

Want to use your Dillon progressive press to reload small mouth cartridges with extruded powders like VihtaVuori N140, IMR 4895, Varget or even IMR 4198? Yes, it is possible but will take just a little work on your part.

Charge-to-charge weight variations are always a concern when working with extruded powder. You must decide whether charges thrown by your machine are safe. However, what keeps most reloaders from using extruded powder in small mouth cases is frequent squib loads followed by an overflowing case.

That issue can be fixed with a slight modification to the Dillon powder funnel. It takes a Dremel tool with fine grinding bit, polishing compound and about a half hour. After modifying my Dillon "A" powder funnel (.223 Rem), I spent several hours performing load-to-load weight variation using 4 different extruded powders: **VihtaVuori N140, IMR 4895, Hodgdon Varget, and IMR 4189.**

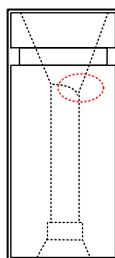
THE PROBLEM AND THE FIX

As extruded powder granules leave the powder bar and fall into the funnel portion of the Dillon powder funnel, powder gets stuck or "bridges" the funnel outlet. Some powder drops down the tube creating a partial (squib) load. When the powder bar cycles for the next round, the powder left in the funnel as well as the next charge drops into the case causing an overfilled case and the tell-tale loose powder laying on top of the turret. If this happens, STOP. It is not just the case under the powder funnel that is an issue. The round in the seating position is a squib load.

To eliminate a squib load followed by an overfill, I used a Dremel tool with very small diameter grinding stone to change the perfect circular shape at the interface of the funnel outlet and top of the drop tube. With a non-symmetrical interface, powder is going to continue dropping out of the funnel until the funnel is emptied.



Grind a small portion of that interface, approximately 45 degrees of the circle, at a steeper angle and farther down into the tube. After grinding, use a rubbing compound followed by a polishing compound to smooth the newly shaped portion of the funnel portion. It's that simple!



RESULTS:

Since modifying the Dillon powder funnel, I have thrown in excess of 500 charges into .223 Rem cases using each of the 4 powders listed (2,000 + loads) without a single occurrence of bridging (squibs or overfills).

NOTE REGARDING SAFETY:

It is still incumbent on each reloader to determine if charge-to-charge weight variation is controlled well enough to remain within the listed max load specification. I used statistical methods to determine what MY max charge weight should be. For example, if I throw and weigh 30 or more charges and find a weight standard deviation (SD) of 0.12 grains using my digital scale, I will subtract twice that value from the listed max charge to become MY max charge. I could use 3 SDs to be even safer but since I'm shooting .223 loads in an AR15 with 5.56 chamber and barrel, 2 SDs is very safe.

MY STATISTICAL DATA:

Note that the charges listed are NOT safe to fire. They may exceed listed max charges. The targeted charge values of 25.0 gr or 20.0 gr were chosen simply to make it easy to do the math and immediately recognize a squib or overfilled load. visually

Powder	Sample Size (n)	Targeted Charge	Measured Average (mean)	SD	Min	Max
N140	124	25.0	24.923 gr	0.11921	24.7	25.2
IMR 4895	30	25.0	24.960	0.11719	24.7	25.2
Varget	30	25.0	25.100	0.12910	24.0	25.4
IMR 4198	30	20.0	20.010	0.08699	19.8	20.2

SUMMARY:

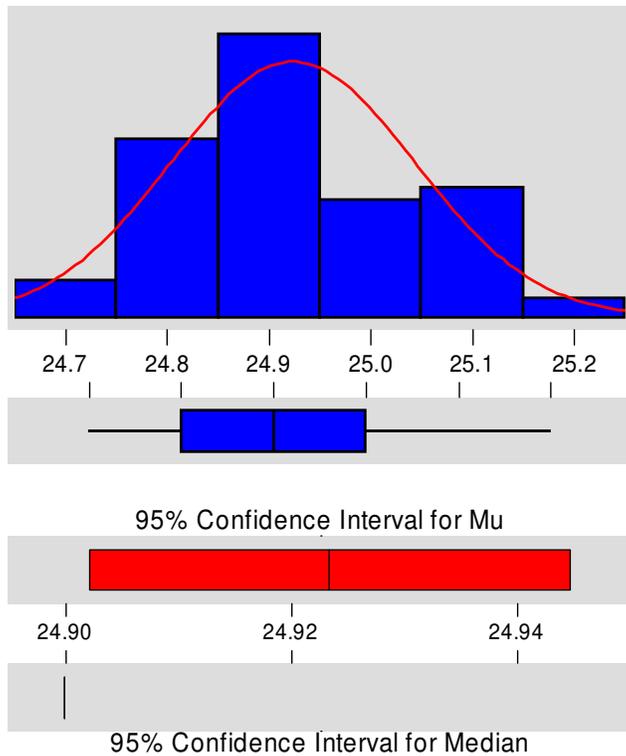
I love N140 and Varget. I have an excess of IMR 4895 and IMR 4198. I want to be able to use my favorite powders as well as use up some older powders. With this modification, I can safely reload all these powders. While I ran a lot more statistical measurements than shown here, I changed powders between runs so the mean is different between the runs. That additional data is not shown.

After gathering the statistical data, I ran 500+ loads with each of the powders where the loads were not individually weighed, simply dumped back into the original container. This testing was done just to prove to myself that the powder funnel modification performed as expected. Also, since there is no keyed feature on the powder funnel to keep the irregular shape in the same position, I rotated the funnel by about 90 degrees each time the powder was changed. In 2000+

tests, I did not have a single instance of bridging. Interestingly, I did have several instances of bridging when dumping powder from the casing back in the original powder container. Just a funny observation.

I use Minitab for my statistical tool. Excel works fine for the basic values of SD, mean, min max. But I like to see graphical representations like the one below. This is the data for the N140 after modifying the funnel. Statistical tools like this immediately show if something is odd, like non-normal data as determined by a P-value of greater than 0.05. And to think I hated my statistics courses 😊

Descriptive Statistics



Variable: Mod Funnel

Anderson-Darling Normality Test

A-Squared: 4.834
P-Value: 0.000

Mean: 24.9234
StDev: 0.1197
Variance: 1.43E-02
Skewness: 0.316968
Kurtosis: -5.7E-01
N: 124

Minimum: 24.7000
1st Quartile: 24.8000
Median: 24.9000
3rd Quartile: 25.0000
Maximum: 25.2000

95% Confidence Interval for Mu
24.9021 24.9447

95% Confidence Interval for Sigma
0.1064 0.1368

95% Confidence Interval for Median
24.9000 24.9000

Have fun. If you modify your funnel and still get bridging, please reply to this forum. Remember to polish the area you grind.