Sharp Shoot R
Precision Products

Sharp Shoot R Precision
Box 171
Paola, Kansas 66071
785-883-4444 phone
785-883-2525 fax
email=getinfo@sharpshootr.com
www.sharpshootr.com

**Barrel Break In**

**Document#70** ©

Let's start by discussing the particular nature of the inside of a barrel in a modern firearm. There are practically no standards of barrel material (which may be carbon steel or stainless),nor are there very many standards in the methods of producing the rifling inside. With this in mind it is easy to understand why there are not many "givens" in the process of barrel break in. Most of the barrels produced fall into two classes. "Factory barrels" are those that come your major brand complete firearm. "Custom barrels" produced by independent custom manufacturers, that offer a wider range of selection and generally a much higher degree of quality. The "Custom barrel" is usually installed by your favorite gunsmith or custom rifle maker.

The rifling process starts with thru-drilling a blank of barrel steel. The straightness of this primary hole drilling is just as important as the following methods of rifling are. Barrel makers have a varied number of grooves in the rifling they can produce. This process is usually achieved by either one of three methods. The way most barrels were made for centuries was to "Cut" rifling in the barrel by the means of a Hook and Broach. Today most barrels produced by this method are called "Cut Rifle Barrels". The second method of producing rifling in a barrel is called "Button Rifled Barrels". A button made usually of a carbide steel alloy, is forced thru the barrel to produce a "Button Rifle Barrel". Lastly is the "Hammer-forged barrel" which is produced by first thru-drilling an oversize hole, placing a mandrel inside which has the rifling on its exterior. The barrel blank is then "hammered" with tremendous pressure in a 360° manner to shrink the barrel down around the mandrel. All of these processes are capable of producing barrels that can produce incredible accuracy.

Let's get a couple of things straight in our thinking. You probably have heard about "rough" barrels, and very "smooth" barrels. I can tell you for a certainty that there are both "rough barrels "and "smooth barrels" that have great accuracy. The "rough barrel" will, however, generally allow fouling to build up quicker. You have to be aware of this fact when you are breaking in your new barrel. You will be looking for factors that will help you determine which of the two groups this new barrel is going fit in. If it's going to be in the "rough barrel" group you're just going to have to clean more often. "Custom barrels" generally have been lapped to one degree or the other before they leave the factory. It's a good idea to find out from the maker if this is part of their practice because lapping will start the break in process. "Factory barrels" have no general rule either when it comes to lapping. You need to check this out in every instance. Lapping can smooth the barrel and help to minimize the build-up of fouling. Lapping by the way is achieved by using a mild abrasive on a patch and "working " on the rough spots, a process done exclusively by feel.

Just what the heck comprises fouling ? Well fouling in a barrel really could be considered anything that is deposited after a round has been fired. Fouling build-up is what causes a barrel to lose accuracy. Fouling is found in three major categories, and several minor ones. Lets look the"majors" first !

**1. Powder and primer fouling** leave a gritty greyish black residue. Powder fouling generally has some degree of corrosive nature on any type of steel. Black powder fouling is highly corrosive and needs to be removed immediately. Shooting a black powder firearm can give you a much better understanding of what the negative nature of fouling is, because a black powder firearm will lose accuracy due to fouling after a very few shots ( 4 or 5 shots usually) Smokeless powder fouling is not as pronounces because it produces less residue than black powder. Clean burning powder is a good thing ! There is still a lot of military ammunition around that uses highly corrosive primers and powder. This fouling like black powder needs to be cleaned and neutralized immediately. You also need to know what the fouling threshold is an any particular firearm. This is part of the education you receive in barrel break in. By the way powder fouling is deposited over most the inner barrel surface.

An ugly sub-species of fouling is the particular propensity of the deterrent coating on ball powder. This fouling is normally present in the area directly ahead of the throat. It is one of the most difficult form of fouling to remove. It is powder fouling, but leaves a particularly nasty form of hard carbon fouling that is almost crystalline in nature.

**2.Carbon fouling** is caused by the by products of burning powder. Carbon fouling can also be caused by the burning oil you left in the barrel. Carbon will always look brown on a patch, and it is distinctly different in color from powder fouling. Carbon is usually deposited in the rear 20 percent of the barrel You can see lots of carbon build-up in the"throat area of the barrel. The throat is just forward of the chamber. A bore scope will also show you just what the flame temperature of the powder will do to the throat. You will see a lot of fissures and cracks in the steel, and these are generally filled with carbon. When the "throat " is gone or "shot out", so is the accuracy of the barrel. Carbon fouling is probably the most difficult to remove, because it has a great"cling" factor. Cool burning powders are a "good thing."

