

What Do You Need to Know About Phosphating?

Session Questions and Answers

Q: Are there other types of phosphating besides iron phosphate?

A: Yes, absolutely. There are zinc and manganese phosphating processes, those are the most common. Depending on what phosphate coating and the properties you want to end up with, there's a lot of different metal ions that you can add in. If you remember the SEM picture that I showed earlier, those crystals that were forming on top of the iron phosphate were actually zinc phosphate crystals. That was from a zinc phosphating process. Whenever you're using a phosphating process whether iron, zinc or manganese, the iron phosphate layer is going to form first on the part and then those crystal will generally form on top of that.

Q: What are typical concentrations in a phosphating process?

A: That's a good question, we get it often. It's a little difficult because a lot of that depends on how many stages you're using. In your typical 4 to 5 stage process, we like to use 5 - 10% alkaline cleaner in the wash stage, you're usually running around 140 to 150 Fahrenheit. As far as the rust inhibitors go, the seal coat stage and dumping a little bit of rust inhibitor in the rinsing stages to prevent flash rusting usually 2 - 4 % is really good for that. Iron phosphating, you're looking at about 5 - 7% iron phosphate or phosphoric acid in that stage. The tricky part is you have to work with the chemical supplier because everybody has a different formulation and if you're using a 2-stage system your concentration has to be higher. If you're using a 9-stage system, the concentration can be lower because you have to clean a process. The key thing there is to work with whoever your chemical supplier is, hopefully KYZEN, to dial in on that process and make sure that you maintain it over time.

Q: How can I reduce my sludge?

A: There is a trade off there. Like any chemical reaction or wash process, the hotter you go the quicker the reaction will be. Similarly, on the iron phosphate process, if you run at higher temperature, we'll say around 140 to 150 Fahrenheit, you're going to produce more iron phosphate. That's going to deposit onto the parts quicker and get the parts out the door quicker. The downside of that is you're producing iron phosphate and you're also producing more sludge. If you run at a lower temperature around the 120 to 130 range, you're going to produce less phosphate. You'll need more time of parts in solution or in contact with solution to get that same coating thickness. The flipside is you're producing less iron phosphate and less sludge on the backend.