Dan Wesson Forum

Reloading Roundtable

Finally, The Cartridge

January 4, 2011

Data compiled by Steve CT

Contents

Since the point of all of this is to build a cartridge, let's look at each component in detail.

Primers:

What are primers, how should they be handled and stored?

LB: Primers are simply the igniter for a cartridge. They are comprised of a small amount of explosive in a metal cup with an anvil inserted to cause ignition when impacted by the firing pin.

Dean: When handling primers, eye protection is recommended, especially around progressive presses where a hundred primers are stacked in the tube for loading. Keep your hands clean and oil-free when handling them, as contamination may cause them to become inert or weaken the spark. NEVER force a primer into a case-stop and see what the problem is first. Also, you should keep them in the factory package, never dump them into a glass jar or other container where they are loose.

Mike: I've bought ancient primers and powder from the 50's and it all still goes bang when properly stored. You must also be careful not to contaminate primers when handling them. This not only includes oil on your skin/fingers, but also case lube, gun oil, etc as well.

Andrew: The most popular explosive compound to use is lead styphnate. In bulk form, it is very sensitive and fast detonating (classed as a high explosive). Primers should last indefinitely. Storage temperatures over 100 degrees should be avoided, as they can become less sensitive or degrade over long term "hot" storage. Military primers have shown to be stable indefinitely at temperatures over 140 degrees, although this should be avoided.

What is the story with Pistol or Rifle? Large or Small? Regular or Magnum?

Phil: The difference is the intended type and quantity of powder they are to ignite.

Mike: There are several small differences, but the main one to consider is the cup thickness. Rifle firing pins hit the primers with much more force than a handgun, hence the thicker cup. There are several small differences, but the main one to consider is the cup thickness.

Dean: There are also differences in the height of the primers...all small rifle and pistol primers are the same height, however, large rifle primers are taller than large pistol primers. You must make sure you are using the correct primer in this case, since a rifle primer in a pistol case will not be seated flush with or below the base. This leads to high primers which can detonate under the recoil of another round while not in the chamber, as in a magazine or a revolver.

Andrew: Magnum primers have either a greater amount of the explosive composition, or a different one (probably both) than their counterparts. Magnum primers are typically used for large capacity cases, to better ignite the larger charge of powder. Follow the manual, excess chamber pressure can be caused by using "too much primer".

Mike: Typically standard primers are for standard loads, and magnum primers are for larger (magnum) loads. However, there are exceptions. You can use them interchangeably, but there are factors to consider, the most important of which is case pressure. Running a magnum primer means hotter ignition, which results in higher case pressures. You can offset this by reducing your powder charge a little. Magnum primers are also used to ignite ball powder, which is harder to ignite

Dean: Magnum primers are hotter than regular primers, meaning there is usually more priming mix for longer spark duration. Sometimes they are recommended with ball powders, which can be hard to ignite in cold temperatures. They are usually required in very large cases, like the belted magnums, where very large amounts of powder need to be ignited.

What else is important with primers? Do you have a favorite brand?

LB: Primers are tedious to work with due to their size. There are many methods and tools to install them and it is up to the individual how to do it. The loader needs to watch out for the upside-down primer or even the one installed sideways (and I have done this).

Mike: The best thing about primers is… they are an excellent accuracy fine-tuning tool!!! Just by changing brands/styles of primers, you can make adjustments in your loads. Some primers will group much tighter than others—it just takes some patience and experimentation. As far as problem primers, Wolf tends to be a “hard” primer. If you have a weak firing pin hit sometimes they will not go off. I’m a fan of CCI and Federal primers—CCI is slightly “hard”, but I never have any problems with them.

Andrew: Some primer cups are softer than others (making the primer more sensitive to firing pin strikes). As a general rule, benchrest primers are softest. Military primers (like the CCI 41) are much harder. I almost exclusively use CCI primers, always with good results.

Phil: Some primers are noted to be made of a harder material and require more impact to ignite, CCI for example are noted to be a harder metal and require more force than say Federal.

Dean: Primers must be seated flush or slightly below the case head to prevent slamfires. The seating of primers requires a good feel to insure they are correctly seated at the bottom of the primer pocket.

My favorite primers are Federal...I use them in everything I shoot. When I started reloading, I had a subscription to "Precision Shooting", the magazine about extreme accuracy handloading. They used to print results from benchrest matches, and virtually without exception, Federal 205M primers were listed for every shooter. I figured if they were what the super-small group shooters favored, they must be good.

