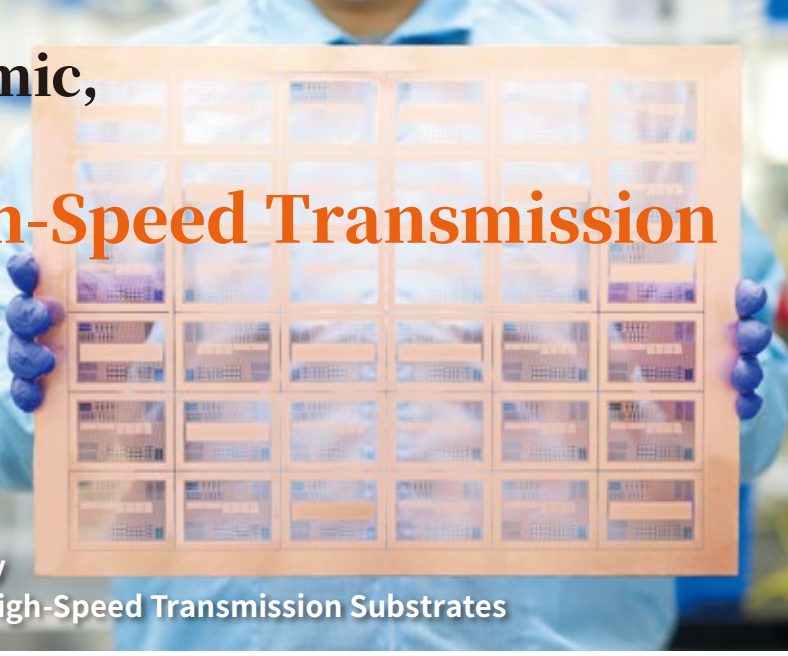
GWC Supports Glass, Ceramic, and Other Substrates for High-Frequency & High-Speed Transmission



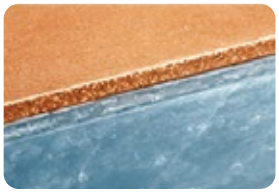
GWC

Glass Wet Cu Plating

KOTO's Proprietary Wet Copper Plating Technology
Advancing Next-Generation High-Frequency and High-Speed Transmission Substrates

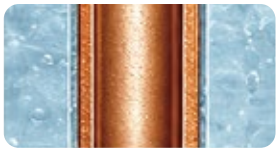
① Uniform Seed Layer and High Adhesion

A uniform seed layer provides high peel strength and strong adhesion.

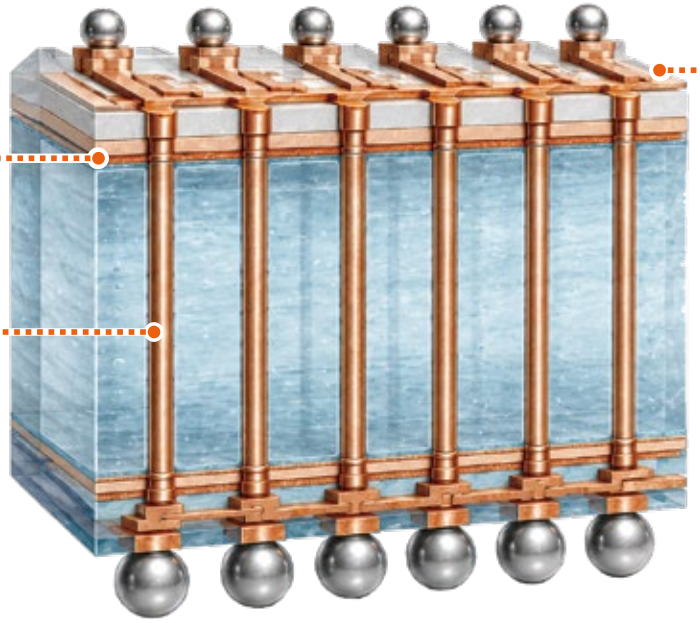


② Conformal Plating

The wet plating process provides excellent coverage for various 3D structures and supports TGVs with aspect ratios up to AR20.



Conceptual Cross-Section of a TGV Glass Interposer

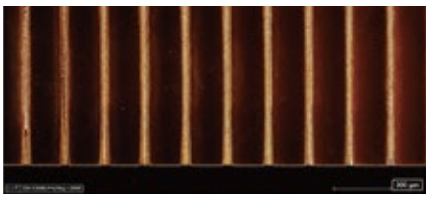


③ Smooth Surface Advantage for High-Speed RF Transmission

By avoiding surface roughening, GWC maintains a smooth interface. This helps reduce transmission loss at high frequencies, where the skin effect has a greater influence.

