

UniqueTek “Tips” File #16: “Die Shims & Die Spacers”

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I've talked to numerous experienced handloaders who had never heard of Die Spacers or Die Shims. But they can be a handy item to keep in your bag of tricks. They are simply flat washers of specific thicknesses that are installed under the die lock ring. The result is that the die is now adjusted up by the thickness of the washer ... without ever needing to fiddle with the die lock ring or upset your original die adjustment.

There are several types of operations that can be accomplished using Die Shims or Die Spacers.

- 1) No Crimp
- 2) Partial Resizing
- 3) Special/Magnum Spacer
- 4) Headspace Adjustment
- 5) Seating Depth Adjustment

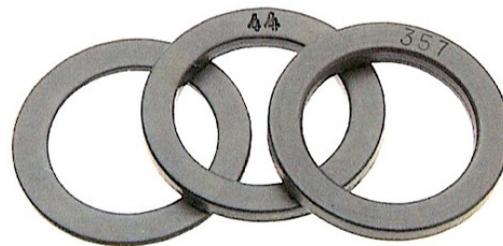


Photo courtesy Redding Reloading.

Die Spacers or Die Shims are most commonly used on single-stage presses but there is no reason they can't be used on a progressive press.

No Crimp

A "No Crimp" Spacer raises a combination Seat/Crimp die just enough that it can seat the bullet without crimping the case mouth. The shim is removed to crimp in a separate operation.

Seat Only: Install the shim under the die lock ring, and then adjust the seat stem down as needed to achieve the desired bullet seat depth.

Crimp Only: Remove the spacer and either remove or back off the seat stem.

In this case, the thickness of the shim is not particularly critical. About 0.060" is plenty. It only needs to be thick enough to ensure that the die will not start a crimp while the bullet is being seated.

Partial Resizing

Occasionally you may want to stop short of fully resizing a case. The most common reason for this is to ensure that the shoulder of a bottleneck rifle case isn't pushed back after having fire formed the case to your rifle's chamber. Essentially you are using a full-length resize die to neck size the case. When you need to full length size cases, just remove the spacer and reinstall the die. Since you didn't need to move the die lock ring, your original die adjustment is preserved.

Again, the thickness of the shim is not particularly critical. About 0.060" is plenty.

Special/Magnum Spacer

A .357 Magnum die set can be used to load .38 Special, and .44 Magnum Dies can be used to load .44 Special. The only difference is the length of the cartridge case as shown below.

.38 Special / .357 Magnum: .38 Spl. = 1.155" / .357 Mag. = 1.290" [Delta = 0.135"]

.44 Special / .44 Magnum: .44 Spl. = 1.160" / .44 Mag. = 1.285" [Delta = 0.125"]

Although the Magnum Full-Length Resize Die does not require any adjustment between Spl. and Mag. versions of these cartridges, the Seat and Crimp Dies require adjustment to accommodate the different case lengths. In this case, the shim thickness is critical and determined by the difference in case length. The .38 Spl/.357 Mag shim must be 0.135" and the .44 Spl/.357 Mag must be 0.125". RCBS Combination Die Sets for .38 Spl/.357 Mag and .44 Spl/.44 Mag come with a spacer and are the only die manufacturer that includes it.

It should be noted that this works perfectly for crimp. But the bullet seating stem may still require adjustment to accommodate differences in the bullet profiles used ... assuming a different bullet is being used for Special versus Magnum. Some handloaders spend the extra effort to find bullet profiles that will seat to the desired COL without any seating stem adjustment.

For users of the Dillon Precision XL-650 press*, a special toolhead is available that uses a horseshoe shaped shim that is installed on top of the toolhead flange for .38 Spl. and below the flange for .357 Mag. The toolhead is also available for .44 Spl./44 Mag. This shim effects all dies in the toolhead, so it not only exhibits the same limitation previously mentioned regarding bullet seating depth, but also affects the resize die. Although you may be able to get away without resizing the last 0.135" or 0.125" of the Magnum cases, you should be prepared to adjust the resize die. Fortunately, adjusting the resize die is easy compared to a seat or crimp die. You could also use a die spacer on just the resize die (Adjust the die when loading the Magnum version of the cartridge then install the spacer when loading the Special version of the cartridge).

NOTE: Since Dillon die lock nuts do not have a set screw, you will need to replace it with a die lock nut that does contain a set screw (e.g. An RCBS Die Lock Nut). This will only be required on the resize die, and only if you choose to use the Die Spacer as described above.

* It appears that, at this time, the manufacture does not make these tooheads for the Dillon RL-550B press. Contact information is provided at the end of this Tips file.

Headspace Adjustment

Die Shims can be used to adjust of the headspace of your full-length sizing die without loosening the lock ring. These shims usually come in a set of seven or more shims ranging from about .003" to .010". Initial die setup is done with a .006" or .007" shim so you can decrease or increase headspace just by changing the shim.

