

Moly-Coating

[a champion's perspective]

David Tubb

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MOLY EXPLAINED

Coating bullets with molybdenum disulfide (MoS₂) is not a new idea. Recent popularity increases due to the ready availability of coated bullets and various bullet coating kits, however, have brought moly coated bullets to the forefront of discussion among competitive shooters. Obviously, I think moly coating provides the shooter with superior performance; as you may know, I own and operate Moly Coatings Inc., which we believe to be the premiere commercial facility of its type. I wouldn't have invested in this operation, however, if I didn't believe that moly coating provided a viable performance increase and, certainly, if I didn't believe that the advantages far outweighed any drawbacks. My focus in this article is giving an overview of what moly coating accomplishes, why it does so, and share a few tips I have used successfully to get the most benefit from this technology.

MOLY EFFECT

Moly coating accomplishes one main thing: it greatly reduces friction between bullet and firearm bore. This effect is shown in several ways and, likewise, has various singular effects on the bullet. All these effects are positive.

The foremost effect, in my opinion, of reduced friction is that moly coating makes it possible to increase bullet velocity at the same chamber pressure.

For example, if we take one specific load that uses an uncoated bullet and simply replace the bullet with a moly coated bullet, velocity will drop. For instance, let's say a .243 produces 2900 fps with an uncoated Sierra 107 gr MatchKing. The load is 41.5 gr IMR-4350. Replace the uncoated bullet with a moly coated Sierra 107 gr MatchKing and there will be an approximate velocity loss of 40 to 50 fps, (1-2 percent). Pressure, however, will likely fall from approximately 52,000 psi to 49,000 psi, or lower (about 4 -5 percent reduction). Note that pressure decrease is greater than velocity loss, and this is the key to increased speed with moly coating. Note also that while all cartridge and bullet combinations will respond similarly, some will demonstrate more or less variance between coated and uncoated bullet figures due to many unpredictable variables (barrel configuration, individual component lots, etc.).

We would take the load now and increase the powder charge with moly coated bullets to attain the "old" uncoated bullet velocity level of 2900 fps. Now we're back at the same velocity as before, but chamber pressures are still lower, so we can increase the charge a little more than that and increase velocity as a result. The net effect is higher velocity at the same or lower chamber pressures. Furthermore, if you only load back to the original velocity of 2900 fps using a moly coated bullet, you will now be working the rifle at a reduced pressure which translates into a longer barrel life and more than likely you will experience an increase in accuracy. Kind of like operating a diesel motor at 2100

rpm vs 1800 rpm -- which one will last longer and operates more efficiently?

Because it is such a tremendous friction reducer, moly also eases bullet entry into the lands. Whether the bullet is seated into the rifling or jumping, the initial contact and acceleration is facilitated with moly coated bullets. Recovered bullets have shown improved jacket integrity and greatly reduced impressions made from the lands. There's no question that moly coating makes the bullet's trip down the barrel much "easier."

To determine case neck tension, simply measure the neck diameter of a loaded round and then measure neck diameter of a sized case. The difference is the amount of constriction, or case neck tension, you'll have. I suggest 0.003 or 0.004 difference for better results with moly coated bullets.

RELOADING CONSIDERATIONS

Related to enhanced friction reduction is a handloading tip I would like to pass along. I have found that moly coated bullets shoot best when there is more case neck tension than one usually uses with uncoated bullets (assuming the bullets are moving before engaging the rifling). I believe this results from the greater ease with which the coated bullet can dislodge from the case neck. I have seen no effect on pressures from increasing neck tension with moly bullets, but definitely have seen tighter groups.

When I refer to case neck tension, that is the difference between sized and loaded case neck diameters. The greater the difference the more constriction the case neck puts against the bullet. With uncoated bullets I sized my case necks 0.002 under loaded neck outside diameter; with moly coated bullets I size the necks 0.003 under loaded neck outside diameter. I strongly recommend the use of a bushing type sizing die, such as a Redding "S" die or one of the Custom Products dies, that will give the shooter a means to control the amount of neck sizing.

Determining bushing size is simple. If I wanted to attain 0.003 case neck tension, I would measure the neck of a loaded round using a caliper, subtract 0.004 from that figure, and that's the bushing size I would order. The additional 0.001 is to account for the small amount of "spring back" that occurs after neck sizing. If you don't have a die that accepts interchangeable bushings, I would suggest first removing the expander ball from your resizing die and seeing what amount of neck sizing is available in the die. If it's too much (it usually will be) then turn down the expander button diameter until you attain the 0.003 difference. Most expander/decapping assemblies can be chucked into a drill and the expander run against emery cloth to reduce the button diameter.

There are no other special considerations in loading with moly coated bullets. I would expect to attain best moly coated bullet performance from the same component combination I had been using with good results for uncoated bullets. The only exception is that due to the potential for increasing the powder charge a significant amount when working up a load with moly coated bullets, it may be necessary to change to a slightly faster burning gunpowder to avoid a compressed load. This, of course, would only apply if the uncoated bullet load was already at or near compression before switching to moly coated bullets.

