Increase your process control and lower cost of ownership.

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With consumers constantly looking for lower prices on their technology products and manufacturers trying to squeak out higher margins from their production lines, the need for process control and lower overhead costs have become even more important. One sector that is often overlooked is the hand soldering area of the factory. Many factories have been struggling with antiquated soldering systems for years. In some cases they are trying to make their investment in stations last much longer than they were designed for, or they are falsely trying to recoup their original investment - all at the cost of higher operating expenses or even worse, reduced operator thru-put.

Frequently, when I am invited to a factory for a soldering system audit, I see many outdated stations that are being used improperly or by untrained operators. This misuse typically manifests itself with stations that are set to their maximum temperature, as the operators make every effort to increase thru-put, but without understanding the board and component damage that they may be causing. It is during these visits that I point out the need for simple but high performance soldering systems.

So, what makes a soldering system simple but still high performance? One of the most important features of a soldering system is transparent to the operator, it is the heat delivery system. For the ultimate performance you need to standardize on a direct power soldering system. Direct power, or SmartHeat®, soldering irons respond precisely to the varying power demands across the circuit board, always providing the correct temperature to solder the components without ever overheating them and in the shortest time possible.

How does SmartHeat® work? It is a pretty complicated explanation, but let me give it a try. We start with a power supply and its only job is to supply a fixed operating frequency output to run the tip. It is connected to a light weight, ergonomic, hand-piece that you insert the tip into. The tip or cartridge is where the real magic takes place. Inserted into the back of your tip is a specially manufactured heater, and that heater has a proprietary coating that responds to the output frequency of the power supply.

When the power supply is turned on, the frequency output causes the heater to heat up and you can solder. Wait, I left out the details of the heater control circuitry, well, that is because the beauty of SmartHeat® Technology is there are no heater controls to go out of specification. The coating on the heater is also the controller for the heater. You see, as the heater heats, the coating crosses into its curie point, and if you know anything about inductive heaters, this is the point where the coating stops being a heater and now, since the temperature is satisfied, it becomes a controller. Touch a solder joint or wipe the tip on a sponge to clean it and the whole process begins again.

The beauty of this system is that it directs the precise amount of power to the solder joint while at the same time it maintains the set temperature ±2°C. Because of this variable power, your operators will be able to continuously solder high demand solder joints without ever having to wait while the “iron catches up” with the operator. No more cold solder joints and no more cranking the temperature up for lead-free applications.

So, what about controls? To truly implement process control in your facility, you need to fix as many variables as possible in your hand soldering process. Keep in mind, your hand soldering operation is the single part of your factory with the most operator influence. How about a power switch? You should select a soldering system with a minimum of operator controls. Let’s face it, if you provide your operator with a variable temperature control they are going to turn it, and they are going to turn it to the maximum possible temperature as they try to meet the thru-put demands of their line supervisor or the flow of the line itself. Purchase a soldering system with fixed temperature tip and an on/off switch and you have fixed one of the biggest variables in your process.

The MFR Series from OKi provides maximum process control on your hand soldering production line. It is simple, you select the tip and the tip controls the temperature. Want to keep your operators from increasing the temperature? It is possible to control exactly what temperature ranges are allowed into the building and without a temperature selection knob, your operators are fixed into the temperature you specified. Plain and simple process control, no more burned boards or damaged traces.

What about calibration? This is always a delicate topic. It is usually brought up, not by the operators, but by the calibration lab. All the new soldering systems claim “No Calibration Required” yet on all of the conventional

(ceramic / wire wound heater) systems, there is a calibration port and a procedure in their manual. Think of what you could save in your factory if you could eliminate the 4 hours per year each station requires for calibration. It doesn't sound like a lot of money, until you do the math:

For Example: 100 Stations X 4 hours X $35 labor rate = $14,000 in calibration costs

Purchase a soldering system that is truly calibration free and repeatable to +/- 2 degrees C, and put that calibration money into your profits or invest in some new equipment. The MFR Series all feature Smartheat from Metcal. If you ask anyone in the industry, they will describe a long history of high quality, high performance soldering systems, and the common feedback will be "NO CALIBRATION REQUIRED." And OK (either OK International or OKi) has never hidden behind that statement, the cartridge or tip is fixed in temperature and is controlled at the molecular level. Sure you can measure the tip temperature, but you are never required to spend your money or your time in a calibration lab And if you did measure the system, you would find that they are 100% repeatable to ±2°C, just perfect for today's demanding industry standards.

So, what about on-going consumable costs? Let's face it, soldering tips and cartridges cost money. When you combine that with operators forced to solder at 850 degrees to keep up to speed, those tips are breaking down and costing you a lot of money. I was in a facility last month where they were so worried about tip costs, they never factored in the life of those cheap tips. In this particular factory, they were buying $4 dollar tips that were lasting 3-4 days. Of course their comment to me was my $8 dollar tips were too expensive. Sure they are twice the money, but in their evaluation they were lasting 20+ days. So in the long run they were increasing output and saving big money on operating costs.

With the MFR Series, you have a choice of 2 tip styles developed especially for the new systems. If your applications demand the precision of a soldering cartridge, OK International has created an entirely new range of lower cost high performance soldering cartridges that fit the needs of operators working in tight board locations or under microscopes. In addition, the SxV range of tips, maximize the power transfer to your PCB while at the same time keeping your operating costs low. These replaceable tips combined with the MFR power supply make SmartHeat® available to users who previously considered the technology out of reach for their production line. There is no other soldering station in the market that allows both a tip and cartridge. Add on top of this the ability to rework smaller components with the precision tweezer tool, and you have an unprecedented system at this price point.

In addition to lower cost tips, OKi has standardized their entire range of soldering systems with sleeper stands. Now each time your operator places the hand-piece into the stand, the power supply automatically reduces the power delivered to the tip. Pull it out and the power is restored immediately and the tip is ready to solder. No operator intervention is required. Your tip life goes up while your operating costs are reduced.

What about ESD safety? In an industry first, the MFRs are designed to look both ways in protecting your PCB environment. While it is standard for soldering systems to have grounded tips, the MFR systems have grounded tips with active tip monitoring. So if the tip ground goes out of specification, the station shuts down that hand-piece and alerts the operator with a red LED. As an industry first, the MFR also monitors your AC Power (mains) ground. If your mains ground should go out of specification or if you damage your ground pin on your supply cord, the system shuts down and alerts the operator with another red LED.

If you are an existing Metcal SP200 user, your operators have come to rely on the simple tip changes that are part of the soldering cartridge experience and they love the SmartHeat® Technology that keeps them soldering and meeting their thru-put demands. With lead free, the SP-200's might need a little boost. Take a look at the specifications of the new MFR Series and you will see 60W power output. OK International has gone one step further to help existing SP200 users migrate over to the MFR range.

This was accomplished by the introduction of a new hand-piece that fits the MFRs but uses the SSC cartridges from the SP200. This allows operators to utilize existing SSC inventory while they are transitioning over to the feature packed MFR. So, you can save money by using existing tip inventory while taking full advantage now of all the features of the new MFR systems.

In the past, direct power soldering systems may have been cost effective only to high-reliability and military manufacturers. There has been a revolution in the availability of SmartHeat® soldering systems and this revolution is called the MFR Series from OK International, the parent company of Metcal. The new Multi Function Rework (MFR) systems provide you with all of the best features you need in a low cost package. The MFR Series provides a wide assortment of power supplies, hand-pieces and tip choices. If you need a single output production soldering system like the MFR-1100 or a dual simultaneous output soldering and rework system like the MFR-2200, SmartHeat® is now available to meet the demands of any size production facility.

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