

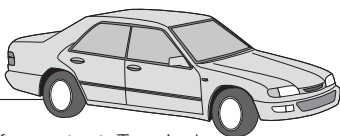

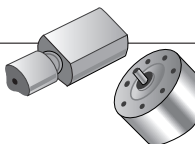
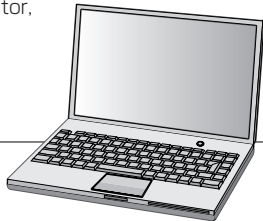


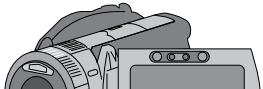
Precious Metal Stripe and Spot Plated Strip



Plated Products are Used in Various Applications

Various Plated Products of Furukawa Electric

Furukawa Electric has established an integrated manufacturing system for plated products covering the entire process from manufacturing of copper and copper alloy strip to final surface treatment. We can offer a variety of product variations, which will make significant contributions in terms of cost reduction due to saving of precious metals, improvement of productivity, compliance with Pb-free solder as well as enhancement of performance and reliability of final products.

Product group		Category		Main applications
		Base metal	Surface treatment	
Strip	Sn plating	Copper and copper alloy	Sn reflow plating	Connector, Terminal 
	Ag plating	Copper and copper alloy	Ag plating	Switches for contact, Terminal 
	Ag plated SUS 301/304	SUS 301/304	Ag plating	Disk spring for contact in mobile phones
	Ag-Sn alloy plating	Copper and copper alloy	Ag-Sn plating	Wear-resistant contact 
	Pd plating	Copper and copper alloy	Pd plating	Highly corrosion-resistant contact, Sliding contact, Micromotor brush, Commutator
	Precious metal stripe and spot plating	Copper and copper alloy, SUS 301/304	Au stripe plating, Au spot plating, Pd stripe plating	Contact, Connector, Terminal 
Wire	Ag plating Ni plating	Copper and copper alloy	Ag plating, Ni plating	Lead wire 
Composite material	Precious metal stripe and spot plating	Stamped material of copper and copper alloys	Au selective plating Au + Pd + Ni plating	Connector, Terminal 
	Resin coating	Copper and copper alloy, SUS 301/304	Resin + plating	High-frequency component, Connector 

Including Electronic Equipment, Automobiles, etc.

