NATIONAL SMALL-BORE RIFLE ASSOCIATION

CODE OF PRACTICE

HOME LOADING

NSRA Code of Practice for Handloading Firearms Ammunition

Introduction

Any person wanting to use handloaded, reloaded or downloaded ammunition on NSRA ranges, or on any range owned or operated by NSRA affiliated Clubs or Associations and covered by insurance provided through NSRA must first read and agree to abide by this Code of Practice. Failure to comply with the following recommendations may invalidate insurance, leaving clubs and individuals directly responsible for meeting any financial claim, and may result in damage to firearms, injury and even death.

Scope

This Code of Practice provides guidance for the safe preparation and use of firearms ammunition.

It is not intended to provide comprehensive instruction on handloading techniques, nor is it intended to replace or be a substitute for handloading manuals or handloading training courses.

Terms & definitions

For the purposes of this Code of Practice, the following terms and definitions apply.

Handloading (synonym: home loading)
The processes of manually preparing and assembling components to produce firearms cartridge ammunition for personal use; not for resale.

Reloading
Handloading cases that have been previously fired.

Downloading
Handloading ammunition using a combination of components (primers, powder and bullets) such that the muzzle velocity and muzzle energy normally generated by factory ammunition of the same cartridge type and calibre are reduced to within the limits specified in the range safety certificate for the range on which the ammunition is to be used.

Factory ammunition
Commercially produced ammunition, which is subject to C.I.P. Approval and Rules of Proof.

Full-bore firearm
A rifle or pistol designed to shoot rimfire cartridges greater than .22 calibre or centre-fire cartridges.

Small-bore firearm
A rifle or pistol designed to shoot rimfire cartridges of .22 calibre or less.

NOTE: Small-bore only ranges are typically certified for .22 LR. Some types of cartridge, e.g. .22 WMR, .17 HMR, etc., may exceed the ballistic limits specified on small-bore range safety certificates and are, therefore, not permitted on such ranges.

1 If you don't know what you are doing … DON'T DO IT!

a) Handloading requires a technical knowledge of firearms and ballistics sufficient to be able to select appropriate components (case, primer, powder, bullet) and assemble them in a reproducible manner to make cartridges that are both safe to fire in a designated firearm and fall within the particular safety requirements for the ranges on which the cartridges will be fired. Before attempting to handload any ammunition, it is essential that expert

advice is sought either from your club or National Association, or by attending a recognised handloading course.

b) Never handload ammunition if you are not prepared to make the commitment you owe to yourself and others to clearly understand the scope of responsibility that accompanies handling things that can kill people.

c) Do not experiment. Target shooting ranges are not laboratories and there is no place in target shooting for a “suck it and see” attitude. Only shoot ammunition that you know is safe and for which you know and understand the ballistic performance.

d) Obtain one or more up-to-date handloading manuals, study their guidance on handling, storing and working with primers, powders, and other ammunition components, and learn how to handload safely. You must understand what you are doing and why it must be done in a specific way.

e) If you cannot find the exact load data in the manual for the combination of components you intend to use, obtain a manual that does have the data, or change components to those for which you do have data. Alternatively, contact powder manufacturers to obtain the specific data you require in written form (e-mail, fax or letter). Never shoot handloaded ammunition unless you have reliable data confirming your load is safe.

NOTE: it may be beneficial for future reference to batch test handloaded ammunition over a chronograph on a suitable range (i.e. one with higher muzzle velocity/muzzle energy limits) to ensure the ammunition is safe for use on the range(s) on which it is normally intended to be used.

f) Handloaded ammunition of initially unknown ballistic performance should be batch tested by an officially recognised proof house to ensure that the associated breech pressures and velocities are within acceptable standards.

g) Read and understand all manufacturers’ instructions for the handloading equipment you will be using. If you do not have instructions, contact the manufacturers to obtain copies.

h) Ask the advice of experienced handloaders, and if possible ask an experienced handloader to show you each step of the handloading process.

i) Consider attending a handloading course such as that offered by the NRA.

j) If you have any doubt about your ability to handload safely, do not do it – use factory ammunition that is within the ballistic performance of range safety certificates.

2 Pay attention to what you are doing.

a) Only handload ammunition when you can give your full and undivided attention to it. Set up your handloading equipment in a quiet area where you will not be constantly interrupted. Do not handload whilst watching television or listening to music, or being distracted by anything else.

b) Do not handload when you are tired or ill.

c) Do not handload under the influence of alcohol, drugs or medication.

d) Allow plenty of time and handload at a leisurely pace without being rushed.

e) Establish your own handloading routine and stick to it so that you avoid mistakes.

