



UNS K94610 Nickel Iron Precision Alloy Pipe 4j29 Kovar Tube

Our Product Introduction

for more products please visit us on victory-alloy.com

Basic Information

- Place of Origin: China
- Brand Name: Victory
- Certification: CE,ROHS,ISO 9001
- Model Number: Kovar 4J29
- Minimum Order Quantity: 5 Kg
- Price: 10 - 499 kilograms \$30.00
- Packaging Details: Plastic film or waterproof woven bag inside, wire packed in spool put into carton, coil wire or strip wire put into wooden case
- Delivery Time: 7-21 days
- Payment Terms: L/C, T/T, Western Union, MoneyGram
- Supply Ability: 300 tons per month



Product Specification

- Product Name: Kovar Tube
- Material: Nickel Base Alloy
- Ni (Min): 35%
- Resistance ($\mu\Omega.m$): Stable
- Powder Or Not: Not Powder
- Ultimate Strength (\geq MPa): 690
- Elongation (\geq %): 35%
- Application: Aerospace Industry, Chemical Industry, Marine Industry
- Chemical Composition: Fe ,Ni ,Co ,Al, Si ,Mn Etc.
- Size: Customized Size
- Highlight: K94610 Kovar Alloy, 35mm Kovar Alloy, 0.3mm kovar tube



More Images



Product Description

Our Product Introduction



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KOVAR ALLOY TUBE

ASTM F15, Nilo-K, UNS K94610, 4J29

Customized service available

ASTM F15 Iron Nickel Cobalt Kovar alloy 4J29 Tubes

Glass sealed and controlled expansion Kovar alloys

* kovar alloy, ASTM F15, Nilo-K, UNS K94610 (FeNi29Co17), Chinese 4J29

*Specifications:ASTM F15; DIN 17745; S.E.W. 385; Werkstoff Nr. 1.3981; AFNOR NF A54-301

Kovar Alloy, also know as ASTM F-15, NILO K, Pernifer 2918, Rodar, and Dilvar P1 is Nickel-Iron-Cobalt, controlled expansion alloy containing 29% Nickel.

It's coefficient of expansion (which decreases with rising temperature to the inflection point), matches the expansion rate of borosilicate glasses and alumina ceramics.

Applications include glass to metal seals in applications requiring high reliability or resistance to thermal shock, ie. high-power transmitting valves, transistor leads and heaters and photography flash bulbs.

| Alloy Type | Trade Name | UNS No. | Specifications | Forms Of Supply | | | |
|------------|------------------|---------|----------------|-----------------|-------|--|------|
| | | | | Rod | Strip | | Wire |
| Ni29Co17 | Kovar | K94610 | ASTM F15 | √ | √ | | √ |
| FeNi36 | Invar 36 | K93603 | ASTM 1684 | √ | √ | | |
| FeNi32Co5 | Super Invar 32-5 | KI93500 | ASTMF1684 | √ | √ | | |
| FeNi27Co25 | Ceramvar | F1466 | ASTMF1466 | √ | √ | | √ |
| FeNi42 | Alloy 42 | K94100 | ASTM F30 | √ | √ | | |
| FeNi46 | Alloy 46 | K94600 | ASTM F30 | √ | √ | | |
| FeNi48 | Alloy 48 | K94800 | ASTMF30 | √ | √ | | |
| FeNi50 | Alloy 52 | K95050 | ASTM F30 | √ | √ | | √ |

| Item | 1J33 | 3J01 | 3J9 | 4J29 | 4J32 | 4J33 | 4J45 | FeNi50 |
|------|-----------|-----------|-----------|-----------|---------|-----------|-----------|-----------|
| C | ≤0.05 | ≤0.05 | 0.22-0.26 | ≤0.03 | ≤0.05 | ≤0.03 | ≤0.05 | ≤0.05 |
| Mn | ≤0.05 | ≤1.00 | 1.80-2.20 | ≤0.5 | 0.2-0.6 | ≤0.5 | ≤0.8 | ≤0.8 |
| Fe | Rest | | | | | | | |
| P | ≤0.020 | ≤0.020 | ≤0.03 | ≤0.02 | ≤0.02 | ≤0.02 | ≤0.02 | ≤0.02 |
| S | ≤0.020 | ≤0.020 | ≤0.020 | ≤0.02 | ≤0.02 | ≤0.02 | ≤0.02 | ≤0.02 |
| Si | 0.30-0.6 | ≤0.80 | 1.30-1.70 | ≤0.3 | ≤0.2 | ≤0.3 | ≤0.3 | ≤0.3 |
| Ni | 32.8-33.8 | 34.5-36.5 | 9.0-10.5 | 28.5-29.5 | 31.5-33 | 28.5-29.5 | 44.5-45.5 | 49.5-50.5 |
| Al | 1.0-2.0 | 1.00-1.80 | -- | -- | -- | -- | ≤0.1 | ≤0.1 |
| Co | -- | -- | -- | 16.8-17.8 | 3.2-4.2 | 16.8-17.8 | - | - |
| Ti | - | 2.70-3.20 | - | - | - | - | - | - |
| Cu | - | -- | -- | -- | ≤0.2 | 0.4-0.8 | ≤0.2 | -- |
| Cr | -- | 11.5-13.0 | 19.0-20.5 | ≤0.2 | -- | ≤0.2 | -- | -- |
| Mo | -- | -- | 1.60-1.85 | ≤0.2 | -- | ≤0.2 | -- | -- |