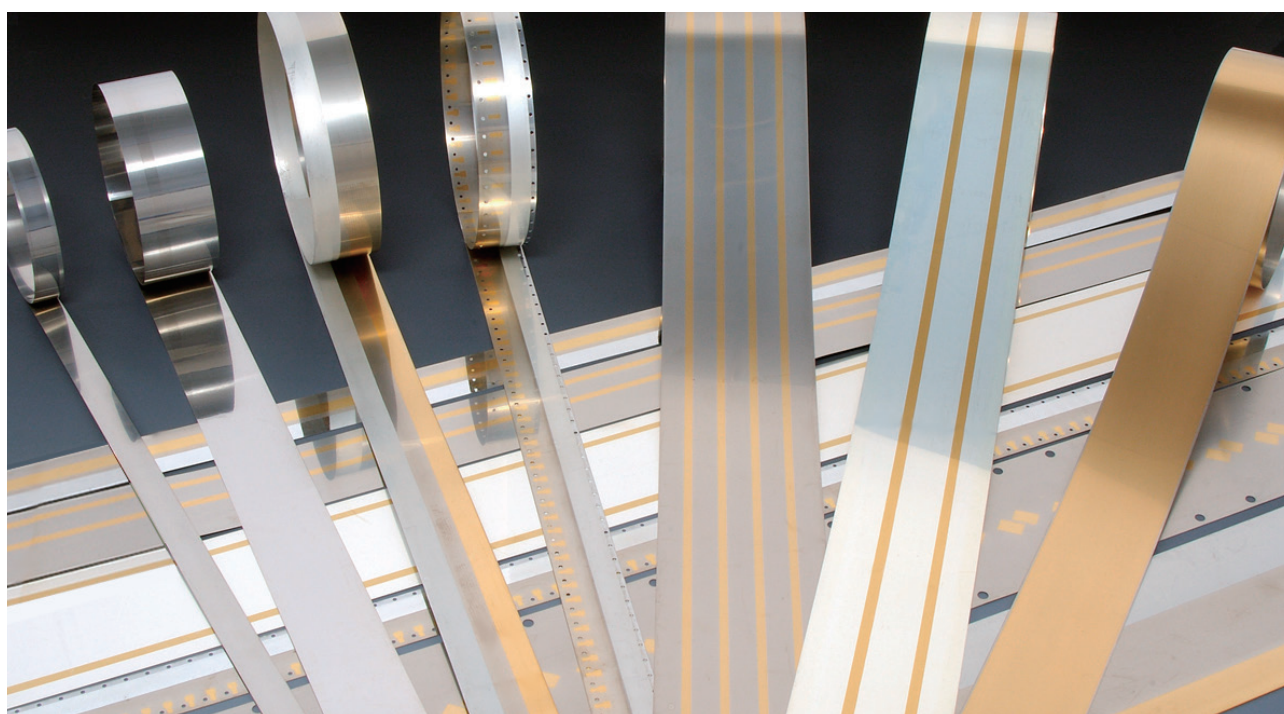


Features of Precious Metal Stripe and Spot Plated Strip

- 1.** Integrated production from manufacturing of raw materials to surface treatment offers the following:
 - Proposal for optimized combination of copper alloy strip and precious metal plating.
---e.g. gold or palladium selective plating on a copper alloy strip or silver stripe plated strip.
 - Comprehensive quality assurance from raw materials to final plated products.
 - Supply of plated strip with superior bendability best suited for customers' stamping process.
 - Stamping of pilot hole for spot plating is available in-house enabling significant reduction of lead time.
- 2.** Since special jigs for partial plating are used eliminating expensive tape masks, selective plating with reduced cost and high positional accuracy is offered.
- 3.** Furukawa Electric's outstanding plating technology enables to offer plated products having excellent distribution in plating thickness.
- 4.** Due to high-performance plating lines, the gold and tin plating + reflow can be carried out in a single process, excluding certain special products.
- 5.** The quality of plated products is supported by high-performance equipment and sophisticated analysis technology of R&D division of Furukawa Electric.

Products available of Precious Metal Stripe and Spot Plating

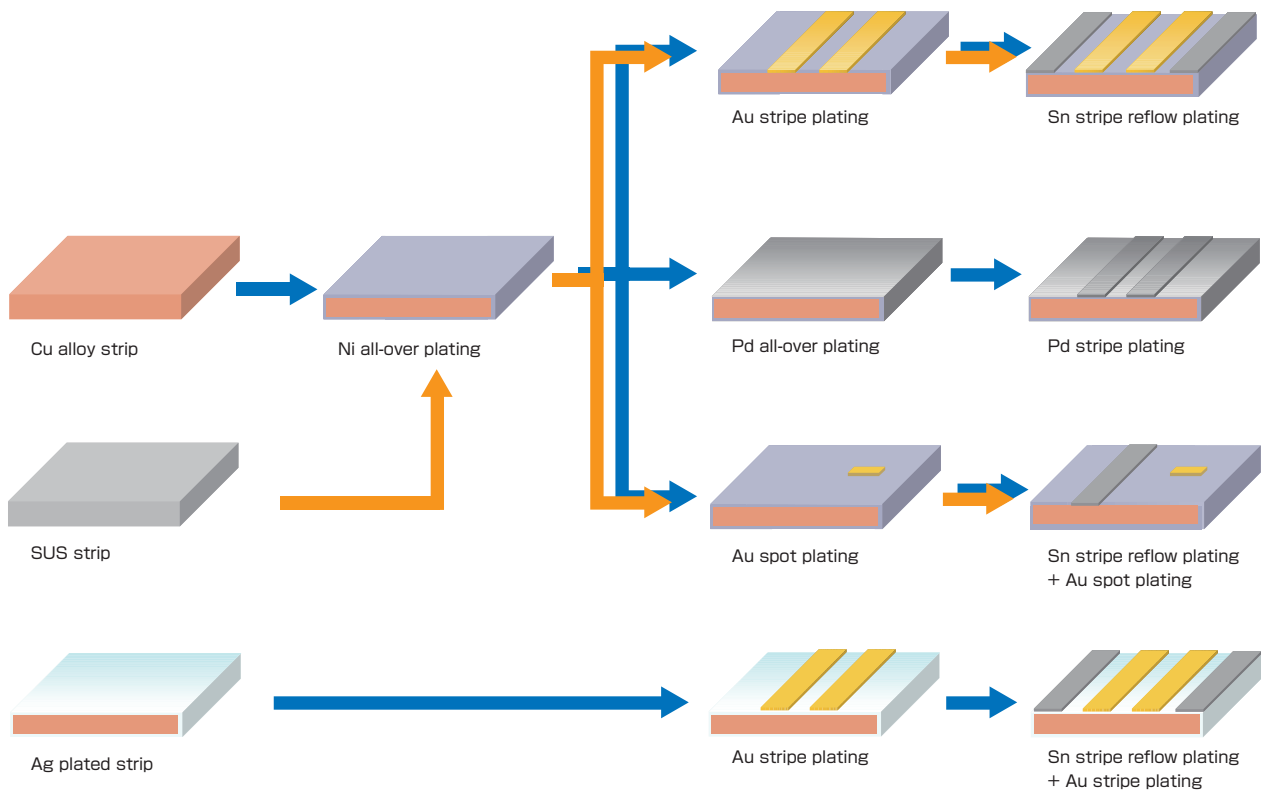
Item		Products available	Notes
Type of substrate		Cu, Cu alloy, SUS 301/304 strips	<ul style="list-style-type: none"> · Ag plated strip can be plated · Flat-stamped strip can be plated (all-over plating only) · Not applicable to certain alloys (please contact with us)
Strip thickness		Cu group: 0.05 ~ 0.64 mm SUS group: 0.05 ~ 0.3 mm	· Pd can be plated on special substrate with thickness from 0.03mm
Strip width		Cu group: 10 ~ 100 mm SUS group: 10 ~ 70 mm	· Contact with us for other sizes
Coil inner diameter		200, 250, 300, 400mm	
Type of plating	Primary	All-over matte Ni plating	
	Cover	Hard Au plating (Au-Co), Matte Sn plating or reflow, Pure Pd plating	<ul style="list-style-type: none"> · In case of Au plating, combination with Sn stripe plating is available · In case of Pd plating, all-over Au flash plating is available



