



Maximizing Solder Tip Life with Step-by-Step Care & Maintenance

Technical White Paper – April 10, 2012

By Kevin Pawlowski, Senior Product Manager, Techspray



Since the move from lead to lead-free solders, a common complaint has been short tip life. The higher heat needed for lead-free solders (e.g. iron temperatures of 700°-750°F vs 650°-700°F) and flux with greater activity all lead to faster tip burn-out. By “tip burn-out”, I mean tips that no longer wet solder properly. Often the tips turn black, and the solder beads and just drips off the end of the tip. It may also be referred to as a “cold tip”, but take care not to touch it with your bare fingers!

Soldering tips have a copper core that transfers heat from the heating element to the working end (tip of the tip). Because copper is very soft and easily corroded and worn away, other metals are used to plate over the copper, including an outer layer of iron. Although iron is very hard, it will still corrode eventually. In addition, it can be coated with flux and other soils, which can cause dewetting. Corrosion and dewetting will slow down soldering and eventually necessitate scrapping the tip. Although all tips will have their day in the trash bin, there are several steps an operator can take to increase tip life:

1. Turn down the heat
2. Properly clean the tip
3. Tin the soldering tip
4. Use special cleaning tools

Step 1: Turn Down The Heat

In soldering, like everything else, speed is king. Operators will turn up the soldering temperature to speed up heat throughput. This allows them to go from one solder joint to the next faster. The catch – the higher the heat, the shorter the tip life. Sure, solder stations may go up to 900°F, but 750°F is the highest you need to go for most lead-free wire. Plato soldering tips are designed for optimized heat recovery, which will help maintain soldering efficiency.

When leaving the solder station for anything over 5 minutes, turn off it off. When you leave the station turned on, the tip remains at soldering temperature, further reducing tip life. Modern soldering equipment heat up to soldering temperature in seconds, so the time savings is not worth the reduction in tip life.

Step 2: Properly Clean The Tip

Solder stations normally come with a sponge and/or brass “brillo pad”. The purpose is to remove excess flux and solder from the tip. If too much flux builds up and burns onto the soldering tip, it will eventually dewet and be unusable (but not necessarily unrecoverable – see step 4). Unless the tip cleaning tools are used properly, they can do more harm than good. When choosing a sponge, make sure it is made of natural cellulose (like Plato replacement sponges). Synthetic sponges will melt onto the soldering tip and can shorten tip life. Use clean DI water. Tap water may include minerals that can build-up on the tip. When you saturate the sponge, wring out so it is not dripping wet. Too much water can increase thermal stress of the tip, and slow down tip recovery.

Brass “brillo pad” type tip cleaners should be used sparingly. While brass is softer than iron, it is certainly more abrasive than a sponge.

Step 3: Tin The Soldering Tip

It is a common practice to wipe down the soldering tip before putting it back into its holder. This exposes the raw iron on the working end of the tip, which will rust in the open air. Add any residual flux to the mix, and you have a prematurely pitted soldering tip. Before taking a break or stopping for the day, wipe off residual flux and solder (see step 2), and retin by applying fresh solder to the end of the tip.

Step 4: Use Special Cleaning Tools

When the soldering tip has turned black from baked on fluxes and no longer wets properly, it is time for the cleaning tools of last resort. Tip tinner (Plato #TT-95) is a combination of lead-free solder and cleaner. While the soldering iron is at full temperature, roll it in the tip tinner. As you roll it, it should change from black to shiny silver as the baked flux is cleaned off. Then wipe off the excess tip tinner from the soldering tip, and retin using wire solder (see step 3). Don't let the name fool you – “tip tinner” is not intended to be left on the tip.

Polishing bars are also available, and used to scrub the tip clean of flux residues. This should only be used as a last resort, because you will be removing iron along with the burnt flux. Once a tip shows pitting, actually holes in the iron, it is time to be replaced.

If you carefully follow these steps, you can expect anywhere from a 30-100% increase in tip life. There is no substitute for a quality manufactured soldering tip. Plato tips tend to last longer than even OEM tips that come with the station because of proprietary plating technology. Combine a quality tip with proper care and maintenance, and you will enjoy faster soldering speeds and fewer tip change-overs.

....

Techspray manufactures Plato branded soldering tools, includes replacement tips for many popular soldering stations. More information on Plato tips and tools can be found at www.techspray.com.