Table 1 Grade & Chemical Composition of kovar alloy 4J29

Kovar alloy is a vacuum melted, Iron-nickel-cobalt, low expansion alloy whose chemical composition is controlled within narrow limits to assure precise uniform thermal expansion properties.

| Grade | Chemical Composition (%) | | | | | | | | | | Ni | Co | Fe |
|---------------|--------------------------|-------|-------|-----|------|------|------|------|--|-----------|-----------|------|----|
| | C | P | S | Mn | Si | Cu | Cr | Mo | | | | | |
| 4J29 Kovar | ≤ | | | | | | | | | | | | |
| | 0.03 | 0.020 | 0.020 | 0.5 | 0.30 | 0.20 | 0.20 | 0.20 | | 28.5~29.5 | 16.8~17.8 | Bal. | |

4J29 Kovar alloy Similar Grades just for customers' reference

| Russia | U.S.A. | U.K. | France | Germany |
|--------|--------|--------|-----------|----------|
| 29HK | Kovar | Nilo K | Dilver P0 | Vacon 12 |

4J29 Kovar alloy Physical Property (see Table 2 & Table 3)**Table 2 Coefficient of Linear Expansion**

Note: Kovar alloy is a Glass and Ceramic sealing alloy (Glass to metal sealing and Ceramic to metal sealing).

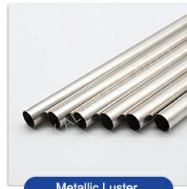
| Grade | Heat Treatment of the Samples | Average Coefficient of Linear Expansion | | |
|---------------|---|---|---------|---------|
| | | 20~300℃ | 20~400℃ | 20~450℃ |
| 4J29 Kovar | Heat to temperature of 900±20℃ in the hydrogen, hold for 1h; re-heat to 1100±20℃, hold for 15 min.; cooled to 200℃ at a rate less than 5℃/min | | 4.6~5.2 | 5.1~5.5 |

Table 3: 4J29 Kovar alloy Typical Coefficient of Linear Expansion

| Grade | Average Coefficient of Linear Expansion | | | | | | | |
|---------------|---|---------|---------|---------|---------|---------|---------|---------|
| | 20~200℃ | 20~300℃ | 20~400℃ | 20~450℃ | 20~500℃ | 20~600℃ | 20~700℃ | 20~800℃ |
| 4J29 Kovar | 5.9 | 5.3 | 5.1 | 5.3 | 6.2 | 7.8 | 9.2 | 10.2 |