Specification of Plating

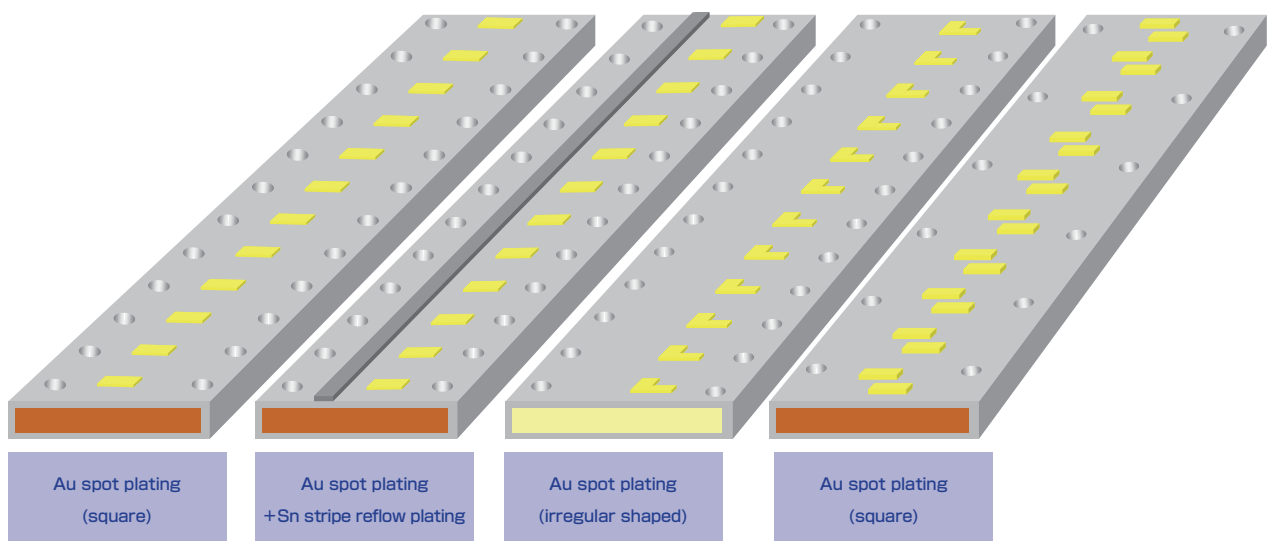
Plating type	Item	Products available	Notes
Stripe plating	Width of stripe	0.5 ~ 30 mm	Precision is ± 0.25 mm
	Number of stripe	Any number of stripe, at 2.5-mm spacing	
	Position of stripe	Above 2 mm from the edge of strip	Depending on the type of product up to the edge of strip is possible
	Plating thickness of each stripe	Up to two different thicknesses is possible	
	Plating side	Single side / both sides	
	Sealing treatment	Available with Au-plated finished products	
Spot plating	Type of spot plating	Au	Combination with Sn stripe plating is available
	Spot plating side	Single side / both sides	
	Minimum plated size	2 mm \times 2 mm square	Contact with us for other shapes
	Sealing treatment	Available with Au-plated finished products	
	Others		Raw material, stamping pilot hole and plating is manufactured in-house and totally quality assured

Examples of selective Precious Metal Plating



We will respond to customers' requirements with an abundant variety of products based on various combinations of substrate and plating specifications. Please inquire for other specifications not shown here.

