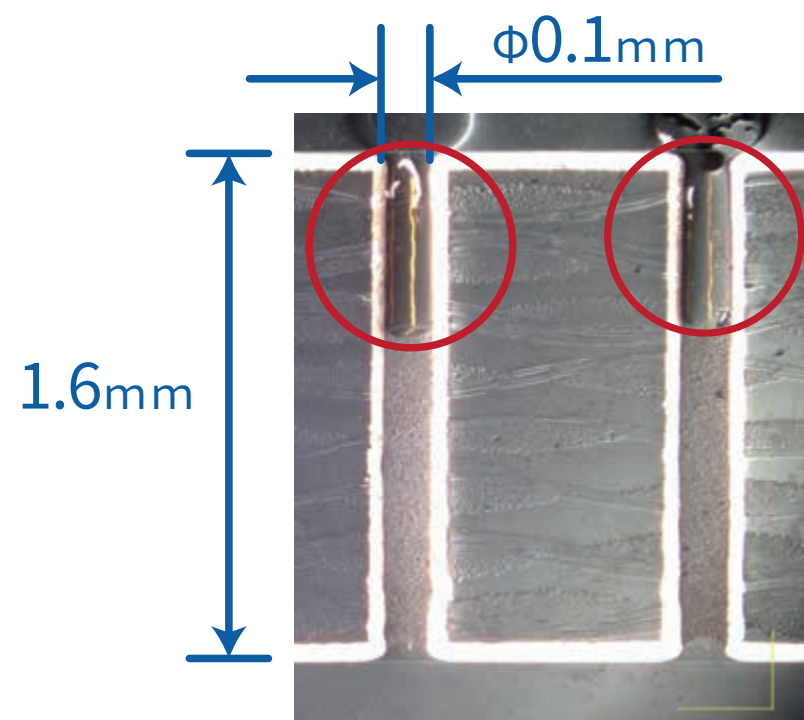


SERIA's Vacuum Filling Technology

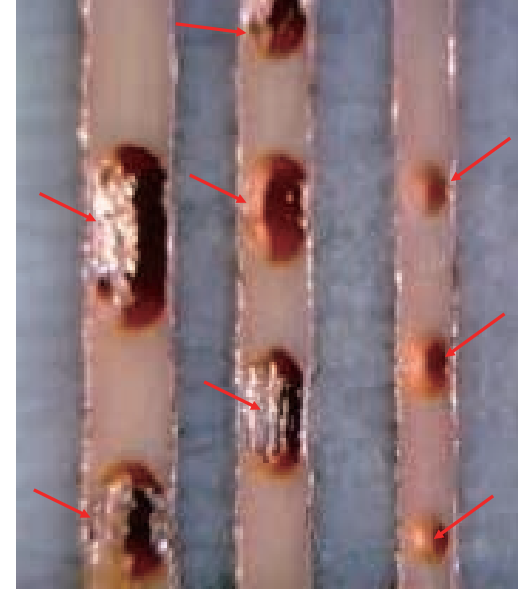
Challenges for Filling Holes with Atmospheric Printing

1. Paste does not fill due to small diameter



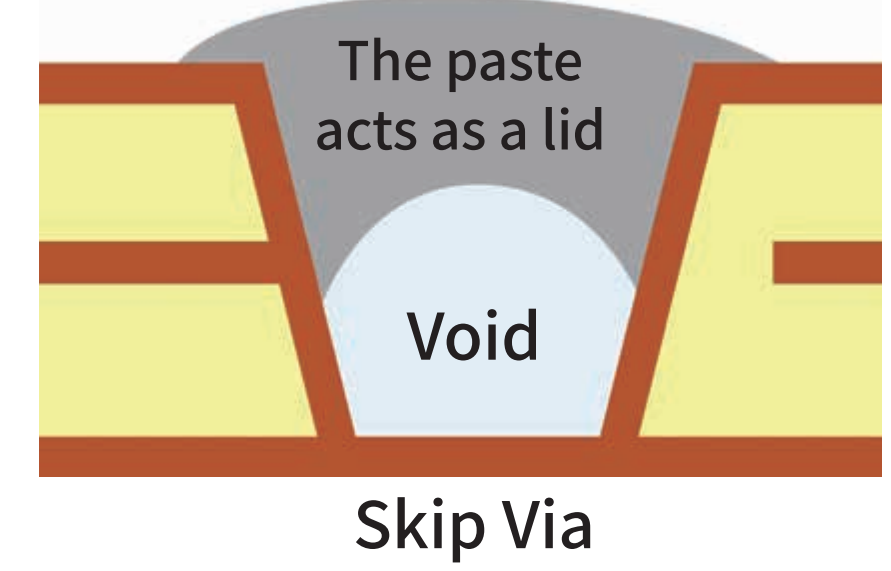
Small diameter through holes of $\Phi 0.1\text{mm}$ or less

