AMETEK®
SPECIALTY METAL PRODUCTS

PRECISION MEDICAL
METAL PRODUCTS

BIOCOMPATIBLE METAL PRODUCTS FOR CRITICAL MEDICAL DEVICES AND ORTHOPEDICS.



finetubes / SuperiorTube / AMETEK SPECIALTY METAL PRODUCTS

SMALL DIAMETER THIN AND THICK WALL TUBES

Small diameter, thin wall tubes are critical components for coronary/cardiac implants including heart valves, pacemakers and stents. Larger diameter, thick wall tubes for orthopedics including trauma implants, spinal cages as well as endoscopic surgical instruments.

We offer excellent strength to weight ratios, the tightest tolerances and high levels of ID and OD surface finish and cleanliness.

PRODUCTS

- Titanium: Ti CP (Grade 1 and Grade 2), Ti 6Al-4V (Grade 5), Ti 6Al-4V ELI (Grade 23), Ti 3Al-2.5V (Grade 9)
- Stainless Steel: 304L, 316L, 316LVM, 17-4PH®, 17-7PH®
- Specialty: L-605™, MP35N®, Nitronic® 50,
- Sizes: From 0.012" (0.30 mm) to 1 5/8" (45mm) OD"
- Seamless, and welded & drawn

APPLICATIONS

- Dental implants
- Cardiac Rhythm Management
- Spinal cages
- Bone Screws
- Trauma nails
- Heart valves
- Coronary and vascular stents
- Surgical instruments
- Dental handles / drills
- HPLC columns for drug and food testing

Fine Tubes
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Superior Tube
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PRECISION METAL STRIP

Our precision strip products are custom-made for applications including implantable enclosures, surgical instruments, stents, PCBs, electronics and more.

Our products are used by the metal forming companies that make the hermetic shield and cans for the largest pacemaker, drug-infusion pump and electronic implant manufacturers around the world. CP Grade 1 Titanium is the preferred material due to its light weight, biocompatibility and ability to be deep-drawn into the desired shape and EB-welded to provide a hermetic seal.

Titanium strip products for implantable devices are produced with fine grain size for drawability, superior surface finish and short lead-times. Titanium can also be reduced to thin gauges (to 7.5 micron), low roughness (<2 µinch Ra) or high roughness (>25 µinch Ra).

We can now also produce grades 5, 9 and 23 to facilitate the external charging of neurostimulators.

PRODUCTS

- Titanium: Ti CP (Grade 1, Grade 2, Grade 4), Ti 6Al-4V (Grade 5), Ti 3Al-2.5V (Grade 9), Ti 6Al-4V ELI (Grade 23)
- Stainless Steel: 316, 316LVM, 420, 450, and others
- Specialty: MP35N® LTi, C1100, CuNi 715,
- Nickel: Ni 201, Ni 270, Range of Nickel Iron materials
- Thickness: Below .090" (2.3mm) to 1.5 micron

We maintain special capabilities to produce materials outside of these ranges for special applications.

APPLICATIONS

- Implantable device enclosures
- Cranial mesh and spinal cages
- Coronary and Vascular stents
- Spring clips for header assembles
- Orthopedic reamer

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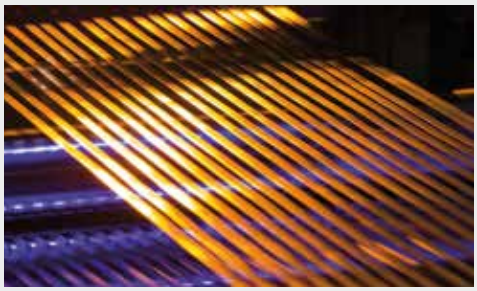

ULTRA-THIN FOIL

Ultra-thin custom metal foil in nearly any alloy rolled to the tightest tolerances and thinnest gauges (1.5 microns) in the industry.

We are experts in controlling consistency, precise thicknesses, specific mechanical, physical, electrical and magnetic properties, and surface finish.

PRODUCTS

- Titanium: Ti CP (Grade 1 and Grade 2)
- Stainless Steel: 316LS
- Specialty: MP35N® LTi, Evanohm®, Constantan®, Havar®
- Size: From 1.5mm (0.060") down to 1.5 microns (0.000060") in thickness

APPLICATIONS

- Strain Gauges
- Resistance Heaters
- Capacitor Cathodes
- Stents and Spring connectors for medical diagnostics
- Pressure Sensing Diaphragms
- PCB Substrates

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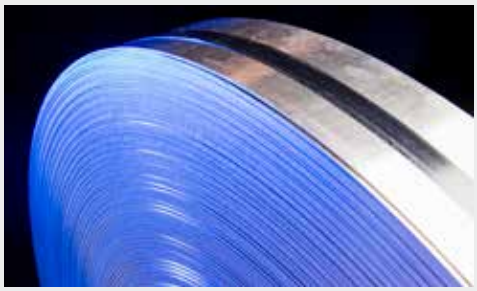

HIGHLY CONDUCTIVE NICKEL STRIP

Our high purity nickel strip battery connectors deliver 15-20% higher conductivity than traditional cast nickel strip connectors.

