

OBATEX TWO : BY THE NUMBERS : By MALCOLM COBB



Author with Deeley and Edge No 2 Musket chronographing the load.

The chronograph is always positioned a good 4-5 metres downrange for black powder testing as the fouling and wadding blasted out of the muzzle can often interfere with the results. High velocity wadding can also damage sky screens which are best removed.

In the July 2017 issue of *Magnum* we reported on the improved Obatex black powder that was becoming available in South Africa, using data largely derived from muzzle loading experience. Since publication, we have received a number of queries on the use of Obatex in cartridges for the old black powder rifles like the Martini-Henrys and the various Westley Richards products, so we located a tin of Obatex FFg, the correct granulation for rifles and put the powder to the test.

To get some meaningful information out of the test, we also thought it useful to make a comparison with data from previous experiments with more traditional powders to give the reader some idea of how Obatex actually performs.

The parameters we needed to test were :-

- was Obatex powerful enough to generate similar velocities to other black powders without showing signs of pressure ? Our yardstick in this exercise was to achieve 1,200 feet per second as a mid-range black powder velocity in a cartridge rifle.
- were those velocities consistent enough to allow a high level of accuracy for target shooting at long distances, by which we mean out to 600 metres?
- was the amount of fouling produced by combustion acceptable such that a minimal amount of cleaning was required between shots, or indeed was any cleaning required at all?

In this last regard, the original 19th century powders were said to be “wet burning,” which kept the fouling produced by firing as moist as possible so that it did not affect accuracy, even though barrels were not cleaned for hundreds of shots. Obatex was said to produce less smoke, which sounded hopeful as far as fouling was concerned.

The rifle used was a falling block Deeley & Edge in 500/450 No 2 Musket calibre, for the reason that it has a heavier barrel than a Martini Henry, which ruled out some variables like barrel band tension and heat distortion, plus the No 2 Musket cartridge is a slightly more “modern design” than the 577/450 of the Martini Henry and gave fewer problems with wadding, fillers and bullet alignment, all of which were variables which could affect the testing. The Deeley & Edge had also been used in the previous tests, which took out another variable. Its other advantage was that it shot exactly to the sights for 1,200 fps loads.

Since we had no idea at all of how the Obatex would shoot under these conditions, we set up at target at 50 metres with the expectation that it would collect any exceptionally high, low or wild shots that would otherwise be lost at longer ranges. The rifle was shot off a light rest under the mid point of the barrel, for the reason that several 19th century sources report that when a muzzle rest was used, the black powder rifles of those days shot inconsistently low.

The Obatex load used for this test was based on the consideration that black powder rifles shot best with no air gap over the powder and the less wadding the better as it could interfere with the bullet's flight as the wadding was blasted out of the muzzle. However, it is a feature with Obatex that it is less dense than other black powders so it is best measured by weight and not by volume in a commercial powder measure. Furthermore, it has been established that Obatex needs much less powder by weight to achieve the desired velocities so it must be regarded as more powerful, all of which meant that we couldn't just fill up the case with powder as we had done in the past, as we might produce a dangerous overload.

Cutting a long story short, we started with the yardstick that 90 grains of Wano FFg would fill the No 2 Musket case and produce good shooting at 1,200 feet per second with a Lyman 457125 bullet and two card wads. What did we have to do with the Obatex to get a similar result?

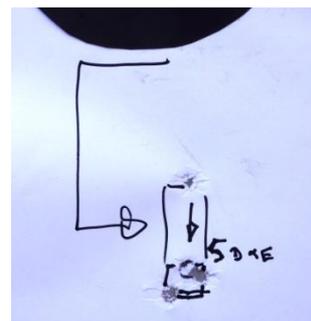
The advisory note on the Obatex tin was to use 40 gr in rifles, which corresponded to the advice given by other shooters, who use between 40% and 50% of their normal black powder loads. Since a 40% by weight load (36 grains) did not fill the No 2 Musket case (another variable), we went with the higher end of the advice and used a 50% load ie 45 grains of Obatex by weight which got the powder up into the case neck so we were able to avoid the use of filler and had only to load in two dry cardboard wads to slightly compress the powder and achieve the correct bullet seating depth.

