Introduction to Reloading

www.monmouthrifleclub.co.uk

Introduction

We have designed this course to be a basic introduction to reloading, so is aimed at those who have never reloaded before.

Reloading is not very complicated as a basic principle, and this course is designed to show you the common tools you will need, how they work and most importantly, how to safely use them. Hopefully, by the end of this course, you will have the ability to leave the club and begin to reload and develop your skills from there.

If you are so inclined, reloading can become very complex as you develop a deeper understanding of the components, how they interact with each other and using different rifles and of course ballistics. There is an abundance of free information available, some excellent and some downright dangerous, so we will provide some useful resources at the end of this guide.

There are many key benefits to reloading your own ammunition, which include:

- Cost
- Quality
- Customisation
- Supply/availability
- Fun!

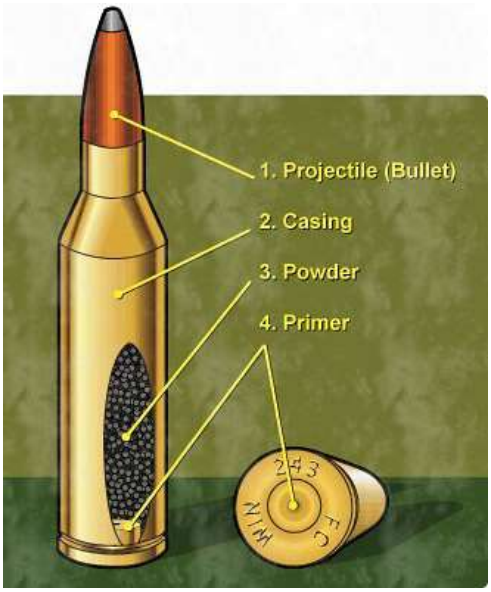
Key Safety Principles

During this course you will receive hands on experience in reloading. It goes without saying that as this involves the use of propellants and explosives, this can be dangerous if not undertaken properly.

Therefore:

- Listen to the instructor at all times
- Safety Glasses must be worn whilst reloading
- Check, and double check, at every stage of the process
- Always work within published guidelines – more on this later!
- If in doubt at any time, on this course or afterwards when starting to load on your own, STOP and ASK. Any and all of the experienced club reloaders will happily answer your questions and provide advice.

So, back to basics…



There are only 4 components to a round, but which components you use and how you assemble them will be critical to your success as a reloader.

Projectile – you should ensure you not only have the correct calibre for your round but have the appropriate type and weight for the application. Will you be hunting, extreme long-range target or simply wanting to chuck rounds down the range?

Casing – this is where the biggest cost benefits come as these can be reused several times. However, this depends on may factors (quality, case prep done, annealing etc.).

Powder – No longer an explosive, but a propellant. It will not explode in a fire, but burn rapidly. Hundreds of different types for different applications and calibres. Always ensure you have an appropriate powder for your calibre and projectile. Always check a suitable resource for not only powder type, but minimum and maximum volumes.

Primer – the part the firing pin strikes and explodes, igniting the powder. This is the most dangerous the most dangerous component used in reloading and requires careful handling. There are 4 common types – small pistol, large pistol, small rifle and large rifle. Magnum primers are also a variation on the 4 common sizes.

Equipment

As with everything shooting related, there is a vast array of different equipment and options available, with varying costs and benefits. Here we look at the essential items:

Press

Single stage press

Turret press

Progressive press

The 'heart' of your reloading equipment, the press is the part that undertakes all the hard work. There are pros and cons to each type, but we highly recommend new reloaders use single stage presses only until they are more experienced to help ensure safe reloading practices are learned. If you do buy a more complex press later on, it's always useful to have a single stage press on hand as well.

Dies

Dies are screwed into your press and undertake various functions. They are specific to the cartridge that you are reloading.

Powder scales

Digital scale

Balance beam scale

Auto dispenser scale

Accurate measurement of your powder is essential to safety, as well as consistency of your loads.