The Cartridge Case:

Please talk about Cartridge Cases in general- likes, dislikes, general information and tips

Dean: Most manufacturers use brass for their cases, but there can be differences in the annealing of the brass or in the thickness of the brass. Military brass is usually thicker to better accommodate firing it in automatic weapons. It is not designed to be reloaded, so it may be quite undersize for the cartridge. This annealing state also applies to commercial brass...some brands are noted as being softer than others. There can be some bad lots of certain cases from any of the manufacturers, but in my experience, you can get good brass from all of them. Federal used to sell unprimed brass years ago, and it was always my favorite due to it being more uniform than the other brands. I still prefer it to this day, but I have to buy factory loaded ammo to get it. Remington, Winchester, Federal are all decent. Some foreign unprimed brass is excellent. Lapua is better than the US brands, and Norma is considered the best of all...of course, you really pay a lot more for Norma brass. Some of the smaller brass makers are also good. Starline makes excellent brass under their own brandname, as well as specially headstamped brass for smaller manufacturers.

Phil: I have always been partial to Remington cases for both pistol and rifle. I have not necessarily had any problems with others, just used more Remington because it is what I had. I do like Starline brass and in many calibers it is all I have. I have read that there are definite differences in case capacity and the pliability of the case.

LB: The secret to accurate ammo is consistency. Herein lies the problem, even the cartridge case (brass) varies from brand to brand even different lots. If trying to obtain the best accuracy everything must be equal. Cases must be weighed, sorted, trimmed, primer pockets uniformed, and so on. If just loading what I call plinking ammo it's not as critical. If loading match ammo I use identical head stamp and for plinking (example 38 special) its mix and match. Most new brass is ready to go, however if trying to get the most accuracy they need to be trimmed and uniformed to insure consistency.

Mike: Cases are an area you need to pay particular attention to. Some cases are made from harder brass than others. SB (Sellier Belliott) is a hard brass while W-W (Winchester Western) is a softer brass. Softer cases reload beautifully. Nickel plated cases are great in semi-autos because they have less friction for the action to work against. ALL cases need to be sorted by brand and then weighed for consistency. Wall thicknesses vary and this affects the internal capacity of the case. Always run your cases through the sizing die before loading them—I learned this the hard way with some brand new factory brass. Primed, powder added, and the bullets dropped right inside the case! The necks were not sized down enough to grip the bullet.

Andrew: I'm not sure about pistols, but Winchester rifle brass usually has a greater case capacity than other manufacturers. I like Starline and Winchester. I have a lot of Lake City brass for 5.56mm that works just fine for me. Lapua is known for making very consistent brass, but you pay a premium price. If you are looking for ultimate accuracy, what you are really looking for is repeatability. Many reloaders weigh each piece of brass, and sort them into lots.

Dean: New cases should be checked for defects prior to using them. Although not common, I have seen new brass with creases in the necks, offset flash holes, flash holes not drilled in the cases, crushed necks, split

necks in pistol brass. Small dents in the case mouth can be easily straightened out before loading. I usually run the case mouth slightly into the resizing die to uniform the diameters of the case mouth before I load them. I will check to make sure none of the cases exceed maximum case length prior to loading...most will be shorter, but it doesn't hurt to check. I will also uniform primer pockets and flash holes prior to first loading, straighten and deburr case mouths.

How many times can I re-use a case, and how do I know when I can or can't reuse one?

Dean: The number of reloads you can expect for a new case depends on several factors. Revolver cases last the least, due to the constant working of the case mouth from resizing, flaring and crimping. I will inspect each case prior to reloading for split necks. If it can't be trimmed out, it is discarded. Same thing for bottleneck cases...check for neck splits, also check for signs of incipient case head separation, indicated by a bright ring near the web. A small dental pick inserted into the case can be used to feel for cracks in the brass. If you detect it catching inside, discard the brass.

Mike: Brass has gotten expensive over the last few years. I keep reloading mine until they are no longer visibly useable. This includes loose primer pockets, split necks, belted case separation, etc. A good example is my 22-250-very hot loads. I extend the life of my 22-250 cases by annealing the necks either with a torch and water, or a pot of melted lead. There is no telling how many times some of these cases have been reloaded. Storage of brass for me is pretty simple. It goes directly from the tumbler to a Ziploc storage bag. This ensures it is clean and kept moisture free. I also mark it as such "tumbled—needs sized".

