

Mould Enlargement “beagling”



This undersize 427098HP double cavity mould started it all.
A .003” brass shim between the cavities takes it from .428” to .433”

I suppose every caster is plagued with a mould that cast bullets undersized for the intended application at least once in his lifetime. This fault, as I call it, occurs primarily with Lyman or Ideal moulds but moulds meeting RCBS specifications are sometimes smaller than we need. I have searched carefully for a specific mould design many times, only to find that it casts small bullets when I finally obtain it. It’s down right frustrating.

Many designs suffer from this problem but it seems that certain moulds or designs are worse than others. Among these are the 457191, the 357446, the 429360, the 41032, the 427098 and the 429434. Then there are the true old classics you obtain that were just cut small to begin with. I have a 358429 that drops bullets at .358 X .355 and that was just a manufacturer’s problem but it is too old now for Lyman to do anything about it.

Some moulds were designed with small noses to fit in black powder rifles. Some of the older moulds were designed with small driving bands so that they would fit in specific designer’s guns. We seem to run into these problems often in casting bullets.

All of these small-casting moulds sat in my mould cabinet for years. Occasionally I’d learn something and try them again, all to no avail. The bullets produced were still too small. After retirement, I had more time to mess some with these moulds and attempt to improve them.

Three Failures, Then Success!

I made three attempts at this before I got it right.

First, I tried lapping the mould cavities with valve grinding compound. This is a very messy and often unsuccessful project and you stand a chance to ruin a fine mould, even though it may not be doing any good for you.

Second, I attempted to increase the diameter by drilling and tapping the open side of the pin alignment holes for setscrews that could be adjusted to hold the blocks partially open. This method works, but the proper adjustment is hard to establish and maintain because changing block temperatures and vibrations from cutting the sprue caused the set screw adjustment to vary.

Third, I took a 5/32” spring pin, cut 3/16” lengths off one end, and then drove them into the openings to hold the blocks far enough apart to enlarge of the bullet. This method also works, but the correct adjustment is very difficult to obtain due to the heat involved and the opening and closing of the mould blocks.

Success!

About this time, I acquired a H&G #73 double cavity mould from eBay. I didn't worry about handles because I already had several other 2 cavity H&G moulds. When the mould arrived, my handles were too thick to fit the block cuts. I finally found that a set of Lyman 4 cavity handles would hold the blocks so that I could try the mould. I fully expected a .358" diameter bullet, but instead they fell from the mould at .361". Close examination of the gap between the mould halves showed that there was a minute gap between the blocks. There was no gap when the blocks were removed from the Lyman handles, so the handles were holding the blocks apart the exact amount required to produce a nice large bullet.

I communicated this information to Orygun Mark and he drilled and tapped a set of handles to incorporate a single .002" shim between a set of SC blocks and it worked for him. Now we were getting somewhere!

I finally located a set of brass shim stock at ACE Hardware of .001, .002, .003 and .005" thickness. I cut and prepared a piece of .002" shim stock and prepared to shim a DC mould by securing the shim stock behind the mould handle screw. It wouldn't work because the alignment pins got in the way. So, it was back to the drawing board.



Beagle tape
Manufacturer: Royal Tapes

I had a roll of .002" aluminum tape with adhesive backing. This tape is used to seal air conditioning ducts. I tried covering the entire mould face on a single cavity mould but the adhesive closed the vent lines on a .22 mould I was attempting to enlarge. Finally, I placed a large square of this tape below the cavity and small strips on either side of the cavity and it worked. Success!!!

Now, back to the double cavity moulds. The same method of using a large patch below the cavities and a small strip along the outside of each cavity does well and stays in place because of the adhesive. Now, the Lyman 427098, which previously ran .428", produces bullets that fall between .432 and .433.

I learned several things during this experiment. I had first anticipated venting to be a problem, but it is not. The gaps between the tape strips provide sufficient venting.

However, the shim must be directly between the mould handles. If the tape shim is placed below or above, the blocks will tilt and close. The shim must be directly between the alignment pins for the same reason.

For reasons unclear to me, bullets don't form "wings" at the side seams unless the mould is very hot and a lot of lead pressure is used. Usually a .003" gap between the moulds can be tolerated without flashing between the mould halves. A small seam is usually present but is small enough so that the bullets are useable. Very little flashing between the mould halves occurs using this method. They will flash due to heat and lead pressure when dipper poured, but no flashing occurs if you use a bottom pour pot and drop the melt $\frac{3}{4}$ " to 1" into the sprue hole. This seems due to reduced melt temperature and the reduced pressure of the melt going into the cavity.

Even elliptical bullets are rounded during the sizing process, especially if sized in one of the newer tapered sizer dies. Accuracy is just as good as with completely round bullets. Even though these bullets may be slightly out of round, they still maintain balance when fired.

If you are using only one thickness of tape in the mould, it seems to work best when placed on the side of the mould with the index pins. I haven't quite figured this one out yet, but that's the way it works. More uniform results can be obtained by applying tape to both halves of the mould. The best method of taping can be obtained by using strips approximately 1/8" wide. If you want a bigger body, apply strips alongside the cavity and between the cavities in the case of a double cavity mould alongside the area you wish to enlarge. These strips should be positioned so that the two strips bear on each other. This separates the mould halves a uniform amount.

This method can also be used to enlarge the nose of the heavier .45 moulds designed for black powder to full diameter for use in smokeless rifles, and also provides a better fit to the bore. Simply place strips of tape on both sides of the nose area where you want to increase the diameter.

On SWC pistol bullets, the areas adjacent to the front driving bands can be taped with small squares to produce a larger diameter front band.



358429 that was undersized in all dimensions
This coverage by .002" brass stock brought even the front band to full diameter.

If you're having problem with a loose gas check fit, a small square on either side of the cavity in the area of the gas check shank will increase the diameter and allow a tighter fit of the gas check to the bullet.



462560HP enlarges to .461"
This mould had a loose gas check also.

Using the current taping method, I am obtaining an additional .003" in diameter without undue design distortion. This has been very useful in the .38, .44, .375 for the 38/55, and in the BP 45 designs in the 45/70.

Based on my experiments over the last year or so, there is still a lot to be learned about this process. As you can see from the pictures, no two moulds behave alike. I started using the brass shim stock and then changed to aluminum tape as it was easier to work with. This method has allowed me to use many moulds that would normally be

out of use because they produced bullets that were under the required diameter.

Get a roll of tape at your local building supply or home repair center and give it a try. If at first you don't succeed, try a different method. It will work and produce a useable bullet for you. The brightest point in this process is that if you don't get what you want with tape, you can peel the tape off with a single edged razor blade, clean the mould, and you are back to the original configuration with no damage to the mould.

The proof is in the shooting. Good "beagling".

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