

# 0Cr25Al5 FeCrAl RESISTANCE WIRE

## DATASHEET

CHANGSHU IPACE INTERNATIONAL CORP

**0Cr25Al5** (DIN W.Nr. 1.4765) has significant advantages over nickel-chromium alloys in terms of maximum operating temperature, resistivity, cost, and oxidation resistance as a representative of Fe-Cr-Al heating alloys. The maximum operating temperature of 0Cr25Al5 can reach 1300°C. This makes it suitable for higher temperature heating application scenarios. Room temperature resistivity of 0Cr25Al5 is approximately 1.42  $\mu\Omega\cdot m$ . Higher resistivity means shorter heating elements can be used for the same power, saving material. Aluminum content forms a dense  $Al_2O_3$  (aluminum oxide) protective layer at high temperatures, which is more stable than the  $Cr_2O_3$  layer of nickel-chromium alloys. During long-term use at 1200°C, oxidation rate is lower and service life is longer. Material cost is 50-70% lower than nickel-chromium alloys, offering significant economic advantages in mass production. Density is approximately 7.1-7.4  $g/cm^3$ , about 15% lower than Cr20Ni80 (8.4  $g/cm^3$ ). Lighter weight at the same volume helps reduce overall equipment weight. When used in sulfur-containing atmospheres, the  $Al_2O_3$  protective layer is more resistant to sulfur corrosion than the  $Cr_2O_3$  layer, suitable for certain chemical and metallurgical environments. Small temperature coefficient of resistance, with relatively stable resistance variation in the high-temperature operating range, beneficial for stable heating power control. Suitable for industrial electric furnaces, household heating appliances, high-temperature heating elements, heat treatment equipment, etc. Particularly advantageous in high-temperature applications above 1200°C.

**0Cr25Al5** also has the following common names: Resistohm 142, FCHW-1 / FCHR-1, FeCrAl II B, CrAl 25/5, FRCA33, GFC142 / GFC142W, X27105T

### CHEMICAL COMPOSITION

C	P	S	Mn	Si	Cr	Ni	Al	Fe
0.06	0.025	0.02	0.5	$\leq 0.6$	23.0~26.0	$\leq 0.6$	4.5~6.5	Remainder

### PHYSICAL PROPERTIES

Max. Working Temp.	1300°C	Resistivity at 20°C ( $\mu\Omega\cdot m$ )	1.42±0.07
Density	7.1 $g/cm^3$	Thermal conductivity (20°C)	13 W/(m·K)
Average linear expansion coefficient(20-1000°C)	$15.0 \times 10^{-6}/K$	Specific heat capacity	0.46 J/(g·K)
Approx. melting point	1500°C	Elongation after Fracture (A/%)	Diameter≤3.0mm: ≥12% Diameter>3.0mm: ≥15%
Tensile strength( $R_m$ /MPa)	≥600	Accelerated life test	≥80h/1300°C
Micrographic structure	Ferrite	Magnetic properties	Magnetic

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### TEMPERATURE FACTOR OF RESISTIVITY

Temp(°C)	100	200	300	400	500	600	700	800	900	1000	1100	1200
Ct	1.002	1.005	1.008	1.013	1.021	1.03	1.038	1.04	1.042	1.044	1.045	1.047

### 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	723.201	71731.87	0.01394	1.1	1.4942	148.21	6.74735
0.06	502.223	49813.80	0.02007	1.2	1.2556	124.53	8.02990
0.07	368.980	36597.89	0.02732	1.3	1.0698	106.11	9.42398
0.08	282.500	28020.26	0.03569	1.4	0.9224	91.49	10.92959
0.09	223.210	22139.46	0.04517	1.5	0.8036	79.70	12.54673
0.1	180.800	17932.97	0.05576	1.6	0.7063	70.05	14.27538
0.11	149.422	14820.63	0.06747	1.7	0.6256	62.05	16.11557
0.12	125.556	12453.45	0.08030	1.8	0.5580	55.35	18.06728
0.13	106.982	10611.22	0.09424	1.9	0.5008	49.68	20.13052
0.15	80.356	7970.21	0.12547	2.0	0.4520	44.83	22.30529
0.17	62.561	6205.18	0.16116	2.2	0.3736	37.05	26.98940
0.19	50.083	4967.58	0.20131	2.4	0.3139	31.13	32.11962
0.21	40.998	4066.43	0.24592	2.6	0.2675	26.53	37.69594
0.25	28.928	2869.27	0.34852	2.8	0.2306	22.87	43.71837
0.27	24.801	2459.94	0.40651	3.0	0.2009	19.93	50.18690
0.29	21.498	2132.34	0.46897	3.2	0.1766	17.51	57.10154
0.31	18.814	1866.07	0.53588	3.4	0.1564	15.51	64.46229
0.35	14.759	1463.92	0.68310	3.6	0.1395	13.84	72.26914
0.40	11.300	1120.81	0.89221	3.8	0.1252	12.42	80.52209
0.45	8.928	885.58	1.12921	4.0	0.1130	11.21	89.22116
0.50	7.232	717.32	1.39408	4.5	0.0893	8.86	112.92053
0.55	5.977	592.83	1.68684	5.0	0.0723	7.17	139.40806
0.60	5.022	498.14	2.00748	5.5	0.0598	5.93	168.68375

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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)
0.65	4.279	424.45	2.35600	6.0	0.0502	4.98	200.74760
0.70	3.690	365.98	2.73240	6.5	0.0428	4.24	235.59962
0.80	2.825	280.20	3.56885	7.0	0.0369	3.66	273.23979
0.85	2.502	248.21	4.02889	7.5	0.0321	3.19	313.66813
0.90	2.232	221.39	4.51682	8.0	0.0283	2.80	356.88462
0.95	2.003	198.70	5.03263	8.5	0.0250	2.48	402.88928
1.00	1.808	179.33	5.57632	9.0	0.0223	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; Golden surface: 1.2-3.9mm; Blue surface: 4.0-10.0mm; 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.