2. Increasing the number of prints to fill the holes creates voids among prints



High Aspect: Aspect 6 or more

3. In blind vias, the ink acts as a lid and the air at the bottom of the via cannot escape

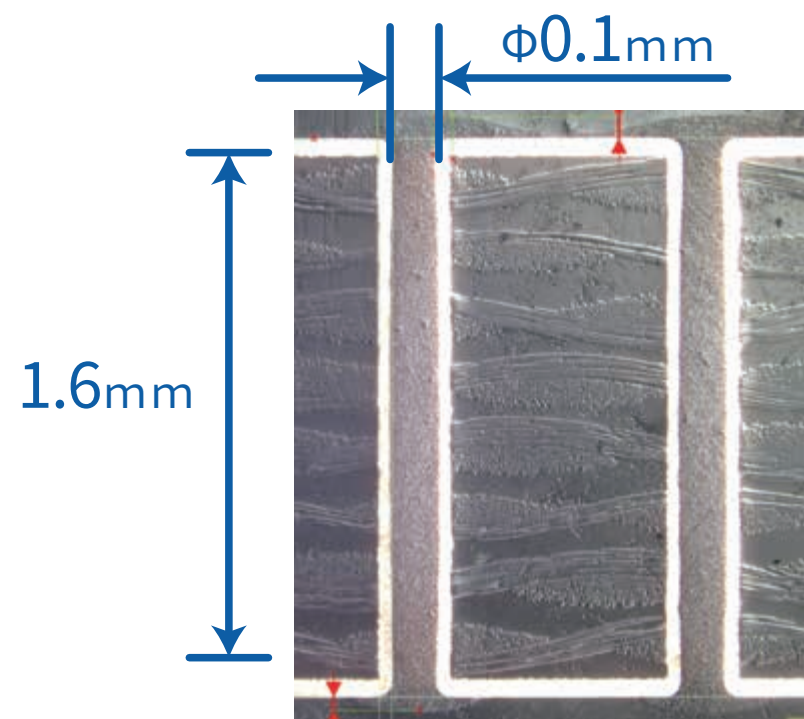


Branded Via (Bottom Via)

As miniaturization progresses, smaller diameter and blind vias are increasingly used in circuit boards, the atmospheric filling has become more difficult, and "**Void Inclusion**" has become an issue.

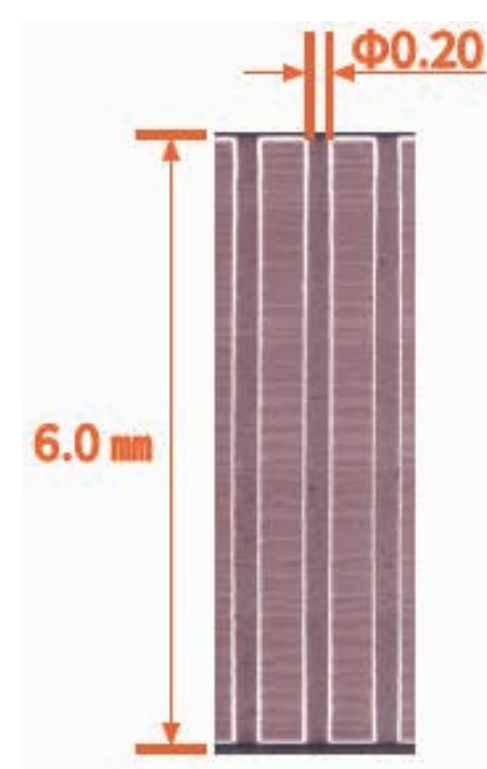
Filling Holes by Vacuum Printing (Voidless)

