

Fire lapping tutorial

by Scott Laughlin

The following is intended to be the first of two segments on lapping your airgun bore. This one is on "fire lapping," a somewhat controversial technique borrowed from firearms accurizing. One detractor called it "firing sandpaper down your barrel".

Sorta scary huh, considering how often we read that you need to treat your airgun barrel very carefully.

Lapping can be described as using a soft metal lap, loaded with an abrasive paste or slurry, to smooth and flatten a metal surface. (sometimes two parts are rubbed together to abrade both to a better fit)

How do you decide that lapping is worthwhile and which technique is best to use, hand lap or fire lap? For me, the process looks like this: Is the gun I'm considering lapping less accurate than I think it should be and have I dealt with the usual suspects such as loose screws, bedding, crown, scope mounts, etc? If I push a pellet down the bore, do I find the muzzle loose compared to some other part of the bore, or a series of tight spots? If yes to all the above, I plan to lap.

Fire lap or hand lap, which one? When I want to get the very most out of a gun, I hand lap. I have to be pretty committed to that goal to hand lap a .177 bore as they are much harder to do than larger bores and pretty much a PITA.

Fire lapping is almost too easy, but less controllable, and with less feedback built in, so it's easier to go wrong, and gives a less than perfect bore. I tend to fire lap cheap guns and hand lap more expensive guns, but it depends some on the other criteria as well.

I'd suggest doing a Google search on "fire lapping" and choose accordingly, but my take is this: An accurate bore is consistent in diameter, or at least, no part of the bore is smaller than the muzzle and smooth as possible, with rifling that keys into the pellet well enough to spin it, but not so much as to prevent a good seal at the skirt, or distort the pellet. Smoothness to reduce leading and improve consistency, and tightest at the muzzle to insure, as much as possible, that the pellet does not tip leaving the bore. Crown and muzzle damage are proven accuracy destroyers, (see previous) so caution with cleaning rods makes sense. On the other hand, if you've ever tried to remove .001" from the edge of a piece of sheet steel using 400 grit sandpaper, you know how slow that is.

I found it interesting that most shooters who'd fire lapped were happy with the results (unless they "washed out" the barrel throat,) bullet makers don't have a problem with it or like it a lot, but barrel makers that already hand lap their bores are against it.

Fire lapping if done right, smooths the bore, tends to cut high spots while leaving low, thus "truing" the bore, making its ID more consistent. The breech end will be cut more than the muzzle (the compound wears as it is carried down the bore by the pellet) so the breech ends up slightly bigger. This could reduce velocities in Springer's by reducing friction and allowing an earlier release of the pellet as pressure rises. In my experience the loss is small (10-20fps) to nil. The upside is a very slight choke effect, and improved accuracy. It would seem wise to do no more cutting of your bore than needed, let's say 50 shots max (based on the firearms stuff that I've read). You should have some recent test groups to make comparisons.

I've had good luck with this technique on several airguns of American and Chinese makes and one Brit PCP. No gun that I have fire lapped shot poorer groups after lapping than before, and some didn't show any improvement. I've never done a match or high end PCP guns....your mileage may vary and this is for informational purposes only.

You will need: about 50 ringed pellets (silver jets or similar) in the calibre you want to lap

2 lapping plates, hard flat surfaces to roll your pellets between

(Since a lap cuts by holding sharp, hard particles against the work piece (bore), you need to load the pellet with abrasive.)

Lapping compound: DO NOT USE VALVE GRINDING COMPOUND. It's far too coarse), or even fine clover compound, (the grit size is inconsistent so you won't get a good finish). You can try toothpaste, JB bore paste, or rubbing compound, but I go to the expert. Lead Bullet Technology has been making custom moulds for lead bullet shooters for near 20 years, is a big believer in lapping, and sells a bore lapping compound I've used many times. Good directions are included.

Some q-tips for cleaning crevices, your cleaning rod or pull thru, whatever bore solvent you trust with your airgun

Really clean the bore well. Your objective is to cut steel, not clean out old lead deposits. Next put a dry pellet in the bore, and push it through, feeling for tight spots. Do this a few times and mark the tight spots on the outside of the barrel.

Take ten pellets, smear some compound on the lower plate, roll the pellets through it until they're covered and grooves are full. You want to use a little pressure, but not enough to distort the skirts. Wipe off the pellets lightly, you don't want gobs clinging, but not dry either (also your fingers). Load your gun with a treated pellet and wipe off any excess compound in the seal area, and fire.

Note for spring guns: If you find it difficult to load a pellet into the breach, load normally for the first few shots. Then seat the remainder of the pellets about 1 pellet length into the bore. This is to prevent too easy a fit and potential loss of velocity. If you have an easy load breach, load all lapping pellets deep. Repeat until all ten are gone.

Thoroughly clean the bore again and do a pellet push through test. Look at the rifling marks on the pellet. If the tight spots were not very noticeable, and you feel cautious, shoot some groups. Be aware that you may have to fire several fouling shots to get representative groups. Then, if you still feel spots tighter than the muzzle, treat another 10 and repeat the process. You should do some test groups between each lapping groups of ten pellets even if you still find tight spots.

So how do you know when to stop? Ask yourself...Is the gun more accurate than before? Is it more accurate than after the first series? Are rifling marks in your pushed pellets sharp? Do you still feel distinct tight spots other than the muzzle?

I usually shoot between 30 and 50 lapping pellets in groups of ten, then clean and load another 10 with a polishing bore cleaner like JB or Gold Medallion and fire those. If I have easy access to the breach I'll soak a patch in gold medal and give the bore a couple dozen strokes. Also, because it will never be cleaner, now is the time to treat your bore with an anti-friction coating of your choice such as Militec, moly, that new Teflon lube, or your favourite pellet lube if you use one.

Next time I'll talk about hand lapping...if you think fire lapping was tedious, just wait!

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