

Dealing with case bulges in pistol ammunition

by Kevin Whitehead

There are lots of myths and rumours about the causes of case bulges and how to deal with them. This article will give some understanding as to what roll sizing is about and how it works, and has been written around pistol calibre ammunition but can apply with some adjustment to rifle ammunition as well.

The experienced reloader will already know a fired case will stretch to match the chamber dimension when fired - the bulge we refer to is the stretch that occurs at the base of the case. So why do cases bulge? With the variety of firearms, different manufacturing processes and designs and the lighter recoil spring arrangements we use, the level of stretch and bulge varies significantly. Additionally, there are a number of firearms available which come supplied with deliberately looser chambers due to their market requirements. We have the two extremes, high-end custom target guns guaranteed to group and Mil Spec/law enforcement handguns.

The phrase Military Specification or 'Mil Spec' or Law Enforcement (LE) is often seen as a precursor to high accuracy or being able to leap tall buildings in a single bound etc. The reality is Mil Spec (or LE) is simply a specification required by the military to comply with *their* requirements. In cases of handguns, the element of reliability is usually seen as more important than ¼ MOA accuracy. Mil Spec chambers in handguns are often looser and will result in cases stretched significantly more than that custom gun guaranteed to group sub-1 MOA. When you add higher pressure loads or lighter recoil springs etc, the stretch gets worse.

There also appears some co-relation to the linkage system with the Browning lug design appearing to show a higher degree of case stretch than the equivalent Colt 1911 link system when using the same spring / recoil spring rates. This was hard to fully determine as the case chambers could not be compared directly but it is thought to be due to the slightly faster unlocking process in the Browning system allowing cases being subjected to higher pressures whilst being extracted.

So where does that leave us? Well, if the zombie apocalypse came tomorrow, my competition 2011 open gun would not be the first choice on my hip - the Glock or something similar would be preferable.

A common question is "why should I roll size?" Well if you've never had ammunition problems, don't worry about the cases and what they were used in and have plenty of time to check ammunition, you don't need a roll sizer. The roll sizing process is about achieving ammunition consistency and reliability, whether for a high volume commercial processor or the home reloader.

What's often forgotten in the reloading process is the amount of time and cost in checking ammunition by gauging or barrel dropping ammunition and the cost of the wasted reloading components can be significant. The cost of not checking ammunition at a big match can be even more costly. Competitive shooters are very much aware of the cost of reliability - we've all seen a good stage run wrecked by a malfunction at some point. The roll sizing process addresses this problem.

Reloading heavily stretched or bulged cases is problematic when we consider the case is not sized its full length in the reloading process. The normal sizing dies supplied by manufacturers work very well in most cases, but due to the limitation in reaching the bulged section of the case, they don't always result in a successful case gauging.

This has resulted in the market supplying speciality undersized or 'small base circle dies'. These are also designed to go marginally further down the case than standard dies but are a compromise given the stretched section of the case is still not fully resized. This often results in a 'Coke bottle' shape in the case and sometimes leaves a physical crease in the base of the case around the web area and in

repeated reloading. The physical crease is a sign of mechanical deformation (plastic deformation) and if this is evident the case should not be used.

With repeated use and continued mechanical deformation in the web of the case, this can ultimately lead to case head separation in a gun with sometimes spectacular and unpleasant results. When the small base circle dies are used to address the bulge, the effect on the case shape is more pronounced leading to the infamous 'Coke bottle effect'.

While these dies often allow the cases to gauge, there are drawbacks. The pistols and magazines are designed to accommodate ammunition that falls into a size range/tolerance, generally referred to as the SAAMI specifications. When cases are undersized or inconsistent in shape, we see problems in magazine feeding and stacking, particularly in high capacity, wide bodied or double stack magazines. The narrowing of the case means the ammunition does not always stack or feed reliably. This can sometimes be detected by a rattle in the magazine when fully loaded or a case failing to lift up when extracted.

The roll sizing process essentially removes the bulge at the base of the case and, when coupled with normal sizing dies, can produce good quality consistent ammunition that will feed in your firearm. With normal sizing dies and the ammunition formed to the SAAMI/OEM dimensions, feeding and reliability will be vastly improved.

The use of a roll sizer will also allow the ammunition to be used in multiple firearms as well as saving time and effort in case gauging. The cases are insensitive to which gun the case was last fired in. Picking up range brass is also less stressful as collecting the last shooter's cases mixed in with yours does not become a nightmare when you reload.

In a number of commercial and personal applications, reloaders have had to retire cases - including one example of more than 20,000 9mm cases in a shooting range - as they would not gauge consistently using other methods. The use of the longer rolling length in a roll sizer resulted in all the ammunition cases gauging reliably, and this saved significant time in checking the ammunition and removed the need to gauge or separate ammunition for specific firearms.

Another element raised in the discussion of roll sizing is the perceived need to roll or shape the rim of a case. In my experience, as well as feedback from numerous end users and commercial processors, rim rolling was not required when cases were processed correctly. The root cause found in most situations was the case was not concentric to the rim after full length sizing. This eccentricity problem occurs when light recoil springs and/or high pressure loads were used (very common for 9mm major and some 9mm minor production setups).

What was happening was that while the full length resizing process would make the case round, the loose fit of the case within the shell plate allowed the case to stay eccentric to the rim. To bring a case back to spec and concentric consistently requires the case body to be rolled over a significant rolling length. With correctly-sized cases the issue of rim lockup went away.

Some genuine examples of rim deformation have been seen but these are usually in belt-fed machine gun applications and are normally the result of multiple firings in flogged out ex-military firearms. When the rims were stretched to this level, the primer seating was usually poor and primers were dropping out during the loading process. There are limits to roll sizing after all.

While roll sizing is not inexpensive, if the cost of a machine was divided between a handful of shooters the benefits could be felt all round.

Available from rollsizer.com with a retail price starting from \$1800. Prices subject to conversions and shipping.