

UniqueTek "Tips" File #1: 28 Tips for Powder Measure Accuracy

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By Lee Love
With Forward by Dee Hester

"How critical is it to keep my powder measure's reservoir full?"

By Dee Hester

Frankly, it depends on your personal quality standards and the intended use to which you'll put your handcrafted ammo. It also depends on the kind of powder you're using.

If you're cranking out 500 rounds for a weekend of pistol plinking, 1/100th-of-a-grain accuracy is hardly necessary, even if you could achieve it. However, if you're handcrafting 60 cartridges for an early-morning bout of long-distance rifling, you'll be interested in keeping each step in the reloading process as accurate and consistent as possible. A predictable throw from your powder measure should be at the top of that list!

Without attempting to address each shooting application, let me share some of my experience with different powder types and how they flow through a powder measure. Our objective is, no matter your application, to achieve consistent output from the powder measure.

Almost all powders break down into five basic forms: extruded tubular kernels, cut round flakes, cut sheet flakes, round ball and flattened ball.¹ The density and shape of a powder effects how it will pack and flow from your powder measure's reservoir to its delivery point.

For example, cut round flakes (they look like tiny, flat circles) such as Hercules Bullseye, Red Dot or Blue Dot powders, tend to pack loosely within the reservoir and in the finished cartridge or shell. To ensure a consistent charge in the ammo, a consistent "pack" in the reservoir and measure are required. Therefore, the weight of the column of powder in the measure's reservoir should also be kept consistent. Hence, many reloading guides recommend refilling your powder measure's reservoir when the powder column reaches the half-way point.

I agree with this recommendation, especially for extruded kernel, cut round and cut sheet flake powders. My experience with these powder types has been that my measured throw can and does vary as much as 3/10ths of a grain from a full reservoir to a near-empty reservoir. How critical is this variation? Again, it depends on the intended application of the ammo and the firearm in which it will be used. It also depends on how close you are to the ballistic limits for your cartridge type and load. Do not push the limits of the reloading tables. Use your head and stay safe!

In the case of ball powder, be it round ball (e.g., Hodgdon's H380 or H870) or my favorite, flattened ball (e.g., W-W 231 or W-W 760), I find little or no difference in the measured throw from a full reservoir to a near-empty reservoir. Ball powders tend to pack the same from the weight of a full column down to a very short column of powder.

As you can see, depending on your powder type, there is some latitude as to how frequently one really needs to replenish the powder reservoir.

¹ Speer Reloading Manual #10 for Rifle & Pistol, Speer, Lewiston, ID, 1981; Pages 44 & 45.

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26 Tips for Powder Measure Accuracy

By Lee Love

The following information is based on my personal experience and the experiences of other shooters who reload their own ammunition. However, due to the vast number of powders available on the market, as well as the various powder measures and reloading presses, you may find that some of these tips don't agree with your personal experience. Also, some tips are specific to Dillon Precision progressive reloading presses because this is where most of my personal experience has been. However, most of the basic principles can be applied to any powder measure. With that said, here are the tips.

Tip 1: Solidly Mounted Press

Make absolutely certain that your reloading press is mounted solidly to a sturdy table. If the press is wiggling around, it will not yield consistent results no matter how diligent you are with the other Tips. Anchor the table to the wall, preferably with lag screws directly into the wall studs. If possible, also anchor the front table legs to the floor. If the table wiggles, so will your press! When I mounted my XL-650 press, I ran lag screws into the wall studs and set expansion anchors into the concrete garage floor.

But I still wasn't happy with the front two mounting bolts being supported by just the thin lip of the countertop. It still felt a little "mushy" when seating primers. So, instead of using the fender washers supplied with the press, I got a 24" long piece of 1" wide x 1/8" thick iron strap from a hardware store and drilled holes through it for the two front bolts. I put a slight bow in the strap, like a wagon spring, and placed it under the table edge with the bow down (like a smile when viewed from the side). The bow helps to spread the force outward toward the ends of the strap. You only need about 1/2" of bow. With the strap in place, the force is spread across that entire 24" wide section of table. I can actually feel difference, especially when seating primers.

Recently a customer suggested adding more bolts to my Dillon Strong Mount. The base normally has four bolts ... one at each corner. So, I added one additional bolt on each side, halfway between the original bolts. If I hadn't already added the iron strap under the lip of the bench, it might have made a perceptible difference. Regardless, I feel it was well worth the small amount of effort.

Tip 2: Correctly Adjusted Powder Die

Make certain that your powder die is set up correctly. If the powder bar does not travel fully to its limit in both directions, powder drops will be erratic. Refer to your operating manual for a detailed description and procedure for setting up the powder die and powder measure.

Tip 3: Throw Multiple "Dummy" Charges Before Loading

After adding powder to a completely empty powder hopper, throw at least 10-15 "dummy" charges before you start weighing any. Cycling the press multiple times will allow the powder to settle uniformly in the hopper.

Tip 4: Refill Powder Hopper Before Empty

Replenish the hopper before it drops below half full. If you have a Low Powder Sensor, don't just wait for the sensor to alarm. If the alarm does go off, add powder, then throw at least 5 dummy charges before weighing a charge to confirm that you are still throwing the charge weight you want. If you don't get the charge weight you expect, throw and weigh more charges until they have returned to a consistent weight. As mentioned in Tip #3, it may take quite a few cycles of the press before the powder "settles in" when filling a near empty hopper.

