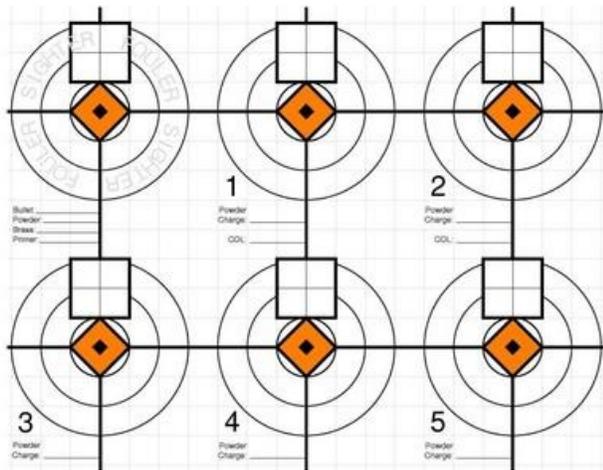


## OCW INSTRUCTIONS



Warning! It is assumed that you are an experienced handloader who follows safe handloading practices. If you have not read and understood the basic instructions in a reputable loading manual (such as Sierra, Lyman, Speer, Nosler, Lee, or Hornady), please DO NOT continue here until you have done so. It is not my intention to bring the novice up to speed on case prep, safe bullet seating length, and such. There are scores of volumes written on these very basic handloading issues, so repeating such instructions here would seem redundant.

1. Decide on the bullet you want to use.

2. Choose a powder. This is probably the most important step in the whole process. As a rule, you should choose the slowest burning powder practical. There seem to be plenty of exceptions here, so if you have it on good authority that a slightly faster powder works well with the bullet/cartridge combo you're using, feel free to choose that powder. A couple of examples would be IMR 4350 in the 30-06 and IMR 3031 in the .243 Winchester. An aside: When in doubt, consult the Nosler manual for their "most accurate powder tested." That powder nearly always gives good results in the application listed.

3. Consult at least three load data sources for maximum charge weight for the powder you've selected. Powder manufacturers are the most reliable source. You must then

decide on what your maximum charge will be.

4. Back away from the maximum charge by about 10 percent, and load one test round with this charge. Add 2% to the charge weight, and load another cartridge with that charge. Load a third test cartridge with the next 2% graduation. You will use these three cartridges for sighters, and more importantly to determine pressure tolerance in your individual rifle. They will also "season" the barrel with the powder that you're testing-- always a good idea.

5. Add another 2% or so to the charge level used in cartridge #3 of step 4, and load three rounds with this charge weight (you may want to load four rounds, in case you pull a flyer, and need an extra). Add .7% to 1% to this charge, and load three more. Add that same graduation again, and load three more. Continue adding the chosen graduation until you have moved ONE increment above your chosen maximum powder charge. If I'm working with a .223 in the 20 grain powder charge area, I move in .2 grain increments. With the .243 and .308, I like to move in .3 grain increments, and with the 270 and 30-06 I might use .4 grain increments. The larger the cartridge, the larger the graduation.

6. The seating depth for all test loads should of course be the same. I normally seat the bullet a caliber's depth into the case, or to magazine length--whichever is shorter. I don't believe loading to approach the lands is necessary, or even desirable in most situations. So long as the bullets are seated straight, with as little runout as possible, the advantages of loading close to the lands are largely over-stated. This said, be certain that the seating depth you choose does not cram the bullet into the lands. Stay at least .020" or so off the lands for these excercises.

7. The primer brand you choose is entirely up to you. Use magnum primers only with magnum chamberings, as their added pressure can distort the OCW conclusions on standard chamberings. You might choose to try a magnum primer with your load recipe after you find the correct charge, as in limited situations a magnum primer will tighten your velocity numbers.