3 Never smoke during a handloading session. Keep matches, flames and other possible ignition sources away from your handloading area.

4 Keep all your handloading equipment and components out of reach of small children and anyone else who does not require access to it.

5 Keep your handloading area neat and tidy.

a) Have only one set of components (cases, powder, primers and bullets) on your handloading bench at any one time. Do not attempt to handload more than one type of ammunition at the same time.

b) Do not have food or drink on your handloading bench.

c) Sweep up any spilled powder immediately. Do not use a vacuum cleaner because internal electrical sparks may ignite the powder causing a fire or explosion.

d) Label components and keep them in a convenient place on your handloading bench.

e) Do not use components that you cannot positively identify.

6 Wear approved eye protection during all stages of handloading.

7 Do not use smokeless powders in cartridges for firearms proofed for black powder only.

a) Smokeless powders for rifle and pistol cartridges are made using nitrocellulose and are much more powerful than black powder. Fast burning smokeless powders for pistol cartridges are often double-base with nitroglycerine added to the nitrocellulose, making them even more powerful.

NOTE: Smokeless powders are also known as propellants and nitro powders. Black powder is also known as gun powder.

b) Most modern cartridge firearms are proofed for nitro powders. Check for nitro proof marks:

Note the “N” for Nitro.

c) Vintage firearms, original or replica, are often only proofed for black powder. Black powder proof marks are:

d) In addition to proof marks, modern black powder firearms, including replicas of vintage firearms, are often engraved with warnings such as *BLACK POWDER ONLY* or *NOT NITRO*.

e) If you cannot identify the proof marks on your firearm, or if you are not sure what they mean, have your firearm inspected by a competent gunsmith.

f) Special black powder substitutes such as Hodgdon Pyrodex® and Triple Seven can be used in firearms proofed for black powder only. Read and understand manufacturers’ instructions for Pyrodex or Triple Seven before using these powders in cartridges for black powder firearms.

g) Do not substitute smokeless powders for black powder, Pyrodex or Triple Seven.

8 Handle powder carefully, and as recommended by manufacturers.

a) Store powder in a cool, dry place away from direct sunlight and sources of heat and other possible ignition sources.

b) Where possible and practical, store powders only in original factory containers with original labels.

NOTE: To comply with the *Explosive Regulations 2014*, it may be necessary to repackage powder into 1 kg plastic containers for storage in approved wooden boxes. Great care must be exercised in properly labelling containers and making sure that powders are not mixed during repackaging. Buying powder in factory supplied plastic containers holding no more than 1 kg of powder avoids having to repackage.

c) If powder needs to be repackaged, for example when splitting down bulk quantities, the containers should be constructed in such a way that, in the event of a fire they do not

provide additional containment that will either increase the explosive force of any deflagration or cause smokeless powder to detonate. Normally plastic/polythene or paper/cloth containers should be used. Metal containers with a screw cap or a push-in lid must not be used.

NOTE: Long term exposure to moisture or sunlight may degrade powders, thereby changing burning characteristics and creating a potential hazard when ammunition is fired.

d) If containers for another type of powder are re-used, make sure all traces of the old powder are removed, remove old labels and clearly label the containers to reflect the new contents.

e) Keep powder containers tightly closed when not in use.

f) Do not mix powders of different types.

NOTE: Similar, or sometimes even the same designation can be used for different powders from different manufacturers. For example, Hodgdon and VihtaVuori both have “110” powders, but they are very different from one another and should never be mixed, or their handloading data inter-changed.

g) Only have one type of powder on your handloading bench at any one time.

h) Pour out only enough powder for immediate use.

i) Return any unused powder immediately to its correct container.

9 Handle primers very carefully, and as recommended by manufacturers.

a) Store primers in a cool, dry place away from direct sunlight and sources of heat and other possible ignition sources.

b) Store primers only in original factory packaging with original labels.

c) Do not store primers in bulk – doing so will create a bomb! For example, do not empty primers from their original factory packing so that they are loose in a large container. Bulk primers will mass detonate if one is ignited.

d) Do not handle primers with greasy or dirty hands. Grease and dirt can affect the igniting characteristics of primers.

e) Do not mix primers from different manufacturers.

f) Do not mix regular primers with magnum primers.

g) Do not mix Berdan primers with Boxer primers.

h) Do not force primers; if resistance is felt when trying to seat a primer, STOP and investigate.

i) Return any unused primers immediately to their factory packaging.