Other essential items

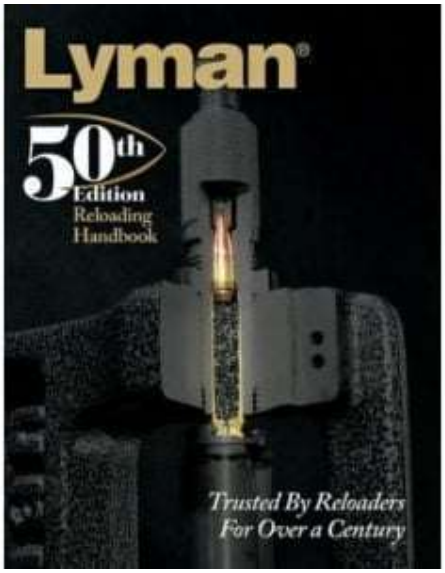
Powder trickler

Hand priming tool

Shell holders

Case prep tools Lubricant Calipers

And most importantly…….



A reliable reloading guide!

Whilst there are some excellent reloading references available on the web, including detailed videos, there are also a lot of sites which contain dubious and sometimes, downright dangerous methods and suggestions. All the mainstream reloading books are the product of decades of detailed testing and these should ALWAYS be your first port of call. You should never exceed the maximum charge weights included in the manual and beware of substituting primers…..e.g. using a magnum primer where a standard primer is specified. That can lead to dangerous chamber pressures.

You can buy whole kits in one, or all the items you may need individually. As you learn, you will no doubt replace various items. This of course depends on your primary objective, budget and time constraints.

RCBS Rock Chucker supreme reloading kit (circa £390)

Many other options and price ranges are available!

A notebook and a plan!

Your notebook is probably the most important item of your reloading kit. In it, you can record details of the components you use, different load combinations, the results of your range testing and many other things which help in producing effective, consistent ammunition.

Your 'plan' is how you are going to organize your work. How will you store and keep track of your fired cases? How do you know how many times a given batch of cases has been fired? How will you ensure that, when you are charging your cases with powder, you don't accidentally miss putting powder in one of them….or, worse still, put in a double charge, This is easier to do than you think when you get distracted by the 'phone, spouse, kids, dog or whatever. It can't be over-stated that working methodically and logically is important if accidents are to be avoided.

Stage 1: Sources of brass

Brass can be purchased new, but it should still be inspected (see below). It won't necessarily need cleaning, but it can vary greatly in quality and therefore it's worth sizing and checking dimensions as per the preparation instructions given for fired brass, below.

Buying new brass is a great way for the novice reloader to practice and get the hang of the process with the confidence that the cases being used are very likely to be in excellent condition, without any hidden defects.

The best source of fired brass is from the rifle(s) that you intend to shoot the reloaded brass through. Most brass from modern rifle and pistol rounds can be re-used although the quality (and therefore, the number of times it can be re-loaded), can vary considerably.

There are a couple of things to beware of. Firstly, many people reload used brass they have collected from the range. For sure, this is a cheap way of acquiring cases but frequently, you will have no idea how many times that brass has been used/fired before. If you do become a 'range womble', be very careful indeed, particularly when it comes to case inspection.

Secondly, some older and/or military brass either uses a "Berdan", largely obsolete, primer or has the primer crimped in such that it cannot be simply and easily pushed out like those used in modern sporting and target ammunition.

Case Inspection: Each case should be carefully examined for any defects such as splits (frequently around the neck), signs of over-pressure (such as 'cratered' primers) and other defects. Your reloading manual will show you what to look for, many people use a hand lens for doing this. DO NOT SKIP THIS STEP. .

Stage 2: Case Preparation

Given the biggest savings come from reusing fired brass, it is essential to make your brass as close to as new again before you begin to reload it.

