# 博锐斯精工科技（丹阳）有限公司

## Bright Spot Technology (Danyang) Co., Ltd.



博锐斯精工科技（丹阳）有限公司
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## 公司简介

博锐斯精工科技（丹阳）有限公司位于风光旖旎的江苏省丹阳市，是一家工贸一体的生产电阻合金丝的专业工厂。

我厂具有冶炼、成材拉拔至氢退软丝全过程的生产能力。主要产品有铁铬铝、镍铬、铜镍合金丝带，以及电炉条、辐射管等电热产品，产品规格齐全，性能优良，是制造各种工业电炉、家用电器、电器设备理想的电阻电热材料。

参照国际先进标准，严格执行国家标准，不断采用新技术，新工艺，使我们的产品精益求精，严格的工艺纪律及质量管理制度，确保了我厂产品精益求精，深得用户好评，产品除在国内市场畅销外，还在国外享有盛誉。

“质量与信誉”为企业之生命，“研究与创新”为企业生存之命脉，本厂积极以先进的技术工艺，优化的生产，完善的管理，为你们的产品在市场竞争中提供最有效的服务。

Bright Spot Technology (Danyang) Co., Ltd. is located in Danyang city, Jiangsu Province. And it is on Shanghai-Nanjing railway,which is at the side of Changjiang delta.The factory is specialized in heating alloy,from smelting to making wires.Our products consist of Fe-Cr-AL Nichrome Copper-Nickel wire&strip.Our products with good quanlity are excellent material for industrial furnace household appliances and heating elements.

In accord with international&national standards using new techinces, new process, so the products can keep improving. There are strict processes and quality manages to insure the products keep improving, and be well received by the users.

"Quality and credit standing"is the life of the factory,"Research and innovation"is the life line for survival of the factory.

The factory uses advance technics, optimizing production and perfect manage to offer effectual service for your products in competition.



## 铁铬铝电阻电热合金

铁铬铝电阻电热合金具有电阻率高、电阻温度系数小、使用温度高的特点。在高温下耐腐蚀性好，尤其适合在含有硫和硫化物气氛中使用，且价格低廉，是工业电炉、家用电器，远红外装置中理想的发热材料。

## Fe-Cr-Al Alloy

Fe-Cr-Al Alloy posses the characteristics of high resistance, low temperature coefficient of electric resistance, high operating temperature, good corrosion resistance under high temperature, especially under the atmosphere containing S, as well as the lower price, it is widely used in industrial electric furnaces, household electrical appliances and far infrared ray devices.

主要技术性能/Performance Parameter

| 性能 Performance \ 牌号 Name | | 1Cr13Al4 | 1Cr21Al4 | 0Cr21Al6 | 0Cr23Al5 | 0Cr25Al5 | 0Cr21Al6Nb | 0Cr27Al7Mo2 |
|---|---|---|---|---|---|---|---|---|
| 主要化学成份% Chemical Composition % | Cr | 12.0~15.0 | 17.0~21.0 | 19.0~22.0 | 20.5~23.5 | 23.0~26.0 | 21.0~23.0 | 26.5~27.8 |
| | Al | 4.0~6.0 | 2.0~4.0 | 5.0~7.0 | 4.2~5.3 | 4.5~6.5 | 5.0~7.0 | 6.0~7.0 |
| | Fe | 余量 REM | 余量 REM | | | 余量 REM | 余量 REM | 余量 REM |
| | Re | Appropriate amount | Appropriate amount | Appropriate amount | Appropriate amount | Appropriate amount | Appropriate amount | Appropriate amount |
| | | | | | | | 加入量 The dosage added Nb:0.5 | 加入量 The dosage added Mo:1.8~2.2 |
| 元件最高使用温度℃ Max.working temperature℃ | | 950 | 1100 | 1250 | 1250 | 1250 | 1350 | 1400 |
| 熔点/Melting Point ℃≈ | | 1450 | 1500 | 1500 | 1500 | 1500 | 1510 | 1520 |
| 密度/Density g/cm³ | | 7.40 | 7.35 | 7.16 | 7.25 | 7.10 | 7.10 | 7.10 |
| 电阻率/Resistivity μΩ·m,20℃ | | 1.25 ±0.08 | 1.23 ±0.06 | 1.42 ±0.07 | 1.35 ±0.06 | 1.42 ±0.07 | 1.45 ±0.07 | 1.53 ±0.07 |
| 抗拉强度/ Tensile Strength Mpa | | 588~735 | 637~784 | 637~784 | 637~784 | 637~784 | 637~784 | 686~784 |
| 延伸率/Elongation % | | ≥16 | ≥12 | ≥12 | ≥12 | ≥12 | ≥12 | ≥10 |
| 反复弯曲次数 Bending Frequency | | ≥5 | ≥5 | ≥5 | ≥5 | ≥5 | ≥5 | ≥5 |
| 快速寿命/ Life Experiment h/℃ | | | ≥80/1250 | ≥80/1300 | ≥80/1300 | ≥80/1300 | ≥50/1350 | ≥50/1350 |
| 比热/Specific Heat J/g.℃ | | 0.490 | 0.490 | 0.520 | 0.460 | 0.494 | 0.494 | 0.494 |
| 导热系数/ Thermal Conductivity KJ/m.h.℃ | | 52.7 | 46.9 | 63.2 | 60.2 | 46.1 | 46.1 | 45.2 |
| 线胀系数/ Linear Expansivity α×10⁶/℃ (20~1000℃) | | 15.4 | 13.5 | 14.7 | 15.0 | 16.0 | 16.0 | 16.0 |
| 硬度/Hardness HB | | 200~260 | 200~260 | 200~260 | 200~260 | 200~260 | 200~260 | 200~260 |
| 显微组织/ Microscopic Structure | | 铁素体/ Ferrite | 铁素体/ Ferrite | 铁素体/ Ferrite | 铁素体/ Ferrite | 铁素体/ Ferrite | 铁素体/ Ferrite | 铁素体/ Ferrite |
| 磁性/Magnetism | | 磁性/Magnetic | 磁性/Magnetic | 磁性/Magnetic | 磁性/Magnetic | 磁性/Magnetic | 磁性/Magnetic | 磁性/Magnetic |

