



## STEEL SHOT

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

There are two types of steel shot cartridges: Standard Steel and High Performance Steel (See table below for criteria). *Standard Steel* cartridges can be fired through any gun proved to the standard level (ie most "Nitro" proved guns, proved to at least 930 bar) and through any choke. **High Performance Steel cartridges should always be marked as such on the box and should only be fired through guns that have passed Steel Shot proof.** These guns should be proved to at least 1320 bar, be stamped with "Steel Shot" and a have a Fleur de Lys  proof mark to prove it). Most High Performance steel can be fired through any choke, but it is recommended not to use choke greater than a half for shot sizes BB (4.1mm) or larger.

As a result of its hardness and the typical plastic wad, steel does have the *potential* to cause some choke expansion ("bulging") particularly in older, traditional lightweight guns. Care is also needed when shooting steel shot as it can ricochet more than lead. Eye protection may be sensible.

The descriptions and limits are set out by the International Proof Commission (CIP) for 12 bore guns are:

Type	Chamber Length (mm)	Max Average Service Pressure (bar)	Max Velocity at 2.5m (m/s) / (ft/s)	Max Momentum (Ns)	Max Shot Diameter (mm)
Standard	65 to 70	740	425 (1395)	12	3.25
High Performance	70	1050	430 (1410)	13.5	-
High Performance	73 to 76	1050	430 (1410)	15	-
High Performance	89	1050	430 (1410)	19	-

"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 robust wad (usually plastic) 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. Therefore it is recommended to use steel shot at least two shot sizes larger than you would use in lead.

For details on what steel shot is available and further advice on its use, contact BASC's Scientific Adviser on tel no: 01244 573006 or by email: [Matt.Ellis@basc.org.uk](mailto:Matt.Ellis@basc.org.uk).

Notes:

1. "Momentum" is velocity (in m/s) multiplied by 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 velocity 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, but can be used through any choke. 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 should be used.
3. Note that if *any* of the limits for Standard Steel are exceeded then that cartridge becomes High Performance and should be fired only through a steel shot proved gun. Note also that the limits on pressure, velocity and momentum for High Performance Steel should not be exceeded.
4. For traditional lightweight game guns, CIP recommends choke generally no greater than half while the British Proof Authorities recommend no more than quarter choke.
5. Steel shot proved guns can either be bought already proved or be submitted for reproofing for steel shot. Guns *not* designed for High Performance Steel cartridges will not normally be accepted for the steel shot proof.
6. High Performance Steel cartridges (and boxes) should be clearly marked. If not, check. 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.).
7. Do not use steel shot in any Damascus or twist-barrelled guns.
8. Note that not complying with these rules risks damage to shotguns. Guns don't "blow up". Scratched barrels are normally prevented by robust wads but guns can suffer choke expansion ("bulging"). This is usually barely visible and does not affect performance or safety, but may prevent the gun being accepted for reproofing at a later date, and could affect its value. Note, also, that not complying with CIP rules could invalidate insurance claims.
9. Finally, these notes apply to steel shot in 12 bore guns. CIP has recently issued comparable regulations for 10 bore, 16 bore and 20 bore guns. Contact BASC for details on tel no. 01244 573006 or by email: [Matt.Ellis@basc.org.uk](mailto:Matt.Ellis@basc.org.uk).

**If in any doubt consult the gun's maker or BASC.**

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