SHOTGUN CHOKES

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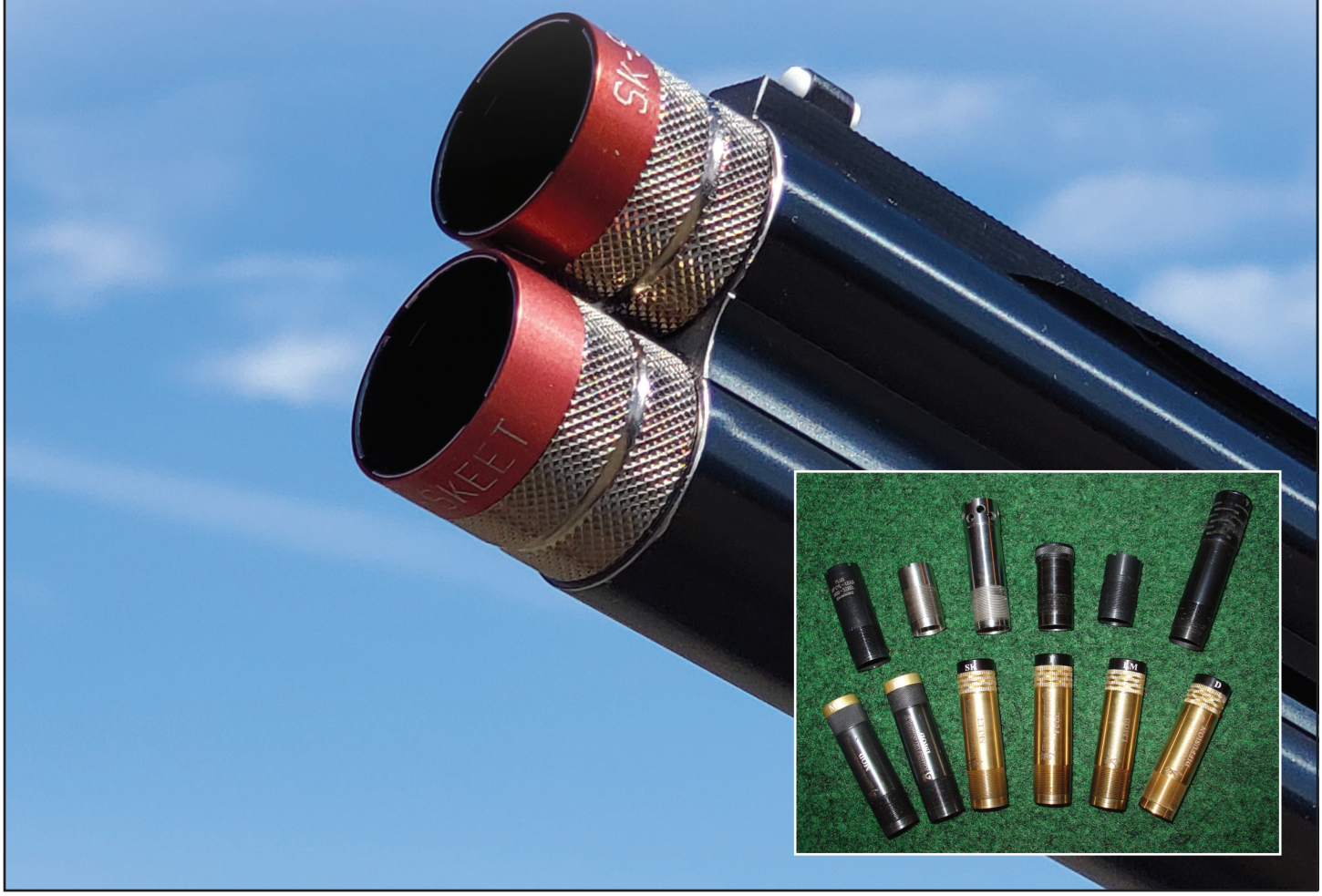
PART OF THE

AHEIA "O.W.L. SERIES"

OUTDOOR WILDLIFE LEARNING

MODULE #9



Choke Workbook

If you went to any gun club in the world and listened to shotgunners, it wouldn't be long before the topic of "Choke" came up. It also wouldn't be long before you were witness to as many opinions as the number of people in the group ... you will hear what is right or wrong and what the mystical powers of choke are and how "Choke" was the answer to all your lost targets or missed birds!

Choke is nothing more than the constriction or lack thereof, at the muzzle end of the barrel of a shotgun. This is a small constriction that is measured in thousandths of an inch ranging from about .005" up to about 0.40" and even slightly more.