NOTE: If you have a Dillon Low Powder Sensor installed, you can shorten the rod to make it alarm at the half full level ... or any level you want (See UniqueTek Tips File #4, "Adjustable Low Powder Sensor").

Tip 5: Install a Powder Baffle

Depending on your powder measure, powder baffles may be available that will make a marked improvement in the powder charge repeatability and make the powder measure less sensitive to the powder level in the hopper. Powder baffles are available for RCBS, Redding, MEC and Dillon powder measures. Some of them are available directly from the powder measure manufactures (e.g., RCBS and Redding). Others are available as aftermarket accessories (e.g., for Dillon and MEC). If you don't have one, or if your powder measure came with one and it has been lost, definitely get one. It is probably the least expensive and most valuable upgrade you can do to your reloading press!

NOTE: Many other powder baffles are now available including Armaov Powder Baffle, Positive Feed Powder Baffle, Prairie Dog Perfect Powder Baffle, Titan Powder Baffle and Powder Baffle 2 and Uncle Nick's Powder Baffle Template.



UniqueTek Precision Powder Baffle™ for Dillon Powder Measures

Tip 6: Increase Powder Level Over Powder Bar

Increase the powder level over the powder bar. This places more pressure on the powder in the powder bar and can improve powder drop weight consistency, especially with “difficult” powders. This is easy to do on powder measures with a baffle that can be adjusted up or down in the powder hopper tube (e.g., Redding, RCBS). The photo at right shows a Redding Model 10X powder measure with the baffle adjusted higher up in the powder hopper tube.

But to do this on the Dillon powder measure requires some minor surgery. First you must cut out the original plastic powder baffle that is molded into the Dillon powder hopper tube. Then install a UniqueTek Precision Powder Baffle™. Position the UniqueTek baffle higher in the hopper tube than where the original plastic baffle was located. Move it up in about 1/2" increments and test the powder drop consistency at each location until you find the optimum height. Don't position the baffle any higher than is necessary as the higher you place the baffle, the less powder capacity the hopper will have. Powder must be added before the powder level drops below the baffle in order to maintain the constant pressure over the powder bar. To gain the maximum benefit, you should also take the time to polish the powder measure body as described in Tip #16.



Redding Model 10X

You can go one step further by getting the UniqueTek 2X Powder Hopper Tube™. The advantages are.

1. You don't need to do any surgery on the Dillon powder hopper.
2. It is easier to position the baffle.
3. You will still have plenty of powder capacity with the baffle positioned higher in the tube.

A Precision Powder Baffle™ is included with the 2X Powder Hopper Tube™, so you won't need to buy one separately. Plus, the tube material will not stain from contact with most powders. *

* Hodgdon TITEGROUP™ will stain the 2X Powder Hopper Tube™ after extended contact time. It is recommended to drain this powder between reloading sessions. We believe that staining will likely occur with other double-base powders.

Tip 7: Don't Tap on the Powder Hopper

Don't tap on the side of the powder hopper to level the powder. This is not needed and may cause the powder to settle differently than it does during normal cycling. If you do happen to bump the hopper, weigh a few charges to confirm you are still throwing a consistent charge weight.

It should be noted that the Lyman #55 powder measure comes with a “Knocker Assembly” ... a weighted pendulum designed specifically to settle the powder.

“When the powder measure has been adjusted, flip the knocker several times to settle the powder in the reservoir. Place a cartridge case in contact with the drop tube, raise the measure handle against its stop without jarring the measure unnecessarily and return the handle to its downward position. Flip the knocker so all of the charge will be jarred down into the case.”⁵



The knocker can be quite effective, but you should flip it the same number of times and lift it the same height each time. It is also interesting that even Lyman cautions against jarring the measure unnecessarily. Although a “knocker” is OK for single stage presses, it isn’t practical for automatic powder measures on progressive presses.

Tip 8: Use Consistent Force when Cycling the Press

Cycle the powder measure or press using consistent force. Changing the force can result in slightly more or less powder in the charge. A heavy-handed operator that slams the lever hard against the stops can cause the powder to settle a bit more, resulting in a slightly heavier charge weight compared to an operator with a lighter hand. A heavy-handed operator can also cause powder to bounce out of an already filled case (when the shellplate indexes on a progressive reloading press) when making loads at near full case capacity.

Tip 9: Lubricate ALL Brass

I decided to make this a separate Tip because I feel it is so important. Lubricating all brass ...even when using carbide dies and loading straight-walled pistol cases ... will make the press operate more smoothly and with significantly less effort and can help improve powder drop weight consistency. I prefer to use Hornady One Shot Case Lube for all my pistol brass, but there are many that work well. Just choose one that you like.



Tip 10: Throw Multiple Powder Drops After Powder Bar Adjustment

After making any adjustment of the powder bar, throw at least 3 dummy charges before weighting any. Obviously, the powder already in the powder bar is disturbed by the adjustment and will not be representative of the new setting. But the powder immediately above the powder bar can also be disturbed, especially if the adjustment is a large change, and will require several cycles of the powder measure to settle in to the new powder bar setting.

It is actually recommended to make powder measure adjustments with the press operating handle in the down position. With the handle down, the powder bar is empty, and your adjustment is less likely to disturb the powder in the powder hopper. This is especially true when adjusting from a large charge to a small charge. If done with the handle up, the compressed powder will tend to push upward, disturbing the powder above the powder bar.

