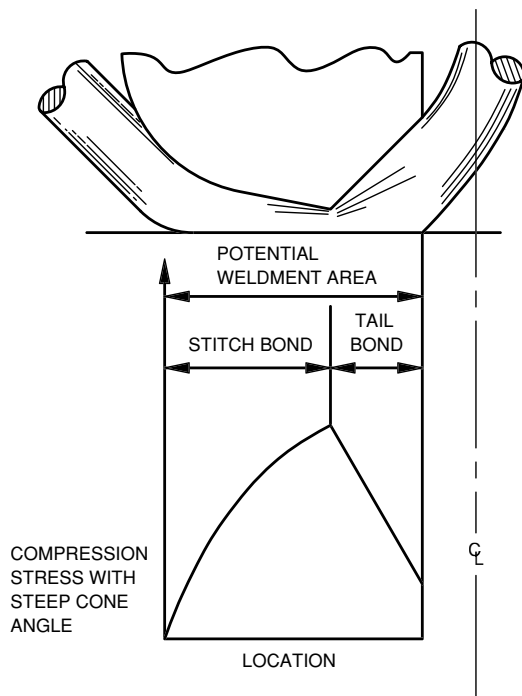


**Face angle -
Stress on Second Bond**

The impact of stresses during the second bond formation is an important subject in order to understand the mechanism behind it. Stresses applied to the wire during the formation of the second bond are responsible for the integrity and strength of that bond.

The following generic diagram illustrates the stress distribution occurring during the second bond.

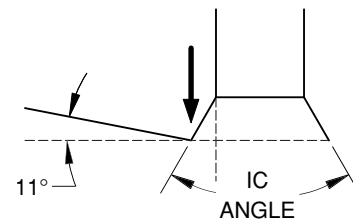
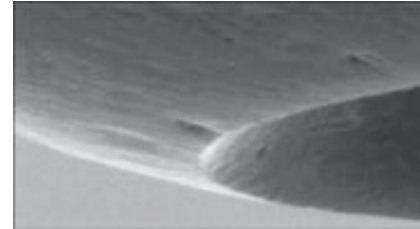


Compressive Stress Graph

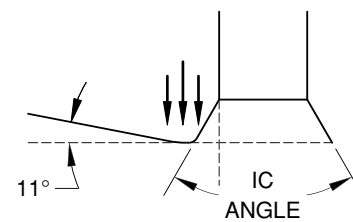
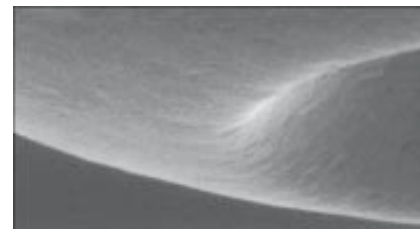
Another way of illustrating the stress points is shown in the adjacent figures where a fixed face angle capillary is compared against a CDR2B type capillary.

The standard face angle capillary shows a Vertical Force component concentrated at the intersection of the IC and Face Angle. If this component is excessive, the results are cut wires resulting in missing balls.

The CDR2B design shows the same type of Vertical Force component but distributed over a larger surface area resulting in smaller components that reduce the potential cutting the wire during the bonding operation.



Standard Capillary



CDR2B Capillary

| FACE ANGLE | BOND STRENGTH | PARAMETER SETTINGS | PLANARITY SENSITIVITY | SURFACE CHARACTER |
|------------|---------------|--------------------|-----------------------|-------------------------------------------------|
| 0° | Highest | Highest | Highest | Rough, Thin, Thick and Clean (Au) |
| 4° | High | High | Lower | Thin, Thick and Clean (Au, Cu, Pd) |
| 8° | Good | Average | Low | Soft, Rough, Thin, Thick, Hard (Ag, Au, Cu, Pd) |
| 11° | Good | Low | Minimal | Soft and Thick (Ag, Au) |

Face angle comparison table