Phil: The quantity of times I can reload a case is based on inspection of the case after it has been resized and reflared. If it shows signs of stress cracks in the case wall or weakening at the rim or base of the case it is discarded. I personally do not keep track of the quantity of times each case is reloaded because I just do not have that much time. I store cases in plastic or metal containers for storage but I do not know that it is an important criteria in the reloading process.

Dean: You can extend the life of the brass by working it the least amount for each loading. For single-shot firearms, you do not need to crimp the case, unless it is necessary for good ignition, as in those using ball powders like W-296 or H-110. If you are using your brass in only one firearm, full-length resizing is not necessary, but you might want to do that for hunting rounds to insure proper chambering. Most of my rifle brass is neck-sized only...these will last a long time. Some of it gets partial sizing.

Andrew: Depending on the round you are shooting, brass can have varying lives. Low pressure rounds can go on and on and on for a very long time, higher pressure rounds have a shorter lifespan. Inspecting brass is very important prep. Look for any cracks, separations, gouges, and anything that doesn't look right. I'm not too worried about dents, especially in rifle rounds. I have fired hundreds, probably thousands of dented rounds that come that way from Uncle Sam's ammo plants, but use common sense. If the side of the case is smashed in, pitch it. I store unprimed brass in ammo cans.

LB: The life of a case depends on how it is loaded. Hot loads work a case much more and will tend to wear them out quicker. I generally will use brass for hot loads for only a few loadings and then retire them to the plinking pile, which get mild charges. Some cases last only a few rounds but some I have loaded dozens of

times. However I do not keep track of the number of uses once they get moved to the plinking pile. All cases are inspected each time they are loaded.

How do you clean and trim cases?

Dean: I always tumble my brass in a vibratory tumbler with walnut media and Dillon case polish. After tumbling, I wipe down each case to remove any residual dust from the media. This is when I give each one a first visual inspection. Clean brass will make your dies last longer and prevent them from getting dirt embedded in them, causing scratches in your brass.

Andrew: I tumble all of my cases, using corncob for everything. Get the fine stuff, and not the stuff made for pets. The large stuff made for pets seems to get stuck in flash holes, and especially bottleneck cartridge cases.

LB: Cleaning saves wear and tear on the loading equipment as well as the firearm. Of course, the appearance of the finished ammo is better too. Cleaning the primer pocket will also help insure proper ignition. Cleaning is usually accomplished by tumbling with a media and/or polish. Corn cob or walnut hulls seem to be the norm. I have found it is best to tumble before depriming or the media gets stuck in the flash hole and is a pain to remove. Primer pockets are cleaned by hand with a small tool twisted just to remove the burnt residue.

Mike: Believe it or not, dirty brass shoots just as good as shiny brass… the key is that dirty brass is harder on dies, chambers, and magazines. I personally go through a ritual when cleaning brass. Most of my brass is range pick-ups, so they get washed in the sink with dish detergent first. Then they go to tumbler #1 with semi-used corn cob media. After that they go to tumbler #2 with clean media and some liquid case polish. Finally, they get tossed around in an old towel to get the dust off the outside. I use Lyman Turbo 1200's for my polishing needs.

Phil: I clean cases with a tumbler using either corn cob meal or walnut shells. When cases need to be trimmed it is done with an RCBS case trimmer. I rarely trim pistol cases but often trim rifle cases.

Mike: If I'm building accuracy loads, or ANY load that is getting a crimp, I measure them with dial micrometer and trim them all the same with the RCBS case trimmer. If you want good crimped loads you must trim all cases the same length.

Dean: I check all my cases for length AFTER resizing. I set my dial calipers to .0005" over my recorded trim length and pass each one thru the calipers. Those that don't fit are trimmed on either a Hornady or Sinclair/Wilson case trimmer, and get deburred inside and out. I made a database chart for each cartridge noting all the trim lengths. Some vary quite a bit by brandname. To determine my case trim length, I measure the batch to find the shortest case and trim all the rest to match that one.

What else is important to know about cartridge cases?

Mike: Try to keep it sorted in lots if possible; consistent cases make for more accurate loads. I personally like Winchester brass for the pistols. It is soft and reloads very nice. Most of my rifle brass is old Norma brand, it just never seems to wear out. I don't like SB, it is a very hard brass and tends to be difficult to produce nice rounds.
Dean: My favorite is Federal, however I can get it. For pistol brass, I have some Remington and Winchester, which work just fine, but I also like Starline brass. My XP-100's use Remington brass...I know Lapua is better, but mine had chambers cut before Lapua ever made their BR brass, and it won't fit my guns. Seems their web is a tab larger in diameter than Remington. I do not suffer inaccurate loads due to the "inferior" Remington brass.

