



TECHNICALLY SPEAKING

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Using Soder-Wick Desoldering Braid with Lead-Free Solders

Tin-Lead solders have been around for centuries. There is historical evidence that tin-lead solders have been used for various “welding” purposes as early as 2000 B.C.! Given the long history of use and the unique ability of tin-lead solders to form strong, durable bonds with other metals, it’s easy to see why there is resistance to lead-free soldering, but there are a number of concerns, within the electronics industry, that are driving the push to lead-free soldering

New environmental regulations in Europe and Japan, which mandate the elimination for lead from some types of consumer electronics, to facilitate recycling of the equipment once it has been discarded, raise the possibility of such laws being passed in this country. Some companies have found that being “lead-free” offers an apparent competitive advantage in the market place, with increased sales of electronic products labeled as lead-free. If a company, municipality or nation bans leaded solders, this would result in trade barriers against the entry of electronic products containing lead, with the resultant loss of potential sales for any manufacturer using leaded solders in their products.

Such concerns are prompting many electronics manufacturing companies to consider moving to lead-free soldering processes. One question that is frequently being asked is ‘will the Chem-Wik and Soder-Wick desoldering braids I am now using, work with the new lead-free solders’? The answer is simply “Yes”. Both Chem-Wik and Soder-Wick desoldering braids will work just the same with lead-free solders, as they always have with conventional leaded solders.

Lead-free solders are nothing mysterious. Due to its perceived toxicity, the lead metal in these solders has been replaced with another metal, such as cadmium, bismuth, indium or silver. These new compounds are not “drop in” replacements, though, for leaded solders and the switch to these materials is raising some concerns. The industry does not have the same length of experience with these new solders, as it has with tin-lead solders, so there are concerns with regard to the long-term strength of the bonds they form. All of the new lead-free solders melt at higher temperatures than tin-lead solder, so there is concern for the effect that these higher soldering temperatures may have on circuit boards and components.

Regardless of the problems the switch to lead-free solders may entail, the process of wicking molten solder is essentially the same as that of soldering a component onto a board- you are trying to form a bond between the solder and another metal. In the specific case of desoldering, you’re forming a bond between the molten solder and the braided copper wire. The weave of the copper wire creates capillary action, which draws the molten solder upwards against the force of gravity and the flux coating on the braided wire, facilitates the formation of the bond between the solder and the copper. The acids in the flux clean the surface of both the solder and the copper, removing the oxide tarnish layer caused by the attack of oxygen in the air on these metal surfaces. This helps promote wetting of the solder, so that it seeks the greatest coverage area on the copper and therefore forms a tight bond with the copper surface. The molten solder travels up the braided wire, bonding tightly to it, leaving the formerly soldered surface of the board clean.



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This whole process of solder-to-metal (in this case copper) bond formation works just the same whether the solder contains lead or another metal. The only difference is that the bond must be formed at the higher melting temperature of the lead-free solder. The presence of metals other than lead, have no effect on the formation of the solder bond with the copper wire. (Our other soldering products, such as the CircuitWorks Rosin and No Clean flux dispensing pens, work just as well, when using lead-free solder, as they do when using a leaded solder.)

We have tested our Soder-Wick Rosin and Soder-Wick No Clean braids in the laboratory with a representative lead-free solder and found little difference in the test results, than with those obtained with leaded solder. This test data is available to all sales reps and customers, on request.

Michael Watkins
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