1. Small diameter through holes of $\Phi 0.1\text{mm}$ or less



Complete filling with 100Pa vacuum and unique printing

2. Because it is vacuum-filled, no voids are generated



Voidless Filling to Aspect 40

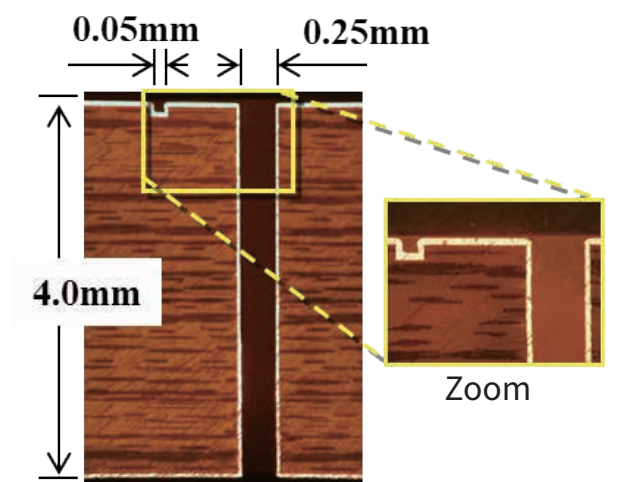
3. No voids are generated due to the vacuum, so it is possible to fill a mixture of through holes and blind vias



Skip Via



Blind Via Filling



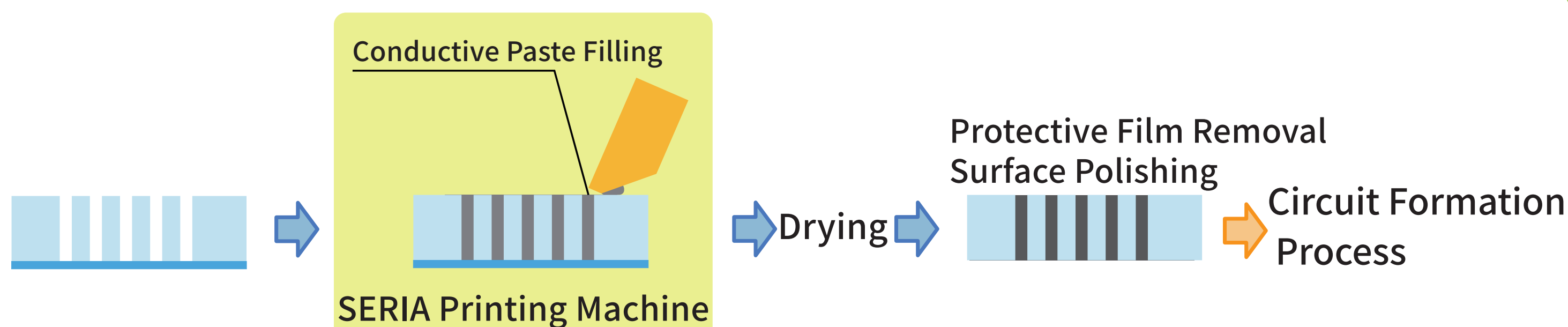
Simultaneous filling of through holes and blind vias

Vacuum filling improves the quality and reliability of the board

A New Proposal for Vacuum Printing

Glass Core/Glass Interposer

TGV filled with conductive paste



In addition to printing machines, we also offer as follows,

Automation

Cutting/Laminating Substrates

Sticking/Removing Films

Drying Machines

Electronic Components

Filling vias in green sheets and hard ceramics with conductive paste

