The Los Angeles Silhouette Club

The .45 Keith SWC

By Glen E. Fryxell

In 1928 Elmer Keith scratched out the design for his landmark .44 SWC, which later gained fame as the Ideal 429421. Shortly thereafter, he drew up his plans for a bullet engendering the same features for the .45 Colt. Thus was born the Ideal 454424, one of the greatest revolver bullets of all time.

Lyman bought out Ideal and continued production of many of the Ideal bullet designs. Over time however, Lyman has changed many of their designs for one reason or another. The 454424 has undergone a number of changes over the years, and these changes have generated lots of questions and confusion among each new crop of bullet casters that comes along. The purpose of this piece is to outline the history of the .45 Keith SWC, explain the changes that have taken place, and show the new caster what some of the options are today, and how they stack up relative to the original.

Elmer Keith designed his semi-wadcutters to have 3 driving bands of equal width (he felt very strongly about a full-width forward driving band), a deep, "square-cut" grease groove, a beveled crimp groove, a wad-cutting shoulder, a gently curved ogive for stable long-range flight and a hearty meplat to generate dependable, open wound channels. Three sizeable and well-spaced driving bands combine to provide lots of bearing surface to keep the bullet aligned in the cylinder throat, the full-width forward driving band provides positive engagement as the bullet transitions between the cylinder and barrel and starts to be engraved. The so-called "square-cut" grease groove was actually beveled slightly so that bullets would release from the mould more easily, but he used the "square-cut" description to differentiate between his design and the rounded grease grooves of other designs (which he didn't care for since they didn't hold as much bullet lube). The original Ideal 454424 embodied all of these concepts. Bullets drop from my old Ideal 454424 right at 250 grains using WW alloy, seasoned with a pinch of tin. The bullets are .676" long and the distance from the top of crimp groove to meplat is .380". Both of the front two driving bands are about .075" wide and the base band at .070". Meplat diameter is approximately .330", square-cut grease groove is cut with what I would guess to be a 75 degree bevel (as a result, the bullets are sometimes still a little reluctant to drop from the blocks). Overall bearing surface (i.e. the distance from the bottom of the bullet to the forward edge of the front driving band) is about .375".

One of the changes that Lyman made later on was to change the grease groove from the original "square-cut" design that EK preferred to a radiused design intended to allow the bullets to drop from the cavities more easily. We normally think about alloy shrinkage in terms of diameter, but a 3-dimensional bullet shrinks in 3-dimensions as the alloy cools, roughly towards the geometrical center of the bullet.


Lyman 454424

Thus, if the mould has sharply cut right angles in it (like the 90 degree grease grooves of the old black powder bullet designs) the bullet metal can "pinch" these ridges upon shrinkage, thereby causing the bullet to hold fast when the blocks are separated. This is why some of the old black powder designs can be such a pain to cast, and one of the reasons why Elmer Keith stipulated a slight bevel for the grease grooves he designed for the 429421 and 454424 (my old 429421 looks to be roughly 60 degrees, while my old Ideal 454424 is closer to about 75 degrees). His "square-cut" (more accurately "flat-bottomed") grease grooves also held more bullet lube than the radiused design adopted by Lyman. I had originally believed that this change was made concurrent with Lyman changing the nominal bullet diameter from .454" to .452", but I recently have found moulds stamped Lyman 454424 that have the radiused grease groove (see photo above). Bullets drop from this newer 454424 at about 263 grains (same alloy as before), with an overall length of .698". The distance from the top of the crimp groove to meplat is .385". Ogive appears identical to the original. In this bullet, the front driving band measures about .070", but the middle driving band and the base band are somewhat wider at .105". Meplat diameter is still approximately .330". Overall bearing surface of this version of the 454424 is .398". This bullet is heavier than the original because it is longer (wider driving bands) and because the "square-cut" grease groove has been replaced with a smaller radiused grease groove.

Later, when the change was made to the smaller diameter (.452", which I believe took place sometime in the late 60s) there was also a change made to a slightly more tapered and rounded ogive, resulting in a slightly smaller meplat. I'm not sure why Lyman did this (possibly to enhance the aerodynamics of the design?). There is certainly nothing wrong, or bad about the newer 452424 design, it's just that one of the reasons the .45 Keith SWC is so popular and useful is that big, flat nose - to reduce that meplat is to turn one's back on what Elmer Keith taught. The new bullets are still perfectly good, and perfectly deadly, it's just that they're almost as good as the original.