8. At the range, you should set up 5 to 7 targets at 100 yards. The number of targets

you use will depend on how many "sets" of cartridges you loaded. Be sure the targets are identical, and level. I like to use a simple black square, drawn on a white background with a large felt tip marker. I draw the square about 3/4" (interior dimension) for my 9 power scope setting. This allows a "tight fit" of the crosshairs in the square, and thus a repeatable sight picture. For higher power scopes, draw the square smaller, and vice versa.

9. You can also put up one "sighter" target, and use the initial reduced rounds to get the POI on paper, as close to the bullseye as possible.

10. Your barrel should of course be clean before starting. Most barrels settle in to good accuracy with a controlled amount of copper fouling in the bore. (If a barrel won't shoot well fouled, the rifle may as well be a muzzle loader, right?) With a decent barrel, you will not need to clean during the test, and I don't advise cleaning until the test is complete.

11. After you have fired the sighters and confirmed that there are no pressure signs (hard bolt lift, flattened primers, etc.) you allow the barrel to cool for an adequate amount of time (use common sense--the hotter it is outside, the longer it will need to cool) you will then fire your first shot from the first group of the graduated charges. You fire this shot at target number 1.

12. Allow the barrel to cool, then fire a shot from the second graduation at target number 2. Wait for cooling of the barrel, then fire a shot from the third graduation at target number 3. Continue this "round robin" sequence until you have been through all of the targets three times. At this point you will have a three shot group on each of the targets.

13. It is assumed that you are an experienced reloader, and that you know to watch for pressure signs on each of the increasing charges. **Fire the subsequent charge only if there are no pressure signs on the previous charge.** You can safely fire the heaviest charge you loaded so long as the next charge under it showed no pressure signs. This "heaviest charge" should be about 1% over your selected maximum charge, but will be safe so long as the next lowest graduation showed no pressure signs. It is necessary to

test this slightly higher charge level since the OCW might end up being right on the published maximum.

14. Triangulate the groups. This means to connect all three shots in a triangular form, and determine the center of the group, and plot that point on the target. Measure this point's distance and direction from the bullseye, and record the information somewhere on the target. Do this for all of the targets. If you have a called flyer, you should discount that shot, or replace it in the group if you have an additional round loaded with that charge (and having a fourth round is always a good idea).

15. You will now look for the three groups which come the closest to hitting the same POI (point of impact) on the targets. The trend of the groups should be obvious, normally (but not always!) going from low and favoring one side, to high and favoring the other side. But along the progression, there should be a string of at least three groups that all hit the target in the same relative point.

16. After you have carefully measured group sizes and distances and directions from the bullseye, you will know which three groups come the closest to hitting the target in the same POI. You now choose the powder charge which represents the center of this string. For example, if 34.7, 35.0, and 35.3 grains all grouped about 1.5 inches high, and about 3/4 of an inch right of the bullseye, you would choose the 35.0 grain charge as your OCW (optimal charge weight). This charge will allow 34.7 and 35.3 grain charges to group right with it. This will be a very "pressure tolerant" or "resilient" load.

17. Remember, don't get "bowled over" by a tiny group which falls outside the OCW zone. You can tune any of the groups to be tiny with bullet seating depth changes. After you have determined the OCW, you may want to try seating the bullets deeper or longer in .005" or .010" increments to see where your particular rifle does its best. If you're a real stickler for accuracy, you can do another "round robin" test using varied seating depths, perhaps in .003" increments. Look for at least two seating depth stages that hit the same POI and group tight as well. This said, I have often found that OCW recipes are so reliable that seating depth alterations--especially for game hunting cartridges--often don't seem necessary.

18. Your next step would be to confirm your load recipe at the maximum range you will expect to use it. Load one round about 1% below, and another round about 1% above the OCW charge, and fire a three shot group with these two charges plus the standard charge at the maximum range you will require the load to be accurate at. You should note MOA, or very close to MOA grouping...

