

FeCrAl (Cr23Al5) Electric Resistance Heating Alloy



FeCrAl (0Cr23Al5) is used to generate large amount of heat in the commercial heating operations. It offers superior resistance to oxidation and corrosion at the high temperatures. It inhibits scaling and embrittlement of material and offers prolonged functionality in the rigorous corrosive conditions at the elevated temperatures up to 1400oC.

Chemical composition

Elements	0Cr23Al5
Chromium	20.5 to 23.5
Aluminum	4.2 to 5.3
Rhenium	Suitable
Iron	Rem.

Physical Properties

Elements	0Cr23Al5
Highest application temperature	1250 oC
Resistivity at 20°C (micro ohm·meter)	1.35 micro ohm·meter
Density (gram/cm ³)	7.25 gram/cm ³
Thermal conductivity(KJ/m·h·°C)	60.2
Coefficient of lines expansion(×10 ⁻⁶ per oC)	15.0 ×10 ⁻⁶ per oC
Melting temperature (°C)	1500
Tensile strength (N/mm ²)	630 to 780
Elongation (%) at cracking	Above 12
Reduction of area (%)	65 to 75 %
Bending frequency (F/R)	Above 5
Hardness(H.B.)	200 to 260
Regular application period (Hours/ °C)	Above 80/1300

Why FeCrAl heating alloy

1. Elevated temperature functionality in natural atmosphere from 1200oC to 1400oC.
2. FeCrAl alloy has longer service life than Nikrothal alloy at the same temperature limits.
3. Higher max temperature and prolonged function period.
4. It prepares alumina oxide when placed in air. Alumina oxide is more reliable and sustainable. It better prevents diffusion of external particles in the alloy and offers excellent resistance to carburization as compare to Nichrome alloy.

5. It has nominal density as compare to nickel-chrome alloys thus higher equivalent can be created from these materials.
6. High resistivity of **FeCrAl(0Cr23Al5) Alloy** makes it to be used with bigger cross section that improves the service life of an element, comparatively less weight gained. Moreover the resistivity properties of FeCrAl alloys are less affected by cold and hot processing than Nichrome alloys.
7. FeCrAl(0Cr23Al5) Alloy has large yield strength so these do not cause noticeable alteration in cross section of coiling wire.

High Temperature Electric Resistivity

Diameter	Cross Sectional Area	0Cr23Al5		
		Resistivity micro-ohm • m		
		Resistance at 20°C	Length	Weight
0.10 mm	0.0079 mm ²	173.2 Ω/m	17683 m/kg	0.000057 kg/m
0.12 mm	0.0114 mm ²	119.6 Ω/m	12206 m/kg	0.000082 kg/m
0.15 mm	0.0178 mm ²	76.5 Ω/m	7793 m/kg	0.00013 kg/m
0.17 mm	0.0228 mm ²	59.6 Ω/m	6076 m/kg	0.00017 kg/m
0.19 mm	0.0285 mm ²	48 Ω/m	4854 m/kg	0.0021 kg/m
0.21 mm	0.0347 mm ²	36 Ω/m	3986 m/kg	0.00028 kg/m
0.25 mm	0.0492 mm ²	28 Ω/m	2809 m/kg	0.00036 kg/m
0.27 mm	0.0574 mm ²	22 Ω/m	2407 m/kg	0.00045 kg/m
0.29 mm	0.0662 mm ²	19.2 Ω/m	2087 m/kg	0.00052 kg/m
0.31 mm	0.0756 mm ²	17 Ω/m	1827 m/kg	0.000582 kg/m
0.35 mm	0.0963 mm ²	14.1 Ω/m	1434 m/kg	0.000698 kg/m
0.40 mm	0.1258 mm ²	10.8 Ω/m	1097 m/kg	0.000912 kg/m
0.45 mm	0.16 mm ²	8.5 Ω/m	867 m/kg	0.0012 kg/m
0.50 mm	0.197 mm ²	7 Ω/m	703 m/kg	0.00143 kg/m
0.60 mm	0.284 mm ²	4.8 Ω/m	496 m/kg	0.0021 kg/m
0.70 mm	0.39 mm ²	3.6 Ω/m	358 m/kg	0.0028 kg/m
0.80 mm	0.51 mm ²	2.7 Ω/m	274 m/kg	0.0037 kg/m
0.90 mm	0.64 mm ²	2.3 Ω/m	217 m/kg	0.00462 kg/m
1.00 mm	0.79 mm ²	1.8 Ω/m	176 m/kg	0.0057 kg/m
1.20 mm	1.132 mm ²	1.2 Ω/m	122 m/kg	0.00821 kg/m
1.40 mm	1.54 mm ²	0.88 Ω/m	89.6 m/kg	0.01117 kg/m
1.60 mm	3.02 mm ²	0.7 Ω/m	68.6 m/kg	0.01458 kg/m
1.80 mm	2.55 mm ²	0.533 Ω/m	54.3 m/kg	0.01843 kg/m
2.00 mm	3.15 mm ²	0.431 Ω/m	43.9 m/kg	0.02278 kg/m
2.20 mm	3.81 mm ²	0.356 Ω/m	36.3 m/kg	0.02756 kg/m
2.50 mm	4.92 mm ²	0.276 Ω/m	28.1 m/kg	0.0385 kg/m
3.00 mm	7.08 mm ²	0.192 Ω/m	19.5 m/kg	0.0513 kg/m
3.50 mm	9.63 mm ²	0.141 Ω/m	14.3 m/kg	0.0698 kg/m
4.00 mm	12.6 mm ²	0.11 Ω/m	11.0 m/kg	0.09114 kg/m
4.50 mm	15.91 mm ²	0.085 Ω/m	8.67 m/kg	0.1154 kg/m
5.00 mm	19.62 mm ²	0.069 Ω/m	7.03 m/kg	0.1424 kg/m
5.50 mm	23.81 mm ²	0.0569 Ω/m	5.80 m/kg	0.173 kg/m
6.00 mm	28.31 mm ²	0.0478 Ω/m	4.88 m/kg	0.2051 kg/m

Diameter	Cross Sectional Area	0Cr23Al5		
		Resistivity micro-ohm • m		
		Resistance at 20°C	Length	Weight
6.50 mm	33.21 mm ²	0.041 Ω/m	4.15 m/kg	0.241 kg/m

Available Forms

Wire, Mesh, Strip, Rod, Bar, Foil