

David Tubb's Competition 6XC die set

Engineered
by 11-time
National NRA
High-Power
Champion,
6-time National
NRA High Power
Long Range Rifle
Champion
David Tubb

from **Superior Shooting Systems Inc.**

[the leader in high-performance accessories for the competitive shooter]

Information & Instructions

[SAFETY NOTE: Reloading ammunition is a potentially dangerous activity. Please take time to familiarize yourself both with this product as well as accepted safety practices. If you do not fully understand something, please call us for help at 1-806-323-9488. Play it safe!]

Superior Shooting Systems Inc. has produced what we believe to be the very best die set for the 6XC. These instructions will provide you with the information needed to get the best performance and accuracy from this record-setting cartridge.

Sizing Die

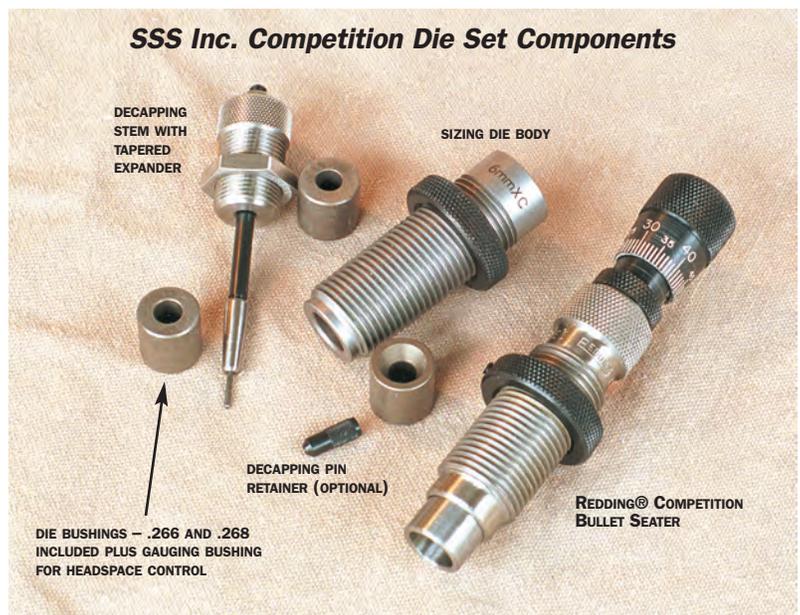
This isn't just another cartridge, and our sizing die isn't just another sizing die! This custom resizing die has some advantages over conventional neck bushing style dies.

1.) On our die, *both* the neck and shoulder are included in the bushing, not just the neck. This is a better design because it allows excess sizing lubricant a place to escape and not make a dimple on the shoulder of the case. It also allows changing the bushing to make a caliber change (say, to a 6.5mmXC) or you can make a shoulder angle change (say, to 45 degrees) and you can still use this same body die. You could effectively use this die for any caliber and any shoulder angle as long as you use the correct parent case.

2.) By having an integral neck and shoulder bushing, the entire case neck is able to be resized, unlike a neck bushing full-length sizing die in which the very bottom of the case neck is NEVER resized. Plus, having the neck and shoulder bushing consolidated is an asset to alignment and preservation of concentricity in the sizing operation.

3.) Since the neck and shoulder area are one piece, it is also possible to adjust the amount or extent of case body sizing and shoulder set back *independently*, without compromising and being unable to size the full length of the case neck to prevent having too much shoulder set back. I like to have the full length of the case body sized (die threaded fully down to shellholder) and then adjust the height of the neck/shoulder bushing independently to specify the amount of case shoulder set back.

4.) This die comes with two different bushings for use in sizing, and a third bushing designed to be used to determine cartridge case headspace when used in conjunction with a set of dial or digital calipers. The use of this "gauging bushing" will be explained



later. The two sizing bushings have different neck diameters and, thus, will result in different amounts of case neck tension. The bushing diameter is clearly indicated on each bushing. Keep in mind that the sized case neck will be approximately 0.001 inches larger than the actual bushing diameter; this is due to spring back in the brass.

5.) This die features a tapered expander (.17 cal. to 6mm) for those who wish to form 6XC brass from .22-.250 parent cases (neck must expand from .224 caliber to .243). The taper greatly eases this operation and results in less stress on the case neck.

6.) The die also has a separate knurled decapping pin retainer for use without an expander plug. The expander should be unnecessary once the case has been fire-formed (this retainer won't expand the neck when you resize).

There are excellent Norma commercial 6XC cases available. If you are starting off with these, we recommend using an expander mandrel prior to initial use. This is done mostly to bring the case necks to desired dimensions and eliminate any imperfections in the case mouth area.

Selecting a Sizing Bushing

Two neck/shoulder sizing bushings are included with the die set. One is .266 diameter, one is .268 diameter. Depending on the make and lot of brass you're using, there may be different neck wall thicknesses. I choose a bushing that gives me 0.003-plus case neck tension on the bullet. In other words, I measure the sized case neck inside diameter and want that to be 0.003 smaller, or slightly more, than the actual bullet diameter (0.243 inches).