Regardless, you are likely to disturb the powder any time you are rattling around with a wrench on the powder bar adjustment bolt and will need to throw at least 3 dummy charges before weighing any.

Tip 11: Weigh At Least 3 Charges Before Making Another Powder Bar Adjustment

It makes no sense to make another adjustment to the powder bar until you are confident what the current adjustment is throwing. Weight at least 3 charges to ensure you are throwing a consistent charge weight. With most powders, the charge weight should not differ by more than 0.1 to 0.2 grains across the three measurements. Any time I get a spread of 0.2 grains or more, I weigh a few more charges until I am confident that I have a consistent reading. By doing this, I avoid making unnecessary adjustments.

Certain powders (e.g., long grain extruded and stick powders) may not meter as uniformly due to their grain size. Experience and weighing a lot of charges will tell you just how repeatable charge weights can get with each powder you use.

Tip 12: Fighting Static Cling

To keep powder from clinging to the inside of the powder hopper (some powders have a greater tendency to cling than others), empty and remove the powder hopper, wash it, then dip it in a soapy water solution (Liquid Joy seems to work the best) and let dry completely before re-assembly. The soap film will remove static cling and allow the powder to settle more evenly. You will need to repeat this treatment occasionally.

I've also heard that wrapping an anti-static drier sheet (e.g. ClingFree®) around the outside of the hopper helps, but I have not tried this myself. I have also not tried using anti-static laundry spray (e.g., STATIC GUARD®) but, if it works, would be a lot less unsightly than a drier sheet. Thoroughly wash and dry the hopper tube before spraying and spray both the inside and outside.

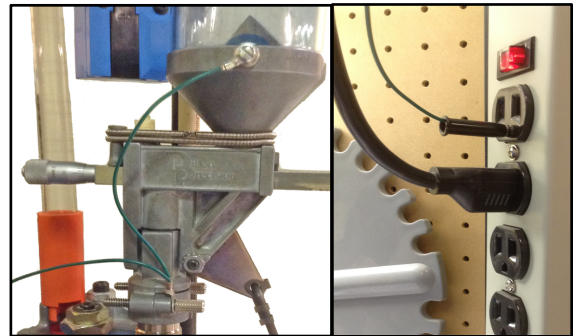


Glass powder hopper tubes are available from a couple of sources. With glass, there is zero chance of static cling and it absolutely will not stain from contact with any gunpowders ... but they still need periodic cleaning.

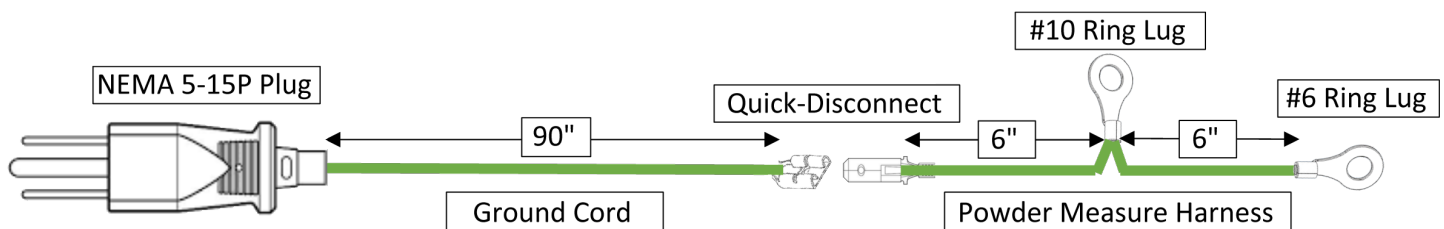
Grounding your powder measure will give static charge a clear pathway to ground. Just because the press is metal, still doesn't guarantee an effective ground; as the press itself is not likely to be grounded. But grounding the powder measure is easy and inexpensive. Here is a list of parts you will need.

- 1 - #6 Ring Lug (This will go under one of the screws that attach the powder hopper to the powder measure.)
- 1 - #10 Ring Lug (This will go under one of the screws that clamp the powder Measure onto the powder die.)
- 1 - Banana Plug (This will insert into the ground hole of any handy electrical outlet.)
- 6' of 20-gauge stranded copper wire. (This will connect the parts and provide a pathway to ground.)

Cut a 5.5" length of wire and strip the insulation from both ends. Insert one end into the #6 Ring Lug and crimp in place. Strip one end of the remaining wire and insert it, and the loose end of the 5.5" wire, into the #10 Ring Lug and crimp into place. Attach each of the ring lugs to the powder measure; the #6 Ring Lug under one of the screws attaching the powder hopper tube to the powder measure, and the #10 Ring Lug under one of the screws clamping the powder measure to the powder die. Use the screws on the side opposite the bellcrank, so the ground wire can't get snagged. Next, route the remaining wire to an electrical outlet, making certain that it doesn't interfere with anything, and allowing enough slack that it isn't pulled tight. Cut the wire and strip the end. Insert the end into the Banana Jack and crimp in place. Now just plug the Banana Jack into the ground plug in the electrical outlet.