## 镍铬、镍铬铁电阻电热合金

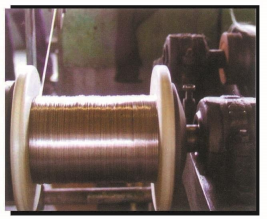
镍铬、镍铬铁电阻电热合金具有较高的电阻率，表面抗氧化性好，并且在高温下有教高的强度，有良好的加工性能及可焊性，可广泛用于治金、家用电器、机械制造业等做发热元件和电器行业做电阻材料。

## Nichrome alloy

Nichrome alloy has high resistance,good oxidation resistance,good intensity in high temperature,perfect machining formability and weldability.It can be used for making heating element in smelting,household appliance and machine building industry.

主要技术性能/Performance Parameter

| 性能 Performance \ 牌号 Name | | Cr20Ni80 | Cr30Ni70 | Cr15Ni60 | Cr20Ni35 | Cr20Ni30 |
|---|---|---|---|---|---|---|
| 主要化学成份% Chemical Composition% | Ni | 余量 REM | 余量 REM | 55.0~61.0 | 34.0~37.0 | 30.0~34.0 |
| | Cr | 20.0~23.0 | 28.0~31.0 | 15.0~18.0 | 18.0~21.0 | 18.0~21.0 |
| | Fe | ≤1.0 | ≤1.0 | 余量 REM | 余量 REM | 余量 REM |
| 元件最高使用温度℃ Max.working temperature℃ | | 1200 | 1250 | 1150 | 1100 | 1100 |
| 熔点/Melting Point ℃≈ | | 1400 | 1380 | 1390 | 1390 | 1390 |
| 密度/Density g/cm³ | | 8.40 | 8.10 | 8.20 | 7.90 | 7.90 |
| 电阻率/Resistivity μΩ·m,20℃ | | 1.09 ±0.05 | 1.18 ±0.05 | 1.12 ±0.05 | 1.04 ±0.05 | 1.06 ±0.05 |
| 延伸率/Elongation % | | ≥20 | ≥20 | ≥20 | ≥20 | ≥20 |
| 比热/Specific Heat J/g.℃ | | 0.440 | 0.461 | 0.494 | 0.500 | 0.500 |
| 导热系数/Thermal Conductivity KJ/m.h.℃ | | 60.3 | 45.2 | 45.2 | 43.8 | 43.8 |
| 线胀系数/Linear Expansivity α×10⁻⁶/℃ (20~1000℃) | | 18.0 | 17.0 | 17.0 | 19.0 | 19.0 |
| 显微组织/Microscopic Structure | | 奥氏体/Austenite | 奥氏体/Austenite | 奥氏体/Austenite | 奥氏体/Austenite | 奥氏体/Austenite |
| 磁性/Magnetism | | 非磁性/Non-magnetic | 非磁性/Non-magnetic | 非磁性/Non-magnetic | 弱磁性/Low-magnetic | 弱磁性/Low-magnetic |



## 铜基发热电阻合金

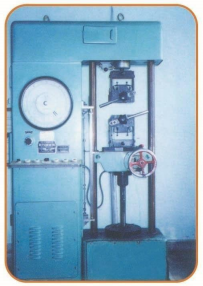
铜基发热电阻合金具有较好的耐腐蚀性，良好的焊接性能和加工性能，广泛应用于热过载继电器、低压断路器等低压电器中的电热元件。

## Copper-Nickel(Albata)&Manganin alloy

Albata&Manganin alloy have good corrsion resistance,weldability and formability.They are wildly used for making heating element in low-voltage apparatus such as thermal overload relay and low-voltage circuit breaker.