Phil: If you are reloading cases that have been intended for military use the primer pockets need to be swaged (reamed) to make new primer installation easier, this is an added process that is a bit of a pain, but to reprime these cases without this process makes repriming difficult due to the fact that the original primers were more or less crimped into place.

LB: I have a preference for Winchester products but I don't have any reason to support it. Military brass requires extra work due to the crimped and glued primers. Some brass is Berdan primed, which has two flash holes and is a pain so I discard those as well as aluminum or steel cases

Powder:

What is it? How is it stored? How is it safely handled? What are the different types?

Andrew: Single base propellants are made mainly of nitrocellulose. Double base propellants are made mostly of nitrocellulose and nitroglycerin. Modern smokeless powders for our uses are double base. Triple base propellants are made mostly of nitrocellulose, nitroglycerin, and nitroguanidine. This is used mostly for cannon propellant (think howitzers and such). Other chemicals are added in to reduce flash, slow burn rate, reduce degradation, and many other things. Each company has its own mixtures for their product lines.

LB: Powder is stored as any other reloading supply indoors, dry, away from children. Shelf life is not much of an issue as far as I know; I have had powder for 20 + years and had no problems. Powder is produced by some method of extrusion and the powder comes out either in ball form, flakes, or what looks like many short sticks.

Dean: Different powder types exist to influence the properties of the powders. The shape and size of the powder particles determine how fast they burn and how much pressure is produced when being burned. In general, the larger the size, the slower the granules will burn. Ball (spherical) powders burn faster than flakes or sticks. Smokeless powder has added chemicals to promote stability, control decomposition, and reduce flash and copper buildup. Powder comes in plastic jugs or metal cans. The cans have low melting points so that if a fire occurs, the can melts before the powder can explode.

Phil: I store powder in the factory containers in a cool dry location out of sunlight. The various shapes of smokeless powders are more indicative of their intended uses as I have experienced.

Mike: Storage is always in a cool, dry place out of sunlight. Always store powder in its original container and don't mix batches of powder. A quick way I check to see if powder has been properly stored is to smell it. If you take a whiff and it smells like vinegar, the powder is breaking down chemically and should be discarded. Each style of powder has a design based on burn rate and pressure.

What are the characteristics of the powder types that dictate how they are used?

LB: The difference in different powders is the speed or burn rate and temp. The manufactures do the science to write the load data and the loader tweaks the recipe to find the sweet load or combination for his or her needs.

Dean: There is a chart in each reloading manual listing powder burn rates in order of fastest to slowest. Generally, this applies to the smallest cases at the fastest end, to the largest cases at the slowest end. There are differences in case volume and operating pressures that will affect the powders each one uses. Powder size and shape is used to determine the pressure curve as the propellant burns. The intent is to regulate the burn rate so that a constant pressure is exerted on the bullet as long as it is in the barrel for maximum velocity.

Mike: There are many different varieties of powder on the market. Each type is designed to burn a different way. Fine powders burn much faster than their coarse granule brothers, which results in a faster burning and typically higher pressure powder. Sometimes I need a load that is "compressed" (powder all the way up to the neck). These are usually for accuracy purposes, so I look for a bulky powder.

Dean: Flake powders are used in pistol cases, as they have the fastest burn rates. Extruded powders are most common in rifles and ball (spherical) powders can be used in either, depending on powder type. H-110 is great in magnum pistol rounds, while BLC-2 is better for rifle rounds...both are ball powders, but have different coatings to control burn rate. This is determined by the size of the case and amount of powder it can hold.

Are different brands of powder specific to pistol or rifle only? Are there "universal" powders?

LB: Some powders can be used for both rifle and pistol and some cannot. It all relies on pressures, burn rates and complete combustion.

Mike: Most powders are purpose built for one type firearms or the other, but there are exceptions. Most shotgun powders can be used in handguns. Very few rifle powders can be used in anything but rifles. This is exactly why you need good sources of reloading data. Never just grab some powder and decide to build a load. There are some powders that just work good period. Some examples of these are Win 231, H4831, Win 748, Unique, Red Dot, and the list goes on….

Dean: There are some powders for both pistol and rifle cartridges that are quite versatile, being useful in a large number of cartridges of various sizes. What makes them that way, I don't know. The manufacturer tests them for suitability before they are brought on the market. Some that come to mind are 2400, Bullseye and Unique for pistols and H-4895, Rel-7 and IMR-4198 for rifles. Others seem to be more specialized due to perhaps unusual case sizes or velocity requirements.

