

Even on materials which cannot be plated by sputtering or vapor deposition method!

# With the new MARBS plating technology it is feasible!



We are a printed circuit board company with a 50 years history from Fukuoka ...  
We have developed a core technology that does not require using PCBs.  
For materials and application which cannot be handled by sputtering or vapor deposition it became possible to achieve the result using the MARBS production method.

Plating is possible on large formats and double-sided boards as well as inside through holes.  
Electrolytic plating is also possible, thus thickness can be achieved.  
Those who are looking for new functional materials and those who are worried about material properties and adhesion strength - please make sure to contact us.

## List of plating test results by MARBS production method (as of January 2019)

Material		Plating	Plating thickness	Peel strength (N/cm)	
Teflon-type	PTFE (tetrafluoroethylene: teflon)	Cu	20μm	1.2 or more	
	RF-60A (PTFE + glass fiber cloth + ceramics)	Cu	20μm	7.0 or more	
	CER-10 (PTFE + glass fiber cloth + ceramics)	Cu	20μm	7.0 or more	
	TLY-5 A (PTFE + glass fiber cloth)	Cu	20μm	10.0 or more (3.0 or more during peak times)	
Special resin	Super engineering plastics	PPS (polyphenylene sulfide resin)	Cu	20μm	10.0 or more
		LCP (liquid crystal polymer)	Cu	20μm	2.8 or more
		PI Kapton® (polyimide sheet)	Cu	20μm	8.0 or more
	Engineering plastics	PC (polycarbonate resin)	Cu	20μm	Good adhesion properties
		PPA (polyphthalamide resin)	Cu	20μm	5.5 or more
	General purpose plastics	PP (polypropylene resin)	Cu	20μm	Good adhesion properties
		UP (unsaturated polyester resin)	Cu	20μm	Good adhesion properties
In general, good adhesion to other resinous materials					

Material		Plating	Plating thickness	Peel strength (N/cm)	
Glass-type	Soda-time glass	White plate glass <small>(high grade white glass)</small>	Cu	35μm	2.8 or more
		Blue plate glass <small>(low grade general soda-time glass)</small>	Cu	35μm	2.8 or more
		B270@i <small>(The ultra white glass by the German company Schott)</small>	Cu	20μm	1.7 or more
	Quartz borosilicate glass	Synthetic quartz	Cu	20μm	1.3 or more
Other	TEMPAX <small>(Low alkali borosilicate glass by the German company Schott)</small>		Cu	20μm	1.3 or more
	Silicon wafer		Cu	20μm	Good adhesion properties
	ferrite		Cu	20μm	Good adhesion properties
	Anodize		Cu	20μm	Good adhesion properties

Regarding the peel strength, this is not simply the final result but it is evolving through our constant improvements. It is also possible to prepare prototypes according to customer's needs with required strength and from desired materials.  
Plating is mainly done with copper, but other materials can also be used.  
Mass production will be quoted separately. We can also provide technical licensing, etc.



Please feel free to contact us for prototyping, quotations, etc.



## What is MARBS?

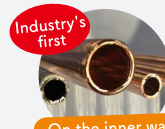
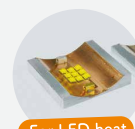
It is the next generation core technology which uses molecular bonding technology to convert the unusual into common sense.

It is the next-generation plating and three-dimensional wiring technology combining the "molecular bonding technology" which is drawing much attention in Japan with Hokkohsha's "plating technology with new ideas".



## For example, it can be implemented like this.

The MARBS production method is effective as the next-generation core technology for heat dissipation in LEDs, etc. and its efficient transfer to the heat sink. Polyimide is bonded on molecular level onto the aluminum heat dissipation material (heat sink). Copper is bonded on molecular level onto polyimide. Using masks for pattern formation, copper patterns are formed and electronic



components are mounted. It is possible to integrate the heat sink and heat generating parts which could not be realized through conventional heat dissipation technology. The MARBS production method can also be applied to three-dimensional structures.



Official website of Hokosha [www.hokkohsya.co.jp](http://www.hokkohsya.co.jp)

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We plan to constantly be uploading the latest test results on our homepage.



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MARBS Official Website ▶ <http://marbs.pro> ※Written in Japanese