主要技术性能/Performance Parameter

| 性能 Performance \ 品种 Name | | NC003 | NC005 | NC010 | NC012 | MC012 | NC015 | NC020 | NC025 | NC030 | NC035 | NC040 | NC050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 主要化学成份% Chemical Composition% | Ni | 1 | 2 | 6 | 8 | – | 10 | 14.2 | 19 | 23 | 30 | 34 | 44 |
| | Mn | – | – | – | – | 3 | – | 0.3 | 0.5 | 0.5 | 1.0 | 1.0 | 1.0 |
| | Cu | 余量REM | 余量REM | 余量REM | 余量REM | 余量REM | 余量REM | 余量REM | 余量REM | 余量REM | 余量REM | 余量REM | 余量REM |
| 元件最高使用温度℃ Max.working temperature℃ | | – | 200 | 220 | 250 | 200 | 250 | 300 | 300 | 300 | 350 | 350 | 400 |
| 熔点/Melting Point ℃≈ | | 1085 | 1090 | 1095 | 1097 | 1050 | 1100 | 1115 | 1135 | 1150 | 1170 | 1180 | 1280 |
| 密度/Density g/cm³ | | 8.9 | 8.9 | 8.9 | 8.9 | 8.8 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 |
| 电阻率/Resistivity μΩ·m,20℃ | | 0.03 ±10% | 0.05 ±10% | 0.10 ±10% | 0.12 ±10% | 0.12 ±10% | 0.15 ±10% | 0.20 ±5% | 0.25 ±5% | 0.30 ±5% | 0.35 ±5% | 0.40 ±5% | 0.49 ±5% |
| 抗拉强度/Tensile Strength Mpa | | ≥210 | ≥220 | ≥250 | ≥270 | ≥290 | ≥290 | ≥310 | ≥340 | ≥350 | ≥400 | ≥400 | ≥420 |
| 延伸率/Elongation (>Φ1.0)% | | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 |
| 电阻温度系数 Temp.coeff.of resistance 10⁻⁵/℃ (20 600℃) | | <100 | <120 | <60 | <57 | <38 | <50 | <38 | <25 | <16 | <10 | −0 | <−6 |
| 对铜热电动势 Thermal EMF.vs copper E μV/℃ (0~100℃) | | −8 | −12 | −18 | −22 | – | −25 | −28 | −32 | −34 | −37 | −39 | −43 |



## 康铜、新康铜、锰铜电阻合金

康铜、新康铜、锰铜是以铜作为基体成分的电阻合金。具有较低的电阻温度系数、较宽的使用温度范围，良好的机械加工性能，耐腐蚀易钎焊，可用于制造各种电阻器、分流器以及交流仪器的可变电阻和应变电阻的精密电阻元件。

## Constantan alloy

Constantan alloy have low temperature coefficent of electric resistance,wide operating temperature range(up to 500℃),good machining formability,corrsion resistance and good weldability.It can be used for making adjustable resistor of AC instrument and for straingage sensing element.

主要技术性能/Performance Parameter

| 名称、牌号 Name&Code / 性能Performance | | 康铜 Constantan 6J40 | 新康铜 New constantan 6J11 | 锰铜 Manganin 6J12 | F1 锰铜 6J8 F1 Manganin 6J8 | F2 锰铜 6J13 F2 Manganin 6J13 |
|---|---|---|---|---|---|---|
| 主要化学成份% Chemical Composition% | Mn | 1~2 | 10.5~12.5 | 11~13 | 8~10 | 11~13 |
| | Ni | 39~41 | – | 2~3 | – | 2~5 |
| | Cu | 余量 REM | 余量 REM | 余量 REM | 余量 REM | 余量 REM |
| | | | Al: 2.5~4.5 Fe: 1.0~1.6 | | Si:1~2 | |
| 元件使用温度范围 Element working temp. range | | 5~500 | 5~500 | 5~45 | 10~80 | 10~80 |
| 密度/Density g/cm³ | | 8.88 | 8.00 | 8.44 | 8.70 | 8.40 |
| 电阻率/Resistivity μΩ·m,20℃ | | 0.48 ±0.03 | 0.49 ±0.03 | 0.47 ±0.03 | 0.35 ±0.05 | 0.44 ±0.04 |
| 延伸率/Elongation (>Φ0.5)% | | ≥15 | ≥15 | ≥15 | ≥15 | ≥15 |
| 电阻温度系数 Temp.coeff.of resistance α, 10⁻⁶/℃ | | -40~+40 | -80~+80 | -3~+20 | -5~+10 | 0~+40 |
| 对铜热电动势 Thermal EMF.vs copper E μV/℃ (0~100℃) | | 45 | 2 | 1 | 2 | 2 |



