PRODUCT DATASHEET / 2026

IRON–CHROMIUM–ALUMINIUM RESISTANCE & HEATING ALLOY · 低铝易加工铁铬铝合金

# 0Cr20Al3

0Cr21Al4 · Resistohm 123 · CrAl 193

The aluminium-lean Fe–Cr–Al grade: ductile at room temperature, easy to draw and deep-draw, and still protective to 1100 °C.

低铝铁铬铝合金——室温韧性好、易拉丝深冲，1100 °C 以下抗氧化可靠。

0Cr20Al3/0Cr21Al4 holds 3.0–4.2 % aluminium, deliberately below the high-aluminium grades. Room-temperature brittleness drops sharply and elongation stays above 20 %, so fine wire, deep-drawn parts and complex cold-formed elements need fewer intermediate anneals.

Maximum working temperature of about 1100 °C is a little lower than 0Cr25Al5, but for most industrial and domestic heaters below 1100 °C this is the most economical Fe–Cr–Al choice. A dense $Al_2O_3$ film still forms, and the leaner aluminium avoids the weld cracking typical above 5 % Al.

**SPECIFICATION 规格**

ALLOY TYPE 合金类型
**Ferritic Fe–Cr–Al**

STRUCTURE 晶体结构
**Ferrite**

MAGNETIC 磁性
**Magnetic**

STANDARDS 标准
**GB/T 1234-2012**

## 01 CHEMICAL COMPOSITION 化学成份

WT. % · GB/T 1234-2012

| C | P | S | Mn | Si | Cr | Ni | Al | Fe |
|---|---|---|---|---|---|---|---|---|
| ≤0.08 | ≤0.025 | ≤0.02 | ≤0.5 | ≤0.7 | 18.0–21.0 | ≤0.6 | 3.0-4.2 | Remainder |

## 02 PHYSICAL PROPERTIES 物理性能

TYPICAL VALUES

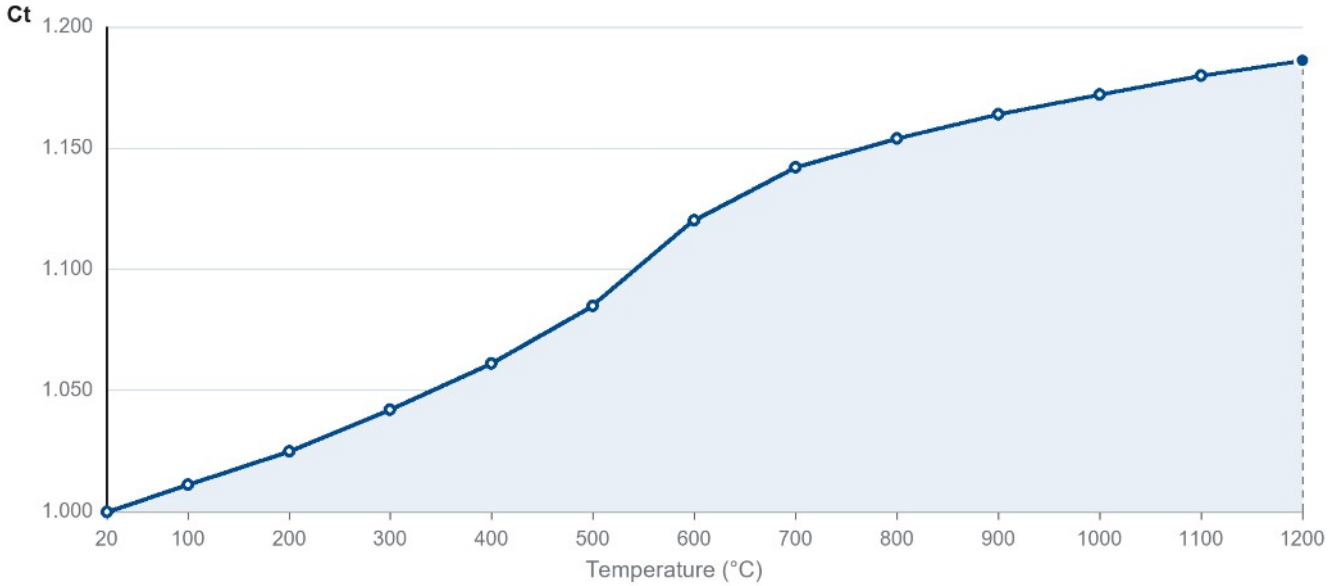
| | | | |
|---|---|---|---|
| Max. Working Temp. | **1100 °C** | Resistivity at 20 °C (μΩ·m) | **1.23±0.07** |
| Density | **7.35 g/cm³** | Thermal conductivity (20 °C) | **13 W/(m·K)** |
| Average linear expansion coefficient (20-1000 °C) | **13.5×10⁻⁶/K** | Specific heat capacity | **0.49 J/(g·K)** |
| Approx. melting point | **1500 °C** | Elongation after Fracture (A/%) | **Ø≤3.0 mm: ≥12%<br>Ø>3.0 mm: ≥15%** |
| Tensile strength (Rm /MPa) | **≥580** | Accelerated life test | **≥80 h/1250 °C** |
| Micrographic structure | **Ferrite** | Magnetic properties | **Magnetic** |

