

# 0Cr27Al7Mo2 FeCrAl RESISTANCE WIRE

## DATASHEET

CHANGSHU IPACE INTERNATIONAL CORP

**0Cr27Al7Mo2** is the "King" of Fe-Cr-Al heating alloys. By adding 2% Molybdenum and increasing Chromium and Aluminum content, it achieves exceptional creep resistance and oxidation resistance for an iron-based alloy at 1400°C. Although it has high processing difficulty and cost, under extreme conditions of 1300-1400°C horizontal installation, it is currently the only iron-based solution that balances long life, high reliability, and relatively low cost, making it the best upgrade choice when standard 0Cr25Al5 is inadequate. The core advantage of 0Cr27Al7Mo2 is its unparalleled high-temperature creep resistance (sag resistance). Molybdenum (Mo) is a potent solid-solution strengthening element that significantly improves the high-temperature strength of the ferritic matrix. When horizontally installed at ultra-high temperatures of 1350-1400°C, 0Cr27Al7Mo2 exhibits almost no sagging, whereas standard 0Cr25Al5 would rapidly soften and fracture. It is the preferred material for horizontal heating elements in large tunnel kilns and pusher kilns, requiring minimal support. Thanks to the synergistic effect of high chromium (~27%), high aluminum (~7%), and molybdenum, the maximum safe operating temperature of 0Cr27Al7Mo2 can reach 1400°C (short-term up to 1425°C). It fills the gap between Fe-Cr-Al alloys and expensive refractory metals (like Mo, W), allowing the use of lower-cost, easier-to-process iron-based alloys instead of precious or refractory metals in oxidizing atmospheres below 1400°C. The addition of molybdenum not only strengthens the matrix but also effectively inhibits excessive grain growth. Even after long-term operation above 1350°C, 0Cr27Al7Mo2 maintains a relatively fine grain structure, preserving good toughness and thermal shock resistance, significantly reducing the risk of sudden fracture due to coarse grains. The high aluminum content of up to 7% (standard grades are 5-6%) ensures the formation of a thicker, denser Al<sub>2</sub>O<sub>3</sub> protective film at high temperatures. In extreme environments of 1400°C, its oxidation rate is extremely low, and its service life is typically more than 2 times that of standard 0Cr25Al5. It is particularly suitable for industrial furnaces where life requirements are extremely high and element replacement is difficult (e.g., glass melting tanks, ceramic sintering kilns).

### CHEMICAL COMPOSITION

C	P	S	Mn	Si	Cr	Ni	Al	Fe	Mo
≤									
0.05	0.025	0.02	0.5	≤0.4	26.5~27.8	≤0.6	6.0~7.0	Remainder	1.8~2.2

### PHYSICAL PROPERTIES

Max. Working Temp.	1400°C	Resistivity at 20°C (μΩ·m)	1.53±0.07
Density	7.1 g/cm <sup>3</sup>	Thermal conductivity (20°C)	13 W/(m·K)
Average linear expansion coefficient(20-1000°C)	16.0×10 <sup>-6</sup> /K	Specific heat capacity	0.49 J/(g·K)

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Approx. melting point	1520°C	Elongation after Fracture (A/%)	≥10%
Tensile strength(R <sub>m</sub> /MPa)	≥680	Accelerated life test	≥50h/1350°C
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	0.992	0.986	0.981	0.978	0.976	0.974	0.972	0.97	0.969	0.968	0.968	0.967

### 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	779.223	71731.87	0.01394	1.1	1.6100	148.21	6.74735
0.06	541.127	49813.80	0.02007	1.2	1.3528	124.53	8.02990
0.07	397.563	36597.89	0.02732	1.3	1.1527	106.11	9.42398
0.08	304.384	28020.26	0.03569	1.4	0.9939	91.49	10.92959
0.09	240.501	22139.46	0.04517	1.5	0.8658	79.70	12.54673
0.1	194.806	17932.97	0.05576	1.6	0.7610	70.05	14.27538
0.11	160.997	14820.63	0.06747	1.7	0.6741	62.05	16.11557
0.12	135.282	12453.45	0.08030	1.8	0.6013	55.35	18.06728
0.13	115.270	10611.22	0.09424	1.9	0.5396	49.68	20.13052
0.15	86.580	7970.21	0.12547	2.0	0.4870	44.83	22.30529
0.17	67.407	6205.18	0.16116	2.2	0.4025	37.05	26.98940
0.19	53.963	4967.58	0.20131	2.4	0.3382	31.13	32.11962
0.21	44.174	4066.43	0.24592	2.6	0.2882	26.53	37.69594
0.25	31.169	2869.27	0.34852	2.8	0.2485	22.87	43.71837
0.27	26.722	2459.94	0.40651	3.0	0.2165	19.93	50.18690
0.29	23.164	2132.34	0.46897	3.2	0.1902	17.51	57.10154
0.31	20.271	1866.07	0.53588	3.4	0.1685	15.51	64.46229

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0.35	15.903	1463.92	0.68310	3.6	0.1503	13.84	72.26914
0.40	12.175	1120.81	0.89221	3.8	0.1349	12.42	80.52209
0.45	9.620	885.58	1.12921	4.0	0.1218	11.21	89.22116
0.50	7.792	717.32	1.39408	4.5	0.0962	8.86	112.92053
0.55	6.440	592.83	1.68684	5.0	0.0779	7.17	139.40806
0.60	5.411	498.14	2.00748	5.5	0.0644	5.93	168.68375
0.65	4.611	424.45	2.35600	6.0	0.0541	4.98	200.74760
0.70	3.976	365.98	2.73240	6.5	0.0461	4.24	235.59962
0.80	3.044	280.20	3.56885	7.0	0.0398	3.66	273.23979
0.85	2.696	248.21	4.02889	7.5	0.0346	3.19	313.66813
0.90	2.405	221.39	4.51682	8.0	0.0304	2.80	356.88462
0.95	2.159	198.70	5.03263	8.5	0.0270	2.48	402.88928
1.00	1.948	179.33	5.57632	9.0	0.0241	2.21	451.68210

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

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.