## 扁带、炉条、辐射管

扁丝，炉条，辐射管具有使用温度高，价格低廉等特点，广泛用于工业电炉，家用电器和电热元件等行业。

## Ribbon,furnace grate and radiant tube

Ribbon,furnace grate and radiant tube have high working temperature,low price,and are widely used in industrial furnace, household appliance and heating elements

主要技术性能/Performance Parameter

铁铬铝扁丝/ Fe-Cr-Al ribbon

| 牌 号 Material Name | 0Cr21A16Nb | 1Cr13A14 | 0Cr27A17Mo2 | 0Cr21A16 | 0Cr25A15 |
|---|---|---|---|---|---|
| 电阻率/Resistivity (10-6Ω•m) | 1.43 | 1.53 | 1.25 | 1.23 | 1.40 |
| 比重/Specific gravity (g/cm2) | 7.1 | 7.1 | 7.4 | 7.35 | 7.15 |
| 最高使用温度 Max.working temperature (℃) | 1350 | 1400 | 950 | 1100 | 1250 |

镍铬扁丝/Nichrome ribbon

| 牌 号 Material Name | Cr20Ni80 | Cr30Ni70 | Cr15Ni60 | Cr20Ni35 | Cr20Ni30 |
|---|---|---|---|---|---|
| 电阻率/Resistivity (10-6Ω•m) | 1.09 | 1.18 | 1.12 | 1.04 | 1.06 |
| 比重/Specific gravity (g/cm2) | 8.4 | 8.1 | 8.2 | 7.9 | 7.9 |
| 最高使用温度 Max.working temperature (℃) | 1200 | 1250 | 1150 | 1100 | 1100 |

