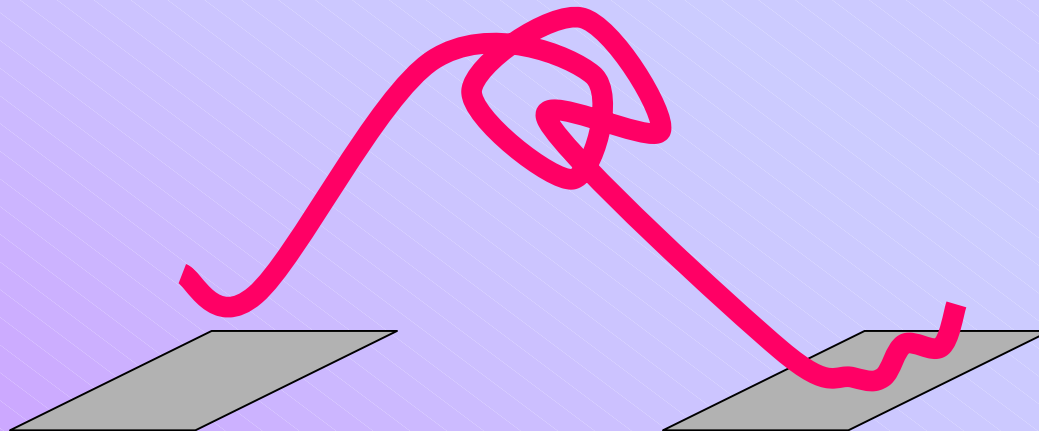


What can go wrong in wire bonding ?

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Do I understand what is happening ?

- With respect to machine parameters and the operation of the parameters during the bond/loop sequence ?
- How the machine and wire are interacting with the bond surface ?
- What parameters do I need to change and how should I change them to improve the bonds ?
- How is the loop and machine speed affecting the bond quality ?

When did I last change the tool ?

- 60.000 is a normal change interval, but this can change depending upon the bond surface quality.
- Have I completed repair work or bonded on less than perfect surfaces recently?

Is the bond surface stable ?

- Basic requirements are the tool to bond surface have good planarity and that the bond surface dose not move
- Jigs are very important !

Can the surface be bonded ?

- Verify by test bonds and pull tests.
- Easy to say, but can be a little more difficult in practice
- Need for real test pieces to optimize the bond geometry and parameters to verify the surface bondability
- Try to avoid building complicated, exotic and expensive devices before verification.

How reliable will the bonds be ?

Factors affecting this are:

- Bond surface quality and consistency
- Environment (moisture), time before and after bonding
- Thermal issues (loop region)
- Risk of physical damage
- Transport (packaging, shock and vibration)

Testing reliability

- Accelerated life time tests
- Thermal cycling tests
- Shock / vibration tests
- + ...



In conjunction with pull tests

Production

- Consistent quality of bond surface. Probe marks.
- Screening during production to detect changes
- Consistent geometry (planarity, loop)
- Cleanliness
- Storage before installation (time and environment)
- Avoid changes
- Fiducials on hybrid, detectors and chips.
- Machine limitations → geometry
- Realistic time scales

Questions

- Is the bond technology compatible with the layout ?
- Could some applications make gains in reliability from using larger wire, when the geometry and surface allow ? Only applicable to dedicated production sites.

Needs

- Machine service intervals, maintenance + qualification
- Pull test facility
- Good inspection. It is difficult to cure a problem when it is not seen.
- Dedicated technical staff