10 Never exceed maximum loads given in handloading data tables.

a) Do not begin handloading with the maximum powder charge shown in handloading data tables. Always begin with the starting load indicated in the data tables. If a starting load is not given, reduce the listed maximum load by 10% and use that as a starting load.

b) Always work up from a starting load towards the maximum load in small steps, watching for signs of excessive pressure at every step. If you see signs of excessive pressure, stop shooting that load immediately. Reduce subsequent loads back to where you no longer see signs of excessive pressure and use that as your maximum load.

c) Do not exceed the maximum load given in handloading data tables or the maximum load that you have discovered for yourself.

d) Cases made to military specifications often have thicker case walls, which reduces the internal volume of the case. Maximum loads quoted in data tables should be reduced, typically by 5%, when handloading military cases.

11 Never reduce the minimum starting load given in handloading data tables.

a) Using too little powder to load cartridges can cause dangerous over-pressure.

b) If downloading is required to reduce muzzle velocity and muzzle energy, and this cannot be achieved with a particular powder without loading less than the starting load, select a different powder that will allow the required ballistic performance to be achieved without reducing the powder load below that listed in handloading data tables (see clause 19).

12 Do not attempt to handload without a reliable powder scale.

a) If using a volumetric measure, the weight of a given volume should be checked using a reliable powder scale both before and regularly (e.g. every 10 rounds) throughout the handloading session.

b) A reliable powder scale is one that has been calibrated or checked using a check weight before each handloading session commences.

c) Keep powder scales clean and properly maintained in accordance with manufacturers' instructions.

13 Select the correct type and weight of bullet for the range on which ammunition will be used.

a) Do not use tracer, tungsten/steel cored, or other specialist bullets on target ranges unless the local range regulations specifically allow for it.

b) Do not use full or partial metal jacketed bullets on indoor ranges unless the local range regulations specifically allow for it.

NOTE 1: some bullets, typically referred to as copper washed, have a very thin copper coating to reduce lead fouling in barrels. Such bullets are not classed as metal jacketed and can usually be used safely on ranges where jacketed bullets are not allowed.

NOTE 2: the base of cast lead bullets are sometimes fitted with copper cups known as gas checks to help seal gases and prevent deformation of the base of the bullet. Gas checked bullets are not classed as metal jacketed and can usually be used safely on ranges where jacketed bullets are not allowed.

14 Make sure ammunition is within the cartridge overall length (COL) limits specified in handloading manuals.

a) Firing cartridges that are only a few thousandths of an inch longer or shorter than the specified COL can create excessive pressure.

b) Always measure cartridges with an accurate set of digital or dial callipers (or vernier callipers only if you are confident in reading vernier scales) to ensure they are within safe specification.

c) COL specified in most handloading manuals is based on industry standard chamber and cartridge dimensions. COL is specified with tolerances such that any cartridge will be safe in firearms with chambers within the size tolerance specified for the particular cartridge. In other words, any standard cartridge can be fired safely in any standard firearm chambered for that cartridge.

Some firearms may have non-standard chambers that require non-standard COL, or it may be desirable when making high accuracy ammunition to fine tune COL to suit a specific chamber. Assembling such ammunition should not be attempted without specialist measuring and handloading equipment and the necessary skill to use it. Bullets should not, in any circumstances, be in contact with the rifling in a barrel when a cartridge is loaded in the chamber. Bullet jump, i.e. the free space between the barrel lead and the bullet ogive, or wadcutter face, should still be within established safe limits. Specialist handloading manuals dealing specifically with loading for accuracy should be consulted.

15 Be aware that different types of firearm have different handloading data.

a) Rifles with bolt actions are generally stronger than lever-action carbines and revolvers when chambered for the same cartridge, and so are more likely to withstand accidental high pressures without failing, although signs of excessive pressure may be visible (see sub-clause 17c) below).

b) Do not use handloading data for rifles with strong actions to make ammunition for firearms with weaker actions, e.g. lever-action carbines or revolvers.

16 Record and label each batch of ammunition you make.

a) Record details of all components used for each batch of ammunition:

   i. brand of case, how many times it has been reloaded, full-length or neck sized, etc.
   ii. brand and type of primer;
   iii. brand, type and quantity of powder;
   iv. brand, type and weight of bullet;
   v. cartridge overall length;
   vi. date the ammunition is loaded.

b) Label the container in which the ammunition is stored and include either the full loading record or a reference code that will allow you to positively identify the ammunition.

17 Always check for signs of excessive pressure.

a) When shooting handloaded ammunition check for signs of excessive pressure with every shot.

b) If you see signs of excessive pressure, stop shooting immediately.

c) Signs of excessive pressure are:

   i. harder recoil than usual;
   ii. louder report than usual;
   iii. difficulty when extracting fired case;
   iv. bulging and/or split fired cases;
   v. cratered primers (see picture below);
   vi. flattened primers (see picture below);
   vii. pierced primers (see picture below);
   viii. blown primers, i.e. primer blown out of primer pocket;
   ix. case head imprinted with bolt face/ejector marks.