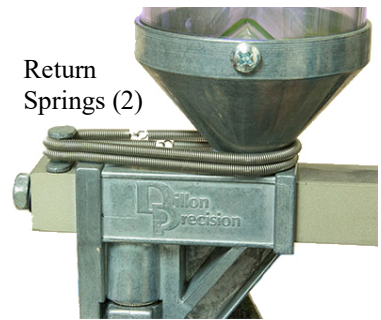


UniqueTek used to sell a Powder Measure Ground Cord specifically for the Dillon Powder Measure. It featured a "Safety Resistor" that blocked any accidental voltage on the ground (e.g., from a near-by lightning strike) and a quick-disconnect so you didn't have to detach the connections when changing toolheads. Alas, it is no longer available.



Tip 13: Powder Bar Return Springs

Older model Dillon Powder Measures used springs (Powder Bar Spring, Part No. 14036) to return the powder bar. The powder measure on my XL 650 was delivered with only one spring and I was unhappy with the sluggish and jerky return to battery. I added a second spring and it help immensely. If you have an older model powder measure that uses springs, always use two Powder Bar Springs for smoother operation and a more positive return.



The new style Dillon Auto Powder Measure has eliminated the need for return springs. Some users have found this to be “clunky” in operation and have added springs and/or made other modifications to their powder measure.

Tip 14: Correctly Assembled and Adjusted Powder Measure *

The Bowed Washer (Part No. 14041) on the Dillon Auto Powder Measure should be oriented on the Bellcrank Bolt (Part No. 13904) so that the high center of the washer is against the Bellcrank Bushing (Part No. 13848) and the low outer diameter of the washer is against the Bellcrank. Occasionally, the Auto Powder Measure is shipped with the Bowed Washer installed upside down. Correct orientation of the Bowed Washer will provide greater range of tension adjustment of the Bellcrank, which is critical to smooth movement of the Powder Bar. The photo at right shows the correct washer orientation ... although the adjustment is way too loose.



The Dillon press instruction manuals say to “snug” the bellcrank screw. I find that the powder measure operates more smoothly with the bellcrank bolt adjusted just shy of being “snug”. I like to see just a little bit of bow remaining in the bowed washer rather than it being completely flattened. However, leaving the bellcrank bolt too loose can cause in the powder bar to not reach its full travel, resulting irregular powder drop weights. It can also cause the white cube to disengage from the powder bar during the powder measure cycle. Again, the photo at right shows the bellcrank bolt adjusted way too loose.

The Bellcrank Bolt threads into a Nylock Nut (Part No. 16340) in the current version of the powder measure. This is superior to the Kep Nut used in earlier powder measures, as it doesn’t loosen up easily. If you experience a problem with the Kep Nut loosening up during press operation, replace it with a Nylock Nut.

* Refer to the Instruction Manual for your press for these part numbers and were to find them on the Powder Measure.

Tip 15: Correct Powder Bar Size for the Charge Weight

Use the correct sized powder bar for the charge weight you are loading. **

- Extra Small – Use for dropping less than 3 grains of powder. Generally used only for .25 ACP, .32 ACP and .32 S&W.
- Small – Use for dropping 3 to 10 grains of powder.
- Large – Use for dropping 10 to approx. 45-50 grains of powder.
- Magnum – Use for dropping more than approx. 45-50 grains of powder.
Throws up to: Approximately 72 grains of extruded powder
Approximately 82 grains of ball/spherical powder.
- Belted Magnum Powder System – From about 70 grains to well over 100 grains.

** This list of powder bar ranges is taken directly from Dillon Precision press Instruction Manuals and their web site.

It is never a good idea to use a powder bar at its extreme maximum or minimum powder drop limits. If you are using the Small powder bar at near its maximum charge limit, you will likely obtain better accuracy if you install the Large powder bar. Similarly, if you are using the Magnum powder bar at near its minimum charge weight, you should switch to the Large powder bar. As always, the proof is in charge weight consistency. If you

are working near one of these limits, try both powder bars and see which one yields the most repeatable powder charge weights.

There can be quite a large overlap in powder drop weight ranges between powder bars. The overlap between the Small and Large powder bars covers a range from approximately 6 to 15 grains (depending on the powder). So, you are likely to run into many instances where the powder drop weight you want, can be achieved by either powder bar. So, which one should you use? Again, test both powder bars and use the one that gives the best powder weight consistency.

Tip 16: Tighten Up a Loose-Fitting Powder Bar Insert

The powder bar adjusting bolt is steel and the powder bar insert is a soft metal casting (probably a zinc/aluminum/magnesium/copper “pot metal” alloy). The fit between the threads can be loose even in a new powder bar, plus the threads in the powder bar insert can wear with repeated use. A loose fit between the insert and adjusting bolt yields inconsistent powder weights and difficulty in making small powder weight adjustments. I have often heard handloaders say they always back off the adjustment bolt and approach the final adjustment from one direction. This may help for the initial adjustment but a loose fit between the bolt and insert will rattle loose during further press cycling resulting in powder weight changes.

You can cure a loose-fitting adjustment bolt in one of two ways.

- 1) Add a spring to maintain tension between the adjustment bolt and powder bar insert.¹ Any good hardware store should have a selection of springs. Choose a compression spring that has thin wire and just barely fits over the threads of the adjuster bolt without binding. I used a SERVALITE® #S-147 spring I found at an Ace Hardware. Install the spring so that the adjustment bolt passes through the spring and then threads into the powder bar insert (you will need to cut the spring to the proper length). Once installed, the spring applies pressure against the powder bar insert, removing any play or backlash in the threads.
- 2) Install a Micrometer Powder Bar Kit™. This kit has a 1/4"-28 threaded bushing that engages the powder bar insert. The bushing is held in place with Loctite®, eliminating any play due to worn threads in the powder bar insert. The micrometer also has 40 threads per inch instead of 28 so will give you a finer adjustment capability. The Micrometer Powder Bar Kit™ is available at www.uniquetek.com/.



