



## Technical Handouts

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### Soldering Iron Tip Care: Information You Should Know

Proper care and maintenance of your soldering iron tip involves tinning, wiping (and wetting) and also periodic cleaning of the tips shank. These actions are very important and quite simple to perform, but are often neglected. When performed properly they will not only ensure the longest possible working life for your soldering iron tips, but they will also have positive effects on the overall performance of your soldering iron.

#### Tinning

Tinning may not be necessary if the tip you are using is new and arrives pre-tinned from the manufacturer, or has been used previously and been properly maintained. When a tip does need to be tinned (or re-tinned) it must be clean and free of any surface oxidation before it will accept any solder. Once the tip is properly tinned, care should be taken to prevent tip de-wetting by occasionally cleaning and adding small amounts of fresh solder, especially if the tip is being subjected to long periods of inactivity or idling.

If the tip to be tinned is un-plated copper it should be cleaned and dressed with a single cut, flat file. After filing the tip it should be heated in the iron. When the tip reaches the lowest temperature required to melt solder, a rosin core solder should be fed onto the tip. Do not allow the iron temperature to rise too high before applying the solder, because excess heat will cause the tip surface to re-oxidize and no longer accept the solder.

If the tip is plated it should never be filed, or heavily abraded. Care should be taken to ensure the plating is not damaged or removed, as this will shorten the working life of the tip dramatically. When pre-cleaning is necessary for plated tips, they should be cleaned with a mildly abrasive emery cloth and may require an acid flux to remove the oxides before tinning, or re-tinning.

A solder pot may also be used to tin, or re-tin your soldering iron tip. This is done by first ensuring the tip is clean and free of surface oxides. Turn the solder pot on and allow it to achieve the desired temperature. Apply liquid flux to the working area of the tip and submerge it into the molten solder in a smooth even motion.

#### Wiping the tip

During use a bright, thin, but evenly tinned surface must be maintained on the working portion of the tip. Oxidation and contaminants must be continually removed from the tip surface to achieve maximum performance. This will help to ensure the proper transfer of heat from tip to work and will eliminate the possibility of impurities being transferred into the solder joint. Between each solder application simply wipe the working area of the tip clean on a damp cellulose sponge to remove the dross and oxides that will accumulate and add small amounts of fresh solder to the tip as needed. A gentle wiping is all that is required and care must be taken not to over wipe the tip, because oxidation will occur on the surface quite rapidly if all of the solder has been removed. Once this oxidation occurs it becomes difficult, or even impossible for solder to wet to the tip. It then becomes necessary to properly clean and re-tin the tip in order to regain the appropriate wetting action required for adequate performance. When you have finished the soldering application, you should wipe any contaminants from the tips surface and add a small amount of fresh solder to it before allowing the iron to cool. This layer of solder ensures protection from oxidation of the tip between uses and will help to extend the tips working life.

#### Periodic Cleaning

It is important to periodically clean the shank of the plug style tips as well as the inner surface of the element. This is done to keep the tip from seizing in the element and also to keep from building a layer of oxides and contaminants that would obstruct the transfer of heat from the element to the tip. After allowing the iron to completely cool the tip should be removed and the tip shank and inner walls of the element should be wiped clean with a mildly abrasive emery cloth or soft wire brush. This cleaning process should be done as often as needed, depending on the work environment, but not less than once a week.

#### Summary

If a tip has not been properly tinned, solder will not wet to it. Without solder on the tip heat transfer from the tip to the work surface may become extremely difficult and time consuming, or even impossible. You must understand that proper wiping and continuous wetting is important and a lot easier than continually having to clean and re-tin the tip, especially at the risk of damage to the plated surface because of accidentally scratching, or over abrading it. When you notice that an iron is not performing as well as it did when it was new you will find that poor thermal transfer from the element to the work is usually the cause. As previously stated, improper care and maintenance and the lack of a periodic cleaning of the tips shank can cause a layer of oxides, which will inhibit the transfer of heat through the tip. Always ensure plug style tips are properly seated into the elements before heating the iron. If a tip is not inserted fully into the element there may be a gap behind the tip. This gap can cause a hot spot within the element causing a premature failure of the soldering iron.