FLYU®

1Cr13Al4 FeCrAl RESISTANCE WIRE

DATASHEET

CHANGSHU IPACE INTERNATIONAL CORP

The core advantage of **1Cr13Al4(DIN W.Nr. 1.4725)** does not lie in extreme high-temperature resistance (which is the domain of 0Cr25Al5), but in its excellent overall mechanical and processing performance. It is one of the few grades in the iron-chromium-aluminum family capable of handling structural load-bearing and welding assembly. If your application requires the production of complex, weldable heating elements with certain strength in a 900°C environment, 1Cr13Al4 is a more suitable choice than high-aluminum electric heating alloys and more economical than nickel-chromium heat-resistant steel. Compared to high-aluminum grades (such as 0Cr25Al5), 1Cr13Al4 has lower aluminum content and moderate chromium content. This significantly reduces room temperature brittleness, improving elongation and impact toughness. It can undergo certain degrees of cold bending, stamping, and welding, making it suitable for manufacturing complex-shaped heating structural parts. Most Fe-Cr-Al alloys (especially high-aluminum types) are extremely difficult to weld due to high-temperature grain coarsening and low-temperature brittleness. 1Cr13Al4, with aluminum content controlled below the critical threshold and containing small amounts of carbon and possibly trace stabilizing elements like Ti/Nb, has far superior weldability compared to 0Cr25Al5. It can be joined using TIG welding, making it suitable for manufacturing large welded assemblies (e.g., furnace linings, welded heating frames), which is difficult to achieve with other high-aluminum heating alloys. Although its maximum operating temperature is lower than 0Cr25Al5, within this range, the Al_2O_3 protective film formed by 1Cr13Al4 provides excellent oxidation and carburization resistance. As a nickel-free iron-based alloy, its cost is far lower than nickel-chromium alloys. When the application scenario requires heat and corrosion resistance, certain conductive heating functionality, and good machinability and weldability, 1Cr13Al4 offers the best cost-performance balance.

1Cr13Al4 also has the following common names: Resistohm 125, CrAl 14/4(DIN W.Nr. 1.4725), Alkrothal 14, 15ĸO5, Alloy 750, Ohmalloy 40, Alferon 902, Alchrome 750, Aluchrom W, 750 Alloy, Stablohm 750

CHEMICAL COMPOSITION

C	P	S	Mn	Si	Cr	Ni	Al	Fe
≤								
0.12	0.025	0.02	0.5	≤0.7	12.0~15.0	≤0.6	4.0~6.0	Remainder

PHYSICAL PROPERTIES

Max. Working Temp.	950ºC	Resistivity at 20ºC (μΩ·m)	1.25±0.08
Density	7.4 g/cm^3	Thermal conductivity (20ºC)	15 W/(m·K)
Average linear expansion coefficient(20-1000ºC)	15.4×10^{-6}/K	Specific heat capacity	0.49 J/(g·K)

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Approx. melting point	1450ºC	Elongation after Fracture (A/%)	Diameter≤3.0mm: ≥12% Diameter>3.0mm: ≥15%
Tensile strength(R_m /MPa)	≥580	Accelerated life test	≥80h/950ºC
Micrographic structure	Ferrite	Magnetic properties	Magnetic

TEMPERATURE FACTOR OF RESISTIVITY

Temp(°C)	100	200	300	400	500	600	700	800	900	1000	1100	1200
Ct	1.005	1.014	1.028	1.044	1.064	1.09	1.12	1.132	1.142	1.15	-	-

TECHNICAL PARAMETERS

Diameter (mm)	Ohm per meter (20ºC Ω/m)	Length per kg (m/kg)	Weight per meter (g/m)	Diameter (mm)	Ohm per meter (20ºC Ω/m)	Length per kg (m/kg)	Weight per meter (g/m)
0.05	636.620	68823.82	0.01453	1.1	1.3153	142.20	7.03245
0.06	442.097	47794.32	0.02092	1.2	1.1052	119.49	8.36920
0.07	324.806	35114.19	0.02848	1.3	0.9417	101.81	9.82218
0.08	248.680	26884.30	0.03720	1.4	0.8120	87.79	11.39141
0.09	196.488	21241.92	0.04708	1.5	0.7074	76.47	13.07687
0.1	159.155	17205.95	0.05812	1.6	0.6217	67.21	14.87857
0.11	131.533	14219.80	0.07032	1.7	0.5507	59.54	16.79651
0.12	110.524	11948.58	0.08369	1.8	0.4912	53.10	18.83069
0.13	94.175	10181.04	0.09822	1.9	0.4409	47.66	20.98111
0.15	70.736	7647.09	0.13077	2.0	0.3979	43.01	23.24777
0.17	55.071	5953.62	0.16797	2.2	0.3288	35.55	28.12980
0.19	44.087	4766.19	0.20981	2.4	0.2763	29.87	33.47678
0.21	36.090	3901.58	0.25631	2.6	0.2354	25.45	39.28872
0.25	25.465	2752.95	0.36325	2.8	0.2030	21.95	45.56562
0.27	21.832	2360.21	0.42369	3.0	0.1768	19.12	52.30747
0.29	18.925	2045.89	0.48878	3.2	0.1554	16.80	59.51428
0.31	16.561	1790.42	0.55853	3.4	0.1377	14.88	67.18604

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0.35	12.992	1404.57	0.71196	3.6	0.1228	13.28	75.32276
0.40	9.947	1075.37	0.92991	3.8	0.1102	11.92	83.92444
0.45	7.860	849.68	1.17692	4.0	0.0995	10.75	92.99106
0.50	6.366	688.24	1.45299	4.5	0.0786	8.50	117.69182
0.55	5.261	568.79	1.75811	5.0	0.0637	6.88	145.29854
0.60	4.421	477.94	2.09230	5.5	0.0526	5.69	175.81123
0.65	3.767	407.24	2.45555	6.0	0.0442	4.78	209.22989
0.70	3.248	351.14	2.84785	6.5	0.0377	4.07	245.55453
0.80	2.487	268.84	3.71964	7.0	0.0325	3.51	284.78513
0.85	2.203	238.14	4.19913	7.5	0.0283	3.06	326.92171
0.90	1.965	212.42	4.70767	8.0	0.0249	2.69	371.96426
0.95	1.763	190.65	5.24528	8.5	0.0220	2.38	419.91277
1.00	1.592	172.06	5.81194	9.0	0.0196	2.12	470.76726

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 Iron-Chromium-Aluminum alloy products, such as wires, ribbons and rods in the following sizes**:

Bright and soft annealed finish: 0.05 - 1.6mm; Acid-pickled finish: 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