

## Developing a Load

There are plenty of articles out there on bullets, powders, primers, and brass preparation so we are not going to talk about that here. We are going to cover on how to actually develop a load.

The first thing we need to do is determine the amount we are going to vary the charge. For a .223 sized case .2 or .3 gr is good amount. For a .308 sized case we can go in .5gr increments. For the larger cases such as .300WM we could go in large increments but for simplicity we will use .5gr for them also. After finding our charge steps we will then determine the charge range we are going to develop over. A good place to get this range is from manuals or talking to others who may be shooting the same cartridge/powder/bullet combination you are looking at. In our example we will say our combination the load people are using seems to be around 44-45gr. So the next step is to load up cases that will bracket this charge you at least want to go 1gr on either side or maybe 1.5gr to make sure we capture "The Node". This is where a program like Quick Load will come in handy when we go to 45.5gr we find out that our load is going to be over pressure so we will stop there. Our loading range will be from 42.5 – 45.5gr in .5gr increments. Typically I will load 5 at each charge.

Now that we have the charges decided upon we then need to get the measurement of the bullet to the lands and find a distance to set all the bullets at. Typically a good rule of thumb is a jump of 0.010" for non VLD bullets. The only time this doesn't work is if the bullet must be magazine fed and that won't fit. Then you need to seat the bullet at a distance that will allow it to work properly in a magazine. Using a distance of 0.010" we then will seat our bullets. Once this is done lets head out to the range.

Now the next step is to determine how we are going to test. Some famous shooters will advocate that you need to test how you are going to shoot and say for a sling shooter you need to test from the sling. Well this works if you are an elite level shooter, but if you are just starting your error will mask any error the load has. My suggestion is to test loads from a good front and rear back or a bipod and rear back so the rifle is fully supported and all you have to do is pull the trigger. The other thing that will help is if you can use a scope. Loads can be developed using irons but if a scope can be mounted it helps take away some of the aiming error.

The final decision we need to make is are we going to shoot groups, use a ladder test, and are we going to chronograph.

First lets address the Chronograph. Some people live and die by these things knowing what their Extreme spread and standard deviation is for their load. This can be nice to know what your load does but should not be the determining factor in deciding on a load. You can have loads with great numbers that just don't shoot that good on target. Doesn't make sense but it happens. The determining factor really should be how your load shoots on target. Once you find something that shoots good on target then a person may want to chronograph to find out what their load does. However with programs such as Quickload it isn't necessary to do this so long as you input good data for the variables it requires. The value it computes out will be good enough to know approximately how fast it is going for a come-up chart. Once you know what your zero's are really the loads velocity is no longer necessary.

Ok lets get back to testing , Group shooting or Ladder testing. Group shooting can be good if you choose this method you are looking for the group that has the tightest vertical spread. Over a course of charges you will see how the group will change and the groups that are the tightest will shoot the best. As with any method the farther out you shoot the better information you will know. If all you

have is 100yds you can do group testing and find a good 1000yd load. If in the above case we decide to do group shooting we will fire all 7, 5-round groups at a separate target and then examine for the group with the least vertical. As you go up a charge you are watching for pressure signs and stopping if those signs appear. Ideally you should shoot one of each at a different target then shoot the second of each and so on. However this requires moving the rifle around to different targets and can induce some error. If we keep the rifle stationary on a target and shoot all 5 before we move to a different charge the higher loads will be shot when the barrel is hotter, and a load that may shoot good and be safe may appear to have pressure signs. Also as stated to get a definitive answer you need to at least have a 5 shot group and even then a couple of poorly placed shots could make the load that is actually the best not look so good. Also this method will cause you to go through a bunch of bullets; if your cartridge/powder combination is one that eats up barrels quickly you could lose a fair amount of useful barrel life looking for the load.

Ladder testing is different. The rifle stays stationary and is fired at the same aiming point. You fire your first charge at 42.5, then you fire 43 and so on. As the method goes as the charge increases the point of impact on the target should increase, at some point you will reach a point where the vertical increase will become less and then the next preceding charge will print lower. This is a node. After this it will go back up. Typically it will be a 3 shot knot. The benefits of doing this is the rifle stays still you only shoot 1 of each charge using dramatically less bullets and as your are increasing the charge 1 shot at a time you get a better indication of how the rifle handles the pressure. To verify you can run the ladder again and you should see the node appear at the same time. The drawback is it needs to be done at range 300yds or farther works best. Also if you just strictly do a ladder test you then won't be necessarily sure which of the shots either 2 or 3 in the knot is the charge to use.

The best option is to do a ladder test and then follow it up with a group test if it is a 2 shot node, shoot the remaining shots of the load that went lower. If it is a 3 shot node, shoot the middle one. Your remaining four shots should hopefully be .5MOA or maybe less in elevation. If this is the case you are done or you may want to just shoot the charges on either side of it just to be sure. However at this point you can load and go play or tinker with seating depth. If you are shooting VLD's chances are you are going to need to do this. VLD's tend to like it either a hard jam into the lands, a soft seat, or a big jump on the order of 0.050". You need to figure out what the gun likes and go from there. Of all the methods soft seat will always ensure the bullet is the same as the throat goes farther. If the load is holding sub .5MOA don't mess with seating depth that is good enough, unless your shooting F-Class then you may want to tune it some more as the .5MOA target is tight. This could be done again with a ladder test or with group shooting. If you wisely select your loading range you can have a load found using this method in as few as 7 rounds.