Tip 17: Clean the Powder Funnel

Clean the powder funnel regularly. Powder residue can build up on the inside diameter of the powder funnel of the Dillon Auto Powder Measure. This buildup can lead to powder sticking and, with certain powders, aggravate powder bridging. Remove the powder funnel and clean it periodically. I make it a point to inspect it every time I change toolheads and after about every 500 rounds. You will quickly learn just how often you need to clean it with each powder you use.

Tip 18: Clean the Powder Drop Tube

Just like the Powder Funnel mentioned above, powder residue can also build up on the inside diameter of powder drop tubes. I make it a point to inspect and clean it every time I clean the powder funnel. On Dillon presses, the powder drop tube is part of the powder measure. The drop tube in the Dillon powder measure is 0.32" ID and is easily cleaned with a .30 cal. or .32 cal. jag tip and a bore patch. Other drop tubes can be cleaned the same way, but you'll need to measure the diameter and use the appropriate size jag tip.

NOTE: Rubbing alcohol works fine as a cleaner for Powder Funnels and Drop Tubes. Don't use any bore cleaner that is a CLP as you absolutely don't want any oil inside the drop tube.

TIP: Foam swabs (e.g., Bore-Tips™) work great as they can't leave lint inside your drop tube.

Tip 19: Reduce Powder Funnel Bridging

Long grained stick powders can “bridge” inside the powder funnel of the Dillon Auto Powder Measure, especially with small caliber rifle cartridges, resulting in grossly undercharged and/or grossly overcharged cartridges. Here is what Dillon Precision has to say about using Hodgdon VARGET™.

“A couple of things to do to get Varget to meter better. Polish the upper part of the interior of the powder funnel, where the powder flows through it. Next, it should take at least one full second to move the powder bar through its' travel stroke. You want the powder to fall through the funnel, not be pushed through. Be sure to start with the hopper at least 2/3 full, throw 10-15 charges to settle the powder under the baffle before you start weighing powder charges. Doing this, your charges should be within ± 0.2 - 0.3 grain.”³

You can reduce the bridging by reaming out the inside diameter of the powder funnel with a taper reamer and then polish the metal.² Do not over ream the powder funnel. You must stop before you ream off the shoulder that the case mouth meets. You may want to take your powder funnel to a machine shop and have them perform the reaming and polishing.

CAD Drawings of .223 powder funnel courtesy Andrew Murrell, CSEP.⁷

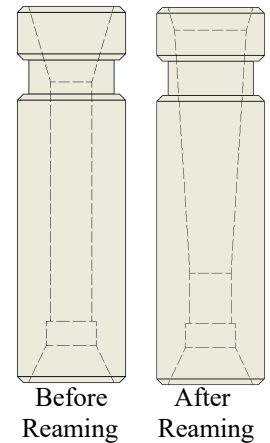
Reamers are available in a variety of tapers. Here are two options currently available on the web.



Grizzly H5890
Repairman's Taper Reamer
(1/8" x 5/8" – 7 Flutes)



Walfront Store
Bridge Pin Hole Reamer
(1/8" x 1/2" – 6 Flutes)



The Grizzly reamer has a wider taper and has been recommended in forums.² The Walfront Store (on Amazon) reamer does not have as wide a taper but does have a hex shank that allows it to be used with a drill. Regardless of the taper, the more flutes (cutting ridges) it has, the smoother the cutting action.

Custom Powder Funnels are now available that can significantly reduce or eliminate powder bridging. They have improved interior profiles and are better polished. But the rifle version is currently available only for 7.62mm/30cal. and 6.5mm/.264cal. ... so they won't help the popular smaller calibers (e.g., 5.56mm/.223cal, 6mm/.243cal, etc.) where powder bridging is a bigger problem. Available from: Double-Alpha Academy, UniqueTek and on Ebay (Seller ID: photoscape).

ALERT: As of this release, a custom rifle powder funnel for .223/5.56 is in the works. It is a collaborative effort between UniqueTek, PhotoEscape and Aerospace Systems Engineer Andrew Murrell, CSEP. The prototype exhibited zero bridging with IMR 4166 (20 consecutive drops: Avg = 20.35gn, SD = 0.17gn versus Avg = 16.72gn, SD = 5.91gn for unmodified powder funnel.). It is expected to be available by Q4 2021.



Tip 20: Polish Interior of Powder Measure Body

Polish the interior of the powder measure body. This is easy to do yourself and the instructions and photos have been posted on several Internet forums by Tom Freeman.⁴ The polished surface helps powder flow more easily into the powder bar and can enhance the powder charge weight consistency of all powders, not just extruded powders like VARGET™.

Start with Scotch Bright or 500grit wet/dry sandpaper to quickly knock down the rough casting surface and smooth out any seams or other imperfections. Then use a paste polish (e.g., Flitz) and a Dremel tool with a felt bullet-shaped tip to give it



a final polish. Keep in mind that gunpowders are abrasive and you will occasionally want to touch up the polish.

NOTE: Never use steel wool on aluminum or pot metal! Tiny bits of the steel wool will embed in the aluminum and eventually rust!