So why do we need to know what choke is or what choke we may have in our firearm?

To put it simply, shotgun choke can make all the difference to your shooting. It can determine the difference between a Miss or a Hit of whatever you are pointing your shotgun at!

While it's a broad topic it doesn't need to remain a mystery. Let's see if we can break it down...

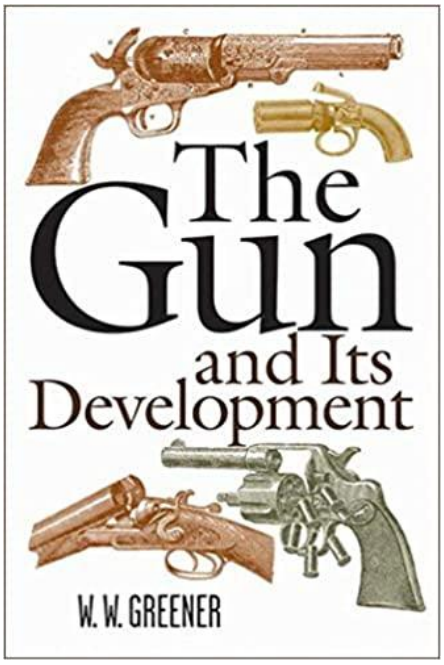
HISTORY:

Although it's virtually impossible to follow the patent or determine exactly who / when they came to be, it is largely believed that choke was invented in Rhode Island

in the early- to mid-19th century by a gunsmith, Jeremiah Smith. On July 14, 1868, an inventor from Boston created the first patented “detachable muzzles for shotguns.” These chokes would be screwed on the outside of the barrel and were not fixed. There is some information in the written record that may predate this in Spain; but as mentioned, no one really has the definitive answer.

Later, one thing we do know is that a gunmaker in England, the famous W.W. Greener did some excellent work to perfect shotgun chokes. Early American versions were inconsistent and patterned poorly. William Greener made lofty promises about the efficiency of his "choked barrels" and that led to the huge popularity in his firearms at the time. It is believed that he come up with first method that could be consistently repeated. His "method" was to fix a choke as a permanent part of the barrel design. He is often credited as the inventor of the first shotgun chokes that actually really *worked*.

In 1875 his claims were put to the test and proved to launch a whole new era of accuracy and efficiency for the use of shotguns in wingshooting. W.W. Greener has the substantial claim to the initiation of the choke and he completed what has become a classic publication, "The Gun and its Development" from 1888. This is a worthy read and it is still available in print today.



The next change in the evolution of chokes was to make the constrictions interchangeable, which made this a much more viable option for use. It could effectively be used for multiple targets at multiple distances. This idea of "screw in or interchangeable chokes" became vogue in the 1960s when Winchester produced the Model 1200, the first mass-produced shotgun that came with their “Winchoke” system. From that point forward, the science, utility, and detailed theories has become an ever-evolving world.

This idea of changing constrictions on our shotgun barrels may be taken for granted by the uninitiated today, but the addition of the capacity of a shotgun to change chokes may likely be the greatest invention that effected the ability of our guns to hit what they are pointed at since the actual invention of the shotgun (smoothbore) itself!

By the latter part of the 19th century, choking of shotgun barrels had progressed from an art to a science, with all manufacturers of smoothbores supplying choked barrels to meet the ever changing needs of the customer.

The tightest choke constriction was called a ‘full choke’ because making the constriction any smaller did not improve the pattern performance.

A system was developed to standardise the method of specifying chokes and this resulted in a classification of five choke descriptions. The English, the Europeans and the Americans each had their own way of describing these chokes. The English system was actually pretty easy to follow, with the chokes designated: Full, ¾, ½, ¼ and cylinder. The Americans came up with a different system, with the designations: full, improved modified, modified, improved cylinder and cylinder. Lastly the Europeans, just to be different, have a system of using asterisks or punch marks, starting with * for full choke, ** for ¾, *** for ½, **** for ¼ and CL for cylinder.

The interesting thing about choke designations relative to barrel dimensions is that the true measure of a choke’s designation is classified by how many pellets (as a percentage of the total in the shotshell) will fall in a 30" (76cm) circle at 40 yards (36m).