We employ a sophisticated Wrought Powder Metallurgy process for roll compacted strip which achieves the highest purity nickel commercially available. This means reduced impedance and increased conductivity in battery tab connectors.

Improved conductivity results in higher transmission of power which enables a reduction of the battery tab connector footprint and material weight. Power is carried to the battery via a smaller, thinner strip, which saves costs without compromising on performance.

PRODUCTS

- Available nickel grades: Ni 200, Ni 201, Ni 270, 899L and 899A
- Highest purity (99.98%) for greater conductivity
- Low impedance
- Thickness range: Down to 10 microns
- Standard and custom sizes & tempers
- Customizable materials
- Small minimum order sizes
- Short lead times

APPLICATIONS

- Electrical and battery contacts
- Vacuum tubes

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SINTERED POROUS METAL FILTER POWDERS

High purity metal powders are specially atomized to give the highly irregular shape required for precise filtration. Pressed and sintered into porous filters, they are used in specialty filtration systems, such as mission critical flow control and filter components in life saving ventilator units.

Our metallurgists offer an extensive range of grades and Particle Size Distribution (PSD) control - no company offers more filter cuts than we do.

We have over 50 years' experience in engineering custom filter powders for major filter manufacturers worldwide and have the expertise to control:

- Chemistry for optimized performance
- Particle Size Distribution
- Morphology and Apparent Density
- Green Strength

PRODUCTS

- Stainless Steel: 316L, 310S
- Specialty: Hastelloy® (C-22®, C 276, C, B, X), Inconel® (600, 625), Monel®, Iron Alumindes (FAS)
- Nickel: Ni 200
- Sizes: More than 25 different particle "cuts" - from coarse (~20 Mesh) to fine (10 Micron) sizes with tightly controlled ranges
- Short lead times and small minimum order quantities (as little as 100 lbs/45.4kg)

APPLICATIONS

- Filtration components for ventilators such as porous flow restrictors that control oxygen flow

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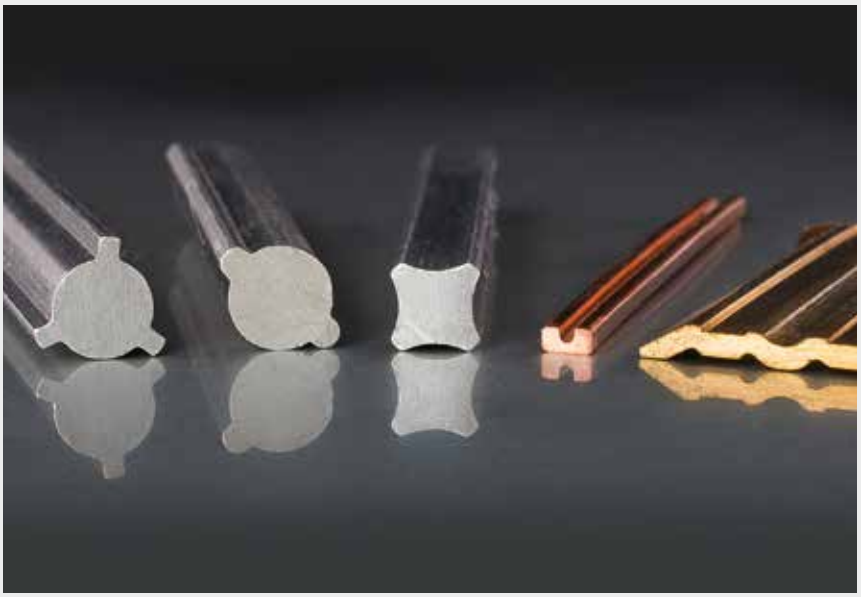
WALLINGFORD / AMETEK
SPECIALTY METAL PRODUCTS



TIGHT TOLERANCE CUSTOM SHAPED WIRE

Specialty shaped wire and flat wire products in an extensive range of standard and custom shapes and alloys.

We utilize a variety of forming technologies: drawing, rolling, and shaping. We provide in-house tooling capabilities and offer experienced engineering support. We consistently work to tight tolerances in the fabrication of simple and complex shapes for superior dimensional control.

Some of our products are available utilizing our wrought powder metallurgy process that delivers proven advantages—purity, consistency, and close compositional control. These advantages give our customers improved die wear, formability, and platability.

PRODUCTS

- Alloys: Aluminum, copper, copper alloys, nickel, nickel alloys, stainless steel, and many others
- Shapes: Custom shapes, round, square, rectangular, half-round, flat-wire, bunched
- Sizes: Square 0.010" to 0.200", round 0.004" to 0.250", flat 0.008" x 0.018"
- Edge capabilities: Square edges, rounded corners, natural rolled or round edges, full rounded or blended edges

APPLICATIONS

- Orthodontic brackets
- MRI channel wire
- Toothbrush staple wires

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GOLD WASHERS FOR MEDICAL ELECTRONICS

Gold washers are bio-compatible braze materials used to form hermetic seals in electrical feedthroughs within implantable devices. Making them ideal for devices such as pacemakers and neurostimulators. Gold's superior metallurgical properties make it the preferred choice for high-performance electronic circuits.

