This ACE Technical Document is intended for ACE representatives only. It was created to present the ACE philosophy and help further the understanding of the technical aspects of the selective soldering process when discussing ACE products with a client.

**PCB Preheaters**

Preheaters offer several advantages.

* Since the board is already warmed, the soldering process itself can be expedited, depending upon board thickness, due to the solder not needing to be used to raise the board temperature as much for an effective joint.
* Since the solder dwell time on the pad is reduced, dissolution of the pad base metal is minimized. This can be a problem with lead-free alloys due to the aggressive behavior of the molten solder.
* Molten solder migrates towards the heat source, so preheating from the top side helps draw the solder to the top side of the board. This is especially necessary when soldering very thick boards such as backplanes or dense / heavy components such as MIL-connectors, RF shields and other heat sinking components.

Preheaters can be implemented in several ways depending on production needs.

* On extremely demanding boards (like back planes) with many sites to solder or boards with a long soldering process time, the board will cool down causing a gradual change in the process and thus solder joint quality. If the preheater is installed in the machine enclosure above the solder pot, it can also be used to maintain the board at a constant elevated temperature during the soldering process. However, because the preheater must first bring the board up to the required temperature before soldering can begin, the preheat time will add to the overall process time.
* To increase throughput, a dedicated flux/preheat unit can be installed in line with the solder machine. This arrangement allows for a board to be fluxed while a second is being heated and a third or even fourth is soldered downstream.
* Often the best solution is a combination of both preheaters. Separate units to preheat the board, then one above the solder pot location to maintain the board temperature while the board is being soldered.

The heater elements within a unit should be selectable to match the board size and thickness. Board temperature also should be monitored and controlled by the machine program, to offer real time elevated and stable board temperature during the soldering process.