It should be noted that headspace adjustment could also be achieved by using special shellholders (e.g. Redding Competition Shellholder Sets). But they can only decrease headspace. To increase headspace will still require a die adjustment. The advantage compared to shims is that it only takes a few seconds to change a shellholder.

Seating Depth Adjustment

The bullet seating depth of L.E. Wilson Arbor Bullet Seat Dies can be adjusted by using shims. The advantage is that you can instantly go back to your original seating depth simply by removing the shim. Unlike the shims previously discussed in this article these shims go inside the die instead of under the die lock ring. It should be noted that the seating depth can only be increased by adding a shim. So it is recommend that a mid-thickness shim be used when setting up the die. Thereafter, bullet seating depth can be increased or decreased by adding, removing or combining shims as

needed. Shims are available as thin as 0.002" and as thick as 0.025".

It should be noted that you could accomplish this same trick with any bullet seat die by using the die spacer shim kit discussed under Headspace Adjustment. The same rule would apply with regards to setting up the die with a mid-thickness shim. However, if you are making bullet seating depth adjustments frequently, it is much more convenient to invest in a micrometer adjustable bullet seat die.

Closing Thoughts

I hope you find this Tips file useful. If you have found additional applications for Die Shims, please let me know and I'll add them to this list!

Where to Get Die Shims and Spacers

Granted, Die Shims or Spacers are not for everyone, but they were more difficult to find than I expected. The only sources I could find are listed below, and it appears that only Redding Reloading sells a spacer kit for Spl./Mag. adjustment.[†] (Listed in Alphabetical order.)

[†] Although RCBS includes a die spacer in their "Combination" Die Sets, they do not appear to be sold separately. But if you call RCBS, you can probably get them ... especially if you lost the spacer from your die set.

AR-Master: (As of writing rev1, I was unable to find their web site and they may have gone out of business.)

Headspace Control Shims

List Price: \$20.00

Includes 15 shims: .002", .004" to .050" in 0.001" increments.

Benchrite Professional Shooting Equipment:

Skip's 7/8-14 Sizing Die Shims

List Price: \$14.00

Includes 7 shims: .003", .004", .005", .006", .007", .008" and .010".

Skip's Seater Die Shims (Designed for L.E. Wilson Seating Dies)

List Price: \$14.00

Includes 10 shims: .003", .004", .005", .006", .007", .008", .010" and .025".

Kits available for: .22 cal. to 6mm or .25 cal. to 30 cal.

Skip's 0.002 Inch Seater Die Shims (Designed for L.E. Wilson Seating Dies)

List Price: \$3.00

Includes 2 shims: .002" red plastic shim stock (because metal shims this thin would crack or split)

Doug Williams

eBay: Adjustable Toolhead Kit for Dillon 650 Reloader 38Spl/357Mag-44Spl/44Mag

List Price: \$60.00

Email: dougwilliams@embarqmail.com

Larry Willis

Precision Die Shims

List Price: \$11.95

Includes 5 shims: .001", 0.002", 0.003", .004" and .008".

Redding Reloading:

Die Spacer Kit: #80901 (Featured in photo on page 1.)

List Price: \$14.70

Includes three spacers: No-Crimp/Partial Resizing (.062"), .44 Spl/.44 Mag Spacer (.125") and .38 Spl/.357 Mag. Spacer (.135").

Competition Shellholder Sets: #116XX *

* Replace XX with the shellholder number for the cartridge (see the Redding Die Caliber Reference Chart).

List Price: \$81.90

Five Piece Set: +.002", +.004", +.006", +.008" and +.010".

Sinclair International:

Reloading Die Shim Kit

List Price: \$11.99

Includes 7 shims: .003", .004", .005", .006", .007", .008" and .010".

Arbor Seater Die Shim Kit (Designed for L.E. Wilson Seating Dies)

List Price: \$12.99

Includes 10 shims: .003", .004", .005", .006", .007", .008", .010" and .025".

Kits available for: .22 cal. to 6mm or .25 cal. to 30 cal.

Arbor Shims: Long before reloading die manufacturers sold Die Spacer and Die Shim kits, industrious handloaders had discovered Arbor Shims. Arbor Shims are designed for accurate spacing of machinery such as milling cutters, saws, grinding tools, etc. So you could take the DIY approach and use Arbor Shims (available at industrial supply outlets like Fastenall, Grainger, Global Industrial, McMaster-Carr and MSC, to name a few). But be prepared for a frustrating experience. Some only sell in 10-packs and those that do sell individual shims charge excessively. Plus, finding shims of the exact thicknesses you need (in particular 0.135" for .38 Spl./ .357 Mag.) may be impossible. You can end up needing to stack several shims of various thicknesses to achieve the desired thickness. To me, it just isn't worth the expenditure of time that it will require given that the shim kits from suppliers such as those mentioned above are readily available and comparatively inexpensive.

NOTE: Prices shown are List Prices and may have changed since this document was published.