OUR WASHERS OFFER:

- Biocompatibility for safe implantation
- High purity and accurate volume control
- Low vapor pressure for vacuum brazing
- A melting temperature compatible with standard brazing furnaces
- Compliance with RoHS, REACH, PFAS, CA Prop 65, and TSCA standards

PRODUCTS

- Sizes range from Ø.016 x Ø.009 x .004 (Ø0.41mm x Ø0.23mm x 0.10mm) to Ø1.211 x Ø1.189 x .024 (Ø30.74mm x Ø30.20mm x 0.61mm)
- Custom dimensions available upon request
- Short lead times and low minimum order quantities

APPLICATIONS

- Electrical feedthroughs in pacemakers
- Neurostimulator assemblies
- Other implantable medical electronics requiring hermetic sealing

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GOLD BONDING WIRE FOR MEDICAL ELECTRONICS

COINING specializes in manufacturing high-purity gold wire with tensile strength and small diameters. Our gold wire is doped with precise amounts of beryllium and other elements to enhance looping characteristics and eliminate sagging, ensuring consistent and reliable performance.

ADVANTAGES

- Extreme bond reliability
- Wide processing window
- Low-impact ball and wedge bonding
- Superior looping performance
- High-tensile test performance
- Excellent corrosion resistance
- Ultra-fine pitch capability
- Variety of spool sizes available

PRODUCTS

- Composition: Au 99.99% min; Be 3–10 ppm
- Diameters as small as 0.0005 (12.5 microns)
- Custom spool sizes and configurations available
- Gold Bonding Ribbon sizing also supported

APPLICATIONS

- Pacemakers
- Neuromodulation systems
- Cochlear implants
- Diagnostic imaging equipment
- Surgical drills and saws
- UV lasers for surgical procedures

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KOVAR SINGLE CLAD COPPER BOND PADS

COINING's Kovar Single Clad Copper Bond Pads are designed for high-reliability applications where secure metal bonding is essential. These pads consist of a Kovar substrate clad with a thin copper layer, forming a dual-function interface. The copper side enables soldering to circuit boards, while the Kovar side supports wire bonding, typically with stainless steel or gold wire, making them ideal for implantable medical electronics.

ADVANTAGES

- Solderable on one side
- Laserwire bondable on the other
- High reliability and durability
- Biocompatible and environmentally resistant
- Visual differentiation between layers
- Compatible with automated packaging
- Cost-effective and customizable

PRODUCTS

- Materials:
  - Kovar: Mil-I-23011 or ASTM F-15
  - Copper: CDA 101/102
- Dimensions:
  - Minimum: 0.025 x 0.25
  - Maximum: 1& x 1 square
  - Thickness: 0.005 to 0.020 overall
- Flexible shapes and sizes available
- Extensive cladding capabilities with the ability to create multi-layer strip, ribbon, and bond pads.

APPLICATIONS

- Implantable medical electronics

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AMETEK®
SPECIALTY METAL PRODUCTS

ENGINEERED TO LAST A LIFE TIME

Our high performance metal products are custom-made in Specialty Stainless Steel and Titanium alloys for excellent biocompatibility, corrosion resistance and strength-to-weight ratios.

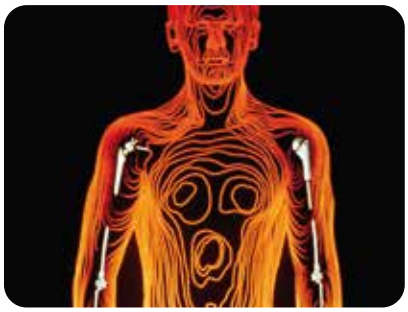
- Cochlear implants 
- Orthodontic brackets 
- Dental implants 
- Spinal cages 
- Bone Screws 
- Trauma nails 

- Cranial mesh 
- Neuro-stimulators 
- Heart valves 
- Coronary and Vascular stents 
- Pacemakers 
- Spring clips for header assembles
- Drug pump implants

- STRIP
- TUBE
- POWDER
- MICRO COMPONENTS

ADDITIONAL APPLICATIONS

- MRI channel wire 
- Orthopedic reamer 
- Strip for vacuum tubes 
- Dental handles / drills 
- Medical heaters 
- Toothbrush staple wires 
- Surgical instruments 
- Filtration components for ventilators 
- PCB substrates for implantable devices 
- Battery contacts for implantable devices 
- HPLC columns for drug and food testing 



ABOUT AMETEK SPECIALTY METAL PRODUCTS

For over 90 years, AMETEK Specialty Metal Products has been at the forefront of manufacturing precision-engineered metal products that meet the most demanding performance standards for critical applications.

With production facilities in the UK and USA, and sales offices strategically located worldwide, we serve a diverse range of industries with leading expertise in metallurgy.

AMETEK SPECIALTY METAL PRODUCTS WALLINGFORD / HPM HAMILTON PRECISION METALS / COINING™

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