How is the powder for a particular loading selected? Is it "science" or "art" (or both?)

Phil: I often will look at load data and first check out to see what I possess that can be used and start there so I do not have to own so many different powders. If a new caliber presents a powder requirement that I currently do not have, I'll look to see what powder would work with it and also cover some other calibers I load for. No real science or art here, just prudent use of space and finances, in my humble opinion.

Dean: This one is pretty easy if you look at several reloading manuals. Each will list a variety of powders giving different velocities with each bullet. Determine what bullet weight you want, and what the bullet will be used for. For hunting, you'll probably want the highest velocity obtainable, for target shooting, you would want an economical load. Pick the velocity you are looking for with that bullet, and see what powders are listed in that range. I will pick a couple powders that the manual suggests and start working up loads for each until I find a load I like. Each gun is different, so what works for one may not be the best for another. Be ready to try something else in the list if you can't get the results you need.

Andrew: I follow reloading manuals, and if I am looking for a different result, I may adjust my powder selection to a faster or slower powder.

LB: Both. It's like buying a car you look at all the options and even have a few test drives until you find what you want. This is where you need several load books to give you a broad view of the options

Mike: We can spend hours on this… I think it is as much science as it is luck. I usually start with a well known respected load. I like to use older powders, so I have 50 years of data to fall back on. Newer powders are great, but sometimes there isn't much history/data to get you started. Once I find a load I like, I start tweaking it-powder changes by the tenth of a grain. I also look at how much it is going to cost me per pound to reload at a particular velocity. Some powders will give you the same velocity for much less powder. Here's some eye openers: 7000 grains of powder in a pound… my 300 Weatherby Mag takes 80 grains per round… That's only 87 rounds per pound of powder. Now let's go the other way—my 9mm plinking loads take 3.5 gr of powder… that's 2,000 rounds per pound.

What else is important to know about powder?

Mike: One thing to consider is that finer powders flow much better if you are using a powder measure instead of a scale for your loads. A fine example of this is H4831—one of my favorite magnum rifle powders, but it is HUGE… it won't meter at all. So they came out with H4831 SC (short cut) basically half the size of the original powder. Flows better and produces the same results. I have more powder in stock than most guys, basically due to the amount of reloading I do. I reload for every caliber I own and like to experiment with different powders. I keep an average of 80 pounds on hand at any given time. Some powders I never run out of because they get used so much—Unique, Win 231, red dot, IMR 4064, Win 748, Win 296.

LB: I use all kinds of powder but have a liking for Winchester products. The biggest thing is to be sure when you return powder from the dropper to the container that you do not mix up containers as mixed powder can be disastrous. Flake powders tend to not fall as consistently when using a volume type measure such as a powder drop especially on a small charge. For match ammo, I weigh every charge.

Phil: I have about 15- different powders most of the time, because I load pistol, rifle and shotshell. I prefer AA-1680, IMR-4227 and H-110 for pistols of magnum variety and WW-231 and Unique for lower velocity rounds. I do not have a real "problem powder", but a caution powder is H-110. You need to be very careful with temperatures when loading this close to maximum levels.

Dean: Since I have a lot of different powders on my shelves, due to reloading for over 40 cartridges, I tend to pick something I already have on hand...don't really want to try something new if it's not needed. Some powders I really like for their versatility are H-4895, BLC-2, Rel-7 and AA-2015. These I will start with first. One powder I use a ton of is SR-4759. This was designed for cast bullets and reduced loads in rifles, but it has found a place as THE powder I use for the Remington Benchrest rounds in 6.5mm through .30 caliber. Doesn't meter well, as it is a small extruded stick powder, but it gives supremely consistent velocities and accuracy that can't be beat. As far as pistol loads, AA-5 is a better substitute for anything using Unique, and H-110 and W-296 are favorites for magnum loads. AA-7 is great for the 9mm and 10mm autos, while AA-9 works for the magnums also and the .30 Carbine. AA-1680 and Lil Gun are my favorites for the SuperMag cases.

Andrew: I really like using Alliant powders. I use RE15 for 5.56mm and some .308, and RE17 for .308. I use Green Dot, Red Dot, Blue Dot, 2400, and Unique for pistol rounds. I also use Winchester powder for certain applications. If I had to pick one “all around” powder, it would be Unique. It may not be the best for everything, but it is incredibly versatile.

Bullets:

First off-some people cast their own bullets. Why?