## 03 TEMPERATURE BEHAVIOUR 温度特性

CT · GB/T 1234-2012

# Resistance rises predictably with temperature

Ct is the factor by which the 20 °C resistance is multiplied at a given temperature. Standards publish it as a table; plotted here, intermediate values can be read at a glance.




**Where the curve is used:** $R(T) = R_{20} \times Ct$. From 100 to 1200 °C the factor ranges from 1.011 to 1.186 (+1.1 % to +18.6 %); at constant voltage the power at temperature is $P_{20} / Ct$.

## 04 CT BY TEMPERATURE 温度系数表

°C · FACTOR

| °C | 20 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ct | 1.000 | 1.011 | 1.025 | 1.042 | 1.061 | 1.085 | 1.12 | 1.142 | 1.154 | 1.164 | 1.172 | 1.180 | 1.186 |

## 05 PERFORMANCE 性能要点

VERIFIED DATA

**Cold forming**
Elongation above 20 %; deep drawing with fewer anneals.

**Weldability**
Aluminium held near 4 %: a wider weld window than 0Cr25Al5.

**Oxidation at 1000–1100 °C**
Life typically better than Cr20Ni80 at the same temperature.

**Cost**
Nickel-free — the economical choice below 1100 °C.

## 06 APPLICATIONS 应用领域

SERVICE-PROVEN SECTORS

**Industrial heating elements**
elements for service below 1100 °C

**Domestic appliances**
heaters wound from fine wire

**Deep-drawn parts**
complex cold-formed heating components

**Welded assemblies**
resistance- and TIG-welded elements

**Fine wire elements**
small-gauge, tight-tolerance windings

TRADE NAMES · 商品牌号

0Cr21Al4 · Resistohm 123 · CrAl 193 · GFC123 · 0Cr19Al3 · FCHW-2 / FCHR-2 · CrAl 20 5

Several names above are registered trademarks of their respective owners; they are given for cross-reference only.