Another way to do it is measure the outside diameter of the case neck of a loaded round and subtract 0.004 from that figure (accounting for 0.001 spring back in the brass); use the bushing that is closest to that figure, but err on the side of the smaller bushing. My experience has been that the only real danger is having *too little* neck tension to hold the bullet (less than 0.002 inches difference).

Sizing Note

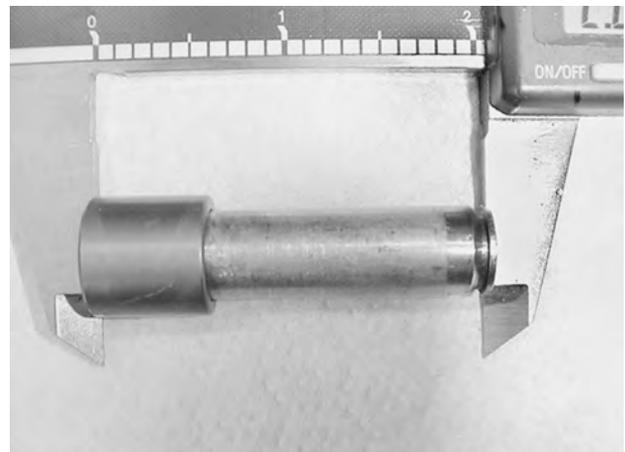
Due to differences in wall thickness and brass characteristics, different brands and lots of brass may size "differently" than others. The best way to proceed might be to size a few cases using each bushing and see what the end results are by measuring outside case neck diameters before and after seating a bullet into them. That is the sure way to determine case neck tension, and, therefore, which bushing to choose for routine sizing use. Sorry, but custom size bushings are not available.]

Gauging Bushing Use

We have included a special neck/shoulder bushing that has an extra-large diameter neck area. This bushing is NOT to be used for sizing, but rather is intended as a means to gauge case shoulder set back, and, consequently, as an aid to determine the correct amount of sizing and determine correct sizing die adjustment to attain proper cartridge headspace.

After fire-forming, take a fired case and place the gauging bushing over the case neck, letting it stop on the case shoulder. Using a suitable caliper, measure from the base of the case to the top end of the gauging bushing (take several readings and average). Record this figure. This figure is a close approximation of the chamber headspace in your rifle (the figure you read from the case will be a little shorter than the actual chamber dimensions because brass contracts a small amount after expansion during firing).

Next adjust the sizing die downward, checking progress using the caliper and gauging bushing, until the sized case shows the same caliper reading as you got with the fired case. This shows that the neck/shoulder sizing bushing has contacted the case shoulder. [Note that the case body is being sized to a smaller diameter and this will, correspondingly, effectively lengthen the case compared to what it was fresh out of the rifle chamber; this will stop once the sizing bushing has made contact with the shoulder.] I recom-



mend now adjusting the die downward a little more until the gauging bushing shows the sized case 0.003-0.004 inches shorter. This indicates that the case shoulder has been “set back” that amount. Setting the case shoulder back that 0.003-0.004 inches ensures that the rounds will function easily and reliably through the rifle. If the case shoulder is contacting the chamber, the bolt will be harder to close. It can also cause other problems, but all are avoided by setting back the case shoulder the amount recommended, and even a little more *does not* compromise accuracy.

Option: Since the neck/shoulder bushing is capable of independent adjustment and not necessarily dependent on the positioning of the die body to attain the necessary degree of case shoulder contact, some people will prefer to proceed in another way. The position of the sizing die body with respect to its height above the shellholder when the press ram is run fully upward determines the extent the case is run up into the sizing die body. This, in turn, influences the amount of contact made with the die body interior nearer the base of the case. The maximum amount, of course, is limited by shellholder contact with the bottom of the sizing die body. To get maximum case body sizing (maximum length of the case body contacting the die interior), thread the die body down until it touches the shellholder, as instructed earlier for initially sizing .22-.250 cases. If the threaded retainer for the neck/shoulder bushing is also snugged down fully against the neck/shoulder bushing, this is liable to result in excessive case shoulder set back. To attain the correct amount of case shoulder set back, leave the die body touching the shellholder and instead back out the threaded retaining piece until desired contact and case shoulder set back is attained. When you're backing off the threaded retaining piece, you are allowing the neck/shoulder bushing to elevate slightly, thus controlling the degree or amount of contact it will have with the case shoulder.

I prefer this method of die adjustment because I am a firm believer in sizing cases to minimum body diameter allowable by the sizing die. I do this for reasons of function and have yet to see more or less case body sizing affect accuracy in any of my rifles.

Seating Die

The bullet seating die for the 6X is a Superior Shooting Systems Inc. modified Redding competition seater. This die features close tolerances and a spring-loaded, sliding sleeve that accepts and supports the cartridge case prior to moving it up to seat a bullet.

The 6XC case will protrude out of the back of the seating die is no cause for concern. The forward portion of the case body as well as the neck and shoulder are supported adequately by this die to seat the bullet into the case with minimal runout.

