Cr20Ni80

DIN W.Nr. 2.4869

High-resistance heating alloy with stable output, freedom from high-temperature embrittlement and long service life.

1200 °C	1.09–1.14 μΩ·m	8.40 g/cm³	≥80 h
MAX. WORKING TEMPERATURE	RESISTIVITY AT 20 °C	DENSITY	ACCELERATED LIFE AT 1200 °C

PRODUCT OVERVIEW

Cr20Ni80 (DIN W.Nr. 2.4869) is a nickel-chromium based high-resistance heating alloy of the 80/20 nichrome family. Its oxidation resistance is markedly better than that of standard alloys: after 100 hours of continuous exposure at 800 °C the surface oxide layer measures only 20 μm, against 50 μm for comparable grades. Resistance rises almost linearly with temperature and deviates by no more than ±2 %, while the temperature coefficient of resistance stays below +400 × 10^{-6} /K — so heating power remains predictable across the entire working range.

Room-temperature tensile strength is 500–700 MPa and still 250–350 MPa between 800 °C and 1100 °C, which keeps element geometry stable under prolonged heat. Unlike iron-chromium-aluminium alloys, Cr20Ni80 does not become brittle after long high-temperature service, so service life is longer and replacement intervals can be widened.

Elongation at room temperature is 20–30 %, giving excellent cold stamping and welding behaviour. After solution treatment the alloy is single-phase austenite, with a microstructure that remains stable in use.

ALSO KNOWN AS

Nichrome V · Tophet A · Alloy A · Brightray C · Cronix 80 · Nikrothal 8 · Chromalloy · Chromel A · Gilphy 80 · N8 · HAI-NiCr 80 · Resistohm 80 · Protoloy · MWS-650 · Stablohm 650 · 80/20 Nichrome · NiCr 80/20

CHEMICAL COMPOSITION

C	P	S	Mn	Si	Cr	Ni	Al	Fe
≤0.08	≤0.02	≤0.015	≤0.6	0.75–1.6	20.0–23.0	Bal.	≤0.5	≤1.0

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

TYPICAL APPLICATIONS

- Periodic heat-treatment furnaces below 1000 °C
- Carburizing, bell and ammonia-decomposition furnaces
- Premium heating tubes and sheathed elements
- Household electric heaters
- High-temperature resistors
- Industrial heating equipment

PHYSICAL & MECHANICAL PROPERTIES

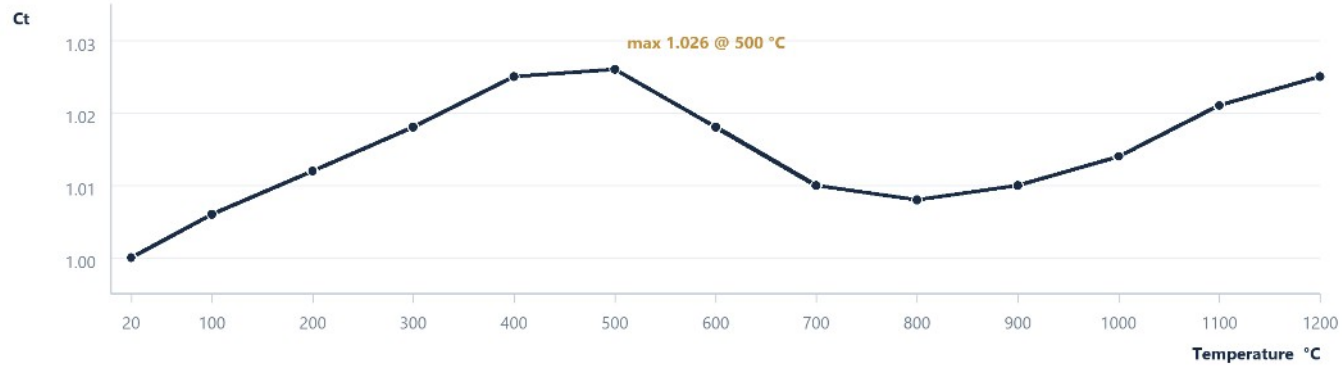
Property	Value	Property	Value
Max. working temperature	1200 °C	Resistivity at 20 °C (μΩ·m)	<0.50 mm 1.09 ± 0.05 0.50–3.0 mm 1.13 ± 0.05 >3.0 mm 1.14 ± 0.05
Density	8.40 g/cm³	Thermal conductivity (20 °C)	15 W/(m·K)
Mean linear expansion 20–1000 °C	18.0 × 10^{-6} /K	Specific heat capacity	0.46 J/(g·K)
Approx. melting point	1400 °C	Elongation after fracture A/%	≤3.0 mm: ≥20 % >3.0 mm: ≥25 %
Tensile strength Rm	≥650 MPa	Accelerated life test	≥80 h at 1200 °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	1.006	1.012	1.018	1.025	1.026	1.018	1.01	1.008	1.01	1.014	1.021	1.025