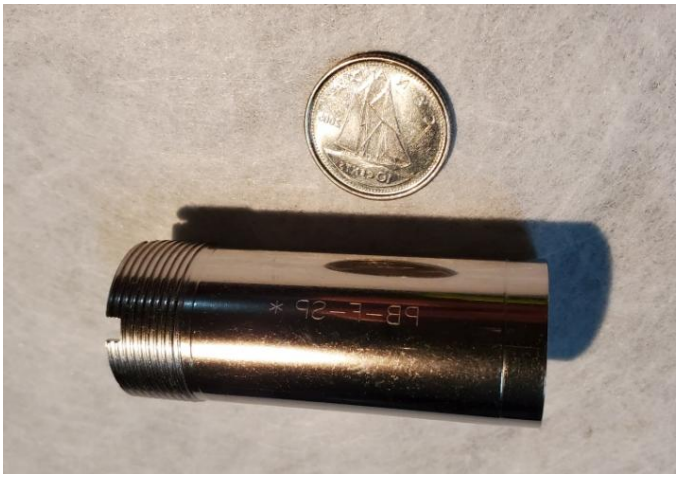
Shortly after WW1 Skeet shooting was developed and a new designation was introduced, which is a cylinder choke with a very slight constriction (about

0.004"). While this level of choke did not significantly tighten the pattern, it made the shot distribution in the pattern more uniform. As you will learn later in the workbook, this is described as "Open".

Today, all manufacturers have to stamp some kind of identification of the choke marking on the barrel when the choke is fixed.

The information on this barrel shows 34*. The 34 indicates the barrel length and the single * for this manufacturer indicates Full Choke.

Instead of being specific with dimensions and stamping the numeric constriction on the choke, they try to make it easy for us and stamp a choke name on it.



When you think about it, it's probably not a bad idea because most of us don't really care or know what the constriction numbers mean. But in the mind of those that build our guns and chokes, we can probably all understand:

"IC" is close,

"Mod" if somewhere moderate or middle

and "Full" is far.

Bottom line: If you really want to know what you have and what patterns it will produce, you have to pattern with the shotshell that you plan to use. More on that later in the workbook.

What is Choke?

When you slap the trigger on your shotgun you set off a chain reaction. As the shotshell is fired, shot travels down the bore, exits the muzzle, and begins to spread out. As it exits the muzzle it is affected by the constriction near the end of the barrel that ultimately determines what the shot exiting does. The inside bore constriction at the muzzle end of a shotgun's barrel is known as the "choke."

Think of it in comparison to the nozzle on the end of a garden hose. As water travels down the hose to the nozzle, you control the spray of water by making it narrower or wider. As you know, when you restrict the hose diameter at the end you compress the water and it travels further and in a tighter pattern. As you open the nozzle up you widen the spray and saturate close distance. The amount of water doesn't significantly change just as the amount of shot doesn't change on a constricted barrel of a shotgun. You merely keep it close together or let it spread apart. Each action has an effect on the coverage of the shot. The objective is to gain more accuracy with your shots as well as better range.

There are three basic chokes for a shotgun. The first is "Full" and as we learned above, this tight constriction delivers a narrow, dense spread. The second is "Modified" which has less constriction and therefore delivers a medium-width spread. The third is "Improved Cylinder" which has even less constriction and delivers a wide, open spread.

A gun with no choke is called a cylinder bore and delivers the widest spread or "open" pattern. There are also a number of specialty chokes that provide narrower or wider spreads—these are typically used for skeet shooting and turkey hunting and of course there are a myriad of sizes in between. These additional sizes allow us to further fine–tune our shotgun for our specific purpose.

Let's Review These Other Chokes:

Remember, the choke in a shotgun is designed to shape how the shot spreads after you pull the trigger. The choke is placed in the bore of the shotgun barrel at the muzzle end. There are two ways a choke gets installed into a shotgun. The screw-in chokes, which are easily replaceable and there are also fixed chokes that are integrated into the shotgun barrel so that it is a part of the bore without being replaceable.

Most current shotgun barrels are threaded for screw–in choke tubes, making them truly versatile tools. By simply swapping chokes, shooters can use the same gun for a wide variety of shotgun sports. While changing chokes is easy, deciding which choke to use can be difficult due to the wide array of choke choices out there. Often-times shooters suffer from the indecision of having too many alternatives to consider. Plus, everyone seems to have their own opinion about

what works best, further adding to the confusion.

Some people say that fish hooks are designed to catch fishermen! Others believe that a myriad of choices allows for the total domination of the quarry. If you apply that analogy to Chokes, you can decide if you are collecting chokes to eliminate excuses or if you need chokes to more accurately hit your target.