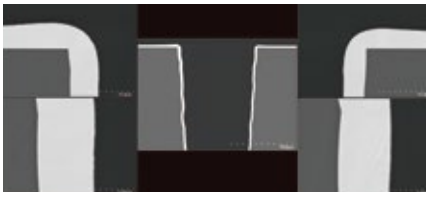
④ SAP-Compatible Fine-Line Patterning

The direct plating process without an intermediate layer allows easy seed layer removal during SAP, enabling narrow-pitch fine-line patterns.



TGV:ϕ50μm　AR20

GWC enables uniform seed layer formation even on the inner walls of microstructures.

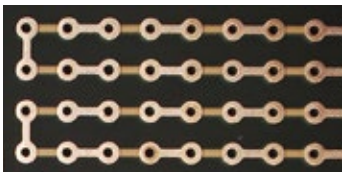


High-AR Via Cross-Section and Enlarged View

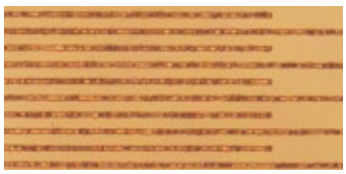
The smooth glass–copper interface demonstrates the effectiveness of our process, even for complex structures such as TGVs.

Fine-Line Circuit Patterns

Land pattern

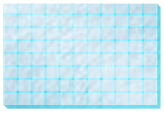


Daisy chain



L/S=4 μm / 4 μm

L/S=50 μm / 50 μm



Compatible with Large-Size Substrates
510mm×515mm

Compatible with Large-Size Glass Substrates.
GWC supports large-size glass substrates, meeting the growing demand for larger-area next-generation packages.

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GWC
Glass Wet Cu Plating

Opening New Possibilities for Next-Generation Devices with GWC
Cu Plating on Various Materials to Support Future Innovation

1 Cu Plating on Various Materials Adhesion Strength (90° Peel Strength)

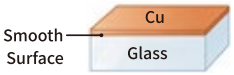
Materials	Adhesion Strength (kN/m)
Alkali-Free Glass	0.8
Borosilicate Glass	0.5
Fused Silica	0.4
Various Ceramic Materials	0.3 - 1.0
Sapphire	1.0

Cu Plating Technology for New Materials
Expanding Product Possibilities with Cu Plating on Various Materials

Key Features of GWC

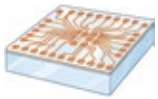

Excellent Coverage by Wet Plating Process

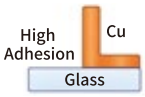

Enables Plating Inside High-AR Vias



No Surface Roughening


High Plating Coverage for Complex Via Structures


Fine-Line Patterning by SAP

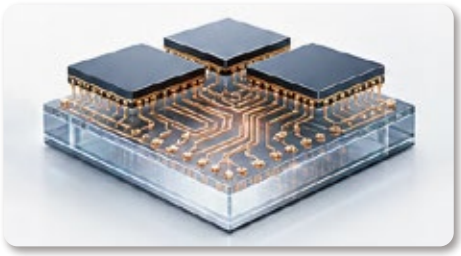


High-Adhesion Cu Plating

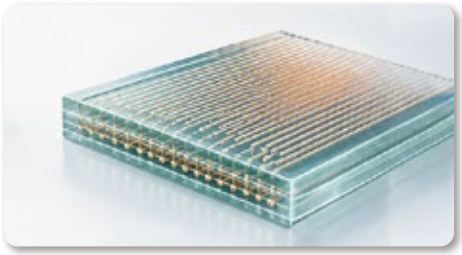
Excellent High-Frequency Performance for High-Speed Transmission

Easy Seed Layer Removal for Fine-Line Patterning

2 GWC Process Application Examples
Supporting next-generation devices for high-speed, high-capacity, and high-frequency applications.

Interposer

Next-generation chiplets enabling high-speed transmission performance

High-Speed Transmission
High-Density Packaging

Glass Core

Warpage suppression, higher density, and high-capacity data transmission

Low Warpage
Higher Density
High-Capacity Transmission

Communication Substrate

Communication Devices Requiring Excellent Insulation and High-Frequency Performance

High-Frequency Performance
Insulating Properties

3 Expanding GWC Applications to New Materials

The GWC process enables Cu plating on new materials,
expanding its application to a wide range of substrate materials.

High Adhesion Strength on a Wide Range of Materials
GWC achieves high adhesion strength not only on glass, but also on new materials such as ceramics.

Superior Performance for High-Frequency Applications
Fine, uniform Cu plating enables high Q-factor characteristics and helps enhance the performance of high-frequency devices.

Lower-Cost Potential Compared with Conventional Processes
By avoiding reliance on Ag paste or precious metals, GWC expands material choices and supports cost optimization.

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