

Muzzle Threading

Muzzle threads are very important to firearm customization. They allow the installation of muzzle devices to give the shooter some control over the accuracy, muzzle rise, flash and sound signatures of the gun. Gun builders and gunsmiths should be competent in measuring, preparing, and cutting threads on the muzzle as well as facing and crowning it to achieve optimum accuracy.



Please understand that information and tips provided here are meant to benefit our customers who have carefully considered the possible hazards of modifying a firearm. We, by no means, want to alleviate your concerns regarding the safety and value of your firearm should you make a mistake. Please consider your skill level, experience, and competency before purchasing any of these tools or trying to use these methods. CNC Warrior accepts no responsibility for results that may occur by following these tips. If you have already purchased the necessary tools, and are having second thoughts about cutting your barrel, please consider taking the tools and gun to a qualified gunsmith and ask him to perform the work.

Make sure also to verify the legality of your modifications. State, Local, and Federal laws apply.

Getting Started

First, you will need to decide which thread pattern you are going to cut. The most common threads that we recommend for rifles are:

Thread Pattern

- 1/2-28 RH (AR15)
- M14 X 1.0 LH (AK47)
- M14 X 1.0 RH (VZ58 and Yugo SKS)
- 9/16 - 24 RH (AR Grendel)
- 9/16-24 LH (FAL)
- M15 X 1.0 RH (Mosin-Nagant custom)
- 5/8 - 24 RH (AR10)
- M17 X 1.0 RH (Saiga .308 custom)

Common To:



LESS COMMON

- M13 X 1.0 RH (Galil)
- 1/2 - 36 RH (9mm AR15)
- 1/2 - 20 RH (some rethreaded AK47s)
- 11/16 - 24 RH (some bull barrel rifles)

Many of the newer AKs have larger threads that are built into the front sight base (M22 X 1.5 RH, M24 X 1.5 RH, and M26 X 1.5 LH).

Saiga and Vepr 12ga shotguns are usually threaded M22 X 0.75 RH.

Choosing the Thread Size

To decide which thread best suits your application, you need to accurately measure the diameter of the barrel along the surface that you're going to thread. This is referred to as the thread's "major diameter". A good set of calipers is perfect for this.

Most of the slide rule (vernier) type calipers are of questionable accuracy and difficult to read. If you're familiar with them and have a reasonably built steel set, then they may suffice. But if you need to buy a set, we would recommend dial calipers. They're generally more precise, easier to read, and more durable than the slide rule types. They're not as easy to read as digital calipers, but you don't have to worry about dead batteries or errors resulting from water/oil penetration.



Our recommendation: 6" dial calipers, .001" graduation, .100" per revolution

Another option:

CNC Warrior manufactures sizing rings that can help determine suitable thread patterns for your application. They are made for each of the common thread sizes mentioned above and slip over the barrel to let you know when you're within size tolerance for threading. If you don't want to invest in calipers but you need to check your barrel size for a specific thread pattern, these inexpensive rings can be used.



The major diameter should ideally fall within these tolerances:

Recommended Barrel OD Sizes for Threading			Absolute Max for Die Threading Without Resizing Barrel OD
Thread Type	Minimum	Maximum	
M13X1	0.5031	0.5101	0.520
M14X1	0.5431	0.5501	0.560
M15X1	0.5824	0.5896	0.605
M17X1	0.6612	0.6682	0.685
1/2-28	0.4924	0.4989	0.510
9/16-24	0.5541	0.5613	0.575
5/8-24	0.6166	0.6238	0.640
11/16-24	0.6791	0.6863	0.700

Theoretically, you can produce a good thread as long as your barrel is larger than the minimum diameter for that thread. But realistically, it needs to be less than .01" oversize so that you can start the die and cut the threads without putting undue stress on the die. Overstressing the die could break it and/or strip the potential threads requiring costly repairs.

Cutting the Barrel OD to Size

If your barrel has to be cut down before threading, there are a number of ways to get this done. The most appropriate way would be to turn it on a lathe. But this involves completely removing the barrel from the gun and probably removing all hardware that is attached to the barrel. That, in itself, is enough to make most builders choose another way (even those who have a shop full of lathes).