You may be a "Choke Junkie" who changes your choke tubes at every station or quarry... or maybe you are simply looking for a way to improve your scores on a particularly troublesome target. Whatever category you fall into, the following list and detailed description may serve as a guide to the many choke options available. Listed are both the choke name and degree of constriction, which remains basically the same regardless of gauge or bore size, although there may be some deviation in the smaller gauges (see accompanying chart). Chokes are available from the gun's manufacturer and aftermarket suppliers:

CHOKE	CONSTRICTION	CHOKE DIAMETER*
Negative	-.005	.735
Cylinder	.000	.730
Skeet	.005	.725
Improved Cylinder	.010	.720
Light Modified	.015	.715
Modified	.020	.710
Improved Modified	.025	.705
Light Full	.030	.700
Full	.035	.695
Extra Full	.045	.685
Super Full	.055 (or even tighter)	.675

* for a 12 Gauge shotgun with a .730 bore

Let's take a deeper more detailed look at each, starting with the top of the chart:

Negative (–.005)

Often called a “Spreader” choke (S), sometimes referred to as a "Diffuser" choke (D) this is a choice for skeet’s low targets that are coming towards you, sporting clays’ rabbit and some springing teal targets. A negative choke has an inside diameter greater than the barrel’s bore. To help achieve this greater diameter, negative chokes often extend beyond the muzzle. Patterns open fast and wide, making it easier to connect on "up close and personal" targets.

There are not a lot of options here as not many companies manufacture these chokes...There isn't a lot of demand for this one. The Negative choke is about as open as anyone can go. If you find yourself struggling to hit one of these really close approaching targets you might want to try a negative choke if you can find one!

Cylinder (.000)

A Cylinder choke (C) has no constriction, the inside diameter is the same as the shotgun's bore. The absence of constriction means patterns open up very quickly. Cylinder works well on close skeet targets like at Station Eight or low–house birds at Stations One and Two. This choke allows for a rapidly expanding pattern and will help you to hit targets described above or even the pesky bouncing rabbit target in sporting clays.

Skeet (.005)

This one is a popular choke with skeet shooters. It has very little constriction and as a result allows for a forgiving pattern that opens up wide and fast. Skeet guns have 2 barrels to allow skeet shooters to shoot pairs. When a double barrel shotgun is equipped with this choke it makes a great choice for the second shot at the close stations when paired with a negative or Cylinder choke for the first shot. For shooting pairs at the farther stations, like #3 through #5, you might consider trying a "Skeet" choke for the first shot (target is approaching you) and shifting to a tighter choke for the second (target is generally travelling away from you).

A Skeet choke can also be used in sporting clays and for hunting upland birds. For the close incomer of a pair in sporting clays or for incoming doves near a waterhole, or even speedy teal passing close, Skeet choke will get the job done!

Improved Cylinder (.010)

This is one of the more common choke constrictions, Improved Cylinder (IC) is a choke often carried by shooters and used by many. This choke is used for everything from 16–yard trap to the second shot on skeet pairs. It also works well on many of the clay target presentations thrown on the sporting clays course.

While chokes are generally designed for multiple pellets if a shooter plans to use slugs (single projectile) for such things as deer hunting. This choke can provide great results with rifled slugs.

Light Modified (.015)

Light Modified (Lt. Mod. or LM) has become increasingly a very popular option among shooters of all types of targets from waterfowl / upland game birds to clay targets.

This is the one used by those who don't want to fool around switching chokes at every station. Lt. Mod. also makes a great all–around choice for sporting clays. It's more forgiving than Modified, yet provides denser patterns than IC. If a person had to choose one or two chokes to be used for all around shooting with the exception of high flyers (geese and clays) this would probably be it.

Modified (.020)

This one is often thought of as the best choke constriction by traditional shooters. It is considered a dependable stand-by for many target / field gunners. For targets presented in Handicap trap, tall tower shots in sporting clays or even pursuing prairie birds at longer distances, you may consider fine tuning and using even more constriction.

Many a prognosis on the trap range and especially in the field, has been heard where the Modified (M) "is as tight as you dare go when shooting steel shot", but in today's world of specialty aftermarket chokes, you can go tighter, as we will explore later.

Improved Modified (.025)

When pursuing our giant Canada geese with large steel shot, with BBBs or BBs, this may just do the trick for you. Improved Modified (IM) Extended, aftermarket IM tubes made of hard stainless steel or alloys designed to handle steel shot will consistently pattern large steel shot better than traditional Mod. chokes. Pattern your shotshell combination to prove it to yourself.

On the Trap field this choke is often used by shooters who desire that "black puff" of a completely powdered clay target when hit. They seem to like the confidence they get from that "puff of clay smoke".

