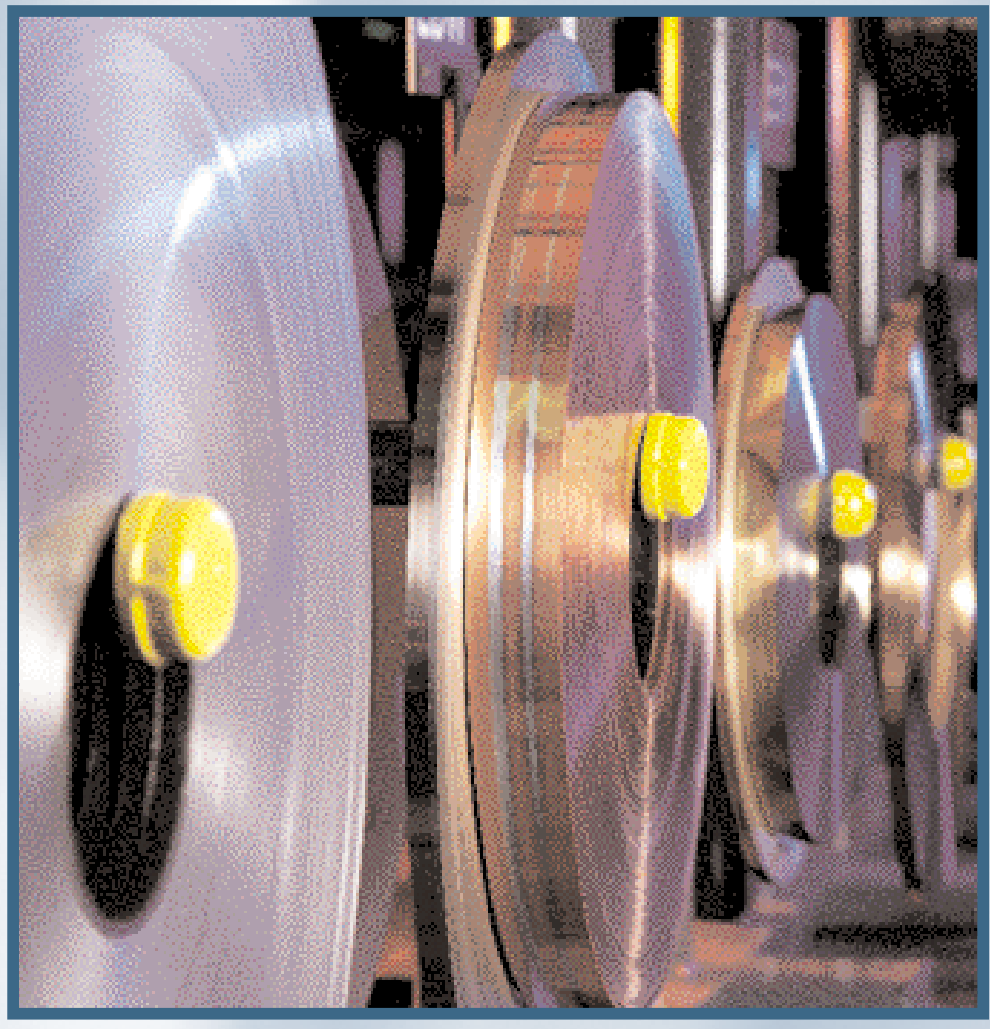
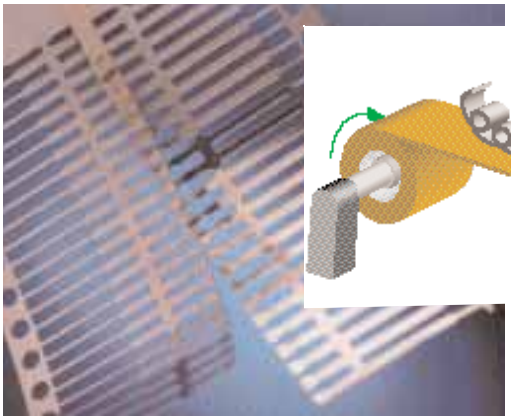
TMI