DOWNRANGE PERFORMANCE

Other performance advantages from moly coating again come from reduced friction and can be related to enhanced bullet flight. I have found that accuracy is usually better comparing moly coated to uncoated bullets. I believe that less stress on the bullet plays a key role in this. I further believe that moly coated bullets can be more consistent shot to shot

Check also for an article on this site David did on cleaning barrels after using moly coated bullets. FinalFinish products are also featured on zediker.com.

and possibly more stable in flight. These differences are difficult to quantify due to the great number of variables that come into play when shooting 600 yards and beyond. One entirely plausible reason for enhanced flight is again due to lowered friction: a moly coated bullet will enter the bore much easier and, therefore, probably with less disturbance to the jacket and less stress on the core. Recovered moly coated bullets usually exhibit shallower rifling impressions, and these impressions have a more uniform appearance.

BARREL LIFE

I have found that moly coated bullets provide extended barrel life. I believe that the coating itself provides a “buffer” of sorts between the powder gases and barrel surface, and also that moly coated bullets result in less heat being transmitted to the barrel. Many time Bianchi Cup champion, Doug Koenig, told me that he can make several more practice runs firing the Barricade Event using moly coated bullets. In this event the shooter secures the handgun barrel against the barricade using his hand: barrel heat build up dictates how long the shooter can make practice runs. Again, moly coating reduced heat build up sufficiently that Doug could get in 3-5 more 6-shot strings before having to stop and allow the barrel to cool.

It’s been my experience that moly coating adds at least 20 percent to accurate barrel life. Barrel wear in a centerfire rifle is almost exclusively due to throat erosion (cracks and roughness in the first 3-4 inches ahead of the chamber caused by heat, flame, and pressure). An additional 500-plus rounds may not seem like much, but it will add up over the course of a few barrels. However, that, like many advantages of moly coated bullets, are welcome side benefits to the major improvements that result from their use.

CLEANING FREQUENCY

There is far less bullet jacket fouling in the bore with moly coated bullets. Specifically, I have found there to be both less fouling in terms of the amount of deposits left behind after shooting, and a much slower accumulation of fouling. Norma AG found there to be a reduction in metal fouling of 30-40 percent. Now, the amount of fouling any one barrel exhibits has a lot to do with the barrel itself, but I think that this estimate is reliable, if not conservative. I normally shoot between two and three times as many rounds through my barrels before cleaning, depending on the caliber.

The effect here is obvious: I can get many more accurate shots between cleanings with moly coated bullets. In the past, I had to clean after each day of shooting at a major event, such as Camp Perry. Now I can shoot the entire four days there without cleaning. This is not only a convenience but greatly enhances the consistency of my sight zeros. No matter what steps are taken in cleaning, the first two (or more) rounds through a clean barrel are always a little outside the group (moly coated or not) -- not anymore! This is the sort of advantage that can make the difference between losing and winning.

I would like to add that my FinalFinish systems products have been showing tremendous benefits much in the same as moly coated bullets. We’re seeing approximately the same performance increases. Whether with coated or uncoated bullets, most are reporting velocity reductions of 40-50 feet per second and the same sort of greater reductions in



A David Tubb Moly Coatings Inc. bullet on the left and a home done bullet using the Neco kit process. Getting a finish like what you see on the MCI bullet requires the sort of high-zoot equipment and quantities that David runs, no way around it.

[Please note that Moly Coatings Inc. DOES NOT sell bullets to the public, nor does it provide bullet coating services for non-commercial clients. Interested manufacturers should contact Kevin at 1-806-323-9488.]

pressure as earlier stated for moly. The net effect is, as with moly, ultimately greater velocity at the same or lower pressure.

I believe that a FinalFinish treated barrel actually enhances performance using moly coated bullets as opposed to uncoated bullets: the moly coating responds that much more to the mirror polish the FinalFinish leaves behind. FinalFinish in conjunction with Moly Coatings Inc. Sierra bullets will dramatically increase the performance of any firearm. Plus, the radically lowered fouling accumulation and accumulation rate of a FinalFinish treated barrel will, in conjunction with moly coated bullets, extend the number of accurate shots between cleanings by at least another one-third. I found that the net effect of combining FinalFinish and moly coated bullets added an easy 100 feet per second to my 6.5-08 600-yard load.

OTHER BENEFITS

There are other benefits to using moly coated bullets. Since there is a coating between the bullet and case neck, moly coated bullets will not suffer from the "sticktion" many have reported with uncoated bullets. This dangerous circumstance results from simple corrosion between the bullet and case neck, and the result is elevated pressures. Likewise, coated bullets won't tarnish or corrode after handling. And there are others, but -- the reason to use moly coated bullets is because they provide better performance! Shooting them because they add to barrel life or so you don't have to clean the barrel as often are, again, side benefits.

OTHER COATING PROCESSES

Moly Coatings Inc. is not the only source for moly coating on bullets, but we're the best! As evidence I'll offer this challenge: put one of our Sierra Moly Coated bullets in your pocket along with one from another source and walk around with them all day. Then examine the bullets and see which one still looks the best. It will be ours.

The various home-done and spray-on coatings certainly contain moly, but our tests as well as independently conducted tests have shown that the Moly Coatings Inc. product provides superior consistency and, in most cases, superior performance. There's no question that the consistency and nature of the coating is directly related to how well it performs, and also dictates how near the "claims" the user experiences in his results.

AVAILABILITY

Sierra Moly Coated bullets are considered by the manufacturer to be a "Specialty Bullet" and, therefore, are available for sale directly from Sierra in 500 round bulk box packs. That's the way Sierra sells all its Specialty Bullets. Call 1-800-223-8799 to order from Sierra. OK Weber also handles these bullets: 1-541-747-0458.