Light Full (.030)

This choke is one of the newer offerings and not used by many yet. But Light Full (Lt. Full or LF) is beginning to be used by confident Handicap trapshooters. It also has great effect as a waterfowl choke for the longer distances. Many pass–shooting goose chokes labeled “Full”, actually measure closer to Lt. Full in true constriction which brings up the point of measuring your chokes to see if they match the sellers claims. Again, you should give this a try with your shotshells and a pattern board.

The high–flying snow geese, tend to be a challenge for most and Lt. Full gets the job done. The thinking is the result is fewer cripples and more birds on the ground and in the pot. Do yourself a favor and try pattern testing with Lt. Full on BB and BBB steel shot... you may find this a better option than Mod.

Full (.035)

This is the last of the three common chokes, Full (F), finds its niche on the trap field when used by the AAA and AA shooters and in the field when chasing after late–season pheasants who seem to spring up from unbelievable distance or wild open prairie sharp tailed grouse. This is a standard choke often coming with your new gun purchase. In the field a full choke is often recommended for turkeys, but there may be even better choices for pursuit of your thanksgiving meal. Again... pattern test your shotshell / choke combination to see what works best at the distance you want your pellet mass to appear.

Extra Full (.045)

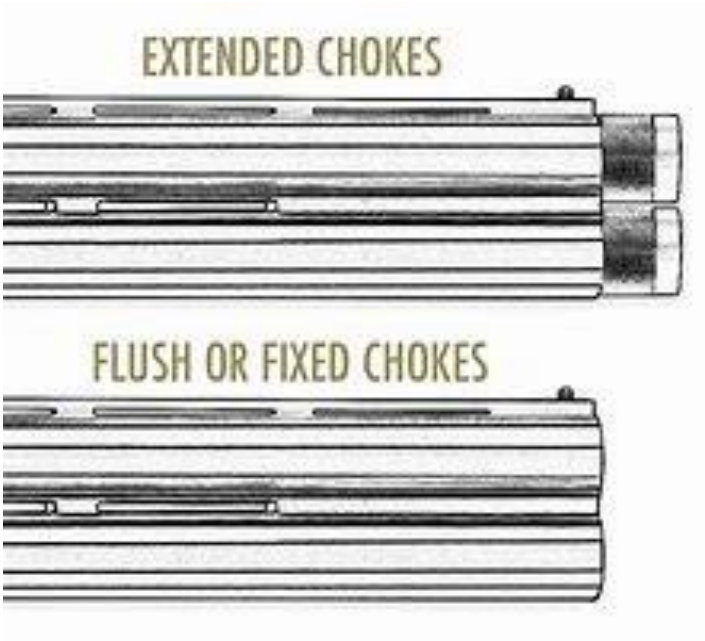
While some would say this choke doesn't have many applications in the target sports, Extra Full (XF) it is considered the go to option on a very windy day by many trap shooters. It is also thought of as the "right medicine" by many turkey hunters. There are numerous factory XF extended turkey tubes produced and one should not rule this out as an option.

Super Full (.055 or tighter)

If your objective is to lay a large number of pellets over the vital head and neck area of a turkey that holds up outside the 40yard marker, then the Super Full choke (SF) may be your best option.

Super Full choke (left) and turkey target (right)

