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Phone: 1 800 025 500

9 Hints to Save Your Cutting Tools plus . . . New Fast Deburring

Don't Kill That Tool - 9 Tips

Cutting tools of all kinds are regularly slaughtered. So here's a few tips to give them extra life.

Let's Start with Drills

► Always use a lubricant with ALL types of cutting tools e.g. drill bits, taps, dies, reamers, lathe tools etc.

► Good brands of specially made lubricating "cutting compounds" are Treflex and Rocol.

► Teflon based materials are also excellent cutting compounds. Things such as Nulon whether grease or engine oil additive - both are good.

► Methylated spirits as a lubricant makes very smooth threads in aluminium, but make sure the job remains wet all the time.

► With High Speed Steel (HSS) cutting tools make sure you don't run them too fast. Here's a rough guide:

Drill Bit Diameter	RPM - HSS Drill Bit in Mild Steel
1/8" or 3mm	3000
3/16" or 5mm	2000
¼" or 6mm	1500
5/16" or 8mm	1200
3/8" or 10mm	1000
7/16" or 11mm	850
½" or 12mm	750
9/16" or 14mm	650
5/8" or 16mm	600
11/16" or 17mm	550
¾" or 19mm	500
7/8" or 22mm	400
1" or 25mm	350

► Downward pressure on drills is called "feed". Too big a feed rate can cause drill overload and breakage. Smaller feed rates [lighter pressures] are generally better when using hand held drills. When feed can be contolled as in milling machines or some pedestal drills, then an ideal rate can be set to speed up the drilling operation.

Solid Carbide Diamohard Drills

► It may sound strange but one main cause of breakage of solid carbide drills and chipping of teeth on carbide burrs is running them too slow. As a guide, RPM when using Diamohard drills should be about double the speed for HSS drills.

The reason to run these drills faster is because it reduces the load on the drill. This applies mainly to manual drilling. Let's explain. The load on a drill bit is increased by taking heavy cuts. So, if you push down on a drill you will usually be pushing with the same force whether the speed is fast or slow. This means that the load per revolution is less if you run at higher speeds and the drill is loaded less. The reason you can run Diamohard drills faster than HSS is that the cutting edge remains sharp even when very hot whereas HSS drills blunt with heat.

► While Diamohard drills are very hard and can drill almost any hardened metal they are also far more brittle than HSS. Obviously anything hard is generally brittle. To help combat this brittleness Diamohard drills are made to a very special geometry as pictured below.

The special shape and the straight flutes leave far more metal in the body of the drill than if the drill had a standard spiral like HSS drills. The drill is greatly strengthened by this extra metal in its body.

Tips for Taps and Tapping

► One of the biggest causes of tap breakage is too small a hole size as the tapping drill diameter. With a tight tapping drill size you will need about 4 or 5 times the amount of torque or force to drive your tap as if you used only a slightly larger hole. If you're worried that the thread's strength will be reduced because there's less thread depth when you make your hole bigger - don't stress. Did you know that even at 50% of thread depth you still have probably 90% of the strength of a full depth thread.

► The next key point is NEVER tap without lubricant. The cutting edge of your tap will blunt probably 50 times faster - yes that's right - at least 50 times faster! What's more you'll break more taps.

► Another cause of tap breakage is too much swarf build-up in the hole. It's common knowledge that in *most* materials you should turn the tap backwards at regular intervals to break the metal chips. (There are a few exceptions to this rule). In a deeper hole it's good practice to back the tap right out of the hole every so often and blow the swarf out.

Why Not Use Solid Carbide Taps?

Sounds logical that Diamohard taps would be great. However, as explained above carbide is brittle and because of this brittleness the teeth of the tap would just break under the stresses involved in tapping in most metals. Carbide taps are manufactured but their use is in softer abrasive materials like fibreglass. In abrasive materials they last heaps longer.

Deburring - New Super Tools - Super Fast

Horrible job deburring but these super tools can cut the hassle 100% and even automate a painful job. They're made with nylon bristles impregnated with various grades of abrasives and ceramics. And then there's the often overlooked Flex-Hone which is also great for deburring. What's more all these tools give improved surface finishes that can save extra processing. Watch the video which shows Flex-Hone in automated production use.

This Month's Teaser

What is "DLC" in engineering terms?

First right answer gets a choice of a 200mm Starrett digital caliper worth $250 or $100 prepaid Visa card runner up gets a metric dial indicator.