Mike: Fun, messy, aggravating, satisfying… take your pick. I’ve been casting a long time and it is worthwhile if you are dedicated to it. My lead comes from the range and wheel weights (all free). I use a Lee Production Pot IV and various molds. I mostly cast for 9mm and 357, and I also cast for my black powder guns. 9mm is fun to cast because it isn’t very important in the grand scheme of life—paper targets, steel plates, and plinking. It doesn’t have to be pretty, I run it slow enough to prevent any leading, and I can cast a ton of it at only 115 grains per bullet. Use tumble lube molds and you can lube your bullets with Lee Liquid Alox in a piece of Tupperware. I also make my own bullet lube from internet recipes—and yes, it works very well. Bottom line is you need to have some spare time and patience.

LB: It’s easy but takes time. All you need is a mold, alloy, and a way to melt it. I use a Lee production pot to melt the alloy and Lee molds. My alloy is a mix of salvage wheel weights and tin. I usually achieve a hardness of 12 to 14 on the Brinell Scale. I batch large amounts of alloy into ingots to have a consistent mix. It takes practice and almost a rhythm to produce good bullets but once you figure it out it’s no problem. Then I use a Lyman luber/sizer press to size and lubricate the bullets as well as add gas checks to some. A gas check is a copper cup added to the base of the bullet to help seal the gasses as well as reduce leading.

What about commercial cast bullets?

Dean: I have shot a lot of these, because I never had the time nor space to cast my own. Leadhead bullets are outstanding...very accurate and they don't lead the barrels at the speeds we use them for in silhouette. Look for good hard-cast bullets, already gas-checked if you need them for rifle loads. Also watch out for how well the lube stays in the lube grooves...I've seen a bunch where, during shipping, it has chipped out of the grooves.

Andrew: They are consistent in size, shape, weight, and hardness. They are also pretty inexpensive. I go through a TON of 158gr semi wadcutters for .357 and .38. I would avoid using lead in anything that is ported or compensated, rifles with a direct impingement gas system, and be careful when loading for Glocks. I don't know much about the Glock issue other than some guns have blown up while shooting lead reloads. I'd find someone knowledgeable about the subject before I load lead for a Glock. When shooting at higher velocities (above 1000fps) use a lead alloy that is harder. Contact the manufacturer if you have any questions.

Phil: I load various cast lead bullets to save cost when making plinking rounds. I have tried and like Laser Cast ones the best as they produce less leading of the bore. In some of the larger calibers such as my favorite, the 475 Linebaugh I almost exclusively load Cast Performance lead bullets, they are accurate, easy to use and do not lead the bore.

Mike: I cast my own bullets when time permits—however, if the price is right I will always buy cast bullets and save my time. Buying in bulk is a huge cost saver. They are cheap to shoot and can be very accurate with some load development. Depending on what you plan on using them for determines your buying habit. Paper shooting—how about some cheap lightweight tumble lubed bullets. Hunting big game—hard cast, heavy, with lube grooves and high temp lube. Don't try to run those nice looking flat point bullets in your 1911—just asking for jams.

Bullets for pistol-what do you use and why?

LB: I mostly use semi wad cutter bullets for plinking, and jacketed bullets for hunting due to high velocities. Selecting the proper bullet is a matter of matching the purpose with the use. Example-wad cutter types for punching paper and the like, and jacketed hollow points for expansion when hunting or defense. As always there are as many opinions on the subject as there are choices.

Mike: Cast for the range/plinking simply due to cost. No point in sending an expensive hollow point jacketed bullet into a paper target all day. I save the jacketed stuff for hunting and exploding jugs of water. Defense loads are not an issue, because no one should ever carry reloads for defense (discussion for another day). For my accuracy loads I prefer Sierra bullets. They all weigh consistently and group very well. My hunting bullets are mostly Hornady or Nosler. Both expand well and hold together. You need to find out what works best in your gun. Depending on how fast you drive them, the twist rate of your barrel, what you are hunting, etc will determine what bullet you use. Try to run a heavy bullet in a slow twist barrel and you'll never hit anything.

Phil: I am a fan of Hornady XTP bullets for hunting and general use. Most any self defense round I load gets XTP's. When loading for any other reason I do like Sierra's jacketed offerings and Remington's bulk bullets have done well for me too. I have had little success with Speer pistol bullets.

Dean: Plinking - the cheapest quality I can find. I don't use smaller manufacturers bullets, but stick with Hornady or Remington when they have bulk bullet sales. For light loads, like .38 Wadcutters or .45 Colt, I use the Leadheads bullets for economical shooting.

