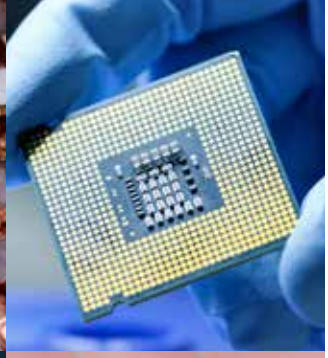
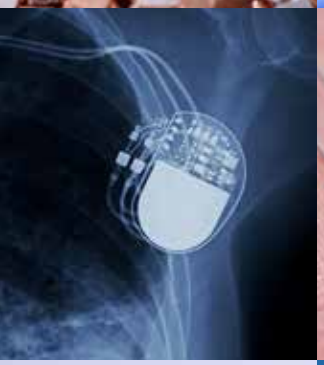
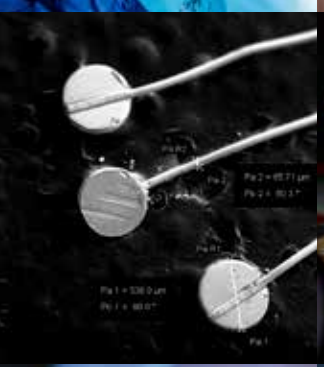
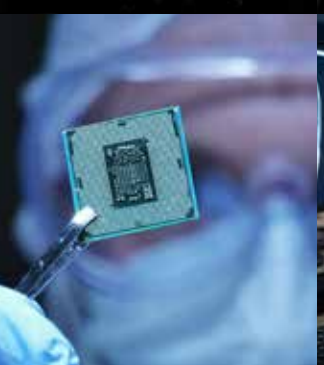













COINING™

AMETEK®
SPECIALTY METAL PRODUCTS

MICRO COMPONENTS WITH BIG IMPACT

- MEDICAL DEVICES
- AUTOMOTIVE
- DEFENSE
- HIGH PERFORMANCE ELECTRONICS
- OPTICAL COMMUNICATIONS
- RF MICROWAVE

COINING™ / AMETEK® SPECIALTY METAL PRODUCTS



Solder Preforms

COINING has been creating cutting-edge **Solder Preforms** since the 1970s. Our solder preforms come in a variety of standard shapes e.g., rectangles, squares, discs or frames, and sizes as required by customers.

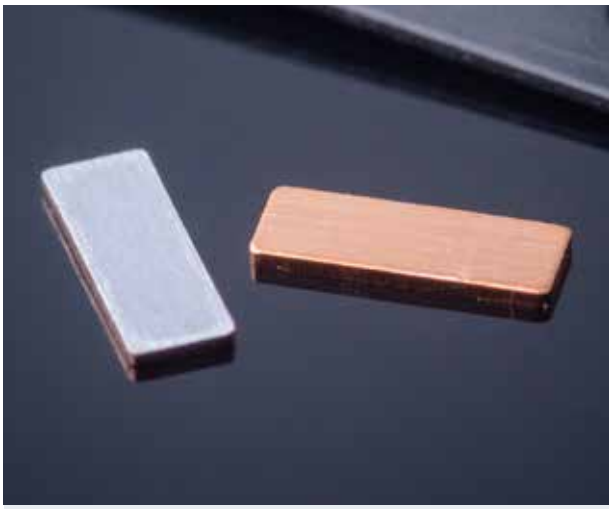
Advantages:

- Increased efficiency and productivity
- Cuts down production costs
- Hundreds of custom blended alloys that are suited for extreme environments and temperatures, with eutectic and non-eutectic melting points above 1000° C.

Solder Wire

COINING's high Pb-based **Solder Wire** is resistant to thermal fatigue, high melting temperature, and the absence of building intermetallics with most electronic materials.

- Produced with a minimum level of impurities, voids-free, and minimal surface oxidation
- Standard Wire Ø: 0.020" (0.508 mm) and 0.030" (0.762 mm)
- Standard Spools:
  Multiple spooling options are available.



Metal Microstampings

COINING's **Metal Microstampings** are used as jumper chips, bonding pads, covers, heat sinks, lead frames, tabs, terminals or other components on microelectronic assemblies and packages. These precision stampings are used primarily to dissipate heat or provide an interface for an electronic circuit or component.

