0Cr23Al5

GB/T 1234-2012

Fe-Cr-Al grade that performs close to 0Cr25Al5 while being easier to process, tougher and cheaper.

1300 °C	1.35 μΩ·m	7.25 g/cm³	≥80 h
MAX. WORKING TEMPERATURE	RESISTIVITY AT 20 °C	DENSITY	ACCELERATED LIFE AT 1300 °C

PRODUCT OVERVIEW

0Cr23Al5 sits alongside 0Cr25Al5 in the Fe-Cr-Al family and shares its main advantages over nickel-chromium: higher maximum working temperature, higher resistivity, better oxidation resistance and lower cost. Against 0Cr25Al5 it trades a slightly lower maximum temperature for better machinability, toughness and a small cost advantage.

For service between 1100 and 1300 °C where the budget matters and the element still has to be formed, it is usually the more sensible pick. Where toughness, weldability and thermal-fatigue behaviour dominate the specification, a nickel-chromium grade remains the better answer, and the two families should be weighed against the actual working temperature, atmosphere, budget and processing route.

The remainder of the property set follows 0Cr25Al5 closely, so the two grades can often be evaluated against the same design data.

ALSO KNOWN AS

Kanthal D · Alloy 815 · Alchrome DK · Alferon 901 · Resistohm 135 · Aluchrom 5 · Stablohm 812 · KD · Aluchrom I · Alferon 20 · Alloy K · X23Ю5

CHEMICAL COMPOSITION

C	P	S	Mn	Si	Cr	Ni	Al	Fe
≤0.06	≤0.025	≤0.02	≤0.5	≤0.6	20.5–23.5	≤0.6	4.2–5.3	Bal.

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

TYPICAL APPLICATIONS

- Heating elements for 1100–1300 °C service
- Cost-sensitive furnace builds
- Industrial electric furnaces
- Household heating appliances
- Duty where machinability matters

PHYSICAL & MECHANICAL PROPERTIES

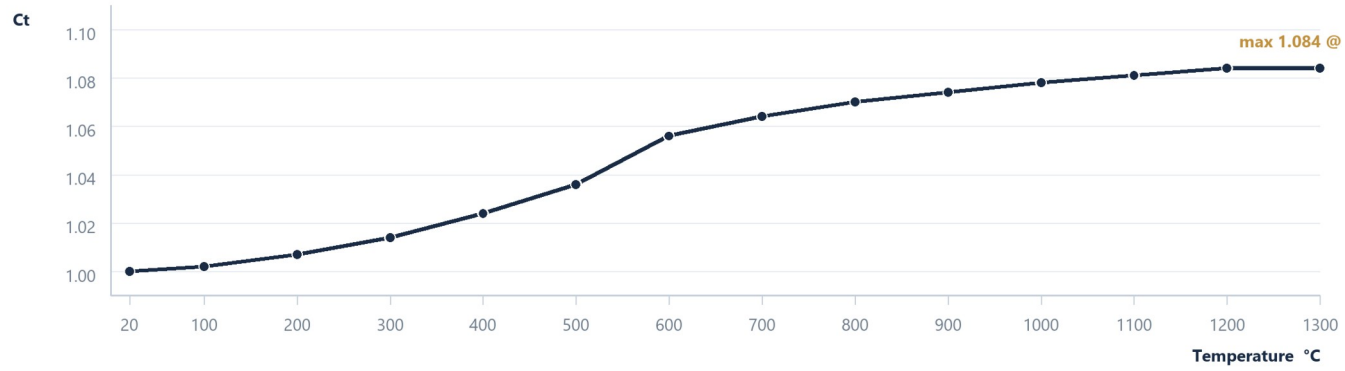
Property	Value	Property	Value
Max. working temperature	1300 °C	Resistivity at 20 °C (μΩ·m)	1.35 ± 0.06
Density	7.25 g/cm³	Thermal conductivity (20 °C)	13 W/(m·K)
Mean linear expansion 20–1000 °C	15.0 × 10^{-6} /K	Specific heat capacity	0.46 J/(g·K)
Approx. melting point	1500 °C	Elongation after fracture A/%	≤3.0 mm: ≥12 % >3.0 mm: ≥15 %
Tensile strength Rm	≥600 MPa	Accelerated life test	≥80 h at 1300 °C
Micrographic structure	Ferrite	Magnetic properties	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	1300
Ct	1.000	1.002	1.007	1.014	1.024	1.036	1.056	1.064	1.070	1.074	1.078	1.081	1.084	1.084



AVAILABLE FORMS & SUPPLY RANGE

Form	Surface / finish	Size range
Wire	Bright, soft annealed	0.05 – 1.6 mm
Wire	Acid-pickled	1.0 – 12.0 mm
Wire	Golden surface	1.2 – 3.9 mm
Wire	Blue surface	4.0 – 10.0 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	687.550	70247.76	0.01424	1.1	1.4206	145.14	6.88990
0.06	477.465	48783.17	0.02050	1.2	1.1937	121.96	8.19955
0.07	350.791	35840.69	0.02790	1.3	1.0171	103.92	9.62308
0.08	268.574	27440.53	0.03644	1.4	0.8770	89.60	11.16050
0.09	212.207	21681.41	0.04612	1.5	0.7639	78.05	12.81180
0.1	171.887	17561.94	0.05694	1.6	0.6714	68.60	14.57698
0.11	142.056	14514.00	0.06890	1.7	0.5948	60.77	16.45604
0.12	119.366	12195.79	0.08200	1.8	0.5305	54.20	18.44899
0.13	101.709	10391.68	0.09623	1.9	0.4761	48.65	20.55582
0.15	76.394	7805.31	0.12812	2.0	0.4297	43.90	22.77653
0.17	59.477	6076.80	0.16456	2.2	0.3551	36.28	27.55960
0.19	47.614	4864.80	0.20556	2.4	0.2984	30.49	32.79820
0.21	38.977	3982.30	0.25111	2.6	0.2543	25.98	38.49233
0.25	27.502	2809.91	0.35588	2.8	0.2192	22.40	44.64199
0.27	23.579	2409.05	0.41510	3.0	0.1910	19.51	51.24719
0.29	20.438	2088.22	0.47888	3.2	0.1679	17.15	58.30791
0.31	17.886	1827.47	0.54721	3.4	0.1487	15.19	65.82416
0.35	14.032	1433.63	0.69753	3.6	0.1326	13.55	73.79595
0.40	10.743	1097.62	0.91106	3.8	0.1190	12.16	82.22326
0.45	8.488	867.26	1.15306	4.0	0.1074	10.98	91.10611
0.50	6.875	702.48	1.42353	4.5	0.0849	8.67	115.30617
0.55	5.682	580.56	1.72247	5.0	0.0688	7.02	142.35330
0.60	4.775	487.83	2.04989	5.5	0.0568	5.81	172.24749
0.65	4.068	415.67	2.40577	6.0	0.0477	4.88	204.98875
0.70	3.508	358.41	2.79012	6.5	0.0407	4.16	240.57707
0.80	2.686	274.41	3.64424	7.0	0.0351	3.58	279.01246
0.85	2.379	243.07	4.11401	7.5	0.0306	3.12	320.29492
0.90	2.122	216.81	4.61225	8.0	0.0269	2.74	364.42444
0.95	1.905	194.59	5.13895	8.5	0.0238	2.43	411.40103
1.00	1.719	175.62	5.69413	9.0	0.0212	2.17	461.22468

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.