Defense - I will stick with factory self-defense loads like most manufacturers have now. Federal is my favorite.

Competition - Mostly I'm a silhouette shooter, so competition and extreme accuracy go hand-in-hand. Sierra MatchKings can't be beat, always my preferred choice. Hornady -Max bullets are very good, but the surprise is the Nosler Competition bullets...not many varieties out yet, but the ones I tried in .308 and 6.5mm are almost non-distinguishable from Sierra's, and at greater savings. For straight-wall cases, I like the Hornady XTP and Crimp-Lock/JTC designs. Nosler also makes a great bullet for the .41 Magnum. Speer's older Silhouette/TMJ is a great bullet for long-range too.

Usually bulk bullet purchases are made for plinking. Through years of testing, I know what works on steel, and that is usually the heavier bullets. Light bullets will ring rams and sometimes pigs, so they aren't normally used.

Andrew: Plinking – Speer FMJ's

Defense – 2 legged gets Barnes XPB, 4 legged gets what is appropriate for the animal.

Hunting – Speer FMJ's for furbearers, anything else see defense.

Competition – Lead semi wadcutters.

Extreme Accuracy – I'm not that handy with a pistol, so I think anything goes.

I really like heavy bullets moving as fast as I can get them to go for everything but plinking and USPSA matches. For plinking I load very light and consistently accurate. I just started loading for USPSA and I go for light, consistently cycles the gun, and makes minimum power factor.

Bullets for rifle-once again, what do you use and why?

Andrew: Plinking – Any FMJ; Defense – Barnes TSX-BT, usually heavier bullet weights.

Hunting – Barnes TSX-BT. I use 208gr Hornady A-max in my .308 with great results.

Competition – Sierra Match King, Hornady A-max, Swift Sirocco, FMJ for practical matches.

Extreme Accuracy – Sierra MK, Hornady A-max, Swift Sirocco, Berger VLD. Again, I like heavier bullets. I shoot a 208gr Hornady A-max in .308 at very high velocity. It's not the most enjoyable thing in the world to shoot, but it's ridiculously accurate, especially at VERY long ranges.

For plinking, it must create enough gas to reliably cycle my AR-15.

Mike: Pretty much the same answer as for pistol. My rifle accuracy bullets usually fit the profile of a long distance bullet. I run spitzer noses as well as boat tails. One of my favorite accuracy bullets is for the 22-250… I run a Sierra 52 gr HPBT (hollow point boat tail). Find me a target at any distance… If the distance really gets out there, we step up to bigger calibers and heavier bullets. Long missile shaped bullets in the 25-

06, 7mm, or 300 will all get the job done. Weights from 117 to 180 gr will stay true in the wind better than the lighter bullets.

I run 154 grain round nose bullets in my High speed 7mm Rem Mag… Why? They are proven performers in that gun. Deadly accurate, really open up well, and they hold together…What more could you ask out of a hunting bullet?

How about a close range rifle—like the Lever 44 mag. My gun likes anything I put in it; but, my choice is heavy cast bullets. They don't shoot far, but if you want to smack something close and stop it cold, they will do it every time.

Dean: Pretty much the same criteria I use for pistol bullets.

Plinking - Bulk FMJ bullets when available.

Competition - Same as above for silhouette. That said, I have shot a ton of bulk Remington SP bullets on steel...never missed a target due to bullet choice, and they do save a lot of money. Too bad they are almost as much as regular bullets not bought in bulk now.

Phil: I like the Barnes TSX bullets the best for performance while hunting, they can be finicky to get the seating depth correct, but when you do they are accurate and perform well on game. While working loads up for these I usually use a less expensive equal weighted bullet to get dialed in, then convert to the TSX for final dial in. I like all rifle bullets to be boat tail type. Flat base designs are hard to get started into the case mouth of bottle neck rifle cases. I usually stay with the most common standard weight bullet for a designed cartridge, that way if you ever have to buy a factory round in a pinch, your rifle should be very close to sighted to utilize it without much adjustment.

LB: I mostly use jacketed bullets for rifles due to the velocity. My favorite hunting bullet is a boat tail spire point.

What else is important to know about bullet selection?

LB: Like many things it's all a matter of a person's choice.