Metallic materials used:

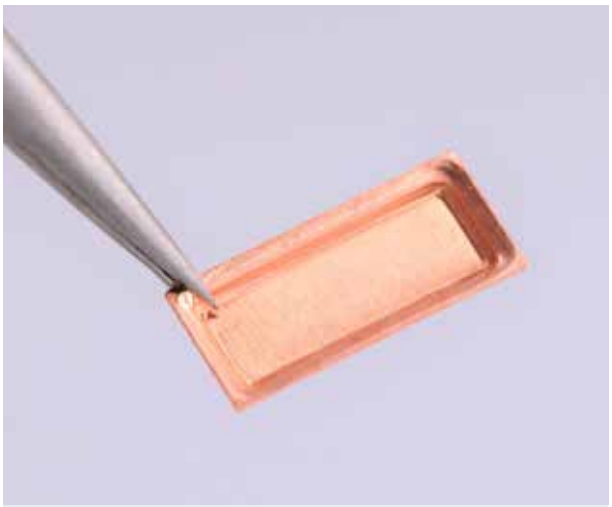
Kovar™, Copper, Molybdenum, Tungsten, Silvar™, Silvar-K™

Advanced capabilities:

- Ensures rapid delivery of high-quality parts
- Over 100 presses and high speed (>2,000 strokes/min)
- Design flexibility: All dimensions, thicknesses, and tolerances are typical.
- Other specifications available upon request

Sizes

- Thickness less than 0.030 inch (0.75 mm) can produce parts that vary in the third dimension
- Dimensions (inches): 0.200 to 1.0 + 0.0004
  1.0 to 2.0 + 0.003
- Thickness (inches): 025 to 0.050 + 0.001
  0.050 to 0.1875 + 0.002



COINING'S Cover Assemblies

COINING's **Cover Assemblies** are designed to provide the necessary hermetic seal for delicate electrical components in the harshest of environments, military-grade bases compliant with regulation MIL-M-38510.

Cover/Base:

- Metals: Kovar™, Alloy 42, Copper/Moly, Aluminum and Titanium alloys, Stainless Steel
- Ceramics: Al2O3, AlN, BeO
- Plating: Nickel plate per QQ-N-290, 50–350 µinches thick. Followed by Gold plate per MILG-45204, Type III, Grade A, 50 µinches thick minimum. High-reliability, 4-layer plating is available.
- Size Tolerance:
  Length & Width: ±0.003"
  Flatness: <0.001" for bases <500" or <0.002"
  Burrs: <0.001"

Preform/Frame:

- Alloy: Au/Sn, Au/Ge, Sn-based (e.g. SAC 305)
- Size Tolerance:
  Length & Width: ±0.003"
  Thickness: ±0.0003"

Assembly:

- Tack weld with three integral welds, minimum
- Position Tolerance: ± 0.005"
- Weld Splatter: <0.003"



Bond Pads

COINING's **Bond Pads** are especially developed for the medical, automotive, and power semiconductor industries.

COINING enables designs for making a final, high-power wire/ribbon connection to contact spots that otherwise cannot be reached.

Exact solder volume allows reduced connection areas and increased connection density.

Advantages:

- Solder/Cu/Solder 3D preform height can be as low as 0.0026 inches
- Improved thermal and electrical conductivity by a factor up to 7x
- Increased reliability through reduced solder spreading, component displacement, shorting and electro-migration

Typical sizes:

- >0.010 inches
- AL- Clad thickness: 12.5 µm (0.0005") min, for wedge bonding up to 200 µm (0.008") diameter wire.
- 125 µm (0.005") max. for Al4N/5N or AlMg heavy wire wedge bonding



Gold Wire and Ribbon

COINING's **Gold Wire** standards are unsurpassed in the industry. Our high-purity wire products are produced from highly refined, vacuum-processed metals.

Our **Gold Ribbon** is for microwave and other applications. We offer a full range of ribbon dimensions that fit the needs for strength, hardness, and elongation in your application.

Advantages:

- Available in diameters as small as 0.0005 inch (12.5 microns)
- Uniform elongation, tensile strength, and dimensional properties

Technical specifications:

- Density: 19.34 g/cm^3
- Melting Point: 1063°C
- Electrical Resistivity: (@20°C): 2.3 μΩ-cm
- Electrical Conductivity: (@20°C): 75 % (IACS)
- Thermal Conductivity: (@20°C): 315W/(m-°K)
- Fusing current (10 mm x 25 μm): 0.52 Amps
- Au: 99.99% min
- Be: 3-10 ppm
- Impurities: Cu, Ag < 30 ppm
- Total impurities: Fe, Mg < 20 ppm



Aluminum Wire

Aluminum Wire is used in microelectronic devices as an electrical interconnect, either between a chip and substrate or between two chips. COINING's Aluminum Wire is low cost and highly suitable for ultrasonic wedge bonding. Our in-house capabilities ensure we deliver homogenous high-purity wire with ultra-clean surfaces and smooth finish.

Aluminum Ribbon

Aluminum Ribbon is typically used in microwave and high-power applications. COINING's Aluminum Ribbon offers improved heat dissipation, increased reliability, and the need for fewer bonds. Using our high-purity corrosion-resistant Aluminum Bonding Ribbon eliminates the need for multiple wire bonds.