**3. Copper fouling** in general has been one of the most over-looked areas of barrel fouling. Most of the old traditional "Powder Solvents", are just that. They get rid of most f the powder fouling, some of the carbon, and NONE of the copper fouling. I personally have seen many rifles that had as many as 6 or 7 distinct layers of fouling, just like a "Black Forest Torte". There are many firearms, the dealers tell me; are traded in because the owner believes the rifle is "shot out." In most cases they are badly copper fouled, and are in need of a good cleaning. When the copper is removed these rifles return to their previous accuracy. Copper fouling is generally found in the last 20 percent of the barrel. The reason for this is that this portion of the barrel is where the bullet has achieved maximum velocity, and maximum friction. Believe it or not, most of the barrel heat is caused by bullet friction. Flame temperatures from burning powder can be felt in the chamber area. Bullet friction is felt at the end of the barrel. You should notice that the mid portion of the barrel is a bit cooler than either one of the previously mentioned. Rifle target shooters and varmint hunters for the most part have been long been aware of problems caused by copper fouling. If copper fouling is present it is easily visible to the naked eye. Look down the muzzle end of the rifle using a strong light. If it's there, .....there will be pronounced copper streaks on the rifling. In the past the only way to remove copper has been with strong solutions containing lots of ammonia. The removal always required lots and lots of brushing. Along with that there have been lots of rifles that were not "shot out" they were "cleaned out." In just one cleaning session count the number of passes you take thru a barrel using this stuff. Then multiply that number times the number of cleanings, and finally multiply that number times the age of the firearm. <u>The product is thousands of strokes through a barrel.</u> There is NO way you can pass a cleaning rod thru a barrel that many times and "NOT" compromise the quality of the barrel. Brushing is <u>not</u> a "good thing." We believe brushing a barrel is "dark ages technology".

**<u>GETTING DOWN TO NUTS & BOLTS</u>**

With all this in mind we now can turn to the task itself of breaking in a new barrel. Generally we can say that most new barrels are "broken in" somewhere between 50 and 100 rounds. In my personal experience I have

seen some factory barrels that would not settle down in to shooting good groups until 200 or so rounds had been fired. You should be able to see a marked improvement in group size as the barrel "breaks in".

**BEGINNING THE BREAK IN PROCESS**

Firstly you need to make sure that your new barrel is dead clean. Apply Wipe-Out™ and let it sit for an hour. Patch out the barrel and re-apply Wipe-Out, letting the second application sit of at least 20 minutes. This second application is a "Proof Test". It will **' prove**' if the first application really got the barrel clean. Twenty minutes is long enough for the chemicals in Wipe-Out to react if there is any fouling left in the barrel. Remember that copper will leave a blue patch. Powder fouling will leave a patch greyish black. Carbon will always leave a brown color on the patch. If, after the second application of Wipe-Out there is still color on the patch, you will need to re-apply Wipe-Out and let it set overnight. When you get a clean white patch, using Wipe-Out, that means that the barrel is "dead clean".

We can now start the " break in" process. **What we want is to let the barrel tell us how far we are in the "break in " process.** I also recommend using a good coated one piece cleaning rod and a bore guide in the cleaning process. Be sure to use a caliber specific jag and good 100% cotton patches.

**Step # 1**

**With a clean barrel the first thing I recommend is to fire three shots,** using ammunition that I know is accurate in this cartridge. Remember that we are shooting for the best group possible. The concentration of shots into a small group will also tell us how far along the barrel is in the "break in " process. I then apply Wipe-Out and let the bore cleaner sit for approximately 20 minutes. Pay close attention to the color left on the patches, because the color will tell you what is going on in the barrel with regard to fouling.

**Step#2** (no evidence of copperr on the patch)

Apply the second application of Wipe-Out.....the "proof test" application, and let it set another 20 minutes**. If you do not get any color on the patch after this second application, you then know that the initial application really did clean the barrel.** You may the proceed shooting groups of three shots, allowing Wipe-Out to set for 20 minutes after each group of three. I normally will fire 5 groups of three shots, cleaning after each 3 shot group. I am interested to see if the groups are getting smaller. I normally will increase to a four shot group, with a 20 minute cleaning in between each fired group. After 5, four shot groups, I will then progress to five shot groups. You may need some additional break-in with a particular stubborn barrel. I would suggest trying a different load or a different brand of ammunition. Normally the barrel will tell you as it breaks in by shrinking group sizes.

The barrel may still show evidence of copper after total 100 rounds has been fired in groups of two, three, four or five . That is not indicative of anything other than the fact that this barrel will copper foul easily and it will need to be cleaned more often.

This process will fire between 50 an 75 rounds of ammunition. What is important about this break in method is that all along the way we have been shooting groups. We know that as the barrel breaks in, group sizes will get smaller. **We also know that when the groups quit getting smaller- that barrel is broken in.**

What is most important is that the barrel is clean between each group firing. As the barrel is breaking in you'll be able to see a definite improvement in group size. Smaller for a change, is always better. The beauty using Wipe-Out in the "break in " process is the fact that the barrel quality has not been compromised by endless amounts of brushing There is no guesswork about how far the barrel is broken -in?.

If you have any questions please do not hesitate to call. I will be happy to help you with any questions you may have.

**Learn to use the PROOF TEST Apply Wipe-Out or Patch-Out and let it set for 5-10 minutes. If you get no color on the patch you're good to go. But if you get any color, the barrel is fouled and needs further cleaning. It is totally reliable. It will remove any question in your mind if a barrel is clean or fouled.**

Best regards,

Terry Paul
Sharp Shoot R Precision Products
785-883-4444 Phone
785-883-2525 Fax
E-MAIL = gethelp@sharpshootr.com
Web site: www.sharpshootr.com