Regarding the other ways to size a barrel OD, you will need to consider how much material has to be removed. If the diameter has to shrink by more than .03" you may need to use an annular cutter. These can be used with a hand drill to cut a substantial amount of material down to a size that can be workable for a particular thread. They must be ran at a very slow speed (about 200-300 RPM), used with a pilot, and patiently operated by someone with good mechanical aptitude and common sense. Cutting oil should also be liberally applied to keep the cutter sharp.



A belt sander can also be used to cut the OD. Unfortunately, it is very hard to keep the OD round if you need to remove more than about .005" - .010". One solution is to run a larger die over the barrel, then sand those threads off (using the teeth marks as guides to know when to stop sanding), then cut the threads with your finish die. This method requires quite a bit of patience and skill as well. If you decide to try it, then your 1st die (roughing die) should be chosen based on it's minor diameter. It's minor diameter would, ideally, be within the major diameter tolerance of your finish die. For instance, an M15 X 1.0 die has a minor diameter of about 0.547". This just happens to be within the major diameter tolerance of an M14 thread. So let's say you have a barrel that measures 0.600" and you want an M14 X 1.0 thread. Then you could thread it first with an M15 die, sand the threads off until the tool marks are very faint, then cut it with the M14 die.



Here are some potential “roughing” dies that could be used in such a way:

ROUGHING DIES	USED TO ACHIEVE
M15 X 1.0	M14 X 1.0
M17 X 1.0	5/8-24
M14 X 1.0	1/2-28
M13 X 1.0	9/16-24

This method could also be used with a file or small drum sander but would require even greater skill and/or patience.

Cutting the Threads

Once your barrel is the proper diameter for the thread that you have chosen, use the following method to cut the threads.



Screw the TAT about 4-5 threads into the back of the die with the pilot sticking out in front.



Insert die and TAT into handle, preferably lettered towards you and aligning at least one of the tightening screws in the handle with the divots in the die OD.

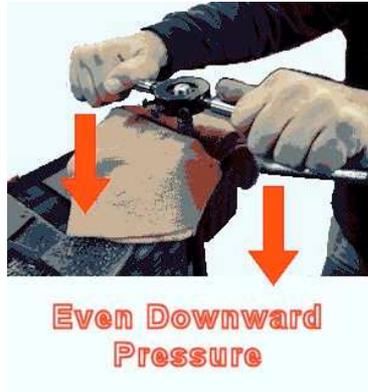


Tighten the screw that is in the divet so that the thread alignment tool will not turn.

Secure the barrel vertically in a padded vise.



Apply a good cutting fluid/oil to the die teeth and start cutting. It will take a little bit of vertical downward pressure to get started. Apply even downward pressure and rotate the die slowly.



Repeatedly advance the die about 1/8 turn, then back it off to break up the shaving (chips).

Do not allow the face of the TAT to ever reach the barrel face. This could strip the teeth out, possibly damaging the TAT and ruining the few threads that you have cut on the barrel.



Once you've cut about 4-5 threads, and before the TAT reaches the barrel face, unscrew the die completely, loosen the 2 tightening screws on the die holder, and remove the TAT.

With the TAT removed, put the die back in the handle and hand tighten the 2 tightening screws.

Resume threading as above, breaking the chips and applying cutting fluid as you go.

Thread to the desired depth, blow off the threads and check the fit with whatever muzzle device you plan to use. You want the threads firm but able to screw on by hand.

If your threads are too large, tighten the 2 screws in the handle a little bit, apply more cutting fluid and run over the threads again. Blow off the threads and check the fit again. Repeat as needed.

If necessary, you can take the die out of the handle, unscrew the preset screw in the die itself, and place back in handle, tightening the 2 screws for an even smaller thread.

Hopefully this information will help you successfully complete your barrel threading project. Make sure to wear protective glasses throughout the process and Take Your Time!. This type of work can be very rewarding when all goes smooth, or a disastrous, aggravating, mess if you try to rush.