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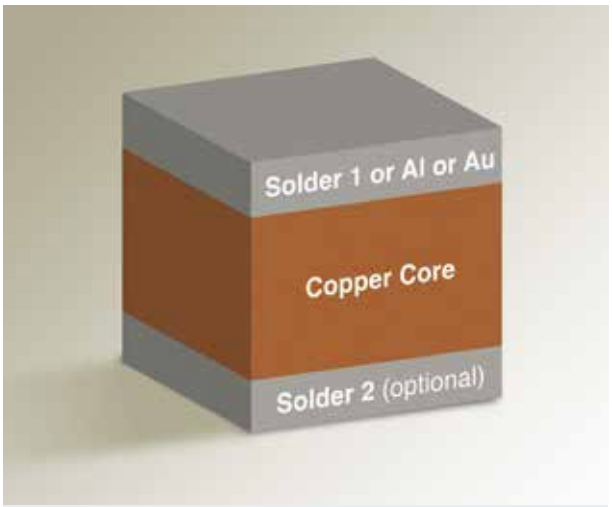


Copper Core Connect™

COINING's Copper Core Connect™ enables designs for making a final, high-power, wire/ribbon connection to contact spots that otherwise cannot be reached or must be made in an earlier assembly step. The Copper Core Connect™ can be soldered to the ground level board and can be provided with the same or a different solder topside for placing a component at the required height or making an elevated connection.

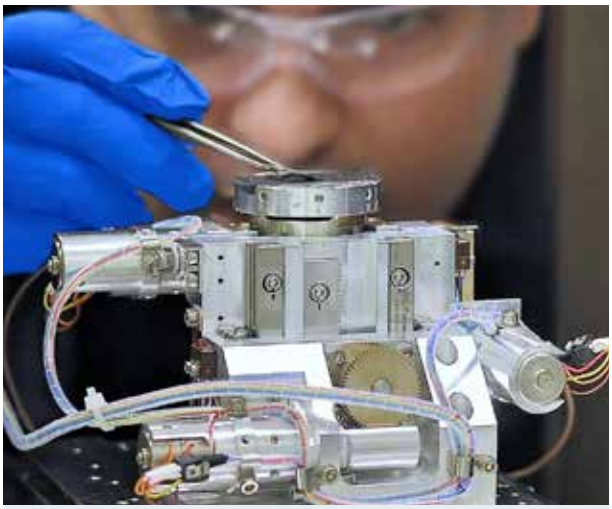
Our Copper Core Connect™ are available in Solder/Cu/Solder and Solder/Cu/Al (Au) configurations for soldering and Wire/Ribbon bonding.

For Soldering Applications

- Configuration: Solder1/Cu; Solder1/Cu/Solder2
- Total Thickness: 0.010"
- Solder 1 & 2 Thickness: 0.001" to 0.003" Typical
- Solders: Bi57Sn42Ag1
  (melting range 138-140°C)
  Sn96.5Ag3Cu.5 (melting range 217-218°C)
  Au80Sn20 (melting point: 280°C)
  Pb95Sn5 (melting range: 305-314°C)

For Wire/Ribbon Bonding Applications

- Configuration: Cu/Al; Solder2/Cu/Al; Solder2/Cu/Au Total Thickness: 0.010"
- Solder 2 Thickness: 0.001" to 0.003" Typical
  Al layer Thickness: 0.001" to 0.002" Typical



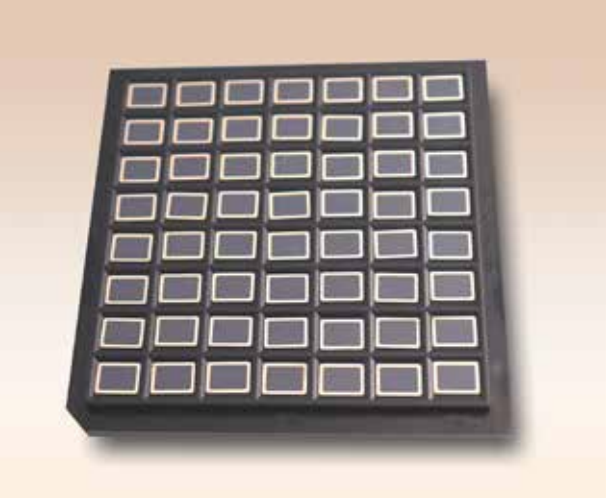
Lab Services

COINING has completed A2LA accreditation and now offers analytical laboratory and failure analysis services. Our industry leading analytical laboratory is staffed with experienced material scientists and metallurgists. Our lab is equipped with the latest generation of instruments to measure bulk compositions, trace impurities and bulk physical characteristics.

All our testing methods meet or exceed ISO-17025 requirements for testing laboratories, ensuring the accuracy and integrity of test analyses.