Extended vs. Flush



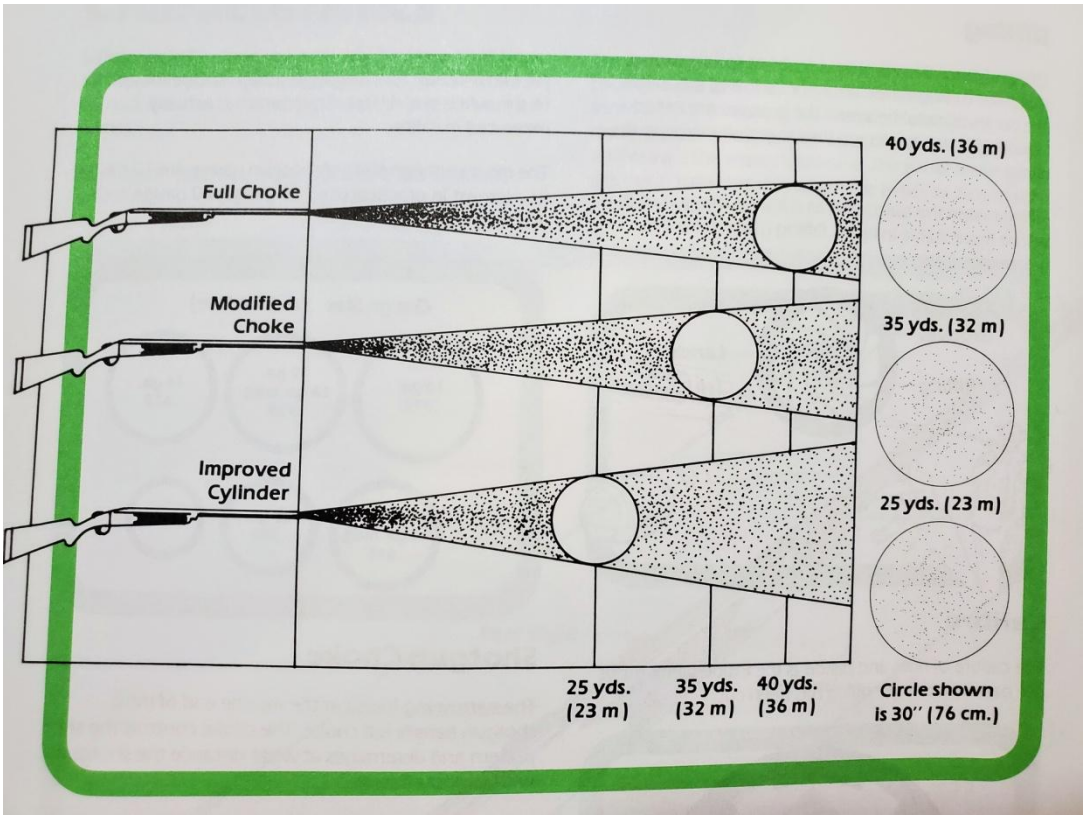
Confused yet? Well to make the decision a bit more complicated, all the chokes we have discussed so far come in "Flush" (do not extend beyond the end of the muzzle) and "Extended" (which as the name implies - extends beyond the muzzle).

This is worth considering when choosing choke tubes. One school of thought is extended tubes often pattern better than flush–mount chokes, since extended tubes will usually have a longer taper and parallel section in which constriction can occur more gradually and uniformly, as opposed to the more abrupt constriction in shorter tubes.

Additionally extended chokes require little effort to remove and can often be swapped out by using your fingers instead of the choke tools supplied by the manufacturer. This makes it handy and quick for the "choke junkies" referred to earlier. Even though they have knurled edges at the end they sometimes are so tight a tool is required to remove them. Regardless they are certainly popular in the clay target sports. Field gunners also like them because they can be removed quickly while wearing gloves when those high flyers seem to be all that are approaching the decoys.

Regardless of what you use, never change a choke on a loaded gun! Check to ensure the firearm is unloaded!!! Once certain it is safe, then you can place your hands near the muzzle and remove the choke. Place lubricant onto the tube threads and some on the barrel threads because removing a stuck choke is no treat and often requires a gunsmith's assistance.

A shotgun's choke also determines its effective range. The tighter the constriction, the further the effective range. For instance, a full choke is most effective at 40 to 50 yards. An improved cylinder is most effective from 20 to 35 yards. Shotgun barrels come with either fixed (non-removable) chokes or today's more popular interchangeable screw-in choke tubes that let hunters quickly and easily change chokes to match changing shooting conditions.



While there are a myriad of choices and you may be suffering from indecision, choosing chokes doesn't have to be difficult. To fine–tune your shotgun, try some of the lesser–known constrictions. Also, as described above, spend some time at the patterning board to determine what works best in your gun.

The Pattern Board:

We Should Pattern Test Our Shotguns and Chokes - clearly, if you want to know what you have, you have to pattern with the shell that you are going to use. Don't be afraid to experiment.

With six common shot sizes and nearly a dozen choke sizes in a double-barrelled shotgun, there are more than enough permutations and combinations to experiment with, until you can find the ones that work best.

Here is an example of a steel patterning board. Paper is spread over the surface and secured by magnets on each corner. When lead shot strikes the pattern board it flattens and falls to the ground. In the unlikely event of rebound, wear safety glasses, but when standing 20 to 30 yards back it is highly unlikely that lead will ricochet back to the shooter. Other forms of pattern boards can include wooden sheets. Regardless of what you use, beware of the backdrop and know where your projectiles will end up.

How Do I Pattern my Shotgun?

