

Printed Circuit Board Rework - Pad Preparation

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Rework Process

After each successful component removal process, it is imperative that the printed circuit board pads be properly prepped so that the new device can be placed down with a high degree of accuracy and repeatability. The pads should be completely level so that all leads or solder balls of the device being replaced make full contact with the cleaned pads.

Tools of the Trade

To do this, there are certain tools that every technician should have to properly perform the cleaning process. This application will normally require the use of several different types of tools and subsequent materials. Below is a list of materials that can be found on most rework benches.

- Temperature controlled rework system with vacuum and hot air capabilities
- Vacuum desoldering iron with tiplet
- Soldering iron with standard tip
- Blade style tip (width of blade to match component dimensions)
- Wire cored solder (solder and flux should match original soldering process criteria)
- Flux pen (flux type to match original process criteria)
- Solder (flux type should also match original process criteria)
 - Width of solder braid should also be selected based on blade style tip and process being performed
 - Flux cleaner (selected to match flux type)
- IPA (Isopropyl Alcohol) wipes
- Lint-free wipes



Solder Pad Excavation

Begin by using the vacuum desoldering tool with a tiplet designed to match the pad dimension for the component being reworked. The desoldering tiplet should be slightly larger than the pad being cleaned, but not too large (20% larger than pad is the maximum). A tiplet that is too large may damage the surrounding solder mask or adjacent pads and components.

On the rework station, select a temperature for the desoldering tool that closely matches the process temperature when the PC Board was originally assembled.

Note: As soon as the desoldering tool temperature reaches the melting point of the solder alloy, "tin" the desoldering tiplet with the wired core solder prior to performing the desoldering process. Clean the tiplet by wiping it on a damp sponge or dry tip cleaner to remove any excess solder prior to performing the next desoldering operation.

Using the flux pen with the proper flux selected for the process, apply a light coating of flux to the pad(s) being cleaned. With extremely light pressure, apply the desoldering tool tiplet to the pad(s) that have solder remaining on them. Allow the tool to thoroughly reflow the solder on each individual pad prior to activating the vacuum on the desoldering tool.

Some desoldering stations offer both "on time" and "off time" delays for the vacuum to make this process more error-proof for the operator. The "on time" delay will

prevent the operator from activating the vacuum prematurely, allowing the solder to completely reflow before the vacuum is initiated.

The “off time” delay allows all residual solder to be thoroughly pulled into the solder collection reservoir before the vacuum pump is cycled off. Clean all of the excess solder from the pads thoroughly with the vacuum desoldering tool.

Note: Be sure to re-tin the desoldering tiplet before placing back in the tool holder **Cleaning the Pads**

Now that most of the excess solder has been removed, it is now time to clean the pads to be sure that all remaining solder is removed and the pads are level.

Using the appropriate flux cleaner and scrubber brush (most high quality flux cleaners now come with a scrubber brush attached to the spray nozzle for ease of use), thoroughly clean the rework area of all remaining flux residue by applying the spray flux and cleaning with the brush. The flux cleaning process will allow the remaining excess solder to be clearly identified on the pads.

Leveling the Pads for Component Placement

Continue the pad preparation process by again applying a light coating of flux using the flux pen. Again, on the rework station, select a temperature for the soldering tool that closely matches the process temperature when the PC Board was originally assembled.

Note: As soon as the soldering tool temperature reaches the melting point of the solder alloy, “tin” the soldering tip with the wired core solder prior to performing the cleaning process and wipe the tip on a damp sponge or dry tip cleaner to remove any excess solder.

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Now, using the soldering station and soldering tool with the blade style tip and the solder braid, apply the braid to the pads while lightly applying the blade style tip over the braid. Trim the braid each time that it is used to provide an area of braid with fresh flux. Repeat this for each row or series of pads while re-applying the blade tip to the braid.

Caution: Do not apply pressure to the braid as this may cause pads to lift or damage the solder mask between the pads.

Note: Be sure to re-tin the soldering tip before placing back in the tool holder.

Second Cleaning of the Pads

Once all of the solder has been removed, it is time to “fine clean” the pads to be sure that all remaining solder has been removed and that the pads are level.

Use the flux cleaner and scrubber once again to thoroughly clean the area of all remaining flux residue by applying the spray flux and clean with the scrubber brush.

Using an IPA (Isopropyl Alcohol) wipe, or a lint-free wipe with IPA, lightly clean all areas that have been reworked while gently feeling the individual pads for solder bumps, icicles, etc. If nothing unusual is found, the pads are now prepped and ready for the new component to be reflowed into place.

Caution: IPA should be stored in appropriate safety containers for normal bench soldering/rework applications. IPA has a very low flash point and should not be used in the vicinity of heated soldering or desoldering tools or any other flammable materials.

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