Product Details

High-quality materials and surface treatment technology



Metallic Luster



Smooth Edges



Product Comparison

The quality of our products has been strictly tested and guaranteed



OTHERS



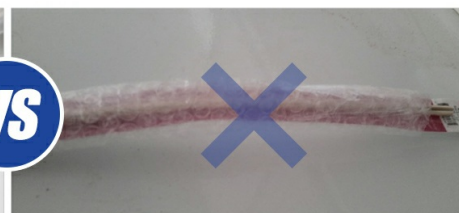
Smooth And Shiny Surface



Product Surface Rust



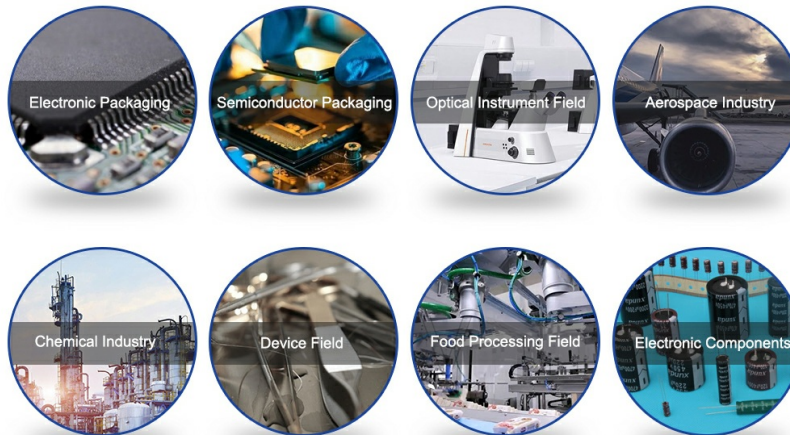
Product Quality Strict Inspection



Product Deformation

Application Field

Kovar tubes are widely used in many fields



Kovar (also known as KV-1 or ASTM F15) is a nickel-iron alloy that finds wide applications in the field of electronics due to its thermal expansion coefficient that matches that of borosilicate glass. Here are some of the application areas of Kovar:

1. Electronics industry: Kovar strips are commonly used in the electronics industry for the manufacture of vacuum tubes, cathode ray tubes (CRTs), microwave tubes, and other electronic components. The low coefficient of thermal expansion of Kovar ensures that the electronic components maintain their shape and size under varying thermal conditions.
2. Aerospace industry: Kovar strips are used in the aerospace industry for the manufacture of aircraft and spacecraft components, especially those that require high thermal stability and dimensional stability. The low coefficient of thermal expansion of Kovar makes it an ideal material for use in critical aerospace applications.
3. Optical industry: Kovar strips are used in the optical industry for the manufacture of optical filters, mirrors, and lenses as they have excellent thermal stability and low thermal expansion.
4. Automotive industry: Kovar strips are used in the automotive industry for the manufacture of sensors, switches, and other electronic components that require high dimensional stability and thermal stability.

In summary, Kovar strip is a versatile material with a wide range of applications in various industries that require high thermal stability, low thermal expansion, and good mechanical properties.

Product Process

The production process and technology used in the product



1 Nickel Plate Baking



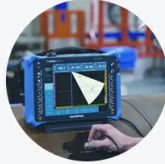
2 Vacuum Refining



3 Electroslag Remelting



4 Forging



5 Ultrasonic Flaw Detection



6 Processing Round Bar



7 Dye Penetrant Inspection



8 Perforation



9 Cutting & Grinding



10 Cold Rolling Annealing



11 Surface Treatment



12 Finish Rolling



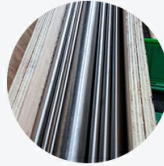
13 Annealing



14 Forming



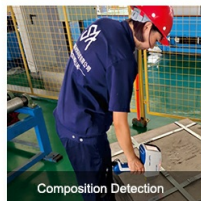
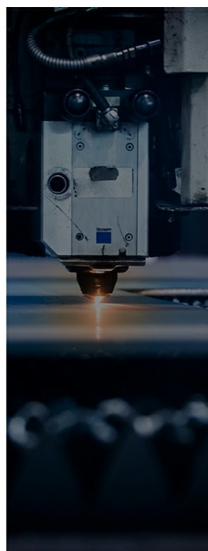
15 Detection



16 Packaging

Product Comparison

The quality of our products has been strictly tested and guaranteed



Composition Detection



Composition Detection



Measuring Instrument



Micro Hardness Tester



Micro Hardness Tester



Tensile Test Equipment

OEM Services

We can provide customized services for customers

Product Customization

Size: custom made

We can customize kovar alloy tubes of any size and thickness.



Label Customization



We can provide label customization service for customers' products.

Recommended Products

Click to learn more about related products



Nickel Strip



Nickel Wire



Nickel Bar



Monel Tube



Incoloy Bar



Hastelloy Alloy Tube

20+

Industry Experience

50+

Certifications

1000+

Metal Products

2000+

Cooperative Business

Company Profile

We are a leading alloy metal manufacturer founded in 2002, providing high-quality and high-performance alloy products and services to our customers. Our company is dedicated to becoming the industry leader in the alloy field, and we have received multiple industry certifications and awards, including the ISO9001 International Quality Management System Certificate and the SGS Certificate.

Over the past 18 years, we have focused on the resistance alloy business and continuously innovated and explored, ultimately developing new nickel-based alloy products such as chromium-nickel-iron alloy, Monel alloy, Hastelloy alloy, high-temperature alloy, and more.



Our Advantages

Our advantages can provide customers with better service



HIGH QUALITY



SUPER
ELASTICITY



HIGH STRENGTH



BRAND EFFECT



PROFESSIONAL
FACTORY



TECHNICAL
SUPPORT



R&D INNOVATION
SERVICES



AFTER-SALES
SERVICE



ISO
CERTIFICATION



EFFICIENT
LOGISTICS SERVICE

Our Certifications

Our products have obtained national standard certification



Our Partners

We have established long-term cooperative relationships
with many partners



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