Typical Patterns of Precious Metal Spot Plating

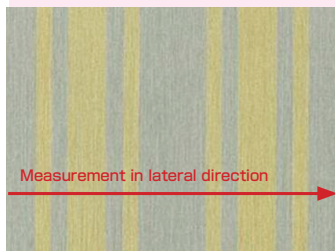


We will meet to your requirements for the shape of spot plating, e.g., circular, irregular shaped, etc. to adapt the applications, Please feel free to contact with us.

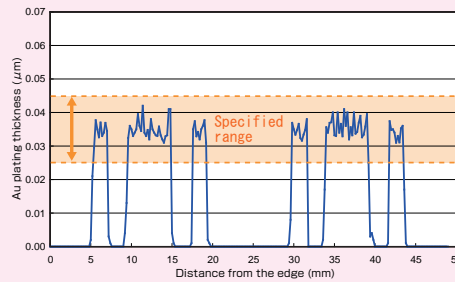
Advantages of Furukawa Electric's Plated Products (Au Plating Thickness Distribution)

We offer plated products with excellent plating thickness distributions, which have been realized taking advantage of the plating technology we have accumulated for years and the use of special plating jigs.

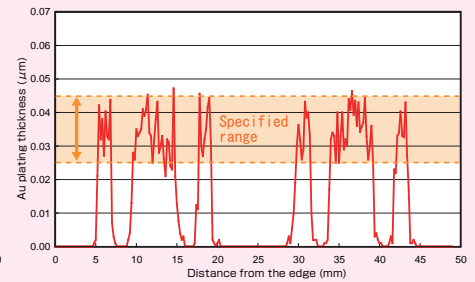
Stripe Plating



Furukawa Electric's product



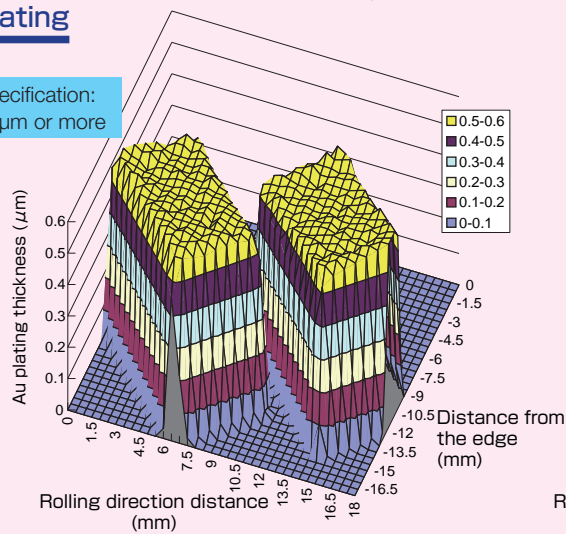
Other company's product



Spot Plating

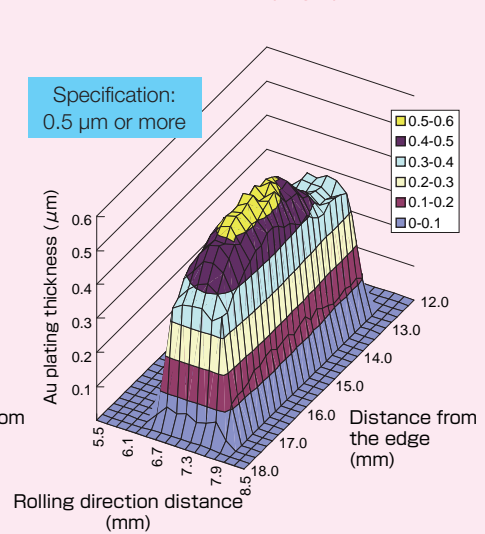
Furukawa Electric's product

Specification:
0.5 μm or more



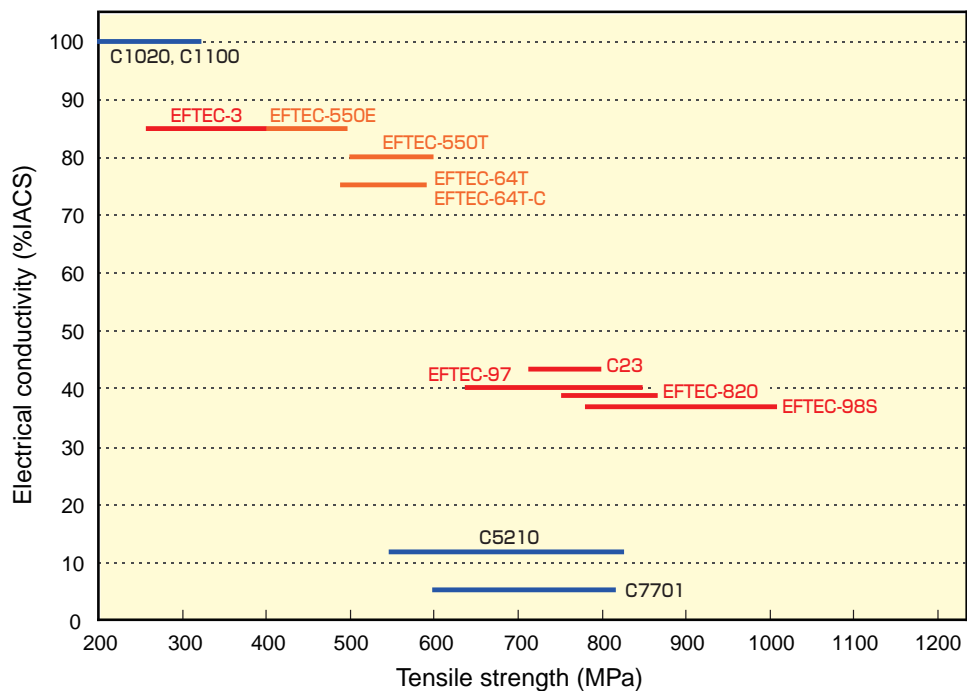
Other company's product

Specification:
0.5 μm or more



Relationship between the Strength and Electrical Conductivity of Various Copper Alloys

Furukawa Electric offers a variety of precious metal plated products combined with our high-performance alloy strips. And also offers the plated strips which are suitable for stamping by raw materials with superior surface quality.

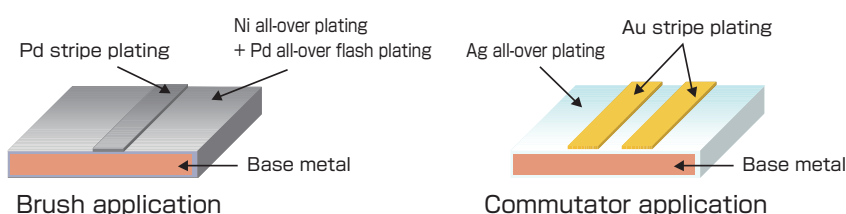


Application to Micro Motor Contacts

Our company is manufacturing plated products for micro motor brush and commutator applications. Previously, Cu alloy strips which were clad with precious metal foil like Au, Pt, Pd, Ag etc. had been used for these applications. But the large amount of precious metals used for them and their complicated manufacturing process made these materials themselves so expensive.

