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6mm PPC for Single Shot Rifles
 Bench Rest Accuracy for Sport Shooters... Tips, Tricks, and Criteria for Success!

6mm PPC for Single Shot Rifles - Brown 97D, TC Encore, Ruger #1 Single Shot Loading and Shooting Techniques

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6mm PPC for Single Shot Rifles

Bench Rest Accuracy Made Easy for Sport Shooters

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You don't have to be a "Bench Rest Competitor" to enjoy shooting one of the most accurate centerfire cartridges in the world... 6mm PPC! With no complicated brass forming or finicky reloading processes, you can be shooting near ½ inch groups right from the start and hone your skills to near ¼ inch groups by your second outing... at least that's how it worked for me... and I'm NOT a good bench rest shooter!

Why am I making a special case for Single Shot Rifles? Well, 6mm PPC is a "Short, Fat Cartridge" and those type are generally believed to produce more bolt thrust than long and skinny cartridges. Not having the camming leverage of a bolt action, the typical single shot will lock-up with a too-hot load that may still function in a bolt gun. But the truth is, too much bolt thrust isn't good for accuracy in ANY rifle... Single shots just let you know when it's happening sooner so you can make adjustments in your loads.

The Cartridge: 6mm PPC - Developed by Louis Palmisano and Ferris Pindell, it has reportedly won more bench rest accuracy competitions than any other cartridge. Easily made from [Lapua 220 Russian brass](#), the 6mm PPC has a small primer and uniquely small flash hole that is credited for much of its inherent accuracy. The "short, fat" shape and nearly straight body contribute to efficient, consistent powder burning and stable chamber performance (it grips the chamber well during ignition).

The Test Rifle: Brown Model 97D - Developed from the EABCO "BF" falling block silhouette pistols that have dominated world [championships](#) and set 500 meter distance records. The [M97D](#) falling block slides perpendicularly and closes the breech with absolutely zero camming leverage. This makes it a perfect test bed for the chamber performance needed for hand loading most other single shot rifles accurately. This rifle was outfitted with a [Swift 8-32X50mm Premier riflescope](#) and [Harris Bipod](#).



Making 6mm PPC Cartridges - Full length size, prime, charge with powder, and seat a bullet... sounds like what you do with any other cartridge, doesn't it? In fact, the only difference with 6mm PPC is that it has to be fired once (fire formed) to expand to its final shape and size. But even the fire-forming shots produce exceptional accuracy. I shot several ¾" groups while fire forming at 100 yards, with my best group at nearly ½"... so the time spent fire forming was wonderful!

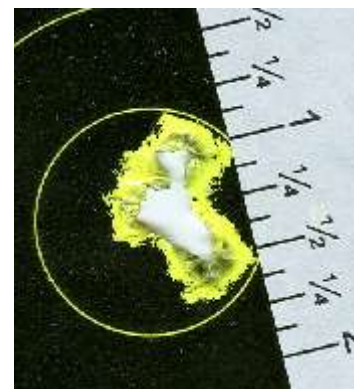
Back at the reloading bench, I set to working up a load with the now fully shaped 6mm PPC brass. I full length sized, trimmed, and primed each case the same as I would with any other cartridge... and began loading. With the resultant load, I easily shot a 5 shot ¼" group... Which is a personal best for me.



Brown Custom Model 97D Rifle

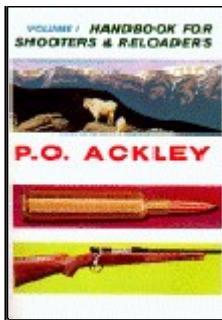


Brown Custom TC Encore Rifle



5 Shots While Fire Forming





Loading for Best Chamber Performance - In the P.O. Ackley Handbook (Vol I), there's a chapter on "Pressure" that dramatically illustrates the proper chamber performance of a cartridge. Ackley unscrewed a barrel one turn and fired the cartridge in a dry chamber. The cartridge head stayed flush with the barrel breech and did not drive backward into the bolt! This is the type of chamber performance that you want for the lowest amount of stress on your action and that consequently results in the best potential for accuracy.

In the Brown Model 97D rifle you can check chamber performance easily: After firing a shot, see if you can press the

block downward with only your thumb on the top of the block. If it moves freely, you've got good chamber performance. I use three pressure indicators when developing loads on the Model 97D. First I check the block with my thumb. Then I check to see if the cartridge sticks at all when ejecting. And finally, I check the primer for the excessive flattening that would indicate too much pressure. Generally, the hottest load that still allows the gun to open and eject freely ends up being my most accurate shooting load... Which tends to confirm the chamber performance approach to accuracy in handloading.