18 Always ensure that the ballistic performance of handloaded ammunition is within the range safety limits.

a) Local range regulations do vary from range to range. Always check local range regulations and any other relevant rules or restrictions.

b) Do not use ammunition that exceeds the calibre, muzzle velocity or muzzle energy limits for the range on which you intend to shoot.

c) Do not use ammunition loaded with a type of bullet that is restricted from use on the range on which you intend to shoot (see clause 13).

d) Some ranges do not allow the use of downloaded ammunition. Do not use downloaded ammunition on ranges where it is specifically prohibited even if the ballistic performance is within the limits specified in the range safety certificates. Such ranges include all ranges certified for small-bore firearms only.

19 Take extra care when downloading ammunition.

a) Full-bore rifles are generally not designed to be shot indoors or at short range. Full-bore rifles, some centre-fire gallery rifles and some long-barrelled revolvers can produce muzzle velocities or muzzle energies far in excess of indoor range safety limits. Such firearms can be used safely on indoor ranges or on short-range outdoor ranges, where permitted by local regulations, only if ammunition is downloaded to reduce muzzle velocity and muzzle energy to within the limits specified in the range safety certificates.

b) Downloading should be approached with the same caution as any other form of handloading; less powder does not mean less risk. All the recommendations in the preceding clauses should be observed.

c) There are additional precautions that need to be observed when downloading. Only attempt to download ammunition for full-bore firearms if you thoroughly understand the additional precautions necessary to ensure safety.

d) Select a combination of components for which you have reliable loading data (see sub-clauses 1 b) to e)).

e) Powders required for downloading are often different to the powder required for a normal handload. For example, a typical load for .308 WIN cartridges is 45 gr of VihtaVuori N140 with a 155 g full metal jacket bullet. To reduce the muzzle velocity and muzzle energy to within the limits for a typical indoor range would require reducing the load of N140 well below the starting load specified in handloading data tables. This is dangerous (see clause 11). Instead a different powder and bullet combination can be selected. In this example, 9 gr of Hi-Skor 700X could be used with a 120 gr cast lead bullet, which will generate muzzle velocity and muzzle energy within the safety limits for a typical indoor range.

f) Very light powder loads in large cases means that there is a lot of air space left inside the cases, which creates a number of potential hazards:-

   i. Powder may not ignite properly, which may cause a bullet to get stuck in the barrel. Always check to make sure that when the rifle is fired there is a bullet hole in the target. If you cannot see a bullet hole, check that the barrel is clear before firing the next shot.

   ii. There is room inside the case to put a double, or even a triple charge of powder, which could cause massive excess pressure on firing. Always visually check and, preferably, weigh cases before bullet seating to ensure there are no multiple powder charges.

   NOTE: cases may vary in weight quite considerably, therefore, it is preferable to weigh cases before and after loading with powder, particularly with very light loads of powder.

   iii. Powder may burn faster than normal in cases that are not filled with powder, which could cause excessive pressure. Check for signs of excessive pressure when shooting.

   iv. A standing pressure wave can be set up inside the case, which can cause peak pressure to rise several times above normal chamber pressure. Check for signs of excessive pressure when shooting.

g) Hang fires are more likely with download ammunition. If nothing happens when the trigger is pulled, or if only the primer fires but not the main charge, keep the firearm on aim and

wait at least 30 seconds before opening the bolt. If the primer has fired, check that the barrel is clear before firing the next shot.

h) If you see signs of excessive pressure, or if you get more than one hang fire, stop shooting immediately.

20 Other ways to reduce muzzle velocity and muzzle energy.

Larger calibre rifles can be fitted with barrel or chamber inserts that allow the use of smaller calibre ammunition. For example, Lee-Enfield rifles modified to shoot .22 LR for training purposes, or chamber inserts in .30 calibre bolt action rifles to allow .32 ACP ammunition to be fired. Such modifications are not considered to be downloading within the context of this Code of Practice.

Declaration

The following declaration must be signed prior to using handloaded, reloaded or downloaded ammunition on any NSRA range or on any range owned or operated by NSRA affiliated Clubs or Associations and covered by insurance provided through NSRA.

A copy of this declaration is to be retained by the range operator and made available for inspection in the event of any insurance claim.

I hereby confirm that I have read and understood the NSRA Code of Practice for Handloading Firearms Ammunition, and that I will abide by this Code of Practice.

Signature …… Date ……

Print name …… Membership No. ……