For what it is worth, 45 grains WEIGHT of Obatex is equivalent to 80 grains by VOLUME in my powder measure, which is calibrated correctly for Wano FFg. Our advice to other shooters is therefore to disregard the markings on their VOLUME measures and recalibrate as far as possible once the optimum load for their rifles is established by WEIGHT.

The other details of the load are that standard large rifle primers were used, in this case Fiochi make, which are said to be slightly hotter than normal. As noted, a Lyman 457 125 bullet was used in hardened cable lead with my own recipe of tallow/beeswax mix which was part of a batch known to have good lubricating and anti-leading properties. The cases were by Bertram of Australia.

As in previous tests, the rifle was shot without cleaning or using any extra lube, the idea being that we needed to find out how quickly the rifle fouled up so far as to produce inconsistent velocities and ruin accuracy. It was the powder being tested, not the lubrication. The first shot as per photo struck the target a good 5" lower than normal, the next four shots struck the target slightly lower again and basically all went through the same hole. Recoil seemed slightly higher than normal but not excessively so.

The 50 metre group obtained with the first trial load. The group overall was a good 5" below point of aim, which was a "6 o'clock hold" on the black. The first shot is higher than the rest of the group as it came from a clean barrel. The rest of the shots went into about a 1" x 1" group lower down. Since it was difficult to distinguish hits, we moved to another target and formed a similar three shot group in the same relative position.



The peanut gallery behind me at the firing point did not seem inclined to believe that the load was “same holing” and offered the opinion that my shots were missing the target altogether, so I swapped to an adjacent aiming point and put another three shots through the same hole, in the same relative position. That’s quite a tight, eight-shot group, no cleaning and no extra lube, which is satisfactory. All cases ejected easily and the primers showed a consistent amount of flattening and barely discernible signs of primer flow into the firing pin hole. This is what might be expected from a relatively high end load.

Since we had established that this load was shooting well, we then went to the chronograph to see how the velocities were doing in a fouled rifle.

Comparison in feet per second	Obatex FFg 45 gr	Wano FFG 90 gr	Swiss 1½ 80 gr	Elephant FFFg 80 gr
Average velocity	1218.0	1203.6	1248.4	1201.1
Extreme spread	65.4	52.8	49.1	209.9
Standard deviation	24.7	16.0	16.5	79.5

Note that some loads used 80 grains and not 90 grains as the recoil produced was unpleasant and in any event, above the desired 1,200 fps velocity. The Swiss 1½ powder was reckoned to be the cleanest burning and most consistent powder available in South Africa. The Elephant on the other hand was not regarded as a top quality powder unsieved, and the FFFg used wasn’t really a rifle powder. However, the results are included as they show what it takes to get the desired velocity of 1200 fps out of what used to be commonly available powders.

To be fair to the Obatex results, they were chronographed with a fouled barrel whereas most of our other velocity testing was done with a clean barrel, so we would expect the Standard Deviation with the Obatex to be just a bit higher, which it was. In reality, 8fps deviation on 1,200 fps is about 0.6% which is negligible really.

How fouled was the barrel ? After the pause for chronographing, the fouling may have dried a little and remaining shots on target did not group well. After the 18th shot the bullets started tumbling sideways. That result ended the test. After shooting, the barrel came out acceptably clean after two or three passes with a lappie and solvent .

However, this is was only a preliminary try-out for the Obatex to establish basic parameters. We have nevertheless determined even at this early stage that Obatex will shoot up to ten shots without cleaning or employing extra lube, which is good enough for hunting and it really does produce acceptably consistent velocities with half the normal weight of powder. That means it is a powerful propellant and must be respected. We already know from the muzzle loading fraternity that Obatex works well in their rifles out to ranges like 600 metres, so South African black powder shooters can be assured that in Obatex, we have a good product that will ensure the continuation of the sport.

More tests were performed with Obatex on the same day, but they will be reported on separately.