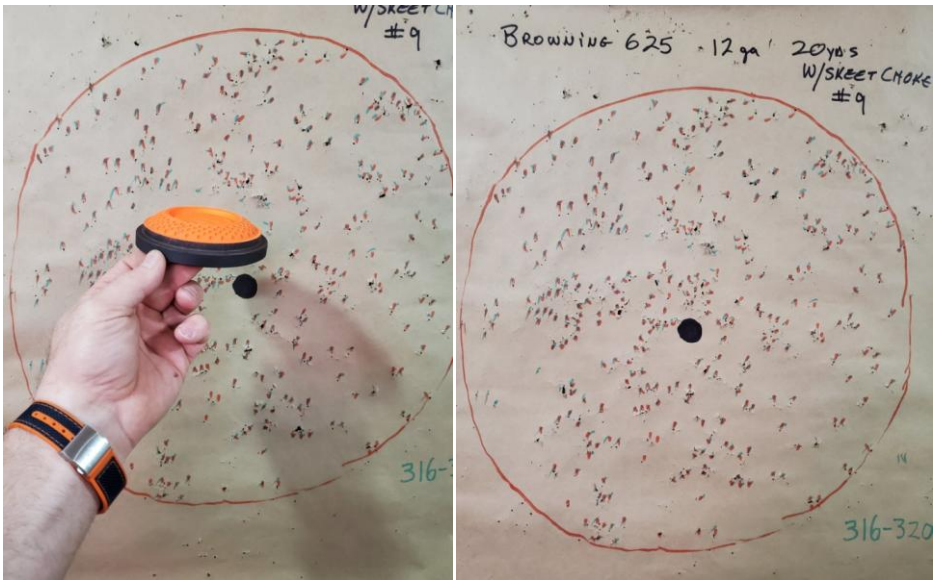
1) Verify Point of Impact

Screw in a tight choke and shoot two to three aimed shots from a rest (we want to take gun fit out of this equation) at the same sheet of paper from 25 yards. The center of your pattern should have obliterated the aiming point, or a spot 1 or 2 inches above it. Don't worry if you are off target by a couple of inches, but if the point of impact is far from the point of aim, try a few different choke tubes to see if you have a bad tube. Not all tubes are created equal

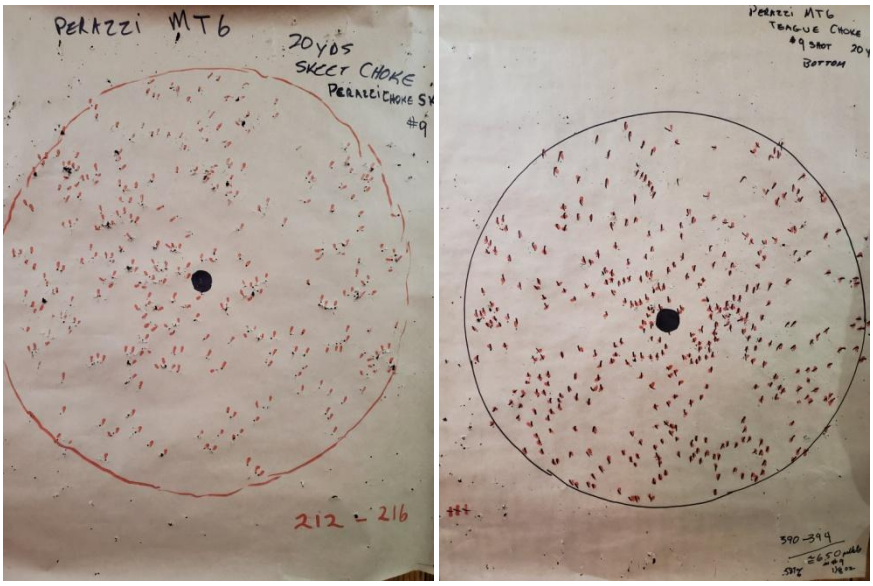
2) Check Your Pattern

Practical patterning takes place at whatever range you typically shoot your birds. Attach a 40-inch square sheet of paper to a backstop, move to your shooting distance and shoot. Collect the information on the pattern sheet - gun, choke, load, and distance, put up another piece of paper, repeat the process at least two more times.

At home, draw a 30-inch circle on your sheet with the densest cluster of pellets at the center. You don't have to count the holes, but it helps; look for a pattern with enough pellets to put four or more hits on the vitals of the species you'll be hunting or the size clay you are pursuing. Pay closer attention to the 20-inch center, which is the reliable part of the pattern. There will be gaps or spaces in the pattern - there is no such thing as a perfectly even pattern with one pellet strike in every square inch of the circle. This is because shot charges cluster pellets more tightly in the center and spatter them randomly around the edges. If the pattern has lots of gaps in it where only one or two pellets strike the spot, you need to experiment with smaller shot, a heavier shot load or a tighter choke. If your patterns is overly dense in the center and weak on the fringes you may be using too tight a choke for passing targets but it may be just what the doctor ordered for trap targets or long distance flying away field targets.



