



## **Giga Connections, Inc. Back-End Board Flow**

The preferred Conductive Diamond Plate (CDP) flow involves Giga Connections performing all back-end plating on those surfaces requiring CDP (i.e., any surface requiring CDP is shipped as copper, following copper etch). If a special final height of the pads/traces to be plated is required, then additional build-up of copper on the surface is requested prior to CDP as the CDP process will only add an approximate 1 to 1.5 mils of topology to the pad (and generally plates outward from the pad by half this amount). Therefore, sizing of pads should take the outward plating into consideration when designing for minimum pad to pad spacing of less than 5 mils.

Giga Connections can preferentially plate specific features with CDP while not plating others by using a typical hard mask shipped from the board supplier. Dupont FX resist (1 mil) works well with our electroless chemical plating processes. Thus, any exposed pads/traces are plated with CDP, followed by resist removal, with a final electroless nickel and gold deposition plated on those copper features not originally exposed with the resist.

Conversely, if desired, Giga Connections can plate only those areas requiring CDP, as long as the other exposed traces have already been put through a normal back-end nickel/gold process and then subsequently covered with resist. The remaining exposed traces are then shipped as bare copper for the Giga Connections back-end flow.

For those features open (not covered) by the resist coating, the flow is as follows:

- 1.) Copper clean, activation, electroless nickel, followed by electroless nickel/diamond plating.

For those features originally masked which may still require a back-end nickel/gold process, the remainder of the flow is as follows:

- 2.) The resist is removed, with all open pads/traces then being cleaned (both the original, already CDP plated surfaces, as well as the newly exposed copper areas), then activated, followed by electroless nickel, and a final electroless gold plating.

For those pads/traces originally processed with CDP, the subsequent nickel plate firmly affixes the particles prior to the final gold plating.

It would be expected that the solder mask will provide a sufficient mechanism to differentiate CDP plated vs. non-plated regions. However, it should be kept in mind that the thickness of the solder mask will offset the final pads lower relative to the overall surface by the same thickness amount (i.e. if pads require a height differential, then this must be achieved with additional plating of the specific pad/trace regions prior to the CDP process).

If a custom finish application (i.e. bondable gold, etc.) is desired, it is recommended that a special back-end flow at the board shop allow for those pads/traces requiring CDP to be coated with resist during the special back-end flow such that they remain as virgin copper when shipped for plating. Furthermore, those regions which have then been subjected to the specialized flow should be masked prior to shipping to Giga Connections for the CDP process on the remaining virgin copper areas. All resist will then be removed prior to final shipment of panels/product back to the customer.

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