

Shot: status as an article

1. What is the function of the object? The basic principle determining the use? (Ref. §2.1, [ECHA Guidance on requirements for substances in articles](#))

Shot is used as the projectile inside shotgun cartridges. In the context of consumer activities, it is used for hunting (killing) small, fast game targets such as birds and for clay target (sports) shooting. The shot is the projectile which impacts the target, having been fired from the gun and ejected from the shell, or cartridge (itself an article).

Some consumers produce their own shotgun cartridges, by filling empty shells with purchased shot. In practical terms, shot cannot be – and is not – produced by consumers.

In some law enforcement settings, shot-firing weapons are useful in close-quarters combat.

2. How does shot perform?

The shotgun is fired: the powder behind the wadding in the shell ignites, propelling the shot forward and outwards from the end of the shell case.

Shotgun cartridges contain multiple shot pellets, which means each projectile is fairly low-energy; however, collectively there is significant stopping power at short-range. (The effective range depends on a number of factors but is usually less than 100 metres.)

3. What is effect of the shape and size – i.e. the design – of the object?

The **shape of shot** is essential for ballistic performance – each shot must be spherical in order to propel sufficiently and correctly to hit the target. The roundness ensures that the shot will not travel in an undesired, or unpredictable, direction once it leaves the shell case.

Shot which is not spherical cannot be used safely in shooting – it is rejected and may be re-melted by the shot producer.

Shot is traditionally produced using the Tower or Bleimeister methods: molten metal is dropped through a sieve – or turned into a spray by inert gas jets – high in a tower. As the metal falls it cools and solidifies; the free-fall motion ensures the shot is spherical by the time it reaches a fluidised-bed or water-bath for further, final cooling. Shot can also be produced by being punched from extruded wire.

In addition to the shape, the **size of shot** is also very important in regards to ballistics and kill performance. The consumer will purchase shot by size, considering the intended target (for example, what type (size) of game), the range, and the bore size of their gun.

For a target (game or clay) to be killed cleanly, it must be hit with enough pellets. The size of the quarry determines the **pattern density** necessary, which in turn affects the choice of shot size. A small target requires a denser pattern, i.e. there is a smaller target area for the number of pellet-hits required for a clean kill. Therefore, smaller shot (used in smaller-bore guns) – which gives denser patterns – is used for smaller targets.

Larger quarry does not need such a dense pattern, but the shot must be heavier to effect a clean kill. Therefore, larger shot is usually used for larger targets. Large-bore guns allow heavy loading – i.e. larger shot in higher numbers – to maintain the pattern density of pellets with adequate energy to help ensure a clean kill on such quarry.

Larger shots, having more inertia, have longer effective **ranges** – they hold their velocity and retain enough energy for quick kills on distant, larger quarry. Smaller shot sizes are preferred for shorter range shooting.

4. Is the chemical composition more important than the shape and size?

No. Shot can be – and is – produced from a range of metals, including steel, bismuth, lead, copper, tin, zinc, and tungsten alloy.

5. Deciding whether an object is an article or not: §2.4

Considering the flow chart on Page 13 of the latest [ECHA Guidance on requirements for substances in articles](#):

Step 1: the function is identified in Point 1 above.

Step 2: the shape and size of the shot more relevant to the function than the chemical composition – other chemistries can be – and are – used, and the shape and size are critical for ballistic performance.

Therefore, lead shot is unambiguously an article.

If, however, it was thought that it is not possible to unambiguously conclude yes or no to the question in Step 2 of the workflow, we might then consider Step 6, as the object (shot) does not itself contain a substance/mixture which can be separated from that object:

Question 6a: Does the object have a function other than being further processed?

Yes. Although the shot is further processed in that it is added mechanically to empty cartridges to produce ammunition, the subsequent end-use of the shot inside the ammunition is in game hunting and clay target shooting. The shot is not formulated nor melted or otherwise processed.

Question 6b: Does the seller place the object on the market and/or is the customer mainly interested in acquiring the object because of its shape/surface/design (and less because of its chemical composition)?

Yes – the consumer will buy shot according to size and shape – the size is important in consideration of the size of the target, the range, and the gun to be used. In addition, the consumer would not buy misshapen, non-spherical shot.

It is noted that the consumer may look for a particular material, a decision which is based on cost but also some aspects of performance.

Question 6c: When further processed, does the object undergo only “light processing”, i.e. no gross changes in shape?

Yes – the shot is not changed in shape, it is simply added into a cartridge with other components such as wadding and powder, to produce shotgun ammunition.

Question 6d: When further processed, does the chemical composition of the object remain the same?

Yes – there is no change to the chemical composition of the shot during this mechanical handling.

Conclusion: the object (shot) is an article, as indicated by predominantly answering ‘yes’ to these questions.