Chamber Preparation - Best chamber performance happens when a cartridge grips the chamber and does not drive backward significantly. When you want something to grip (rather than slip), you want to make sure there is no lubricant on the gripping surfaces. Case forming lube and gun oil are the two lubricants you want to remove. Clean your 6mm PPC cases after sizing (I wipe mine with a paper towel and Windex). Clean your chamber with a chamber sized jag and patch wetted with acetone. (Note: protect your chamber with a thin coat of [USP Oil](#) when you're not out shooting.)

Powder Selection - I've found that my maximum single shot loads reach the same level of performance as bolt gun loads when I use one level slower burning powder type and proper chamber preparation. For example, when the [VihtaVuori](#) loading guide shows a maximum with V-133, my best single shot load ends up being with the slower burning V-135. Here's the simplest way to proceed: Use a starting load from the loading guide and increase the powder charge until you detect some resistance to block movement with your thumb. Next, charge a case with that same amount of powder, tap it to settle, and look to see if the case is full to the base of the neck. If its not full, step up to the next slower powder and repeat the load development process. There's a powder burn rate chart for all brands of powder in the front of the [VihtaVuori 2004 Loading Guide](#). When you have the maximum load that will fill the case and still allow the Model 97D single shot to open and eject freely after firing, you're ready to shoot some groups!

Bench Resting from a Bipod - I'm a sport shooter, not a benchrest competitor. And, I freely admit to not being very good at bench rest shooting. What has worked well for me is shooting from a [Harris SL](#) model bipod while supporting the buttstock with a sandbag. To keep the rubber bipod legs from jumping around on the rough plywood shooting bench, I rest them on something slippery and smooth... a file folder with wax paper under each bipod leg. You can see my shooting set-up in the top right [M97D](#) photograph.

Choosing a Scope for Shooting Groups - It stands to reason that you can't shoot any more accurately than you can see. The [Swift 8-32X50mm Premier](#) scope I used here has several features that contribute to super accurate aiming. First, the full zoom of 32X magnification lets me see well enough to read the numbers on the [Shoot-N-C targets](#). And at 32X the Swift scope reticle only covers up 1/8 inch of target at 100 yards. So, I was able to aim with 1/8" precision from one shot to the next. Finally, the adjustable objective lens let me dial out any parallax error so that the repositioning of my eye behind the scope from one shot to the next did not change the aiming point.

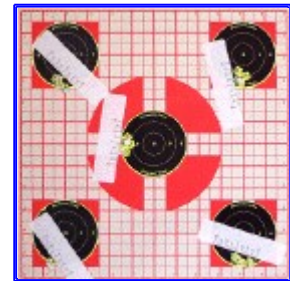
Quirks of the EABCO 6mm PPC Chamber - We dimensioned our 6mm PPC chamber reamer to cut a chamber that fits [Lapua 220 Russian](#) brass closely without neck turning. Naturally we recommend you use the Lapua brass for best results.

Reloading Dies for the EABCO 6mm PPC Chamber - We recommend full length sizing with the Redding 6mm PPC-USA sizer die. Seat bullets with the Redding 6mm PPC-USA seater die (These come in [Redding Die Set #722-80319](#)). Use the Redding #12 Shell holder. Use Redding water soluble case lube for sizing.

Conclusions of a Single Shot Sport Shooter - I love 6mm PPC! It was easy to hand load and it was easy to get excellent results from. The groups shot on this page were with the 65gr bullet and a rifling twist of 1:10. I usually recommend a 1:12 twist and the 58 grain bullet because customers have reported superb accuracy (better groups than I



5 Shots After Fire Forming



Group After Group Accuracy

6mm PPC Reloading Data

[Lapua 220 Russian brass](#) was full length sized and fire formed to 6mm PPC using 65 gr Vmax bullets, CCIBR4 primers, and 24.5 gr of VihtaVuori 135 powder. The following optimum loads were worked up with [VihtaVuori 135](#), 58 and 65 gr. Vmax bullets, and CCIBR4 primers. Please Note: There really is no "standard" for 6mm PPC. It can be finicky. But once you find what works best for you, the cartridge performs superbly... The accuracy will astound you.

*** For Reference Only - Load at Your Own Risk ***

Bullet	Powder	Start	Max	Velocity
58gr	V-135	25.5	28.3	3,382
65gr	V-135	24.5	27.5	3,088

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[Made-to-Order 97D Rifle](#)
[Encore Custom Rifle Barrel](#)
[Swift Premier 8-32X50 A/O](#)
[721-SL Harris Bipod](#)
[103-40856S Harris Clone](#)
[Lapua 220 Russian Brass](#)
[VihtaVuori 135 Powder](#)
[Infinity VI Software](#)
[Redding 6mmPPC-USA Die Set](#)
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can shoot). But the 5 shot ¼" group I shot with this set-up is my personal best ever... so naturally I'm thrilled!

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