19. The OCW load development plan works best with rifles and shooters that are actually capable of MOA accuracy. If your rifle has not shown a propensity for reasonable accuracy, you may want to have it corrected before wasting time and material with additional load development. If you are not confident that you are at a level where you can shoot consistent MOA groups, you may want to hold off on intricate load development until your skills are better honed. Lots of practice with a scoped .22 LR is invaluable...

20. I would sincerely recommend using shooting glasses during the firing sequences of ANY load testing. You can never be too careful here... And please know that anytime you embark on load development, you're basically on your own. Just like any provider of load data or development instructions, I must mention that I accept no responsibility whatsoever for any occurrences which are outside the realm of your expectations...

#### **ADDITIONAL NOTES:**

\* Use brass that is on the same firing, and is still fresh. If the brass has been fired more than three times, or if you have a mixture of cases which have been fired different numbers of times, you will want to anneal your brass. Here is a simple way in which to anneal, which works fine (you don't necessarily need expensive annealing rigs to do a good job): **ANNEALING**

\* Be sure your brass has been properly and *\*evenly\** trimmed. A full length sizing is often the best way to set up the brass for the OCW test. This is not to say that neck sizing is a bad idea--it is simply to say that you don't want some cases having tight chamber fit, and others which others fit normally. This introduces another variable that is best eliminated with a full length sizing of the brass.

\* When you're shooting your test, do not load a shell to fire and leave it chambered for longer than 10 to 15 seconds. If the barrel has warmed up a bit, you'll be "baking" that shell in a hot chamber, and potentially alter the burn rate of the powder, skewing your results. Chamber the round only when you're within seconds of firing it.

\* On multiple occasions, I find that a client in an OCW consulting session has loose scope base screws, or loose action screws. We figure that out only after he's gone to the range and comes back with poor results. It's way more common than you'd think. So it would be a good idea to check the torque on all of the scope mounting hardware as well as the action screws in the rifle before shooting a test.

\* It is a good idea to establish an "accuracy standard" with rifle and shooter before endeavoring to develop a good handload. Factory ammo is pretty good these days. Spend 20 dollars on a box of Federal Fusion, or Hornady American Whitetail, or other reasonably priced ammo if you can find it in your rifle's chambering, and see how it shoots. If it won't hold 1.5 MOA or better, there could be something wrong with the system that needs sorting out before you waste time and material attempting to work up a handload.

\* If you are using bushing type neck sizing dies, I would recommend .004 thousandths of neck tension. Using only .002 thousandths in brass that isn't neck turned, or which may be in need of annealing normally results in inconsistent neck tension. *Consistent neck tension is vitally important for accuracy.*

\* Be sure to use a target that you can see the aiming points clearly on. Tiny scribbled ink blobs from a ball point pen on a cardboard box will not cut it (yes, I've seen this). And focus your scope's reticle against a neutral background (white wall, blue sky, etc.) before using the scope. If your cross-hair gets blurry while you're trying to shoot, there is a focus issue either on the reticle or with the scope's main focus setting. Know how to use your scope before shooting for accuracy! Shadows in the peripheral field of view in your scope means you have improper eye relief, and accuracy will be ruined. Get the "full moon" sight picture in the scope with proper eye position behind the scope. This is very important, as many folks do not realize that crescent shadowing in the scope's field of view means that you're not really aligned on the target--even if the cross-hair itself is on the target. There are two points of reference in any sighting system. With

iron sights, it's the front and rear sight. With a rifle scope, it is the cross-hair, and the **straight, shadow free path of light** making a "full circle" that is the second point. Use your scope correctly or you won't be shooting straight. This is a good video to check out on the subject--> [VIDEO](#)

\* Many times a client in a consulting session finds the load he is looking for, and turns in some photos of excellent groups. Weeks pass, and I get another email with a horrible group and the client is asking "What's wrong?" In 99 percent of cases, he has simply had a bad day at the shooting range. The shooter is the most volatile part of the entire accuracy equation. If the screws haven't worked loose on the scope mount or action, odds are *\*overwhelming\** the problem is shooter error, or "loose nut on the trigger" as we say. :)