0Cr24Al6RE

GB/T 1234-2012

Rare-earth Fe-Cr-Al alloy for 1400 °C duty: scale that resists spalling, better green-rot and sulphur resistance, longer cycling life.

1400 °C	1.48 μΩ·m	7.1 g/cm³	≥80 h
MAX. WORKING TEMPERATURE	RESISTIVITY AT 20 °C	DENSITY	ACCELERATED LIFE AT 1350 °C

PRODUCT OVERVIEW

0Cr24Al6RE is an upgraded, rare-earth bearing version of the standard FeCrAl grades defined in GB/T 1234-2012. Its nominal resistivity at 20 °C is 1.48 μΩ·m — higher resistivity means a shorter wire for the same power and voltage, less material, and a stiffer element.

The rare-earth addition improves resistance to green rot and to corrosion generally, so in sulphur-bearing or mildly reducing atmospheres the alloy outperforms ordinary FeCrAl and in some conditions approaches nickel-chromium. Rare earths also refine the grain and peg the interface between oxide scale and substrate: the scale does not flake off under repeated heating and cooling, which is what extends service life.

By stabilising the growth rate of the alumina layer the alloy resists burn-out and deformation at extreme temperature, and by suppressing grain growth it retains more room-temperature ductility than standard FeCrAl — still not as ductile as NiCr after service, but less prone to cracking during installation and maintenance.

CLASSIFICATION

Fe-Cr-Al heating alloy · GB/T 1234-2012 · rare-earth modified grade for 1400 °C service

CHEMICAL COMPOSITION

C	P	S	Mn	Si	Cr	Ni	Al	Fe	RE
≤0.04	≤0.025	≤0.02	≤0.5	≤0.4	22.0–26.0	≤0.6	5.0–7.0	Bal.	0.04–1.0

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

TYPICAL APPLICATIONS

- Furnaces with repeated heating and cooling
- Sulphur-bearing or mildly reducing atmospheres
- High-temperature elements up to 1400 °C
- Long-life industrial heating elements
- Upgrade of standard 0Cr25Al5 duty

PHYSICAL & MECHANICAL PROPERTIES

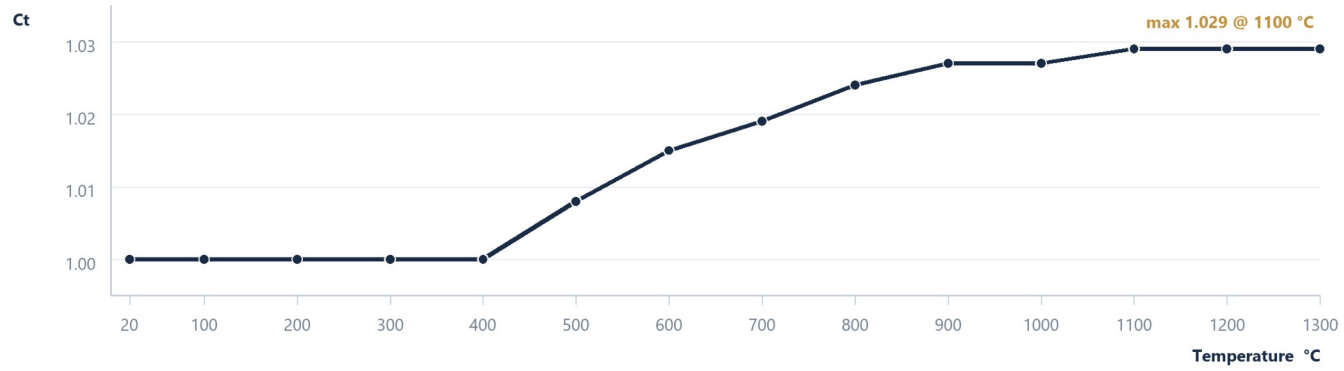
Property	Value	Property	Value
Max. working temperature	1400 °C	Resistivity at 20 °C (μΩ·m)	1.48 ± 0.07
Density	7.1 g/cm³	Thermal conductivity (20 °C)	13 W/(m·K)
Mean linear expansion 20–1000 °C	16.0 × 10^{-6} /K	Specific heat capacity	0.49 J/(g·K)
Approx. melting point	1520 °C	Elongation after fracture A/%	≤3.0 mm: ≥10 % >3.0 mm: ≥12 %
Tensile strength Rm	≥680 MPa	Accelerated life test	≥80 h at 1350 °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	1.00	1.00	1.00	1.00	1.008	1.015	1.019	1.024	1.027	1.027	1.029	1.029	1.029



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
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	753.758	71731.87	0.01394	1.1	1.5574	148.21	6.74735
0.06	523.443	49813.80	0.02007	1.2	1.3086	124.53	8.02990
0.07	384.571	36597.89	0.02732	1.3	1.1150	106.11	9.42398
0.08	294.437	28020.26	0.03569	1.4	0.9614	91.49	10.92959
0.09	232.641	22139.46	0.04517	1.5	0.8375	79.70	12.54673
0.1	188.440	17932.97	0.05576	1.6	0.7361	70.05	14.27538
0.11	155.735	14820.63	0.06747	1.7	0.6520	62.05	16.11557
0.12	130.861	12453.45	0.08030	1.8	0.5816	55.35	18.06728
0.13	111.503	10611.22	0.09424	1.9	0.5220	49.68	20.13052
0.15	83.751	7970.21	0.12547	2.0	0.4711	44.83	22.30529
0.17	65.204	6205.18	0.16116	2.2	0.3893	37.05	26.98940
0.19	52.199	4967.58	0.20131	2.4	0.3272	31.13	32.11962
0.21	42.730	4066.43	0.24592	2.6	0.2788	26.53	37.69594
0.25	30.150	2869.27	0.34852	2.8	0.2404	22.87	43.71837
0.27	25.849	2459.94	0.40651	3.0	0.2094	19.93	50.18690
0.29	22.407	2132.34	0.46897	3.2	0.1840	17.51	57.10154
0.31	19.609	1866.07	0.53588	3.4	0.16301	15.51	64.46229
0.35	15.383	1463.92	0.68310	3.6	0.14540	13.84	72.26914
0.40	11.777	1120.81	0.89221	3.8	0.13050	12.42	80.52209
0.45	9.306	885.58	1.12921	4.0	0.11777	11.21	89.22116
0.50	7.538	717.32	1.39408	4.5	0.09306	8.86	112.92053
0.55	6.229	592.83	1.68684	5.0	0.07538	7.17	139.40806
0.60	5.234	498.14	2.00748	5.5	0.06229	5.93	168.68375
0.65	4.460	424.45	2.35600	6.0	0.05234	4.98	200.74760
0.70	3.846	365.98	2.73240	6.5	0.04460	4.24	235.59962
0.80	2.944	280.20	3.56885	7.0	0.03846	3.66	273.23979
0.85	2.608	248.21	4.02889	7.5	0.03350	3.19	313.66813
0.90	2.326	221.39	4.51682	8.0	0.02944	2.80	356.88462
0.95	2.088	198.70	5.03263	8.5	0.02608	2.48	402.88928
1.00	1.884	179.33	5.57632	9.0	0.02326	2.21	451.68210

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.