## 铁铬铝合金线径系列的设计参数
## Fe-Cr-Al alloy design parameter

| 线径 Diameter mm | 截面积/Xcross Sectional Area mm² | 每米表面积 Surface Per Meter cm²/m | 1Cr13A14 | | 1Cr21A14 | | 0Cr21A16 | | 0Cr23A15 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 每米重量 Weight Per Meter kgm | 每米电阻 Resistance Per Meter Ω /m,20℃ | 每米重量 Weight Per Meter kg/m | 每米电阻 Resistance Per Meter Ω /m,20℃ | 每米重量 Weight Per Meter kg/m | 每米电阻 Resistance Per Meter Ω /m,20℃ | 每米重量 Weight Per Meter kg/m | 每米电阻 Resistance Per Meter Ω /m,20℃ |
| 0.10 | 0.007854 | 3.142 | 0.00005812 | 159.2 | 0.00005773 | 156.6 | 0.00005623 | 180.8 | 0.00005694 | 171.9 |
| 0.12 | 0.01131 | 3.770 | 0.00008369 | 110.5 | 0.00008313 | 108.8 | 0.00008098 | 125.6 | 0.00008200 | 119.4 |
| 0.15 | 0.01767 | 4.712 | 0.0001308 | 70.74 | 0.0001299 | 69.60 | 0.0001265 | 80.36 | 0.0001281 | 76.39 |
| 0.17 | 0.02270 | 5.341 | 0.0001680 | 55.07 | 0.0001668 | 54.19 | 0.0001625 | 62.56 | 0.0001646 | 59.48 |
| 0.19 | 0.02835 | 5.969 | 0.0002098 | 44.09 | 0.0002084 | 43.38 | 0.0002030 | 50.08 | 0.0002056 | 47.61 |
| 0.21 | 0.03464 | 6.597 | 0.0002563 | 36.09 | 0.0002546 | 35.51 | 0.0002480 | 41.00 | 0.0002511 | 38.98 |
| 0.25 | 0.04909 | 7.854 | 0.0003632 | 25.46 | 0.0003608 | 25.06 | 0.0003515 | 28.93 | 0.0003559 | 27.50 |
| 0.27 | 0.05726 | 8.482 | 0.0004237 | 21.83 | 0.0004208 | 21.48 | 0.0004099 | 24.80 | 0.0004151 | 23.58 |
| 0.29 | 0.06605 | 9.111 | 0.0004888 | 18.92 | 0.0004855 | 18.62 | 0.0004729 | 21.50 | 0.0004789 | 20.44 |
| 0.31 | 0.07548 | 9.739 | 0.0005585 | 16.56 | 0.0005548 | 16.30 | 0.0005404 | 18.81 | 0.0005472 | 17.89 |
| 0.35 | 0.09621 | 11.00 | 0.0007120 | 12.99 | 0.0007072 | 12.78 | 0.0006889 | 14.76 | 0.0006975 | 14.03 |
| 0.40 | 0.1257 | 12.57 | 0.0009299 | 9.947 | 0.0009236 | 9.788 | 0.0008998 | 11.30 | 0.0009111 | 10.74 |
| 0.45 | 0.1590 | 14.14 | 0.001177 | 7.860 | 0.001169 | 7.734 | 0.001139 | 8.928 | 0.001153 | 8.488 |
| 0.50 | 0.1963 | 15.71 | 0.001453 | 6.366 | 0.001443 | 6.264 | 0.001406 | 7.232 | 0.001424 | 6.875 |
| 0.60 | 0.2827 | 18.85 | 0.002092 | 4.421 | 0.002078 | 4.350 | 0.002024 | 5.022 | 0.002050 | 4.775 |
| 0.70 | 0.3848 | 21.99 | 0.002848 | 3.248 | 0.002829 | 3.196 | 0.002755 | 3.690 | 0.002790 | 3.508 |
| 0.80 | 0.5027 | 25.13 | 0.003720 | 2.487 | 0.003695 | 2.447 | 0.003599 | 2.825 | 0.003644 | 2.686 |
| 0.90 | 0.6362 | 28.27 | 0.004708 | 1.965 | 0.004676 | 1.933 | 0.004555 | 2.232 | 0.004612 | 2.122 |
| 1.00 | 0.7854 | 31.42 | 0.005812 | 1.592 | 0.005773 | 1.566 | 0.005623 | 1.808 | 0.005694 | 1.719 |
| 1.20 | 1.131 | 37.70 | 0.008369 | 1.105 | 0.008313 | 1.088 | 0.0008098 | 1.256 | 0.008200 | 1.194 |
| 1.40 | 1.539 | 43.98 | 0.01139 | 0.8120 | 0.01131 | 0.7990 | 0.01102 | 0.9224 | 0.01116 | 0.8770 |
| 1.60 | 2.011 | 50.27 | 0.01488 | 0.6217 | 0.01478 | 0.6118 | 0.01440 | 0.7063 | 0.01458 | 0.6714 |
| 1.80 | 2.545 | 56.55 | 0.01883 | 0.4912 | 0.01870 | 0.4834 | 0.01822 | 0.5580 | 0.01845 | 0.5305 |
| 2.00 | 3.142 | 62.83 | 0.02325 | 0.3979 | 0.02309 | 0.3915 | 0.02249 | 0.4520 | 0.02278 | 0.4297 |
| 2.20 | 3.801 | 69.12 | 0.02813 | 0.3288 | 0.02794 | 0.3236 | 0.02722 | 0.3736 | 0.02756 | 0.3551 |
| 2.50 | 4.909 | 78.54 | 0.03632 | 0.2546 | 0.03608 | 0.2506 | 0.03515 | 0.2893 | 0.03559 | 0.2750 |
| 2.80 | 6.158 | 87.96 | 0.04557 | 0.2030 | 0.04526 | 0.1998 | 0.04409 | 0.2306 | 0.04464 | 0.2192 |
| 3.00 | 7.069 | 94.25 | 0.05231 | 0.1768 | 0.05195 | 0.1740 | 0.05061 | 0.2009 | 0.05125 | 0.1910 |
| 3.50 | 9.621 | 110.0 | 0.07120 | 0.1299 | 0.07072 | 0.1278 | 0.06889 | 0.1476 | 0.06975 | 0.1403 |
| 4.00 | 12.57 | 125.7 | 0.09299 | 0.09947 | 0.09236 | 0.09788 | 0.08998 | 0.1130 | 0.09111 | 0.1074 |
| 4.50 | 15.90 | 141.4 | 0.1177 | 0.07860 | 0.1169 | 0.07734 | 0.1139 | 0.08928 | 0.1153 | 0.08488 |
| 5.00 | 19.63 | 157.1 | 0.1453 | 0.06366 | 0.1443 | 0.06264 | 0.1406 | 0.07232 | 0.1424 | 0.06875 |
| 5.50 | 23.76 | 172.8 | 0.1758 | 0.05261 | 0.1746 | 0.05177 | 0.1701 | 0.05977 | 0.1722 | 0.05682 |
| 6.00 | 28.27 | 188.5 | 0.2092 | 0.04421 | 0.2078 | 0.04350 | 0.2024 | 0.05022 | 0.2050 | 0.04775 |
| 6.50 | 33.18 | 204.2 | 0.2456 | 0.03767 | 0.2439 | 0.03707 | 0.2376 | 0.04279 | 0.2406 | 0.04068 |
| 7.00 | 38.48 | 219.9 | 0.2848 | 0.03248 | 0.2829 | 0.03196 | 0.2755 | 0.03690 | 0.2790 | 0.03508 |