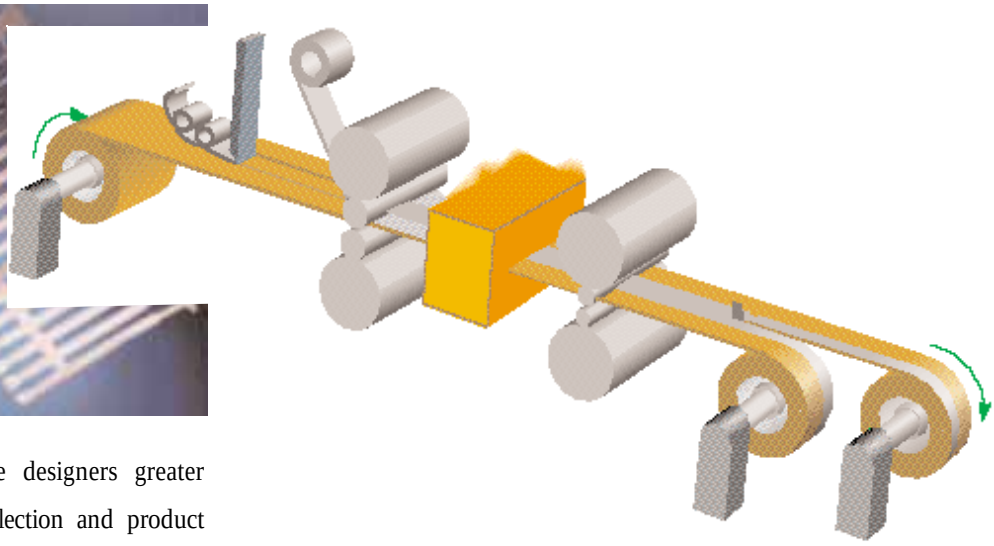
TECHNICAL MATERIALS, INC.



ENGINEERED METAL SYSTEM SOLUTIONS

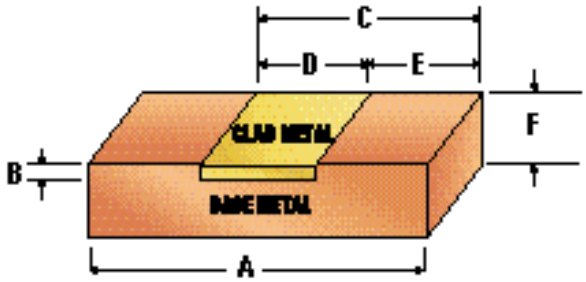
The Advantages of Cladding



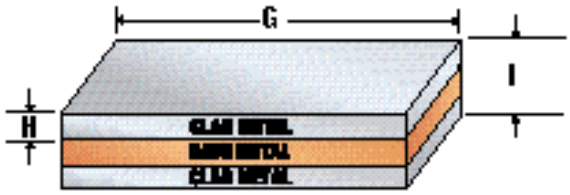


Our cladding process give designers greater latitude in both material selection and product design. We can produce clad inlays or overlays on one or both base metal surfaces with precious or non-precious metal combinations. TMI is capable of embedding up to eight selective stripes (per side) of precious metal or brazing alloy in any kind of a base metal to increase design flexibility, eliminate sub-assembly operations, and maximize precious metal resources.

