

TPT application: bonding with insulated wires

Here we present a special bond application: wire bonding with insulated wires.

Overview:

Insulated wires are usually soldered. In some cases connecting the wire with a bonder can be a viable alternative. Some positive aspects are:

- Short circuit proof through the full insulation of the wire
- Small contact areas (80 x 80 μ) are easier to handle with bonding machine
- No stripping of wire is necessary
- General pollution prevention at the contact pad
- No heat required

Equipment:

- Most "normal" insulated wires are not bondable. Therefore we use a special 50 μ copper wire with a gold layer for oxidation protection. For insulation it has a colored polyamide layer.
- Flat wedge with cross grooves
- Semi-automatic wedge bonder HB16 with manual-Z control



HB16 with work holder, manual-Z, video system



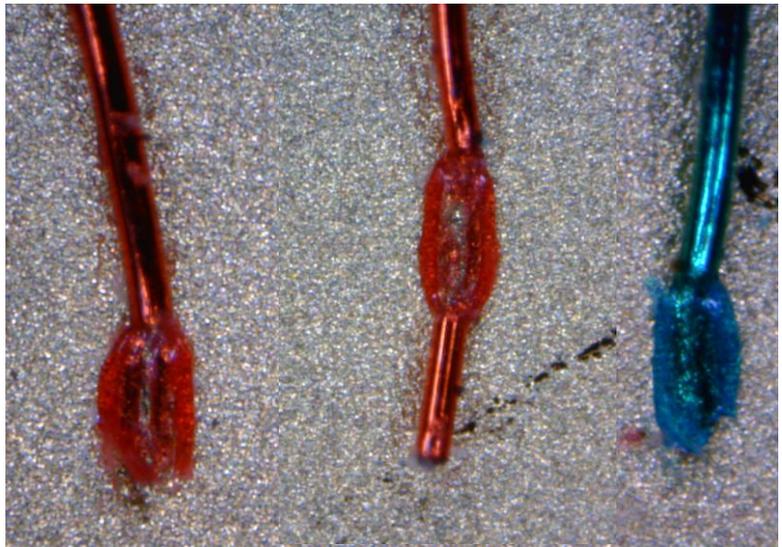
bonded wires with red & blue insulation

Bonding process:

- Due to the lack of abrasion resistance the wire cannot be wind off a spool and passed through a wedge tool.
- Therefore, the wire must be placed by hand with tweezers to the required bond spot. Then the wedge is lowered, the wire is fixed by the tool's grooves and the bonding process is carried out. Applying high ultrasonic power, the insulation and gold layer are rubbed off and a direct connection between the copper and the bonding surface is made.
- The second bond is performed the same way.
- Unfortunately the wire cannot be cut by the wire bonder. So it has to be provided with the correct length beforehand or it has to be cut to length after bonding.
- As the wire is not guided in the wedge tool, no loop-profiles are possible. Only direct connections are possible.
- Also stitch bonds, that means 3 or more bonds are possible.
- In general this process is simple to realize with a high reliability.



wedge in transducer with wire piece



different bonds with insulated wire



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