We offer the following analytical services:

- Bulk composition and trace impurity analysis of pure metals and alloys. Accuracy to ppb levels
- Carbon and Sulfur weight percent analysis in metals. Minimum detection 0.5 ppm
- Oxygen and Nitrogen weight percent analysis in metals. Minimum detection 0.5 ppm
- Qualitative surface chemistry and analysis
- Low temperature (<500°C) material melting points with accuracy to 0.5°C
- Knoop and Vickers hardness testing per ASTM E92
- Grain determination up to 1000x capability



Precision Packaging

Waffle Pack

COINING can package its parts in embossed or pocketed plastic trays called waffle packs. The waffle packs are loaded so that each pocket contains one part oriented properly. The parts are typically covered with anti-static paper and a foam-covered crown which holds the parts in place. Followed by a lid that secures the waffle package together.

Waffle packaging is beneficial for parts that are extremely small or unusual in shape. Waffle packaging permits the automated loading of parts as small as 0.0005 inch in the smallest dimension.

Advantages:

- Eliminates or reduces significantly the defects created by handling:
  - Contamination during handling and transportation between the operations
  - Mechanical defects (bends, chips, warpage, etc) occurring during handling/packaging/transportation
  - Exposure to the ambiental elements
- Allows a wider range of materials and sizes to be used in an automated process by supplying the parts in a package suitable for automated placement



Packaging Solutions

Tape and Reel

COINING's Tape and Reel packaging service is a value- added process of placing preforms and microstampings onto carrier tape before shipping to customers.

Pocket Tape

Plastic tape embossed with pockets. During the taping process, the parts are placed in the pocket and secured in position with a separate cover tape. Pocket tape is available in both standard and custom sizes.

Surf Tape

Surf tape is tape with an adhesive back layer. The back layer holds the part in place without the use of cover tape. It works well with small parts where exact orientation is important. Holding the parts with an adhesive prevents movement and alignment problems.

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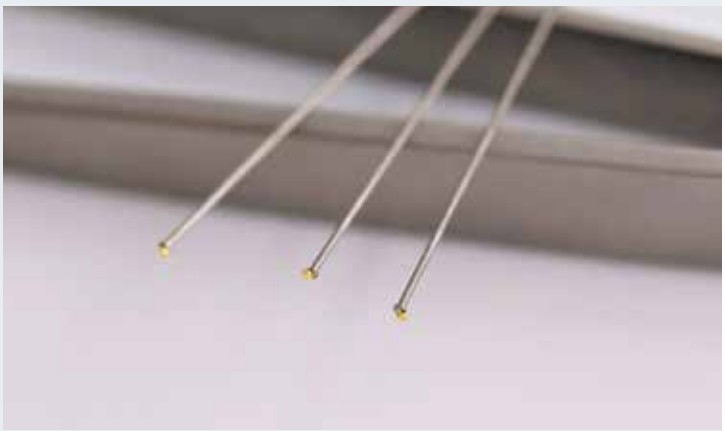

COINING at a Glance

COINING is a world-class manufacturer of micro components that have a big impact on people's lives. From sensors and satellites to implantable electronics, our high-performance metal products operate in a vast range of mission critical applications worldwide.

For people who demand precision, flexibility, and speed, COINING is the market leader in custom alloys, microstampings and solder preforms. COINING also offers specialized bonding wire, precision thermal management materials, and hermetic solutions.

In fact, we're the largest solder preform manufacturer in the world. With a broad range of products, the most extensive library of preform dies in the industry - about 15,000 different tools - and our very own COINING labs to make custom alloys, we can move faster to market than our competition.

Regardless of what you're looking for, we're your go-to team for high-performance, high-precision components custom-designed to meet your unique needs.

COINING is part of the AMETEK Specialty Metals business within AMETEK Inc., a leading global provider of electronic instruments and electromechanical devices.







ABOUT AMETEK SPECIALTY METAL PRODUCTS

AMETEK Specialty Metal Products consists of six leading manufacturers of advanced metal products based in the USA and UK: Fine Tubes, Superior Tube, AMETEK Eighty Four, COINING, Hamilton Precision Metals, and AMETEK Wallingford.

Our extensive product range includes thermal management materials, metal tubes, strip, shaped wire, clad plate, powder, bonding wire and ribbon, solder preforms, and bond pads.

From powering aircrafts and space rockets, to advancing medical care, and accelerating the transition to renewable energy – our precision materials enable technological innovations.

AMETEK Specialty Metal Products is a business of AMETEK Inc., a leading global provider of industrial technology solutions serving a diverse set of attractive niche markets.

COINING™ / AMETEK® SPECIALTY METAL PRODUCTS

15 Mercedes Drive, Montvale, NJ 07645, UNITED STATES

E: coining.info@ametek.com | **T:** +1 201 791 4020

www.ametek-coining.com

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