## 铁铬铝合金线径系列的设计参数（续）
## Fe-Cr-Al alloy design parameter

| 线径 Diameter mm | 截面积/Xcross Sectional Area mm² | 每米表面积 Surface Per Meter cm²/m | 0Cr25A15 | | 0Cr21A16Nb | | 0Cr27A17Mo2 | |
|---|---|---|---|---|---|---|---|---|
| | | | 每米重量 Weight Per Meter kgm | 每米电阻 Resistance Per Meter Ω /m,20℃ | 每米重量 Weight Per Meter kgm | 每米电阻 Resistance Per Meter Ω /m,20℃ | 每米重量 Weight Per Meter kgm | 每米电阻 Resistance Per Meter Ω /m,20℃ |
| 0.10 | 0.007854 | 3.142 | 0.00005576 | 180.8 | 0.00005576 | 184.6 | 0.00005576 | 194.8 |
| 0.12 | 0.01131 | 3.770 | 0.00008030 | 125.6 | 0.00008030 | 128.2 | 0.00008030 | 135.3 |
| 0.15 | 0.01767 | 4.712 | 0.0001255 | 80.36 | 0.0001255 | 82.05 | 0.0001255 | 86.58 |
| 0.17 | 0.02270 | 5.341 | 0.0001612 | 62.56 | 0.0001612 | 63.88 | 0.0001612 | 67.41 |
| 0.19 | 0.02835 | 5.969 | 0.0002013 | 50.08 | 0.0002013 | 51.14 | 0.0002013 | 53.96 |
| 0.21 | 0.03464 | 6.597 | 0.0002459 | 41.00 | 0.0002459 | 41.86 | 0.0002459 | 44.17 |
| 0.25 | 0.04909 | 7.854 | 0.0003485 | 28.93 | 0.0003485 | 29.54 | 0.0003485 | 31.17 |
| 0.27 | 0.05726 | 8.482 | 0.0004065 | 24.80 | 0.0004065 | 25.33 | 0.0004065 | 26.72 |
| 0.29 | 0.06605 | 9.111 | 0.0004690 | 21.50 | 0.0004690 | 21.95 | 0.0004690 | 23.16 |
| 0.31 | 0.07548 | 9.739 | 0.0005359 | 18.81 | 0.0005359 | 19.21 | 0.0005359 | 20.27 |
| 0.35 | 0.09621 | 11.00 | 0.0006831 | 14.76 | 0.0006831 | 15.07 | 0.0006831 | 15.90 |
| 0.40 | 0.1257 | 12.57 | 0.0008922 | 11.30 | 0.0008922 | 11.54 | 0.0008922 | 12.18 |
| 0.45 | 0.1590 | 14.14 | 0.001129 | 8.928 | 0.001129 | 9.117 | 0.001129 | 9.620 |
| 0.50 | 0.1963 | 15.71 | 0.001394 | 7.232 | 0.001394 | 7.385 | 0.001394 | 7.792 |
| 0.60 | 0.2827 | 18.85 | 0.002007 | 5.022 | 0.002007 | 5.128 | 0.002007 | 5.411 |
| 0.70 | 0.3848 | 21.99 | 0.002732 | 3.690 | 0.002732 | 3.768 | 0.002732 | 3.976 |
| 0.80 | 0.5027 | 25.13 | 0.003569 | 2.825 | 0.003569 | 2.885 | 0.003569 | 3.044 |
| 0.90 | 0.6362 | 28.27 | 0.004517 | 2.232 | 0.004517 | 2.279 | 0.004517 | 2.405 |
| 1.00 | 0.7854 | 31.42 | 0.005576 | 1.808 | 0.005576 | 1.846 | 0.005576 | 1.948 |
| 1.20 | 1.131 | 37.70 | 0.008030 | 1.256 | 0.008030 | 1.282 | 0.008030 | 1.353 |
| 1.40 | 1.539 | 43.98 | 0.01093 | 0.9224 | 0.01093 | 0.9419 | 0.01093 | 0.9939 |
| 1.60 | 2.011 | 50.27 | 0.01428 | 0.7063 | 0.01428 | 0.7212 | 0.01428 | 0.7610 |
| 1.80 | 2.545 | 56.55 | 0.01807 | 0.5580 | 0.01807 | 0.5698 | 0.01807 | 0.6013 |
| 2.00 | 3.142 | 62.83 | 0.02231 | 0.4520 | 0.02231 | 0.4615 | 0.02231 | 0.4870 |
| 2.20 | 3.801 | 69.12 | 0.02699 | 0.3736 | 0.02699 | 0.3814 | 0.02699 | 0.4025 |
| 2.50 | 4.909 | 78.54 | 0.03485 | 0.2893 | 0.03485 | 0.2954 | 0.03485 | 0.3177 |
| 2.80 | 6.158 | 87.96 | 0.04372 | 0.2306 | 0.04372 | 0.2355 | 0.04372 | 0.2485 |
| 3.00 | 7.069 | 94.25 | 0.05019 | 0.2009 | 0.05019 | 0.2051 | 0.05019 | 0.2165 |
| 3.50 | 9.621 | 110.0 | 0.06831 | 0.1476 | 0.06831 | 0.1507 | 0.06831 | 0.1590 |
| 4.00 | 12.57 | 125.7 | 0.08922 | 0.1130 | 0.08922 | 0.1154 | 0.08922 | 0.1218 |
| 4.50 | 15.90 | 141.4 | 0.1129 | 0.08928 | 0.1129 | 0.09117 | 0.1129 | 0.09620 |
| 5.00 | 19.63 | 157.1 | 0.1394 | 0.07232 | 0.1394 | 0.07385 | 0.1394 | 0.07792 |
| 5.50 | 23.76 | 172.8 | 0.1687 | 0.05977 | 0.1687 | 0.06103 | 0.1687 | 0.06440 |
| 6.00 | 28.27 | 188.5 | 0.2007 | 0.05022 | 0.2007 | 0.05128 | 0.2007 | 0.05411 |
| 6.50 | 33.18 | 204.2 | 0.2356 | 0.04279 | 0.2356 | 0.04370 | 0.2356 | 0.04611 |
| 7.00 | 38.48 | 219.9 | 0.2732 | 0.03690 | 0.2732 | 0.03768 | 0.2732 | 0.03976 |