Dimensions and Tolerances Possible with Clad Inlays/Overlays

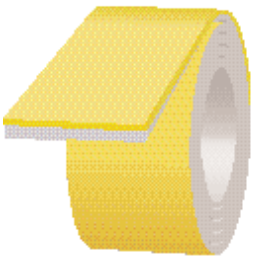


CLAD INLAY



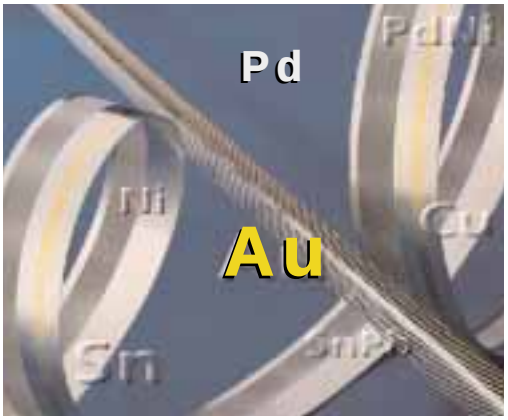
CLAD OVERLAY

Inlay Dimensions Characteristics			
A. Strip Width	Minimum Maximum	3.0 mm 110 mm	0.12 in 4.3 in
B. Inlay Thickness	Minimum Maximum	0.0005 mm 0.5 mm	0.00001 in 0.001 in
C. XXXXX	± 0.25 mm		
D. Inlay width	Minimum	1.5 mm	0.059 in
E. XXXX	± 0.25 mm		
F. Strip Thickness	Minimum Maximum	0.075 mm 2.5 mm	0.12 in 0.098 in
Overlay Dimensions Characteristics			
G. Strip Width	Minimum Maximum	1.5 mm 110 mm	0.059 in 4.3 in
H. Overlay Thickness	Minimum Maximum	0.0005 mm 1.0 mm	0.00001 in 0.039 in
I. Strip Thickness	Minimum Maximum	0.075 mm 2.5 mm	0.12 in 0.098 in

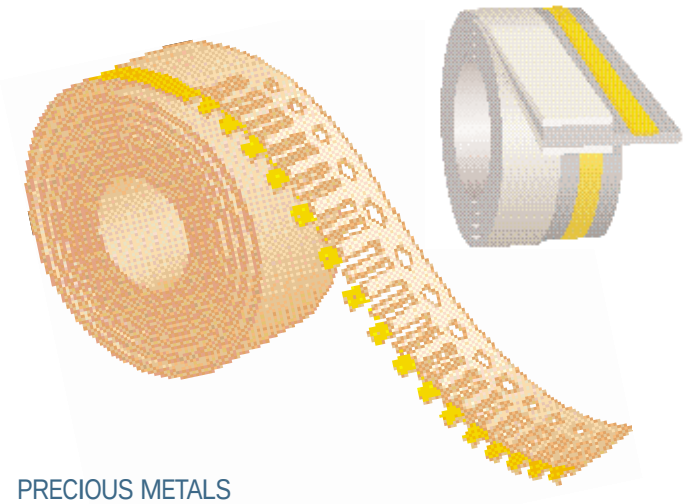




Superior Quality At A Competitive Cost



With over 30 years of experience in specialty strip metal manufacturing and more than 10 years of experience in the reel-to-reel electroplating business, TMI provides state-of-the-art spot, stripe and overall electroplating services on reel-to-reel strip and stamped parts. We offer a wide range of coatings, including Au, PdNi, Pd, Sn, SnPb and Ni, and deliver superior precision and quality at a competitive price.Plating can be combined with other TMI technologies.

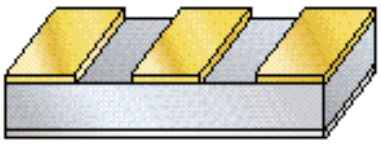


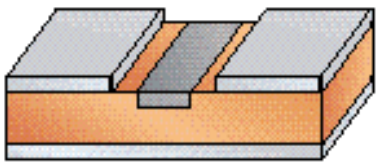
PRECIOUS METALS

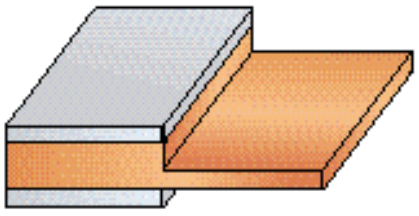
Type		Spot
Capability	Overall and selective stripes on strip Stripe on stamped parts	Spot on stamped parts
Base Materials	All materials except Al-based	All materials except Al-based
Base Dimensions	Gauge .001" - .032" Width up to 3.5"	Gauge .001" - .032" Width up to 2.9"
Plating Materials	Hard Au (Ni hardened), Soft Au = Au > 99.99% Pd, PdNi, Ni, Sn SnPb alloys	Hard Au (Ni hardened), Soft Au = Au > 99.99% Pd, PdNi, Ni, Sn SnPb alloys
Coil SIze	ID per customer requirement, OD max 42"	ID per customer requirement, OD max 42"
Coil Weight	Maximum 1000 lbs.	Typical 50 lbs.