TIP: One of the best polishing compounds for this is Mothers Mag & Aluminum Polish. It is especially formulated for aluminum and magnesium alloys. But if you already happen to have another paste polish (e.g., Purple Metal Polish, Flitz, Simichrome, MAAS, Jeweler's Rouge, etc.) they will work just fine.

Tip 21: Control Brass "Sticking" to Case Neck Expander

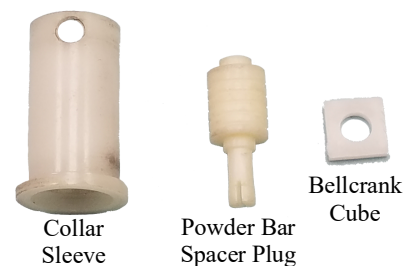
When loading new brass pistol cases, or brass that has been wet cleaned to "as new" condition, they can stick when disengaging from the case neck expanding die (the powder funnel on Dillon presses). On progressive presses, the lurch when the case pops free from the die can upset powder drop consistency and even result in powder being splashed out of the case mouth. If you inspect the case neck expander (or powder funnel), you will see brass residue smeared on the metal. Periodically cleaning off the brass residue will restore smooth operation. Dillon recommends cleaning off the brass residue using a Scotch-Brite™ pad (or similar product). Don't use anything so abrasive that it may scratch the metal surface. After cleaning the expander, try applying some case lube directly to the expander. I recommend a wax type case lube (e.g., Imperial Sizing Die Wax or Hornady One Shot™) for this application. Applying the lube will make the neck expanding operation smoother and may reduce the frequency of cleaning needed. Do NOT use a lube that is sticky, as it will inevitably result in powder grains sticking to it.

UPDATE: I recently discussed this with a friend who said that super polishing the powder funnel helps reduce brass sticking significantly. He worked his way up to 3000 grit!

UPDATE: New brass is coated with lots of tiny brass particles that promote sticking. Run all your new brass through your brass polisher before reloading it the first time. This not only cleans off the brass particles, but the some polishing compounds contain silicone (e.g. Dillon Rapid Polish 290 and Flitz® Tumbler Medial Additive) which leaves a coating on the brass that can reduce sticking. This can also help reduce powder funnel sticking with used pistol brass that has been wet cleaned using stainless steel pins.

Tip 22: Inspect Plastic Powder Measure Components

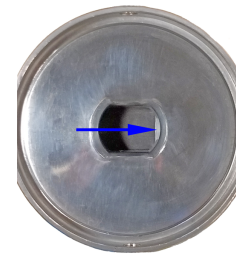
There are three plastic parts on the Dillon Auto Powder Measure that should be inspected regularly and replaced if worn or cracked. They are the Bellcrank Cube (Part No. 13871), Collar Sleeve (Part No. 13845), and Powder Bar Spacer Plug (Part No. 13921). A customer had two seemingly identical powder measures, but one just didn't give powder weights as consistent as the other. After replacing these three parts, it dropped powder weights equivalent to the other powder measure.



The Bellcrank Cube is the most critical of the three parts. If it is cracked or the center hole is worn, it must be replaced. I consider this part a "consumable" and keep several replacements on hand. I don't even bother to inspect them anymore. I just replace them any time I'm changing powder bars or servicing the powder measure.

The Collar Sleeve is also prone to wear or cracking and can get dirty. A dirty Collar Sleeve can bind causing the Powder Measure to not cycle smoothly. It should be removed and inspected periodically. Once cleaned, inspect for any visible sign of wear ... in particular any scuffmarks on the inside diameter ... or cracks. If heavily worn or cracked the powder measure can rattle around, resulting in poor powder drop weight consistency. Although the Collar Sleeve in the photo shows some powder staining, it otherwise in good condition and usable.

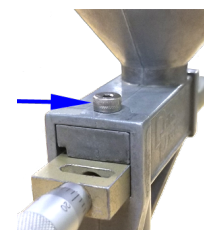
The Powder Bar Spacer Plug doesn't look very important but plays a critical role. It must hold the Powder Bar Spacer (#13644) securely in place. If the spacer shifts, it can create a ledge on which powder grains can hang up. The photo at right shows a ledge caused by the plug not being fully seated so the shoulder was not engaged in the hole in the Powder Measure Body. When installing the plug, ensure that it is fully engaged into the powder bar spacer and fully seated into the hole on top of the powder measure body. If the tip is bent or partially broken off, or does not snap securely into position, replace it.



While you are inspecting these parts, take a few extra minutes to clean and lubricate the powder measure's moving parts. Lubricate the bell crank pivot points (Roller #13793, Collar Roller Bushing #14808 and Bellcrank Bushing #13848) with wheel bearing grease. Also apply grease to the guides on the Body Collar (#13940) and Powder Measure body (#22273) to prevent wear where the casting surfaces meet. Use only a sparing amount of grease as any excess will just collect dirt faster.

Tip 23: Lock Down the Powder Bar Spacer

A customer gave me this tip on how to solidly anchor the Powder Bar Spacer. Rather than just replacing the Plastic Plug as described in Tip #22, tap the hole in the Powder Bar Spacer using an 8-32 thread tap, then use an 8-32x3/8" screw instead of the Plastic Plug. This clamps the Powder Bar Spacer solidly in place, eliminating all motion. Make sure the tip of the screw does not protrude below the bottom of the Powder Bar Spacer as this will scratch the top of the powder bar and cause binding. Also, since the 8-32 screw does not have a shoulder, make sure the Powder Bar Spacer is properly centered before tightening the screw.