## 镍铬、镍铬铁合金线径系列的设计参数
## Nichrome alloy design parameter

| 线径 Diameter mm | 截面积/Xcross Sectional Area mm² | 每米表面积 Surface Per Meter cm²/m | Cr20Ni80 | | Cr30Ni70 | | Cr15Ni60 | | Cr20Ni35 | Cr20Ni30 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 每米重量 Weight Per Meter kgm | 每米电阻 Resistance Per Meter Ω /m,20℃ | 每米重量 Weight Per Meter kgm | 每米电阻 Resistance Per Meter Ω /m,20℃ | 每米重量 Weight Per Meter kgm | 每米电阻 Resistance Per Meter Ω /m,20℃ | 每米重量 Weight Per Meter kgm | 每米电阻 Resistance Per Meter Ω /m,20℃ |
| 0.10 | 0.007854 | 3.142 | 0.00006597 | 138.8 | 0.00006362 | 150.2 | 0.00006440 | 142.6 | 0.00006205 | 132.4 |
| 0.12 | 0.01131 | 3.770 | 0.00009500 | 96.38 | 0.00009161 | 104.3 | 0.00009274 | 99.03 | 0.00008935 | 91.96 |
| 0.15 | 0.01767 | 4.712 | 0.0001484 | 61.68 | 0.0001431 | 66.77 | 0.0001449 | 63.38 | 0.0001396 | 58.85 |
| 0.17 | 0.02270 | 5.341 | 0.0001907 | 48.02 | 0.0001839 | 51.99 | 0.0001861 | 49.34 | 0.0001793 | 45.82 |
| 0.19 | 0.02835 | 5.969 | 0.0002382 | 38.44 | 0.0002297 | 41.62 | 0.0002325 | 39.50 | 0.0002240 | 36.68 |
| 0.21 | 0.03464 | 6.597 | 0.0002909 | 31.47 | 0.0002806 | 34.07 | 0.0002840 | 32.34 | 0.0002736 | 30.03 |
| 0.25 | 0.04909 | 7.854 | 0.0004123 | 22.21 | 0.0003976 | 24.04 | 0.0004025 | 22.82 | 0.0003878 | 21.19 |
| 0.27 | 0.05726 | 8.482 | 0.0004809 | 19.04 | 0.0004638 | 20.61 | 0.0004695 | 19.56 | 0.0004523 | 18.16 |
| 0.29 | 0.06605 | 9.111 | 0.0005548 | 16.50 | 0.0005350 | 17.86 | 0.0005416 | 16.96 | 0.0005218 | 15.75 |
| 0.31 | 0.07548 | 9.739 | 0.0006340 | 14.44 | 0.0006114 | 15.63 | 0.0006189 | 14.84 | 0.0005963 | 13.78 |
| 0.35 | 0.09621 | 11.00 | 0.0008082 | 11.33 | 0.0007793 | 12.26 | 0.0007889 | 11.64 | 0.0007601 | 10.81 |
| 0.40 | 0.1257 | 12.57 | 0.001056 | 8.674 | 0.001018 | 9.390 | 0.001030 | 8.913 | 0.0009927 | 8.276 |
| 0.45 | 0.1590 | 14.14 | 0.001336 | 6.853 | 0.001288 | 7.419 | 0.001304 | 7.042 | 0.001256 | 6.539 |
| 0.50 | 0.1963 | 15.71 | 0.001649 | 5.551 | 0.001590 | 6.010 | 0.001610 | 5.704 | 0.001554 | 5.297 |
| 0.60 | 0.2827 | 18.85 | 0.002375 | 3.855 | 0.002290 | 4.173 | 0.002318 | 3.961 | 0.002234 | 3.678 |