AVAILABLE FORMS & SUPPLY RANGE

Form	Surface / finish	Size range
Wire	Bright, soft annealed	0.025 – 1.6 mm
Wire	Acid-pickled or primary colour (dark green)	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	555.133	60630.51	0.01649	1.1	1.1891	125.27	7.98278
0.06	385.509	42104.52	0.02375	1.2	0.9991	105.26	9.50017
0.07	283.231	30933.93	0.03233	1.3	0.8513	89.69	11.14950
0.08	216.849	23683.79	0.04222	1.4	0.7341	77.33	12.93078
0.09	171.337	18713.12	0.05344	1.5	0.6394	67.37	14.84401
0.1	138.783	15157.63	0.06597	1.6	0.5620	59.21	16.88919
0.11	114.697	12526.96	0.07983	1.7	0.4978	52.45	19.06631
0.12	96.377	10526.13	0.09500	1.8	0.4441	46.78	21.37538
0.13	82.120	8969.01	0.11150	1.9	0.3985	41.99	23.81639
0.15	61.681	6736.72	0.14844	2.0	0.3597	37.89	26.38936
0.17	48.022	5244.85	0.19066	2.2	0.2973	31.32	31.93112
0.19	38.444	4198.79	0.23816	2.4	0.2498	26.32	38.00067
0.21	31.470	3437.10	0.29094	2.6	0.2128	22.42	44.59801
0.25	22.205	2425.22	0.41233	2.8	0.1835	19.33	51.72314
0.27	19.037	2079.24	0.48095	3.0	0.1599	16.84	59.37605
0.29	16.502	1802.33	0.55484	3.2	0.1417	14.80	67.55675
0.31	14.442	1577.28	0.63400	3.4	0.1256	13.11	76.26524
0.35	11.329	1237.36	0.80817	3.6	0.1120	11.70	85.50151
0.40	8.674	947.35	1.05557	3.8	0.1005	10.50	95.26558
0.45	6.853	748.52	1.33596	4.0	0.0907	9.47	105.55742
0.50	5.551	606.31	1.64933	4.5	0.0717	7.49	133.59611
0.55	4.756	501.08	1.99570	5.0	0.0581	6.06	164.93348
0.60	3.997	421.05	2.37504	5.5	0.0480	5.01	199.56950
0.65	3.405	358.76	2.78738	6.0	0.0403	4.21	237.50420
0.70	2.936	309.34	3.23270	6.5	0.0344	3.59	278.73757
0.80	2.248	236.84	4.22230	7.0	0.0296	3.09	323.26961
0.85	1.991	209.79	4.76658	7.5	0.0258	2.69	371.10032
0.90	1.776	187.13	5.34384	8.0	0.0227	2.37	422.22970
0.95	1.594	167.95	5.95410	8.5	0.0201	2.10	476.65774
1.00	1.439	151.58	6.59734	9.0	0.0179	1.87	534.38446

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.