Craftsman's Cribsheet

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Three of My Favorite and Most Shared Ideas to Get the Most from Drills in Your Shop

Keep the drill short.

Drills need a rigid setup. Having extra length can lead to deflection and drill wander. There is a reason drills for screw machining applications are short. It's because we need the rigidity. I learned this while working as the metallurgist for a steel bar company. I got a call from a customer that my steel wouldn't drill straight. After a three-and-a-half hour drive to the customer's shop out of state, I found a very narrow diameter drill (maybe 3/16 inch) in a Jacobs chuck the size of my head being held on a Morse taper the length of my forearm. Add to that a short cycle time, and the drill and chuck never got to a consistently steady location. They were vibrating until they entered into the next workpiece. They could enter the workpiece at a number of different locations based on the vibration. We shortened the setup considerably, and suddenly, the steel we provided was drilling straight, true and on center.

Get the feed rate right.

When I was learning machining, I was taught that the feed rate determines your success in drilling. After years and years in shops like yours, I am convinced that what I was taught is correct. Yes, the wrong speed can burn up a drill, but getting the feed right assures the chips will break up appropriately and flow smoothly down the flutes. Proper feed assures that the drill won't chip out on the cutting edge and the drill itself won't crack or split up the center from too heavy of a feed.

Replace the drill on schedule before it dulls.

Planned replacement of the drill before it dulls will make more parts per shift. This is an under-appreciated way of thinking. In most companies, they have a purchasing culture and want to get the most out of a tool before replacing it. In the most profitable companies, they have a "respect the process" culture that focuses on maintaining process control, not maximum tool life. By replacing the drill before it gets dull, they minimize downtime. They minimize the production of defective parts. They minimize the creation of work-hardening in the parts produced prior to tool replacement. This means less downtime, more trouble-free uptime and more parts at the end of the shift. Twenty extra minutes of production on a part with a ten second cycle time is an extra 120 parts at the end of the shift. Shippable, billable and no anomaly parts.

There are other factors besides feed that influence drilling: proper speed, proper coating, proper geometry, effective delivery of coolant. We could create quite a list. But in my experience, the three factors that hold the secret to productive drilling in our precision machining shops are short rigid setups, proper feed and planned or scheduled replacement. These three factors are the keys to getting more parts with less trouble out of your shop.

All Craftsman's Cribsheets are available for viewing and download at **short.productionmachining.com/cribsheets.**