers in power plants
- Thermocouples
- High-temperature resistors
- Premium elements for periodic furnaces below 1050 °C
- Chemical and energy industry equipment
- Aerospace and automotive high-temperature parts

PHYSICAL & MECHANICAL PROPERTIES

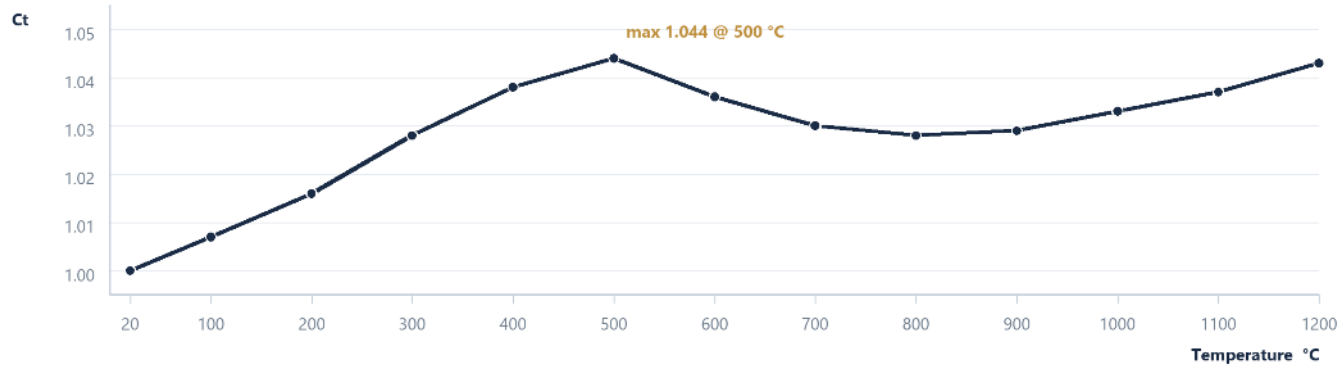
Property	Value	Property	Value
Max. working temperature	1250 °C	Resistivity at 20 °C (μΩ·m)	<0.50 mm 1.18 ± 0.05 ≥0.50 mm 1.20 ± 0.05
Density	8.10 g/cm³	Thermal conductivity (20 °C)	14 W/(m·K)
Mean linear expansion 20–1000 °C	17.0 × 10^{-6} /K	Specific heat capacity	0.46 J/(g·K)
Approx. melting point	1380 °C	Elongation after fracture A/%	≤3.0 mm: ≥20 % >3.0 mm: ≥25 %
Tensile strength Rm	≥650 MPa	Accelerated life test	≥50 h at 1250 °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
Ct	1.000	1.007	1.016	1.028	1.038	1.044	1.036	1.03	1.028	1.029	1.033	1.037	1.043



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	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
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

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.