

Barrel selection

Introduction

If you think of your barrel as a pair of boots you know that some boots last a long time and increase your ability to travel long distances while others break down quickly, slow you down and hurt your entire body. When purchasing a pair of good boots it's important to know two things; they are replaceable and you can only get what's in your budget. The same is true when choosing a rifle barrel. No matter how much you pay or which barrel you choose if you shoot it eventually you will have to replace it. There are a lot of options to consider when you choose a barrel, but the most important option is choosing a barrel that meets your budget and use requirements.

Parts of a barrel

If we are going to discuss barrels it is important that we are using the same names for the each part of the barrel. Even though the parts of the barrel are standard there may be some subtle differences in the way people refer to separate parts. I am going to start at the end closes to the shooter and work my way out. If you were to take the bolt out and look down the hole in the middle, you would see a ramp leading up to the larger hole. Not all rifles have this however if they do, this would be your feed ramp. You then enter the chamber where the larger portion of the brass sits leading you into the neck. This is where the smaller portion of the brass sits or the point closes to the bullet. You will not be able to see the neck from this vantage point but next to it there is a smooth area known as the free bore or throat. This area allows the bullet to leave the case and enter the lands and grooves. The first place that you can see a barrel on a bolt action rifle is the shoulder leading out to the muzzle on the other end. The muzzle is then treated in some fashion to protect the crown. Not all rifles have every component that I have mentioned and some have even more parts. This is only a simplified parts list and description so you can convey what you want in your rifle build.

Rifling / twist:

You will read and hear many ways to get rifling into a barrel and how much better one may be over another. I will assure you that as long as you purchase a match grade barrel from a reputable barrel maker you will not be dissatisfied. There are many methods of accomplishing the same task such as button riffling, single point or hammer forged to name a few. Your attention should be focused more on the rate of twist. This is read at 1 in 10 and is the measurement of how many inches it takes the bullet to travel one full revolution. For example the 1 in 10 twist will take 10 inches to travel one complete revolution. This must be matched to the weight of bullet you intend to fire. If your bullet spins too fast or too slow it will not stabilize when it leaves the crown. When a bullet is not stabilized it spins like a spinning water balloon.

Contour

Here is a choice that should be based solely on the intended use of the rifle. The contour of the barrel refers to the diameter at the chamber to the muzzle. These range from a light and small diameter

barrel to a heavy and large diameter barrels. For a typical hunting rifle I will normally recommend a lighter barrel for those long hikes and single shot applications. In the tactical community or practical shooting competitions I recommend the mid-weight barrels or as much barrel as you want to carry over long distances. The bench rest shooters typically want either more weight or they need to weigh in at a specific weight. Bench rest rifles are where the heavy or largest diameter barrels come into use. No matter what you choose your accuracy is only somewhat reliant on the contour you choose. If you choose to shoot a long heavy barrel in a practical shooting competition you run the risk of being front end heavy and not being able to make those awkward shooting positions.

Fluting

Do those relief cuts do anything for your accuracy? The short answer is no, but they sure take a plain looking rifle and make it look cool. The “cool” factor aside fluting takes a small amount of weight off the rifle, and an argument could be made that they cool faster. Keep in mind that if it cools faster it also heats up faster. I choose to have nearly every rifle I own fluted simply because I like the way they look. I feel that flutes have no bearing on accuracy and may even cause your barrel to heat up faster.

Metal

The two most common metals barrels are made out of can perform equally as well if treated and built correctly. The two most common metals are chrome-moly 4140 and stainless steel 416R. The stainless steel is known for its corrosion resistance without any further treatments. The stainless will last longer in all but the most extreme cases. Chrome-moly barrels can last just as long as stainless steel when treated correctly both inside and out. When comparing the cost of the two, initially the chrome-moly will appear cheaper until you consider that you still have to treat it. After treatments the cost becomes about equal.

Length

Only a few factors play into the length of the barrel. One is the amount of velocity that is achievable and the other is the number of complete rotations a bullet makes before leavening the crown. When building a tactical or competition rifle it would probably be in your best interest to keep your barrel length to a maximum of 20 inches. When mobility is not a factor, one could determine what the maximum length necessary to achieve the highest velocity and best use of burn time for your rifle round. With today’s technology barrel length can have a minimal impact on accuracy. You should be able to match your rounds to your rifle for the best performance.

Brake / Suppressor / Threaded

I have broken down the muzzle end of the rifle into two categories, the muzzle and the crown. To me the muzzle is the end of the barrel that is either threaded or not. You then have the crown that is the last place the bullet touches before it leaves your control. The crown should be polished and free of any burrs, nicks or obstructions. After you fire you should be able to see an even ring or star pattern on the crown from the escaping gas. If you do not see an even ring or star there could be a problem with

the way the bullet is leaving the barrel. The muzzle has a couple of functions for the rifle. One could simply leave it rounded with a recessed crown to aid in the protection of the crown; this is how most factory rifles are. While you are having your rifle built you could also have the crown threaded to accept a suppressor or to add a muzzle brake later on. A muzzle brake is typically my recommendation no matter what caliber you have chosen. They make the rifle louder but they also make follow up shots quicker. A quality muzzle brake that is properly installed will greatly reduce your recoil felt and stop a lot of muzzle climb after firing. The nice part about muzzle brakes is that they can be threaded to accept a suppressor if you decided later on you wanted change to a suppressor.

Closing

Your final choice needs to be one of function over looks. If you are building a tactical or hunting rifle you may want a shorter fluted barrel to help maneuverability. However, if you are building the ultimate 2000 yard rifle you may want a heavier longer barrel for the increased weight and velocity. Ultimately no matter what you choose it needs to meet your intended purpose and budget. Above all if you are putting the money into a custom rifle and making the time to shoot you will have the opportunity to select another barrel at some point.