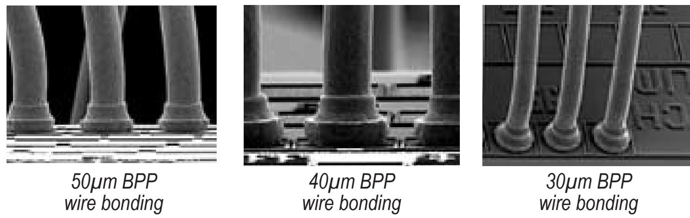
Enhanced Ball Bondablility



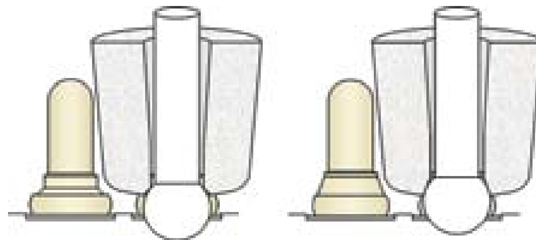
50µm BPP wire bonding   *40µm BPP wire bonding*   *30µm BPP wire bonding*

Typically, as Ultra-Fine Pitch Bonding goes below 50µm BPP, the given BPP and bond pad opening (BPO) requires a much smaller wire diameter (WD) of 20µm and below. While this offers the advantage of cost reduction and the use of standard capillary design, wire sweep problems surfaced during the molding process. Most reverted back to using larger wire diameter of 23µm.

Due to the dimensional constraint on the hole and chamfer diameter of the capillary, SPT developed a unique capillary design, the **'Dfx'** capillary specifically targeting to contain the gold squashed out during bonding. This design concept utilized a smaller chamfer angle (CA) to contain the Free Air Ball (FAB) inside the chamfer, thus resulting in a smaller mashed ball diameter (MBD) as shown below.

Features:

- 40% of FAB contained within the inner chamfer thus resulting in a smaller bonded ball with minimal squashed out.



- Possibility of using larger wire size for better wire control.
- Improved bondability with better ball shear strength.

The design of the 'Dfx' capillary was conceptualized for controlled ball deformation during bonding. Based on lab evaluation and data from customer's production, the 'Dfx' capillary has proven to improve the ball shear reading, especially for BGA device, hence reducing the occurrence of non-sticking on pad during bonding.