The newer, re-designed 452424 has been made in both the round grease groove or the "square-cut" grease groove configuration (although the square-cut version is notably harder to come by).

Many mould makers produce moulds that are very similar to Lyman's most recent (round-groove) version of the .45 Keith SWC. The version I have at the moment is the NEI #309 .451-250 (which is a plain-based version of their GC design #308). The NEI bullet is a virtual carbon copy (do the 20-somethings in the audience know what a carbon copy is?) of the "modern" 452424. It weighs 258 grains (same alloy as before) and is .700" long. The distance from the top of the crimp groove to meplat is .375". The front driving band is still about .075", while the middle driving band measures .100" and the base band is .125" thick. Meplat diameter is approximately .320". Overall the bearing surface of this bullet runs about .410" (the slightly longer bearing surface arises directly from the thicker base band). I have personally seen 2 moulds stamped "Lyman 452424" that were cut with square-cut

grease grooves, and I bought one of them. Bullets drop from these blocks weighing 253 grains, and are .695" long. The distance from the top of the crimp groove to meplat is .380". The front driving band is .070"wide, while the middle driving band mics at .080" and the base band at .125". Meplat diameter is approximately .320" and overall bearing surface runs right at .400". The ogive is now a single radius instead of the compound radius used in the previous designs. The slightly lesser bullet weight (5 grains) is due to the larger and deeper "square-cut" grease groove, the rest of the bullet is virtually identical to the round-groove version described above.


Lyman 452424

Of these 4 Lyman/Ideal designs, by far the most commonly encountered these days is the round grease groove 452424, which is a dandy bullet for plinking, hunting and competition, but it's not what Elmer Keith designed for the .45 Colt. If a new caster wants to get a little closer to the original Keith design, what are the options available? To my mind, there are 2 notable variations on the original theme: the easiest to find is the RCBS 45-255-SWC. This bullet weighs 266 grains (again, WW alloy, plus about 2% tin), and drops from the blocks .725" long. It has a square-cut grease groove with approximately 60 degree bevel (so bullets drop from the mould easily), and the forward 2 driving bands are about .075", while the base band is .110". The distance from the top of crimp groove to meplat is .385" and meplat diameter is .330". It has .422" of bearing surface, and the original Keith ogive. In a nutshell, the RCBS bullet is the original 454424 with a thicker base band and a slightly improved grease groove.

Another very good alternative is the NEI 265 451K (this is a variation of design #317, which is a 275 grain bullet, the 265 grain version has slightly narrower base band, and hence lesser weight). This bullet is proportioned somewhat differently than the 454424 (the front end is actually somewhat reminiscent of Elmer Keith's other .45 SWC, the 452423), but it captures all of the design features that Elmer wanted - 3 approximately equal width driving bands, a beveled crimp groove, a "square-cut" grease groove, and a big, flat meplat. These bullets weigh 260 grains cast with WW alloy. They are .700" long. The forward 2 driving bands are about .105" and the base band is .095". The distance from the top of the crimp groove to meplat is .355", and meplat diameter is .345". Overall, this bullet has .458" of bearing surface.


RCBS 45-255-SWC and the NEI 265 SWC.

You might notice a few similarities in these bullets; all are about 255-260 grains, all are about .700" long, all have a meplat of at least .320", all have ample bearing surface and all have at least half of the bullet seated outside of the case. Any one of these moulds will provide many, many years of happy plinking, and there isn't a buck alive that could tell the difference between these bullets upon impact. Each of these bullets has given me excellent accuracy, and all are killers of the first order in the hunting fields. If your goal is an accurate and hard-hitting cast bullet to feed your pet .45 Colt, then any of these bullets will serve superbly. If you seek the nostalgic satisfaction of shooting a bullet with the specific features that

Elmer Keith drew up in those halcyon days before the Great Depression, then the playing field isn't quite so level. If you can find an old Ideal 454424 then you're all set, but those are getting harder and harder to find. If not, then the next closest bullet design is probably the RCBS 45-255-SWC.

A lot has changed since 1928, but a lot has also remained the same. A Keith SWC weighing about 250 grains, with a big, fat meplat, the right ogive, sufficient bearing surface and a healthy dollop of grease is still one of the best loads you can drop into a sixgun.

- Glen E. Fryxell

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