## 07 TECHNICAL PARAMETERS 技术参数

GB/T 1234-2012

# Metric wire table: resistance, length and mass

| Diameter (mm) | Ω/m at 20 °C | m per kg | g per m | Diameter (mm) | Ω/m at 20 °C | m per kg | g per m |
|---|---|---|---|---|---|---|---|
| **0.05** | 626.434 | 69292.01 | 0.01443 | **1.1** | 1.2943 | 143.17 | 6.98493 |
| **0.06** | 435.024 | 48119.45 | 0.02078 | **1.2** | 1.0876 | 120.30 | 8.31265 |
| **0.07** | 319.609 | 35353.06 | 0.02829 | **1.3** | 0.9267 | 102.50 | 9.75582 |
| **0.08** | 244.701 | 27067.19 | 0.03695 | **1.4** | 0.7990 | 88.38 | 11.31444 |
| **0.09** | 193.344 | 21386.42 | 0.04676 | **1.5** | 0.6960 | 76.99 | 12.98851 |
| **0.1** | 156.609 | 17323.00 | 0.05773 | **1.6** | 0.6118 | 67.67 | 14.77804 |
| **0.11** | 129.429 | 14316.53 | 0.06985 | **1.7** | 0.5419 | 59.94 | 16.68302 |
| **0.12** | 108.756 | 12029.86 | 0.08313 | **1.8** | 0.4834 | 53.47 | 18.70346 |
| **0.13** | 92.668 | 10250.30 | 0.09756 | **1.9** | 0.4338 | 47.99 | 20.83934 |
| **0.15** | 69.604 | 7699.11 | 0.12989 | **2.0** | 0.3915 | 43.31 | 23.09069 |
| **0.17** | 54.190 | 5994.12 | 0.16683 | **2.2** | 0.3236 | 35.79 | 27.93973 |
| **0.19** | 43.382 | 4798.62 | 0.20839 | **2.4** | 0.2719 | 30.07 | 33.25059 |
| **0.21** | 35.512 | 3928.12 | 0.25457 | **2.6** | 0.2317 | 25.63 | 39.02326 |
| **0.25** | 25.057 | 2771.68 | 0.36079 | **2.8** | 0.1998 | 22.10 | 45.25775 |
| **0.27** | 21.483 | 2376.27 | 0.42083 | **3.0** | 0.1740 | 19.25 | 51.95404 |
| **0.29** | 18.622 | 2059.81 | 0.48548 | **3.2** | 0.1529 | 16.92 | 59.11216 |
| **0.31** | 16.296 | 1802.60 | 0.55475 | **3.4** | 0.1355 | 14.99 | 66.73208 |
| **0.35** | 12.784 | 1414.12 | 0.70715 | **3.6** | 0.1208 | 13.37 | 74.81382 |
| **0.40** | 9.788 | 1082.69 | 0.92363 | **3.8** | 0.1085 | 12.00 | 83.35738 |
| **0.45** | 7.734 | 855.46 | 1.16897 | **4.0** | 0.0979 | 10.83 | 92.36275 |
| **0.50** | 6.264 | 692.92 | 1.44317 | **4.5** | 0.0773 | 8.55 | 116.89660 |
| **0.55** | 5.177 | 572.66 | 1.74623 | **5.0** | 0.0626 | 6.93 | 144.31679 |
| **0.60** | 4.350 | 481.19 | 2.07816 | **5.5** | 0.0518 | 5.73 | 174.62332 |
| **0.65** | 3.707 | 410.01 | 2.43895 | **6.0** | 0.0435 | 4.81 | 207.81618 |
| **0.70** | 3.196 | 353.53 | 2.82861 | **6.5** | 0.0371 | 4.10 | 243.89538 |
| **0.80** | 2.447 | 270.67 | 3.69451 | **7.0** | 0.0320 | 3.54 | 282.86091 |
| **0.85** | 2.168 | 239.76 | 4.17076 | **7.5** | 0.0278 | 3.08 | 324.71278 |
| **0.90** | 1.933 | 213.86 | 4.67586 | **8.0** | 0.0245 | 2.71 | 369.45098 |
| **0.95** | 1.735 | 191.94 | 5.20984 | **8.5** | 0.0217 | 2.40 | 417.07552 |
| **1.00** | 1.566 | 173.23 | 5.77267 | **9.0** | 0.0193 | 2.14 | 467.58640 |

**Resistance tolerance** 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 %.

## 08 SUPPLY FORMS 供货规格

OTHER SIZES ON REQUEST

**WIRE**
**0.05–1.6 mm**
Bright, soft annealed

**WIRE**
**1.0–12.0 mm**
Acid-pickled finish

**ROD**
**6.0–150.0 mm**
Drawn and annealed

**FLAT WIRE**
**0.2–6.0 × 0.08–1.0 mm**
Width × thickness

**RIBBON**
**5.0–300 × 0.05–4.0 mm**
Width × thickness

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Founded 1990 · formerly Danyang Resistance Wire Factory · ISO 9001:2015 · 1,500 t per year · about half exported