NOTE: UniqueTek launched a product in December 2020 that includes a stainless-steel shoulder bolt to replace the plastic Powder Bar Spacer Plug. Once installed, it clamps the Powder Bar Spacer securely to the Powder Measure Body ... assuring it can't move out of place.

(Note: Powder Bar Post and Powder Bar springs were removed for photographic clarity.)

Item #: T1751 "Powder Bar Spacer Bolt Kit"

Tip 24: Clamp Your Toolhead

On certain presses with interchangeable toolheads (e.g. Dillon RL 550, XL 650, XL 750 and RCBS Pro 2000), the toolhead is held in the press frame using locator pins. This leaves the toolhead free to move up and down with each cycle of the press. The "clunk" when the toolhead reaches the upper and lower limits of movement, rattles your powder measure resulting in powder drop weight variations. This is especially true with the Dillon presses where the powder measure is mounted on the toolhead. But it can also affect the RCBS Pro 2000 even though the powder measure is mounted directly to the press frame. The "clunk" of the dieplate will be transmitted through the press frame to the powder measure. Granted, it is less of an issue on the Pro 2000 but is still something to take into consideration.

Below is feedback from a customer using a clamped toolhead, and how it helped his powder drop consistency ... as well as his COL variation.

"I was having serious issues with powder (± 0.5 gr) and overall length ($\pm .009$ " variation). I called UniqueTek and asked for some help to see if I was doing things properly. I was on the phone with Lee for a quite a while and he was more than helpful and gave me some great ideas for improving my process, however the one thing we both agreed upon was the fact that my tool head was pinned not clamped allowing movement. Which yes that's how Dillon designed it. However, I was willing to try the clamped tool head because the "idea" made perfect sense. How can I be consistent with all of that movement? Originally, I was trying to throw 5.0 grains of VV N320, but I was getting anywhere between 4.9 to 5.4 grains and my extreme spreads were outrageous which is a scary thing when running a custom 2011 and trying to make power factor at a match or be a consistent shooter. I received the clamped tool head and installed it immediately following the included instructions to the letter. I

began to "dial" in the press also dialing in the UniqueTek micro adjust powder bar (which is a must have!!!) and threw about 15 or 20 drops of powder. Once I was getting a consistent 5.0 gr, I then threw 15 straight drops, and the final number was 75.2gr on my digital scale which is an average of 5.013333gr!! Amazing! Then I checked OAL, now I know there is some variation in the bullet making process especially when dealing with hollow points. However, my goal was 1.184" for my .40cal and I was able to adjust the die to consistently get 1.183"/1.184" which is ± 0.001 "!!! I called Lee back to thank him and he was not surprised. I looked online and read some comments that made the clamped tool head sound like "snake oil" and was worried that it may not be what I needed. That information couldn't be farther from the truth! I have been away and have not been able to check the numbers on my Lab Radar but I'm going to guess they will be much more consistent! VERY VERY PLEASED!!!!" ⁶

Tip 25: Failsafe Rod Alignment on Dillon Precision Powder Measure

The Failsafe Rod or Failsafe Return Rod* on the Dillon Powder Measure must be as near vertical as possible for the powder measure to function smoothly ... especially with the new Failsafe Rod Bushing (Part No. 18086 – all presses except 1050). The older Failsafe Shoulder Washer (Part No. 13953) was only about 1/8" high (0.130" to be exact) x 0.261" ID, so the Failsafe Rod could pass through at a slight angle without a problem. But the new Failsafe Rod Bushing is 5/8" high (0.625") x 0.205" ID, making vertical alignment of the Failsafe Rod critical to avoid binding.



* (#13629 on 650/750, #13960 on Super 1050 / RL 1050, #97000 on 550, #16814 on SDB, #17350 on SL 900).

To get the failsafe rod vertical, the first step is to ensure that it is inserted into the bellcrank from the correct direction. The Instruction Manual for your press will show the correct direction in the Automatic Powder Measure Assembly drawing. Next, loosen the Body Collar Clamp and rotate the powder measure as needed to get the failsafe rod vertical, then tighten the screws.

If you have a really old RL 550 press, the Failsafe Rod (Part No. 593A) required a Throttle Clip (Part No. 593C) to keep the rod attached to the bellcrank. These clips always seemed to make the rod hang at an odd angle and were difficult to install and remove. All newer RL 550 presses have a redesigned rod (Part No. 97000) that doesn't need a clip and therefore hangs vertically. Although it isn't bent to exactly 90° (see photo), that doesn't seem to cause a problem.



NOTE: Instead of purchasing a new style Failsafe Rod, you could take the DIY approach and drill a hole at the end for a Retaining Clip (Part No. 14040) like those used on Primer Pickup Tubes.

Tip 26: Vibrate Your Powder

I know this seems contrary to everything you've read thus far in this "Tips" file. But it has been demonstrated that inducing some constant and consistent vibration into the powder measure can yield more consistent powder drop weights. The difference is that these vibrations are controlled and targeted. Here is how it works.