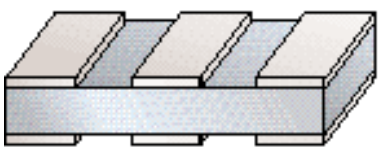
NON-PRECIOUS METALS

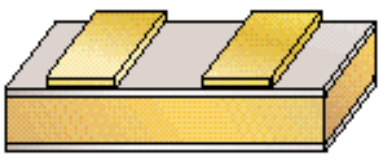
Type	Stripe/Overall
Capability	Overall and selective, stripes on strip
Base Materials	All materials except Al-based
Base Dimensions	Gauge .001" - .032" Width up to 6"
Plating Materials	Ni, Cu, Sn, SnPb alloys
Coil Size	ID per customer requirement, OD max 42"
Coil Weight	Maximum 1000 lbs.

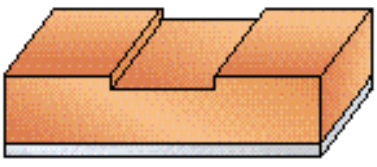

NICKEL SILVER


PHOSPHOR BRONZE

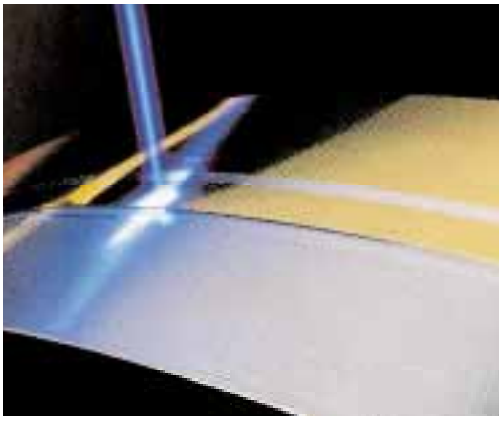

COPPER


NICKEL IRON

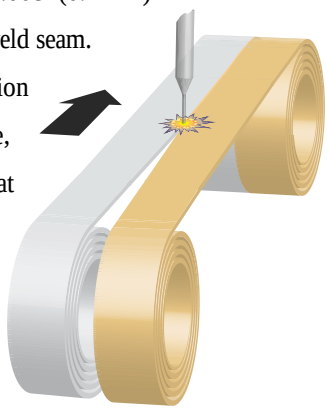

BRASS


BERYLLIUM COPPER

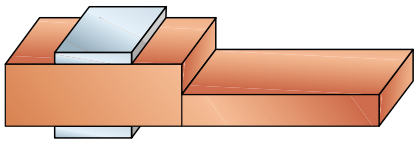
Improving Productivity By Maximizing Component Performance



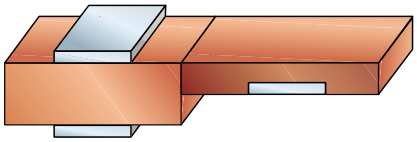
An electron beam produces a higher energy in the weld zone than any other commercial technology, including lasers. The electrons, which achieve a velocity roughly half the speed of light, are focused to a narrow spot - approximately 0.008" (0.2 mm) diameter at the weld seam.



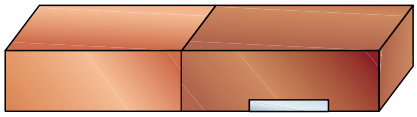
The combination of an intense, concentrated heat source and a relatively fast strip speed the beam - 4" to 6" (100 to 150 mm) per second results in an extremely fast melting and freezing rate. This very rapid cooling rate gives the EB Weld a unique metallurgy that allows dissimilar metals to be successfully joined that might otherwise be deemed “unweldable”.



