

## Which Cleaning Process is Right for Your PCBAs? Session Questions and Answers

**Q: You've talked about cleaning, how about rinsing, and drying? How do they compare?**

**A:** That's a good question. If you look at the diagram here of the inline cleaner, we have to wash them. Normally, you have at least as much rinsing in an inline cleaner as you do wash sections. Of course, rinse chemical solutions don't then rinse and final rinse in the batch washer, you have multiple rinse cycles. It's not different zones but you use that same chamber in your rinse multiple times until you reach a certain conductivity. Both can be effective if you're looking at rinsing parts that have connectors. Make sure they are orientated in a way that helps facilitate draining. We also have another topic on our Tech2Tech series discussing "You're Only as Clean as Your Final Rinse," but that applies to both machines so rinsing and drying can be effective in both types of machines.

**Q: What about batch washers that hold assemblies vertically in a rack, like a stencil instead of a dishwasher-style spray?**

**A:** There are machines that have the whole thing vertical in a rack, sort of a hybrid. You don't have the part density because there on a panel on a rack, but you do have the perpendicular spray. You don't have the shadowing effects in the corners so you have some that flow dynamics on an inline cleaner without the shadowing in that a little bit lower capacity on the cycle depending on the size of boards, but it can be an effective solution.

**Q: How do you determine the chemical effectiveness - concentration or pH?**

**A:** Good question. That really depends on the product that you're using. I would talk to your chemical supplier. We have an array of products, some that are controlled with refracted index. You measure the concentration by taking a well-mixed sample and putting it into a digital or visual refractometer and correlating that through a concentration. There are also ways to measure with a split method where you add a reagent and measure the collar of the split volume. There are some sonic velocity and other techniques we provide as well. Those are what we use as Analyst and PCS. pH was popular back in the 90s and then you had saponifies and products that pH can determine how effective it was and it would start at higher pH and then decline over usage. Now, these moderns cleaning agents are designed based on solvency, so pH is not a good control mechanism for measuring the concentration.

**Q: Any online analyzer will be installed for the measurement of chemical?**

**A:** KYZEN provides what we call the KYZEN Analyst. It uses a sonic velocity sensor. If you go back and look at the different pictures of batch washers that we have that can be installed in basically any manufacturing machine we partner with or you've already had the equipment, we can do a field installation. That device puts on the front screen what your temperature and concentration is and gives you some digital record keeping and history of how the process is operating. It's a really cool

technology and it's called the KYZEN Analyst. It works with our products and some competitors. If you have the Analyst on your system, you're not locked into just one product, your process can evolve.