It's also vitally important to remember that not all chokes and shot mixed together are created equal. A No. 6 bird shot through a Beretta over-and-under with modified choke might pattern differently than the same size choke and shot size combo in a different brand. That applies to different brands of shotgun shells, chokes, wad types, and even the shotgun themselves. You may find that the same gun with 2 different yet same sized chokes will pattern differently! Test them and select appropriately.



Testing on paper to see at what distances a 30 in. circle has an effective pattern should be a part of our pre-season preparation. The consensus seems to be that

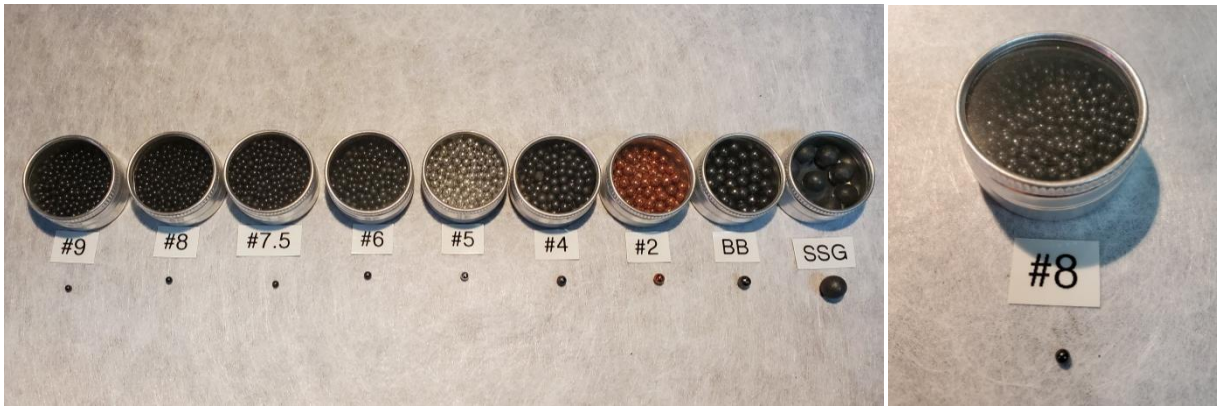
once less than 60 percent of the shot appears in that 30 in. circle, your shot is no longer effective at that distance. Experiment with the brands and combinations as described above to find what the ideal combination for your application should be.

"Blown Patterns" or patterns that have ‘holes’ in them are not our friend as they will allow targets to escape. You might very well have done your part and placed the shot where it needed to be but the combination may have provided unacceptable results. A great uniform pattern can be every bit as important as the degree of constriction or choke you have selected for your purpose.

Please also remember that while a shot pattern looks two-dimensional on a pattern board, the shot is three-dimensional when in the air. The length of the shot string is to some degree determined by the choke, as tighter chokes may produce longer shot string which means there may very well be more margin for error on a poorly aimed shot.

The shot string may be a meter or more (100cm) long, although one would have to have extremely technical and specialised equipment to accurately determine such a measurement.

As briefly described above making the right choke choice for a particular job is also partially determined by the shot size involved. For example, using #8 -shot in a full choke barrel will produce a very dense pattern with a large number of very small pellets, which do not have much energy left after 35 - 40 metres.



The higher the number, the smaller the shot size and the larger the number of pellets in the shotshell.

You have to understand that a lot of science and mathematics are involved in creating the perfect choke for a shotgun. There are so many factors that go into making good chokes such as the length of the shotgun barrel, the material of the choke, the geometry of the choke, the milling / manufacturing of the choke and the final interior and exterior finish of the choke.

Often times you get what you pay for and it is not uncommon for different valued chokes to shoot in different places even though they bear the same constriction. It is also not uncommon for two chokes from the same manufacturer and the same constriction to shoot in different places. This is less likely with some of the finer premium brands and models of chokes currently made. More money doesn't always mean better. Be careful!

Shotgun choke can make all the difference to your shooting, so it's well worth your time and effort to take this seriously. Learn exactly what shotgun choke is, what it does, how it affects your shooting and which you should be using. Test it and be sure. The pattern board will reveal many secrets and dispel many of the tales heard around the shooting benches and coffee shops.

Good luck with your shooting and have fun testing and perfecting your choke combinations.

Be safe and we'll see you in the field or on the line!

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