| 0.70 | 0.3848 | 21.99 | 0.003233 | 2.832 | 0.003117 | 3.066 | 0.003156 | 2.910 | 0.003040 | 2.702 |
| 0.80 | 0.5027 | 25.13 | 0.004222 | 2.168 | 0.004072 | 2.348 | 0.004122 | 2.228 | 0.003971 | 2.069 |
| 0.90 | 0.6362 | 28.27 | 0.005344 | 1.713 | 0.005153 | 1.855 | 0.005217 | 1.761 | 0.005026 | 1.635 |
| 1.00 | 0.7854 | 31.42 | 0.006597 | 1.388 | 0.006362 | 1.502 | 0.006440 | 1.426 | 0.006205 | 1.324 |
| 1.20 | 1.131 | 37.70 | 0.009500 | 0.9638 | 0.009161 | 1.043 | 0.009274 | 0.9903 | 0.008935 | 0.9196 |
| 1.40 | 1.539 | 43.98 | 0.01293 | 0.7081 | 0.01247 | 0.7665 | 0.01262 | 0.7276 | 0.01216 | 0.6756 |
| 1.60 | 2.011 | 50.27 | 0.01689 | 0.5421 | 0.01629 | 0.5869 | 0.01649 | 0.5570 | 0.01588 | 0.5173 |
| 1.80 | 2.545 | 56.55 | 0.02138 | 0.4283 | 0.02061 | 0.4637 | 0.02087 | 0.4401 | 0.02010 | 0.4087 |
| 2.00 | 3.142 | 62.83 | 0.02639 | 0.3470 | 0.02545 | 0.3756 | 0.02576 | 0.3565 | 0.02482 | 0.3310 |
| 2.20 | 3.801 | 69.12 | 0.03193 | 0.2867 | 0.03079 | 0.3104 | 0.03117 | 0.2946 | 0.03003 | 0.2736 |
| 2.50 | 3.976 | 70.69 | 0.03340 | 0.2741 | 0.03221 | 0.2968 | 0.03260 | 0.2817 | 0.03141 | 0.2616 |
| 2.80 | 6.158 | 87.96 | 0.05172 | 0.1770 | 0.04988 | 0.1916 | 0.05049 | 0.1819 | 0.04864 | 0.1689 |
| 3.00 | 7.069 | 94.25 | 0.05938 | 0.1542 | 0.05726 | 0.1669 | 0.05796 | 0.1584 | 0.05584 | 0.1471 |
| 3.50 | 9.621 | 110.0 | 0.08082 | 0.1133 | 0.07793 | 0.1226 | 0.07889 | 0.1164 | 0.07601 | 0.1081 |
| 4.00 | 12.57 | 125.7 | 0.1056 | 0.08674 | 0.1018 | 0.09390 | 0.1030 | 0.08913 | 0.09927 | 0.08276 |
| 4.50 | 15.90 | 141.4 | 0.1336 | 0.06853 | 0.1288 | 0.07419 | 0.1304 | 0.07042 | 0.1256 | 0.06539 |
| 5.00 | 19.63 | 157.1 | 0.1649 | 0.05551 | 0.1590 | 0.06010 | 0.1610 | 0.05704 | 0.1551 | 0.05297 |
| 5.50 | 23.76 | 172.8 | 0.1996 | 0.04588 | 0.1924 | 0.04967 | 0.1948 | 0.04714 | 0.1877 | 0.04377 |
| 6.00 | 28.27 | 188.5 | 0.2375 | 0.03855 | 0.2290 | 0.04173 | 0.2318 | 0.03961 | 0.2234 | 0.03678 |
| 6.50 | 33.18 | 204.2 | 0.2787 | 0.03285 | 0.2688 | 0.03556 | 0.2721 | 0.03375 | 0.2621 | 0.03134 |
| 7.00 | 38.48 | 219.9 | 0.3233 | 0.02832 | 0.3117 | 0.03066 | 0.3156 | 0.02910 | 0.3040 | 0.02702 |

## 部分产品展示