

How to Select Expander Die Body and Expander Mandrel and How to Set up a 21st Century Innovation Expander Mandrel Die

How to Select Expander Die Body and Expander Mandrel

Select the Correct Die Body: The Expander Die Bodies come in two universal sizes; **Large Caliber** for 35-50 caliber; and **Standard Caliber** for .17-.338 calibers. There are multiple lengths of Standard Caliber die body that are dependent on what cartridge you will be expanding. In Standard Caliber there are the **Short Die Body** for cases shorter than 1.760" (shorter than .223 Remington. **Standard Die Body** for cases that are between 1.760" (.223 Remington) and 2.494" (.30-06 Springfield). The **Extra Long Die Body** is for cases above 2.494". **Large Caliber** Expander Die Bodies are available in long and short models based upon case length. Our chart can help you determine what length die body is best for your application. Large Caliber Short expander die body is used for shorter cases (2.5" and shorter), or 50 BMG and 416 Barrett in a 7/8-14" press (only the neck will enter). The large caliber long models are for Cases longer than 2.5". Expander Die bodies are available without and with viewing windows for ease of set-up.

Select the Correct Expander Mandrel: We offer probably the largest selection of Expander Mandrels. Selecting the right expander mandrel for the purpose of your reloads is important. For bolt action target shooting .001"-.002" Neck Tension (Interference) is usually the norm. For hunting with magazine fed bolt actions .003"-.004" is a good number to shoot for. For semi-automatic reloads .004" or more can be required for secure ammunition. For Magnum cartridges it has been found that more neck tension (Interference) is needed one for security, but two it is believed that with more neck tension the powder column is given a fraction of a second more for a complete burn. .003"-.004" is a good starting point for magnum cartridges.

To select the *size* of **expander mandrel**, take into consideration of what purpose and what discipline you are loading for as mentioned above. One main thing to keep in mind is that brass will spring back. There is no set average for this, but usually you will experience around .001" of brass spring back after expanding with a mandrel. For instance, if you are working with a 6.5 Creedmoor and want .002" of neck tension. Take the bullet (caliber) diameter (.264") subtract .001" taking into consideration of .001" Spring back. You should have around .002" neck tension with a .2630" Expander Mandrel. A .2620" will get you closer to .003" and so on.

How to Set Up the 21st Century Innovation Expander Mandrel Die

Clean Brass: Fully resize and clean your brass cases first. Remove any expander ball from your primary sizing die.

Clean Expander Mandrel Die Parts: Wipe all protective oil or residue from the interior and exterior of the die body and mandrel. Clean the inside of the retention cap. **Note:** Black Nitride Mandrels may have a residue on them from oil in the coating process. WD-40 works well for removing this.

Insert Die in Press and Install Mandrel: The goal is to set-up the case so it uses most of the length of the mandrels bearing surface without “bottoming out” on the die. To achieve this, raise your press ram all the way to the top stroke with a resized case in the shell holder that you will be expanding. Insert the Expander Die Body a few threads into the press. Take the cap off of the die body and place an expander mandrel upside down (e.g. flat side down and pointed end up) into the mandrel chamber in the top of die. Lightly loosen the locking ring on your die body. Tighten the die body down into your press until the case mouth comes into contact with the flat base of the mandrel. Look for/feel for the mandrel to raise in the die body. When it makes contact, loosen the die body 1/4-1/2 turn and tighten the locking ring into the press then secure the set-screw. Lower the ram and take out the mandrel from the die and place it point-first into the chamber. Secure the die cap in place. You are ready to expand your necks.

Lubricate necks: Apply a very light coat of dry or liquid neck lubricant to the inside of the case necks to prevent galling or sticking against the bearing surface of the mandrel. We recommend a lubricant be used with any material of mandrel for performance purposes. A dry lubricant such as Moly or Graphite work very well without contamination of the powder. *If you use a wax or liquid lubricant, you may need to tumble your brass again after this process is complete.*

Expand the Case: Raise the press handle smoothly, pushing the case neck over the mandrel. Pause for 1 to 2 seconds at the top of the stroke to let the brass settle and minimize spring-back. Lower the ram and feel for minor, consistent resistance over the mandrel; excessive force means over-sized brass, while zero resistance means loose neck tension.

Clean and Inspect the Expander Mandrel: It is advised that after a set number of expanded cases that you clean the expander mandrel. We clean the mandrel every 50 strokes or so. Take the mandrel out of the die body, wipe off any lube and drop it into a container with a mild copper-removing solvent. We like Bore Tech Eliminator. Soak it for a while depending on how much brass residue or build-up exists. Remove the mandrel and

chuck it up into any standard drill. Using 0000 steel wool turn and polish off the mandrel surface. Continue if there are stubborn deposits. Dry off the mandrel and insert back into the die.

Experimenting with Expander Mandrel Sizes: While *Consistency* is the key with using expander mandrels, experimenting with different sizes to adjust neck tension (Interference) up and down can be beneficial. Different loads and firearms like different things. Just as you tune a rifle for a powder charge, you can do the same with neck tension. With an established powder charge and seating depth, load up 10 rounds each with .001, .002, .003, etc. neck tension. Shoot them the same day on paper and over a chronograph. You should find a stand-out amongst the different groups.

Measuring Expander Mandrels: Avoid using calipers to measure outside diameters. They will not give you the correct measurement. A quality calibrated 1" micrometer is the tool of choice. Measure the Expander mandrel about 2/3 the way up from the point. In machining, we keep a .0002" variance on our expander mandrels from the etched size.

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