- *Profile with solder stripes*

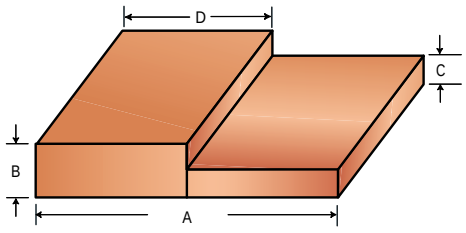


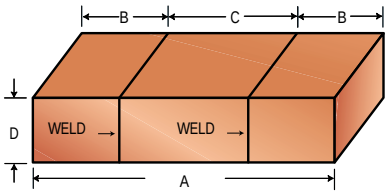
- *Electron Beam Welded Profile with inlay and solder stripes*



- *Electron Beam Welded Combination with inlay*

Dimensions and Tolerances Possible with Electron Beam Welding





	Dimensions	Tolerances	
A Total Width	Single Weld - As Welded	7.5 mm - 127 mm 0.30 in - 5 in	±.127 mm ±.5 in
	Double Weld - As Welded	12.7 mm - 127 mm 0.5 in - 5 in	±.203 mm ±.8 in
	Weld Metals Then Slit	3.2 mm - 127 mm 0.13 in - 5 in	±.076 mm ±.0.003 in
B & C	Each Dissimilar Metal - As Welded	1.6 mm - 121 mm 0.06 in - 4.8 in	±.076 mm ±.0.003 in
	Slit after Weld	0.5 mm - 121 mm 0.02 in - 4.76 in	±.127 mm ±.5 in
D	Thickness As Welded	0.127 mm - 2.0 mm 0.003 - 0.08	± 5.0% ± 5.0%
	Roll after Weld	0 .076 mm - 1.0 mm 0.003 - 0.04	± 5.0% ± 5.0%
	Zone Annealed	0.076 mm - 1.27 mm 0.003 in - 0.05 in	± 5.0% ± 5.0%

Limitations: Excludes most zinc-containing brasses and nickel silvers.

Market and Product Experience

Automotive

Connectors
Terminals
Switches
Bond Pads
Lead Frames

- Air Bags
- Anti-Lock Brakes
- Mass Airflow Controls
- Speed Controls
- Powered Accessories
- Sensors

Telecommunications

Connectors

- Switching Systems
- Cellular Phones
- Shielding Materials

Computers

Connectors

- Switches
- Lead Frames
- Heat Sinks
- Solder Clips for Multichip Modules

Other Industries Served

- Appliances
- Consumer Products
- Medical
- Aircraft
- Jewelry

A Wide Choice of Component Materials

TMI offers a virtually unlimited variety of component materials. Shown below are many of the more common materials. Ask your TMI representative about other selections.

Typical Base Metals

Copper
Brass
Bronze
Beryllium Copper
Steel
Aluminum
Cupronickel
Nickel Silver
Stainless Steel
Nickel Alloys
Titanium

Typical Solder Coatings

100 Sn
90 Sn, 10 Pb
60 Sn, 40 Pb
96.5 Sn, 3.5 Ag
22 Sn, 62 Pb, 10 Bi, 3 Ag
27 Sn, 70 Pb, 3 Ag

Other Coatings

Copper
Nickel
Aluminum

Typical Precious Metals

24 Kt Gold	99.99 + Au
18 Kt Gold	75 Au, 25 Ag
14 Kt Gold	58 Au, 42 Ag
12 Kt Gold	50 Au, 50 Ag
WE#1	69 Au, 25 Ag, 6 Pt
Other Gold Alloys	70 Au, 24 Ag, 6 Cu 70 Au, 20 Ag, 10 Cu 65 Au, 21 Pd, 14 Ag 96 Au, 4 Ni 90 Au, 10 Ni
Palladium	99.9 Pd
Palladium Alloys	PdAg PdNi
Gold Flash Palladium Nickel	Au/PdNi
Gold Flash Palladium Silver	Au/PdAg
TMI 305 (DGR156)	Diffused Au 60 Pd, 40 Ag
Platinum	99.9 Pt
Fine Silver	99.9 Ag
Coin Silver	90 Ag, 10 Cu
BT Braze Alloy	72 Ag, 28 Cu
Silver Cadmium Oxide	AgCdO
Silver Tin Oxide	90 Ag, 10 SnO
Paliney 6	44 Pd, 38 Ag, 16 Cu, 1 Pt, 1 Ni
Paliney 7	35 Pd, 30 Ag, 14 Cu, 10 Au, 10 Pt, 1 Zn

THE WORLD OF SPECIALTY STRIP METALS - WWW.TECHNICALMATERIALS.COM



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