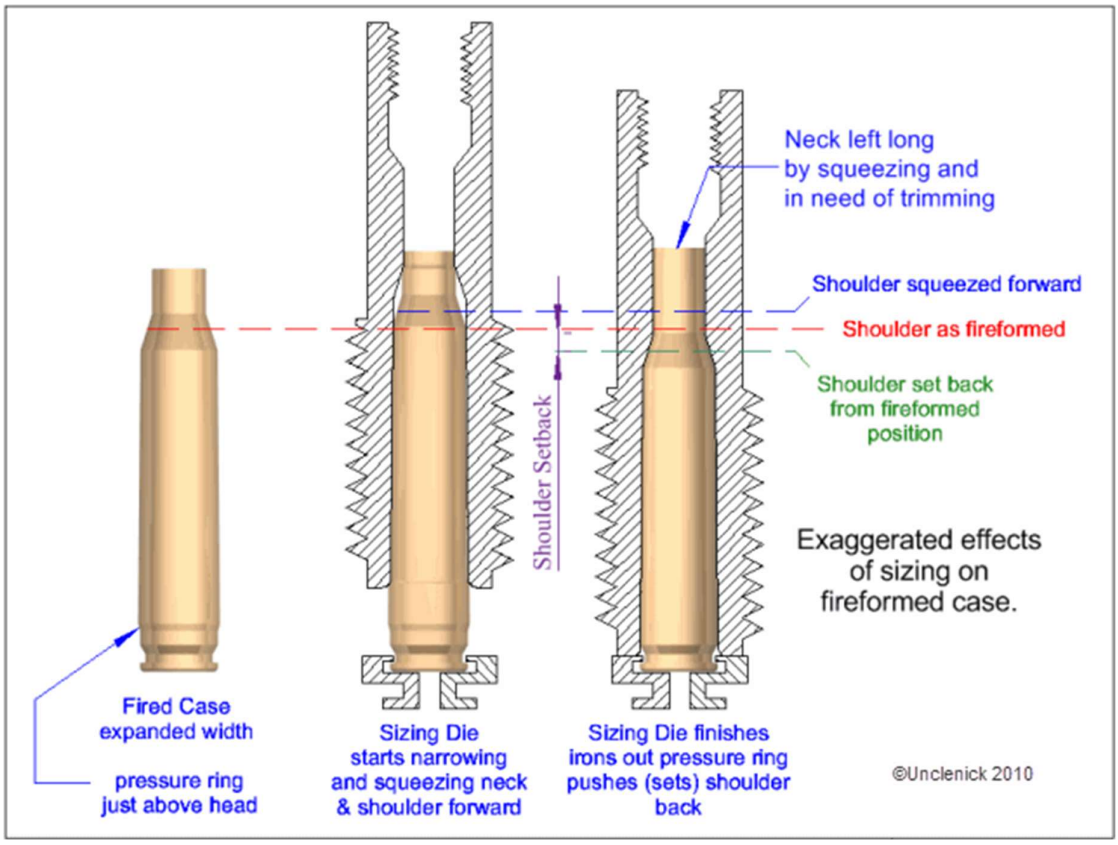
Every time a round is shot, the case expands and extends a little or becomes 'fire formed'. It is also a lot dirtier!

De-priming: You will first need to remove the used primer which is (or certainly should be) still in the brass. This is usually done with a de-priming die that pushes the used primer out of the case. I recommend doing this before cleaning to ensure the primer pocket is also cleaned, but many do this afterwards as de-priming and re-sizing can be done at the same time.

Cleaning: This can be done in a variety of ways, including the use of a sonic cleaner or a brass tumbler. Again, this is a personal preference. Personally, I don't care about my brass

being shiny so long as all debris is removed. I therefore use a sonic cleaner as this is quick and I can clean hundreds of rounds at a time, but many people prefer using a tumbler (wet tumblers seem to give the best results). You may also want to use a special primer pocket cleaner/reamer to clean and re-size the primer pocket. The latter can result in improved consistency between rounds.

Re-sizing: You then need to bring the brass back to its original specifications. If you haven't already de-primed, this should be done now. You now need to bring the case back to its original form before it was fired, known as 're-sizing'. This is done using a sizing die in your press and so you will need to ensure you have the correct shell holders:



This varies slightly between bottle neck cartridges (e.g. .308) or straight walled (e.g. .44) cartridges. You will often also need to use lubricant to avoid the cartridge from getting stuck in your die, especially with bottle neck cartridge as it can result in the die being damaged beyond repair.

For bottle neck cases, there are various types of sizing die, including 'full length' sizing dies 'body-sizing' dies and 'neck-sizing' dies. There are endless arguments for and against these different types but, for the novice reloader, we suggest starting with a full-length sizing die and getting some practice with that before investigating the arguments for other types.

Whilst it isn't usually needed after every use, the size of the case should be checked against specifications in your loading manual using calipers. Where the brass has 'grown' or other

deformity can be seen on the neck or opening, this should then be trimmed, chamfered and de-burred.