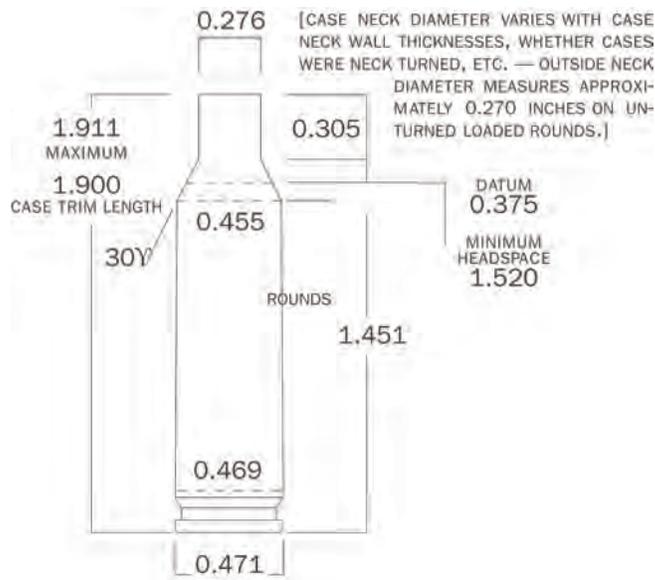
To install and adjust the seater into your press for use with 6XC, **do not follow Redding's instructions** as the 6XC round is longer (the bottom of the die cannot be situated as near the shellholder). Instead, I suggest placing a fire-formed 6XC case into the shellholder with the press ram run fully “up” and then threading the die into the press until light contact is encountered, indicating that the case shoulder has contacted the corresponding portion inside the sliding sleeve on the seating die. Then turn the die farther in until stopping resistance is felt, indicating that the sleeve has compressed fully into the die body. Back the die up a turn and leave it at that! The bottom of the die will show a sizeable gap to the shellholder, but this is again due to the shorter 6BR round length and in no way compromises the function or precision accuracy of the seating die. The case neck and shoulder area are still getting full support, as designed.

Accessory Notes: *If you use a Gracey or LE Wilson case trimmer (or other LE Wilson, or similar, products) get the tooling for 6XC or for a 6BR and it will work just fine. These particular products function either off the neck and shoulder configuration of a round and/or the body diameter and taper. Keep in mind that the 6XC is the same as a 6BR with respect to these dimensions.*

CARTRIDGE SPECIFICATIONS and loading data on next page.

6XC Cartridge Specifications

[figures indicated in drawing are minimum **chamber** dimensions, unless otherwise noted]

**Load Suggestions**

[ALL loads listed are with boron-nitride (BN) coated bullets! Using these loads with non-coated bullets will result in higher pressures.]

[PLEASE NOTE also that ALL loads listed are with a new Gary Schneider polygon barrel. Conventionally-rifled barrels will require more propellant to attain listed velocities.]

200 Yard Event Loads

with Sierra 107gr. BN-coated MatchKing

VihtaVouri N150: **33.0 gr.** [approx. 2850 fps]

Hodgdon VARGET: **34.0 gr.** [approx. 2850 fps]

Hodgdon 4350: **37.0 gr.** [approx. 2950 fps]

VihtaVouri N160: **37.0 gr.** [approx. 2950 fps]

300 Yard Rapid Fire Loads

with Sierra 107gr. BN-coated MatchKing

VihtaVouri N150: **34.0 gr.** [approx. 2850 fps]

Hodgdon VARGET: **34.0 gr.** [approx. 2850 fps]

Hodgdon 4350: **38.0 gr.** [approx. 2950 fps]

VihtaVouri N160: **38.0 gr.** [approx. 2950 fps]

600 or 1000 Yard Event Loads

with Sierra 107gr. BN-coated MatchKing

VihtaVouri N150: **35.0 gr.** [approx. 2950 fps]

Hodgdon VARGET: **35.0 gr.** [approx. 2950 fps]

Hodgdon 4350: **39.0 gr.** [approx. 3020 fps]

VihtaVouri N160: **39.0 gr.** [approx. 3020 fps]

Reduced Bullet Weight Loads

I use 107gr. bullets across the course. Due to the inherently light recoil of this round and bullet weight combination, I see no need of reducing bullet weight, and it never hurts to shoot a bullet at all yard lines that offers superior wind-bucking capability. However, if someone wants to experiment with lighter bullets for 200 yard events, I would simplify matters by shooting the 600 yard load with the lighter bullet. A very light bullet, like a 70gr., might need to have the charge increased a grain or more, but the idea is to reduce recoil and also ensure flawless bolt operation, so I don't think a maximum velocity load is wise in this instance.



www.DavidTubb.com

If you'd like to learn more about all topics addressed in these instructions (fire forming, sizing, etc.) I suggest getting a copy of **Handloading for Competition** by Zediker Publishing. The web site is www.ZedikerPublishing.com or call 662/473-6107.