All gunpowders are granular (albeit in wide variety of shapes and sizes). As such there is a lot of air space between the grains. If you vibrate the powder, it will settle and eliminate some of that air space. Continue vibrating the powder and you eventually reach a point where the grains are as tightly packed as they can possibly get. If you can achieve that within the metering chamber of your powder measure, your powder drops will become very consistent. This is similar in concept to the "Powder Knocker" on the Lyman #55 Powder Measure (see Tip #7) but is a continuous vibration rather than a few well-timed knocks.

Around 2005, Bob Coval conducted some rather extensive research on settling powder to achieve more consistent powder drops. His research resulted in the "Coval Device". It was simply a small DC motor with an

eccentric weight packaged inside a plastic tube and powered by a 3VDC power supply. It strapped to the side of your powder measure using a rubber band and had a piece of foam glued to the side to help stabilize it against the irregular shape of the powder measure. It was on continuously as long as the power supply was plugged into a wall outlet. I tried one but, in my opinion, it shook the powder measure too violently and was very noisy. I think the frequency needed to be higher and the amplitude lower. Plus, it really needed a mounting method that was better than the included rubber bands, and an On/Off switch. Alas, Bob has passed, and the Coval Device is no longer available.



Meanwhile, there are many forum postings about using aquarium air pumps, pager motors, buzzers, alarms, ringers ... and even adult toys to induce vibrations directly to the powder measure. Aquarium pumps seem to be a favorite as they are inexpensive (as little as about \$6.00) and easy to find (most pet stores, Walmart, Amazon, etc.). You can even find battery powered air pumps. Regardless, you'll want the smallest one you can find as they are usually strapped to the side of the powder hopper tube. Ideally, it should be attached as close to the powder metering chamber as possible (like the Coval Device). But even the smallest aquarium pumps are too large to mount there.



Air Pump on
Dillon Powder Measure
(Photo courtesy of Peter Griffin.)

Everyone has a chuckle about this, but egg vibrators from an adult shop can be an effective option. They are small enough to mount directly onto the side of the powder measure (like the Coval Device), placing them as close as possible to the metering chamber. Most have variable speeds and some even have different vibration patterns, so you can experiment to determine the optimum setting for your powder measure and the powders you use. And they cost only a little more than an aquarium pump.

Tip 27: Add Weight to Powder Hopper

There is at least one commercial product that is designed to improve powder drop consistency by floating a weight on top of the powder in the powder measure. The logic is that by adding a weight, you reduce the difference in powder weight at the bottom of the hopper between full and near empty. Here is the manufacturer's description from eBay.

"Dillon Powder measure weight. For those of you who don't want the low powder indicator but would like to have some weight on the powder. This insert fits into the Dillon powder Measure tube and puts even pressure on the powder. This helps keep loads uniformed. Like the Dillon low powder indicator unit, but at a lot less money. Made of aluminum and Brass for extra weight and less chance for static with the powder. This will also work with the Dillon low powder indicator. You just need to unscrew the bottom plate and slide the middle onto the new Dillon Powder weight."

They were out of stock on both eBay and Amazon, so I called the manufacturer. He said that they are currently out of stock due to several large CNC orders that have to be completed first.

He makes them for Dillon, RCBS and Lee powder measures.

Ebay Seller: rrpmi

UniqueTek has a weight kit that is designed to be used in conjunction with the Dillon Low Powder Sensor. The two brass weights are simply installed on the follower rod above the fender washer that floats on top of the powder and add 3 ounces of weight. The instructions include a description of how to use the weights without the Dillon Low Powder Sensor as well as making it work with powder measures from other manufacturers.

This product was launched in January 2024.

[Item #: T1780](#)



Brass Weights →

Tip 28: Keep Your Powder Hopper Full

An alternative to adding a weight, as described in Tip 26, would be to keep your hopper constantly full ... or at least refill it a much higher level. Obviously, this would be a major inconvenience, but there are a couple of ways to keep track of the powder level.

- 1) Modify your Dillon Low Powder Sensor to alarm at a higher level. There are two ways of accomplishing this.
 - a) Instructions on how to make this modification are available for download at UniqueTek ([Tips File #4: “Adjustable Low Powder Sensor”](#)). It won't keep the powder at a constant level, but the difference between Full and Low levels can be reduced significantly.
 - b) Install a UniqueTek [Quick-release Failsafe Rod Nut \(T1753\)](#). Although originally designed for the Failsafe Rod, it can also be installed on the follower rod of the Dillon Low Powder Sensor, allowing you to trigger the alarm at any desired powder level.
- 2) Install a Bulk Powder Feed Kit™. This kit feeds powder directly and continuously from a keg of powder and maintains the powder hopper at a constant full level. It was intended for commercial reloaders to reduce the need to stop and refill the hopper. But it also has the effect of maintaining a constant weight of powder above the baffle. It is available at UniqueTek (Item # T1676).

NOTE: The Bulk Powder Feed Kit™ is no longer being manufactured as of Q4 2023.

A Final Word

Regardless of which powder measure you use, there will never be a single “magic bullet” that will cure powder drop consistency. But multiple enhancements will have a cumulative effect and, together, can help significantly. Above all else, the key to powder measure accuracy is consistent technique. How you operate the powder measure or reloading press doesn't matter nearly as much as it does that you do it the same way each and every time.

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6. Customer product review of CNC Machined Toolhead with Toolhead Clamp Kit™ parts preinstalled. By Andy Heppard. Posted at <https://uniquetek.com/shop/ols/products/cnc-machined-550650750-toolheads>.
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