Mike: Just because they are commercial bullets doesn't mean they are perfect. I weigh every bullet for my accuracy stuff. Open a box of 100 someday and weigh them on a digital scale—you'll be amazed at the different weights you get. Sierra does a better job than most at consistency. I usually set up my digital scale and about a dozen "Dixie cups" labeled 117, 117.1, 117.2, 117.3, etc. They will all have a few bullets in them by the time I'm done. This is a good reason to buy bullets in bulk from the same lot once you choose a bullet.

Load selection and development:

Please talk about the process (mysteries) of component selection and matching.

Mike: At this point in the discussion we are hitting on the "experienced reloader" area. A new reloader will be overwhelmed with options to build a load. If you are just starting out, stick with what the reload books tell you. Try a few loads and go from there. Start with bullet selection, after all this is the important part of the load. Is it for plinking or hunting? This will determine how "hot" you want the load. By the way, velocity doesn't always mean accuracy… That deer you just missed doesn't care how fast the bullet was going. Sometimes slower is better. Cases will depend on where you are getting them—buying new or building a batch of brass from the range? I've done both, and they both work well. After trying a few brands of brass you'll find your personal favorite, and fine tune from there. If you understand compressed loads, MOA, Taylor KO factor and spin drift, you don't need to hear anything else from me!

LB: There is plenty of data out there on bullet co-efficiency but most of it is beyond my ability to comprehend. I keep in mind the basics. Lighter faster bullets mean flatter longer trajectory, heavier means slower but more energy delivered. In the end mass x velocity = energy. How all this calculates out is very subjective to many factors.

Andrew: When I'm developing a new load, I start with the bullet. Then I pick a powder appropriate for the bullet and case. The reloading manual library is an essential tool. I set up my reloading station, run off a dummy round or 2, and then begin loading. When working up a load, I vary my powder charges in intervals. I pick a range, and adjust in .5 grain intervals for rifle, and .3 grain intervals for pistol. I crank out 10-15 of each charge weight, and label them. When I shoot them, my primary concern is accuracy, not velocity. All I am looking for is how consistent my groups are. I find which charges work best and go back to the reloading bench. For rifle, I go .4 grains heavier and .4 grains lighter in .2 grain intervals for each of the charge weights that I liked. Pistols go .3 on either side in .1 intervals. At this point, I usually have 4 or 8 different charge weights. I go back and shoot them over a chronograph and pick out the most consistent in both accuracy and velocity (and they are usually the same). Since I purchased QuickLoad, this process has become much easier. I can get a very good idea of what sort of velocity I will be looking at as well as chamber pressure, and be fairly close on drop and windage calculation. I still have to take them out and shoot at 100, 200, 300, and sometimes 500 yards to really have a good idea of what the bullet is doing in flight.

What else should we know on the subject of the cartridge components?

Dean: For the best reloads you can make, try to assemble them all with components from the same lot numbers. Don't mix up case brands, or even lot numbers with the same cartridge case...purchase in bulk to keep from changing things. I like 500+ cases for one gun, I will order bulk bullets by the 1000 if possible, powder will be ordered in 8 pound+ containers, primers by the thousand. Eventually, you will run out of some component and a new lot number will have to be purchased...it may be the same, or it may be worse, especially when it comes to powders. A new powder lot will require the prudent handloader to back off 5-10 percent and re-work the load to make sure he isn't going over a max load just by substituting for the original. This takes time and more components just to get back to what you had originally.

Try to make each round exactly the same as the last one when you put them all together, using good,

consistent techniques.

Andrew: Have fun loading and shooting. As you gain experience, don't be afraid to experiment a little.

Mike: Remember, this is supposed to be fun as well as cost saving. Don't get all wrapped up in the details at first. Just make a good safe reload and go try it out. If it doesn't work to your satisfaction, try another load, another powder, another bullet… All those bulged cases, flattened primers, and crappy groups are part of the learning process. Don't load 20 rounds at first. Load about 5 and try them out. A box of 50 reloads gives you the opportunity for 10 different loads in one range trip. You can mark the primers with a sharpie, put them in different boxes, use Ziplocs, etc. The best piece of advice I have left to give is this – Write down everything and keep it!!! It doesn't matter if it was a good load or bad—write it down, you'll refer back to it someday.

Thanks again to our Reloading Roundtable experts, IHMSA80x80, Supermagfan, lbruce, freerider 04, and SHOOTIST357, and to Jody for providing the Forum to present this.

As always, the information presented is based on the experience of the contributors. Reloading should always be done under controlled conditions, with attention to every component and process. Work up loads carefully, sensibly, and with safety as the first and overriding concern. Be Safe and Have Fun!