Several different tools exist to help trim cases back to their original size (Redding case trimmer pictured).

A Case chamfer and deburring tool is used to make the case opening smooth.

Straight walled cartridges only – You may also need to use an expander die to slightly 'expand' or flare the case mouth, so when the time comes, a bullet can be seated in it.

You now have brass which is ready to be re-used!

Re-inspect your cases to ensure no defects have become apparent during the preparation phase.

Stage 2: Priming the brass

There are various ways to re-prime your brass, including as part of a progressive press, using a special die in your press or by hand. We highly recommend when starting out this is done by hand, and as above, you check and re-check your case actually is primed before going on to the next step.

The Lee hand priming tool is a staple of many reloaders equipment.

Again, you will need to ensure you have installed the correct size shell holder and the correct size mechanism for the primer type you are installing. Failure to check this can lead to an explosion!

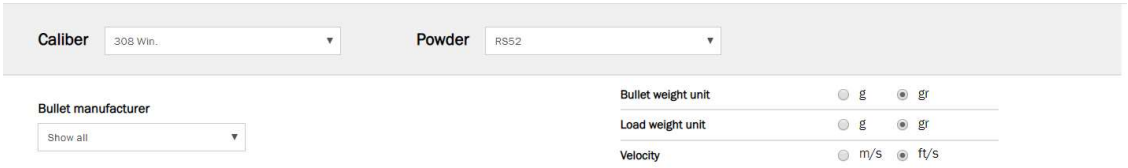
Always hand prime away from your face, and wear safety glasses, following the instructions that come with your priming tool

Stage 3: Powder your case

As mentioned above, it is essential you have the correct type of powder for your cartridge and bullet weight.

It is also essential to ensure you know your minimum and maximum charges.

ALWAYS CHECK YOUR RELOADING MANUAL, AND IDEALLY, SEVERAL SOURCES!



Bullet				Case	Primer	Powder	Start Load			Max. Load			Information		
Caliber	Weight gr	Manufacturer	Type	Manufacturer	Type	Type	Charge gr	V5 ft/s	Pressure bar	Charge gr	V5 ft/s	Pressure bar	Barrel	C.O.L. mm	Info
308 Win.	130	Fox Bullets	Fox CH	Starline	LR RWS 5341	RS52	38,6	2513	2301	47,5	3045	3548	600mm (1:12")	70,5	
308 Win.	150	Fox Bullets	Fox CH	Starline	LR RWS 5341	RS52	34,0	2172	2020	45,1	2825	3536	600mm (1:12")	69,8	
308 Win.	150	Sierra	HPBT	RWS	LR RWS 5341	RS52	40,3	2313	1965	47,1	2802	3212	600mm (1:12")	70,5	
308 Win.	165	Fox Bullets	Fox CH	Starline	LR RWS 5341	RS52	34,0	2133	2127	42,4	2634	3411	600mm (1:12")	70,2	
308 Win.	168	Sierra	HPBT	RWS	LR RWS 5341	RS52	38,7	2231	2071	45,5	2674	3369	600mm (1:12")	71,1	
308 Win.	180	Fox Bullets	Fox CH	Starline	LR RWS 5341	RS52	33,5	1962	1976	41,7	2523	3567	600mm (1:12")	70,5	
308 Win.	180	Norma	ORYX	RWS	LR RWS 5341	RS52	38,1	2149	2202	44,8	2602	3687	600mm (1:12")	68,7	
308 Win.	200	Sierra	SBT	RWS	LR RWS 5341	RS52	36,1	2014	2113	42,4	2441	3566	600mm (1:12")	71,1	
308 Win.	240	Sierra	HPBTMK	RWS	LR CCI BR2	RS52	35,5	1995	2484	40,1	2274	3800	650mm (1:13")	70,0	

Example data from the Reload Swiss website for their RS52 powder for use on a .308.

Therefore, before you even begin to consider putting powder in that new, shiny, ‘as new’ brass make sure you know your limits and what you are planning on doing.

When first working with any load, always start at the lowest recommend powder amount and work up in suitable increments when load testing, such as by .5 grains. When you have narrowed down your results (group sizing, velocity etc.), you can then use smaller increments between your narrowly defined parameters.

