



## STEEL SHOT

### what you need to know from a safety point of view

Steel shot has had a chequered history and is still much maligned. Yet it is widely used in America and has been used successfully in Denmark for ten years with few of the problems the Danish hunters expected. It is the most developed alternative to lead and the least expensive. It suffers much bad press, prejudice and misinformation over its effectiveness and effects on guns. In truth it has much potential for many shooting situations but it does have to be used with extra care and it may not suit all guns or some types of shooting.

"Steel" shot is really soft iron. Its density is about 7.8g/cc (compared with around 11g/cc for lead shot) and it is much harder than lead - consequently it needs to be contained in a plastic wad to protect barrel walls from scratching or wear. Its lower density also requires some adjustments to be made to the choice of cartridge/pellet size for each type of shooting as low density shot (size for size) does not carry the same energy or for as long as lead shot.

Care is needed when shooting steel shot as it is more likely to ricochet than other shot types. Eye protection may be sensible.

As a result of its hardness and the necessary plastic wad, steel does have the *potential* to cause some choke expansion ("bulging") particularly in older, traditional lightweight guns. As a result the International Proof Commission (CIP) has produced rules for steel shot cartridges and their use. *They are somewhat complicated but it is essential to know them in order to minimise any risks.*

There are two main types of steel shot cartridges: Standard Steel and High Performance Steel, defined according to their service pressure, velocity etc., and their suitability for Standard and Steel Shot Proof guns.

The descriptions and limits are set out below:

Type	Chamber	Max Average Pressure (transducer)(bar)	Max velocity At 2.5m (m/s)/(ft/s)	Max Momentum (Ns)	Max shot Size (mm)
Standard	12-65 to 12-70	740	400 (1310)	12	3.25
High Performance	12-70	1050	430 (1410)	15	-
High Performance	12-73 and longer	1050	430 (1410)	17.5	-

#### Explanation:

- "Momentum" is velocity (in m/s) times load weight (in kg). So, a 32g load travelling at 400m/s (at 2.5m from muzzle) - i.e.  $0.032 \times 400$  - gives a momentum of 12.8Ns. This exceeds the Standard Steel Shot limit (12Ns) and so becomes High Performance Steel shot. A 30g load at the same speed would just meet the Standard Steel limit ( $0.030 \times 400 = 12.0$ ). Similarly, a heavier load could be used but its velocity would have to be lower to stay within the Standard Steel limit (eg 36g at 330m/s = 11.9Ns).

2. Standard Steel shot cannot be larger than 3.25mm i.e. English no.3.
3. There is no limit on shot size in High Performance Steel cartridges but if it is greater than 4.0mm (i.e. English BB or larger) then choke less than half must be used.
4. The critical rule is that *Standard Steel* cartridges can be fired through any gun proofed to the standard level (i.e. 850 bar (crusher) or 960 bar (transducer)) or magnum level (i.e. 1200 bar (crusher) or 1370 bar (transducer)) but *High Performance Steel can be fired only through guns that have passed the new Steel Shot Proof* (and stamped with "Steel Shot" and a Fleur de Lys 🦉 to prove it).
5. Note that if *any one* of the limits for Standard Steel is exceeded then that cartridge can be fired only through a Steel Shot Proof gun.
6. Note also that the limits on pressure, velocity and momentum for High Performance Steel cannot be exceeded.
7. CIP recommends choke generally no greater than half while the British Proof Authorities recommend no more than quarter choke for traditional lightweight game guns.
8. Steel Shot Proof guns can either be bought already proofed to the CIP level (eg some Remington and Beretta guns have been imported) or be guns that have passed the Steel Shot proof procedure at either London or Birmingham Proof House (note: guns *not* designed for High Performance Steel cartridges will not normally be accepted for the Steel Shot proof).
9. Cartridge boxes containing cartridges that exceed the Standard Steel limits must show clearly that they are High Performance Steel. If they do not then check with the gunshop/manufacturer/importer. It may be possible broadly to decide which type it is if the muzzle velocity is printed on the box with the load weight - use the formula above (para 1.) but beware that muzzle velocity is around 5% higher than the velocity at 2.5m.
10. Do not use steel shot in any Damascus or twist barrelled guns.
11. Homeloaded steel shot cartridges (a "Homeloading" information paper is available from the Research Department) should comply with these rules even though they are not intended for sale.
12. Note that not complying with these rules risks damage to shotguns. The risk is not in a gun "blowing up" or in scratched barrels (prevented by plastic wads) - but possible choke expansion ("bulging"). While this can be barely visible and does not affect performance or safety it may affect the gun's value in that if a gun requires re-proofing subsequently it would not be accepted for re-proofing with any bulge in the chokes.
13. Finally, these notes apply to steel shot in 12 bore guns. CIP has recently issued comparable regulations for 20 bore guns. Contact BASC for details.

**If in doubt about any gun consult a gunsmith and/or its maker/importer.**

For details on what steel shot is available and further advice on its use, see the BASC's "Lead Free Shot: the complete guide", or contact BASC's Research Department.