

Tap and Dies for Kitless Pen Making

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The International Association of Penturners - 2013

Tap and Dies for Kitless Pen Making - A Beginners guide - by mredburn

This is a general guide not a strict "you have to do it this way" sort of thing.

For some of the techniques and sizes needed you will have to figure out those yourself. You will learn more having to figure out the dimensions and their relationships to each other than if they are just given to you.

Most common metric and imperial tap and die sets will not work well for making pens. Not that you can't make a pen using taps and dies from the sets but they are very coarse next to the threads commonly used. I don't recommend buying a set for pen making. Just buy the sizes you need as you need them.

Triple lead taps for the pens are expensive and I don't recommend you run out and buy one until you have made a few pens and decide that you want or need to make caps with 3 leads. Lots of great pens are made with single threads for the cap.

I prefer using metric threads. You can use any threads that you want but the metric sizes are more widely used in the pens we make and are easier to find in the finer sizes. Your choice or sizes will depend on the design of the pen. You will first need to design your pen and from that you can determine which tap and dies sizes will work.

There are many variables to making kitless pens and from here you can refine your techniques and skills and decide which sizes best suit you.

Listed below are some of the more common sizes of tap and die sets used.

Common Cap threads - single lead

m14 x1
m13x1
m12 x.75
m10 x.75

Nib/feed assembly threads

Bock (classicnibs.com) German made
#5- 6.4x.6
#6- 7.9 x.6

Common Cap threads - triple leads

m14 x .8
m12 x.75
m10 x.75

Jowo (meisternib.com) German made
#5- 6.5 x.5
#6- 7.5 x.5

Nose cone/ front section threads - single lead

m10 x1
m10x.75
m9x.75
m8.4 x1

Heritance (discontinued)
#5 -6.5 x.5
#6 -8.4 x.75

Schmidt Roller Writer Rollerball
6.5 x.5

El Grande kit front ends - m10 x1
Baron/ Sedona/ Navigator etc. front ends –
8.4 x1 or 8.5 x1 (Either will work).

Let's start with making a Roller Ball pen.

There are 2 main areas that need a tap and or die to make a roller ball. Threads for the inside of the cap, the matching threads for the pen body, and the threads for the nose cone. Both male and female threads are required.

You will need: m12 x .75 tap/set, m9 x .75 tap/die set, 7/16 drill bit, 21/64 drill bit, drill bits to make the holes for the refill to fit into, 1/4, 3/16 and #37 will work.

A tap guide and a Die holder are essential for making straight threads.

We will be using the Jr series sizes for this example. The upper cap will be somewhere around .565 to .600 and the pen body around .485 to .513. You can make it to suit yourself.

We will use the m12x.75 single thread tap and die for the cap threads and the m9x.75 set for the nose cone threads.

The general rule of thumb is to cut the tenons for the male threads about .2mm smaller than the thread size you're going to cut. For a m12 thread size that would be the equivalent of 11.8mm (.465) the drill size is determined by the subtracting the pitch from the desired thread size. Or $12\text{mm} - .75 = 11.25\text{mm}$. I generally make a hole slightly larger than the exact size say 11.3 to 11.4 .

Why? Because taps/dies are made to cut about 75% of the threads and cheap sets are less. Also if you haven't noticed on kit pens, the fit at the threads are generally pretty sloppy. For the m12 tap I drill a 7/16 hole, which is close enough.

For the nose cone on the roller ball use a m9 x.75 tap/die cut the tenon 8.8mm (.3456) or close without going over 9mm. For the female threads, $9 - .75 = 8.25\text{mm}$, I use a 21/64 drill bit (8.34mm)

Design your nose cone for length, turn it to rough diameter, and then drill the inside so your refill will fit. Cut your tenon for the m9 x.75 tap and cut the male threads. Use of a lubricant will help make smoother threads. Pam cooking oil, wd40, soapy water etc.

You will need to make both a plug and a female holder for the m9 threads out of scrap material. The plug will be used in the pen body to keep the threaded area from breaking while threading the cap threads. The female piece will be used to hold the nose cone for final shaping and finishing.

Design your pen body, drill it deep enough for the refill to fit if you want to make a closed end or all the way through and make a cap later. Drill the body with the 21/64th drill bit. Tap the inside threads. Cut the outside tenon and then insert the plug you made. Cut the outside male threads with the die. The plug will help support the inside thread area while you cut the cap threads.

Design and cut your cap to rough dimensions. Drill the cap with the 7/16 drill bit. Tap it with the M12x.75 tap.

You can make finials for both the cap and pen body and just glue them in at assembly or you can thread both areas and the finials to be able to disassemble the pen. Or you can make a closed end pen.

Finish the pen.

A fountain pen is done much the same way but you need to decide on a brand of Nib/ feeds and buy the specialty tap for that size and brand. You make a front section instead of a nose cone and it has to be drilled and tapped specifically for the size and brand you choose.

You may find a m10 x.75 will work better for the front section interior threads when using the larger #6 feed assemblies.

From here you can modify your designs and techniques in any way to suit you. Try different sizes and threads on scrap pieces to get the feel for the material.

Resources

Metric taps:

Amazon, victornet.com, enco.com, Littlemachineshop.com etc.

Taps for the Bock feeds and the 9x.75 set:

classicnib.com and Indy-Pen-Dance.com

Taps for the Jowo (Meisternib.com) nibs and triple lead taps, M8.5 x1:

silverpenparts.com

MIke