Example:

I use 150 grain Sierra Matchking's on my .308 and am developing a load to shoot out to 1000 yards, so need a higher muzzle velocity than someone who shoots no further than 100yds.. Using RS52 powder, I established my minimum load was 40.3 grains and maximum of 47.1 grains. I therefore *started load testing and loaded 5 rounds of each .5 grain increments up to 46.8 grains. My best groups with suitable velocities were using 44.8 and 45.3 grains. I then loaded 5 rounds at .1 grain increments between these paraments, and discovered, by testing on the range, that my best groups and velocities were at exactly 45 grains.*

So you now know how much powder you are going to put in to your brass. There are several ways of doing this, and many tools which offer expedience but usually at a cost. Most people start by simply using a dipper-or similar to place the powder in to a scale until the right amount is reached, then using a funnel, pour this in to the case.

However, many also pour close to the amount into the scale, and then use a trickler (as pictured above) to slowly increase the amount until the target is met.

You may also consider using a powder measure. These can be very accurate, but need careful setting up, consistent technique, and frequent checking of the actual powder weight. If you have the budget, you may also use an automated system.

Stage 4: Bullet seating

The final stretch – seating the bullet in your powdered and primed case and completing the process.

Before this is done, you should ensure your seating die is set up correctly to ensure that the bullet is seated at the correct depth and with the correct amount of crimp (when needed, largely only pistol calibers). This should be determined in advanced, usually done by checking against factory rounds you have used, or your loading manual but in due course will likely involve you measuring the precise dimensions of your rifles chamber and what 'jump' you would like. Again, varying seating depth and tension can have a significant effect on the ballistics of your round.

Simply rest the bullet on the mouth of the case and push into the seating die on your press. The type of die you use will depend on the bullet type as this affects how the bullet is seated – for example, you may want to crimp the bullet.

Then, voila, you have a reloaded round! One last safety check – measure the round to make sure it is the correct length, or 'COAL' (Cartridge OverAll Length).

Note the use of a bullet comparator on the calipers – this measures from the ogive of the bullet (the widest point) to the base for a more accurate measurement.

AND THERE YOU HAVE IT!

FINAL CHECK.

If any of you ride motorcycles, you will be familiar with that final, 'life-saver' look over your right shoulder, before turning across the traffic. In reloading, if you want to adopt the same, potentially life-saving precautionary approach, consider weighing each round before you box it up to take away and shoot. It doesn't take long, but it will reveal any rounds that you've managed to miss putting powder into or have managed to double charge. A primed case without powder will likely send the bullet part-way down the barrel. If the shooter doesn't notice this and another round is fired, this can (and has) resulted in the barrel exploding. Similarly, a double-charged case can result in a chamber explosion. I don't think we need to say any more about how dangerous either of these events could be.

Conclusion

Hopefully now you will feel confident to get into what many believe is a 'dark art' but, is not that complicated! In my view, this is all part of the fun of our sport, and the more involved you can be with the process the better.

The one key takeaway from today is to remember to check every stage, and then recheck. A double charged round for example could blow up, turning your chamber into a hand grenade, but ensuring you are concentrating and checking what you are doing, there is absolutely no reason not to home load.

We could prepare a vast number of detailed documents and training on the advance elements of the subject, but why reinvent the wheel with the abundance of resources out there. How much detailed knowledge you want to develop will be entirely personal, and dependent on what you want to get in to. Those of us into our precision long range shooting, it is borderline essential to have more than a basic knowledge to be competitive.

Those of us who just want to make shooting more affordable and be able to chuck more lead down the range simply wont need (or probably want) to spend that much time and effort on the complex. Hopefully this course has given the latter almost everything you need to know and works as a foundation for the former to carry on learning.

Useful resources:

- Powder manufacturers websites, such as:
    - https://www.reload-swiss.com/en/reload_swiss/index.php
    - https://www.hodgdon.com/
    - https://www.vihtavuori.com/reloading-data/rifle-reloading/
- Equipment manufacturers
    - https://www.hornady.com/support/
    - https://leeprecision.com/instructions.html

Some of the best manuals include:

- Lyman's 50th edition Reloading Manual
- Hornady Handbook (10th edition)
- Lee precision modern reloading (2nd edition)
- Sierra 5th edition rifle and handgun reloading manual