Then our company developed Pd-plating for brush application and Au- and Ag-plating for commutator application to reduce the production cost drastically, which were received by our customers favorably.

These plating have also a merit of increasing the life of not only micro motor but also movable contact like brush for encoders.



Products available of Pd-plated strips for micro motor brushes

Item	Products available	Notes	
Type of base metal	C7701 C5210, EFTEC-97, EFTEC-550 and others	· Some alloys cannot be plated in this way (please consult us)	
Plate thickness	0.030 to 0.20 mm		
Plate width	10 to 50mm		
All-over base plating	Standard: matte Ni 0.5 μm Range: 0.1 to 2.0 μm		
All-over Pd flash plating	0.01 to 0.03 μm	· The plating thickness is out of our warranty	
Pd stripe plating	Plating thickness	Standard: 0.5 μm , 1.0 μm Range: 0.1 to 2.0 μm	
	Stripe width	0.5 to 30 mm	· Standard positioning accuracy: ± 0.25 mm
	Number of stripes	Standard: one or two Range: one to four	

Products available of Au- and Ag-plated strips for commutators

Item	Products available	Notes	
Type of base metal	EFTEC-3 C1020, C1100 and others	· Some alloys cannot be plated in this way	
Plate thickness	0.08 to 0.50 mm		
Plate width	10 to 80 mm		
Ag plating	Standard: 4 μm on contacting surface: 1 μm on rear surface Range: 0.5 to 10 μm		
Au stripe plating	Plating thickness	Standard: 0.05 μm , 0.1 μm Range: 0.02 to 0.5 μm	
	Plating width	0.5 to 30 mm	· Standard positioning accuracy: ± 0.25 mm
	Number of stripes	Standard: one or two Range: one to four	

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