INFORMATION SHEET

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. Standard Steel cartridges can be fired through any gun proved to the standard level ("Nitro" proved guns) and through any choke. The limits below are for standard performance steel, but 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.

Limits for Standard Performance Steel

Calibre	Maximum pellet diameter	Max Velocity at 2.5m (m/s) / (ft/s)	Max Momentum (Ns)
10	3.25	425 (1395)	12
16	3.00	390 (1280)	9.5
20	3.00	410 (1345)	9.3

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 stamped with "steel shot" and a have a Fleur-de-Lys proof mark to prove it. We cannot give advice on the suitability of guns without steel shot proof, regardless of service pressures. The maximum choke you can use with high performance steel varies with calibre and can be seen on the following page.

Steel shot does have the *potential* to cause some choke expansion ("bulging") particularly with heavy loads in older, traditional lightweight guns. Care is also needed when shooting steel shot as it can ricochet more than lead. However, an unsafe shot with steel would also be an unsafe shot with lead.

As a result of its hardness, steel shot has traditionally been contained in robust plastic wads which are not biodegradable and contribute to plastic pollution. Photodegradable or oxodegradable wads simply disintegrate in to microplastics, but truly biodegradable wads are now coming onto the market and we encourage you to use them.

"Steel" shot is really soft iron. Its density is about 7.8g/cc (compared with around 11g/cc for lead shot). Therefore it is recommended to use steel shot at least two shot sizes larger than you would use in lead. Due to the tighter patterns you get with steel you should not need to increase your load weight. However, we encourage all shooters to pattern their gun and practice with clays, regardless of the shot material they use.

The limits set out by the International Proof Commission (CIP) for High Performance Steel are below:

Limits for High Performance Steel

Calibre	Chamber Length (mm)	Max Velocity at 2.5m (m/s) / (ft/s)	Max Momentum (Ns)	Choke
10	89	440 (1445)	19	Choke half or less for shot >4mm
12	70	430 (1410)	13.5	Choke half or less for shot >4mm
12	73 to 76	430 (1410)	15	
12	89	430 (1410)	19	
16	70	420 (1375)	12	Choke half or less for shot >3.5mm
20	70	410 (1345)	11	Choke half or less for shot >3.25mm
20	76	430 (1410)	12	
28	70	400 (1310)	7	Choke half or less for shot >3mm
28	76	430 (1410)	8.5	
.410	76	400 (1310)	4.2	Choke half or less for shot >2.5mm

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. 0.032x400 – 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 (0.030x400=12.0). Similarly, a heavier load could be used but its velocity would have to be lower to stay within the Standard Steel limit (e.g. 36g at 330m/s = 11.9Ns).

2. The limits on pressure, velocity and momentum for High Performance Steel should not be exceeded.

3. For traditional lightweight game guns, the British Proof Authorities recommend no more than quarter choke and lighter loads (for example 21g for 12 bore).

4. Steel shot proved guns can either be bought already proved or be submitted for reproving for steel shot. Guns *not* designed for High Performance Steel cartridges will not normally be accepted for the steel shot proof.

5. 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 (note 1.).

6. 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 reproving at a later date, and could affect its value. Note also, that not complying with CIP rules could invalidate insurance claims.

7. Remember, cartridges loaded with bismuth and tungsten shot are also available. These cartridges cost more than comparable lead or steel loads but can be used in a wider variety of guns.

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

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Rec sec\publications\Steel Shot – what you need to know from a safety point of view
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