

(d) *Applications.* Printed circuit boards (pcb) are an important application of electroless copper plating.

In double side and multilayer boards where plating-through-holes is required, electroless technique is must since the holes cannot be electroplated.

*Subtractive method of the manufacture of printed circuit board (pcb)*

The various steps involved are :

- (i) In pcb, the base object is a plastic material like phenolic polymer, epoxy or glass reinforced plastic (GRP) ;
- (ii) On this base, a layer (5 to 100  $\mu\text{m}$ ) of copper is electroplated (see figure) ;

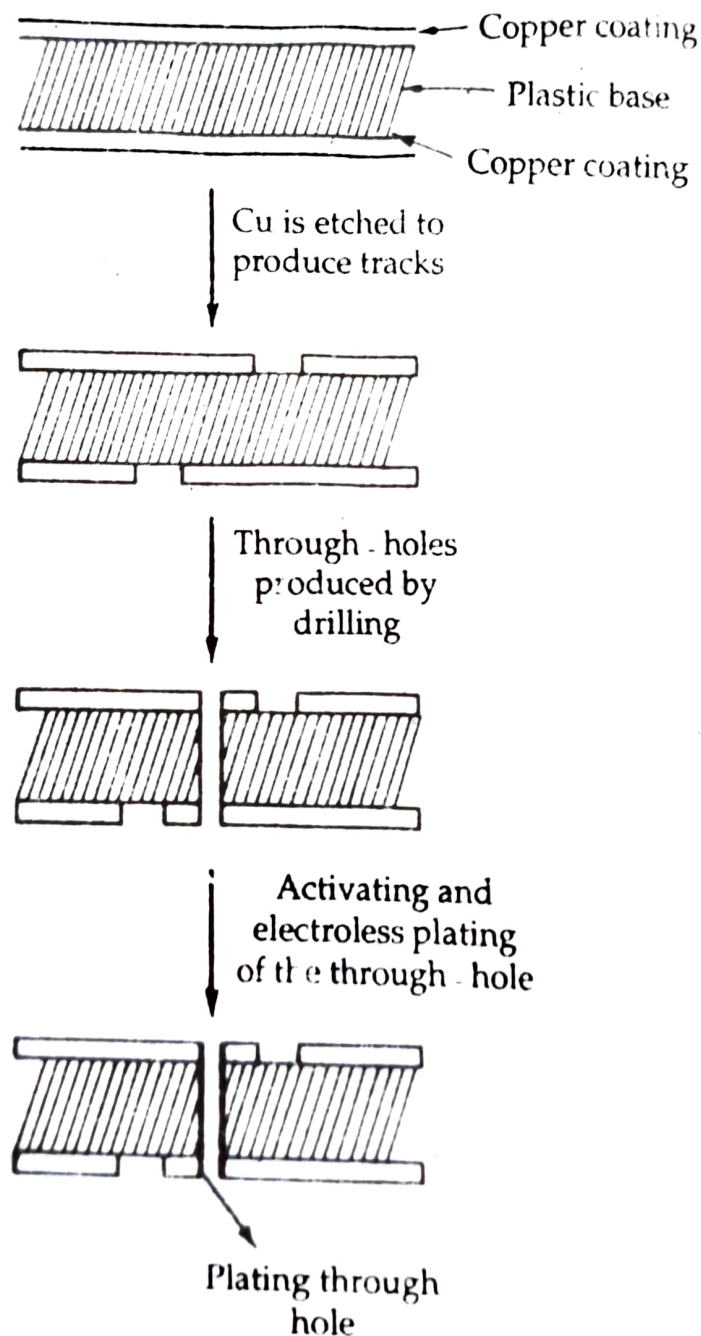


Fig. 5. Steps in subtractive technique of plating-through-hole in the manufacture of double-sided pcb. Copper clad tracks on each side of the plastic board are connected through hole.

(iii) Selected areas are the