



Designation: F 589 – 85

AMERICAN SOCIETY FOR TESTING AND MATERIALS
1916 Race St., Philadelphia, Pa. 19103
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Standard Consumer Safety Specification for NON-POWDER GUNS¹

This standard is issued under the fixed designation F 589; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

This consumer safety specification is intended to address the primary causes of injuries involving non-powder guns and projectiles. Information concerning these injuries was obtained from data collected by the Consumer Product Safety Commission, hereinafter referred to as the Commission, consumer sounding boards, and the manufacturers' knowledge of the product and experience with consumer injuries.

A detailed analysis of the 101 in-depth investigations conducted by the Commission reveals that in 92 % of the accidents, the product operated as it was intended. Most injuries were caused by carelessness or intentional shooting. Some injuries resulted from children who were too young to realize the inherent hazards of non-powder guns, who had their parents' approval but were unsupervised. Meetings with consumer sounding boards indicated a need for the consumer to understand the power of the various non-powder guns and the seriousness of non-powder gun injuries.

To perform as intended, a non-powder gun requires a level of power which, if misused, can cause serious injury. This consumer safety specification is intended to reduce the hazards associated with non-powder gun use. This specification cannot control careless use or eliminate all hazards of misuse, but does provide for warnings of specific hazards and instructions for proper handling, use, and storage. Terminology is standardized in this specification, so that conforming products will be identified in the same manner, and critical dimensions are standardized to assure safe interchangeability of projectiles and propellants in all conforming non-powder guns. Product performance hazards are identified and requirements are established to minimize these hazards.

This consumer safety specification is written within the current state-of-the-art of non-powder gun technology. The intent is to revise this consumer safety specification whenever substantive information becomes available which justifies revising existing requirements or adding new requirements.

1. Scope

1.1 This consumer safety specification covers non-powder guns, commonly referred to as BB guns, air guns, and pellet guns, which propel a projectile by means of energy released by compressed air, compressed gas, mechanical spring action, or a combination thereof, and is to be used in conjunction with Specification F 590.

1.2 Special-purpose match precision and adult guns, as classified in 5.1 and 5.2, are exempt from the performance requirements

¹ This specification is under the jurisdiction of ASTM Committee F-15 on Consumer Products and is the direct responsibility of Subcommittee F15.06 on Safety Standards for Non-Powder Guns.

Current edition approved June 28, 1985. Published August 1985.



for trigger mechanisms (see 8.3), safety mechanisms (see 8.4), and drop tests (see 8.5).

1.3 Special-purpose training guns, as classified in 5.3, are exempt from the performance requirements for the safety mechanism (see 8.4).

1.4 *Limitations*—This consumer safety specification does not cover the following categories of gun products: custom-made non-powder guns (see 6.2.6); or replica guns (see 6.2.15); tranquilizer dart guns; toy products such as rubber-band guns, cork guns, pop guns, rubber-tip dart guns, or pea and bean shooters; other recreational-type guns such as blow guns, spear guns, catapult guns (also identified as sling shots), bows, crossbows, or carbide guns; nonrecreational guns such as those used by law enforcement, scientific, or military agencies; nor industrial and consumer tools such as paint-ball guns, staple guns, or conduit guns.

1.5 The values stated in inch-pound units are to be regarded as the standard; the SI units in parentheses are provided for information only.

1.6 The following precautionary caveat pertains only to the test method portion, Section 9, of this specification: *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Applicable Documents

2.1 ASTM Standard:

F 590 Specification for Non-Powder Gun Projectiles and Propellants²

3. Use and Significance

3.1 This consumer safety specification establishes performance requirements and test methods intended to provide a reasonable degree of safety in the normal use of non-powder guns and projectiles.

3.2 This consumer safety specification attempts to address the misuse of non-powder guns and specifies the minimum warnings and instructions that are to be provided in literature and on labels and packages.

4. Conformance

4.1 Non-powder guns shall not, either by

label or other means, indicate conformance with this consumer safety specification unless they conform with the applicable requirements contained herein.

4.2 Any statement or symbol on the gun, package, or literature that is used to indicate that a special-purpose non-powder gun conforms with this consumer safety specification shall, where applicable, also specify the exemptions that are specifically provided for herein.

5. Classification of Special-Purpose Non-Powder guns (See Table 1)

5.1 Match Precision Guns:

5.1.1 *Rifle*—To be classified as a match precision rifle, a non-powder gun shall be capable of firing a five-shot group such that the centers of all five shots fall within a 0.30-in. (7.6-mm) circle. The target shall be fired at a distance of 32.8 ft (10 m). These results can be obtained by shooting offhand or by using a bench rest or mechanical rest and may be evidenced by serial-numbered factory test target, fired in accordance with this specification.

5.1.2 *Hand Gun*—To be classified as a match precision hand gun, a non-powder gun shall be capable of firing a five-shot group such that the centers of all five shots fall within a 0.40-in. (10.2-mm) circle. The target shall be fired at a distance of 32.8 ft (10 m). These results can be obtained by shooting offhand or by using a bench rest or mechanical rest and may be evidenced by serial-numbered test targets, fired in accordance with this specification.

5.2 Adult Guns:

5.2.1 *Rifle*—To be classified as an adult rifle, a non-powder gun shall meet the following criteria:

5.2.1.1 is a single-shot gun,

5.2.1.2 is capable of attaining a muzzle velocity of 550 ft/s (167.6 m/s) when firing projectiles 0.177 cal (4.5 mm) or smaller or 400 ft/s (121.9 m/s) when firing projectiles larger than 0.177 cal,

5.2.1.3 has a rifled barrel,

5.2.1.4 has a minimum overall length of 36 in. (916 mm),

5.2.1.5 has a minimum weight of 5.3 lb (2.4 kg),

² Annual Book of ASTM Standards, Vol 15.07.



5.2.1.6 has a rear sight adjustable for windage and elevation or has a receiver designed to mount an adjustable rear sight,

5.2.1.7 has a hooded front sight or is designed for telescopic sight use, and

5.2.1.8 has an adjustable or two-stage trigger.

5.2.2 *Hand Gun*—To be classified as an adult hand gun, a non-powder gun shall meet the following criteria:

5.2.2.1 is capable of attaining a muzzle velocity of 320 ft/s (97.6 m/s) when firing projectiles 0.177 cal (4.5 mm) or smaller or 280 ft/s (85.3 m/s) when firing a projectile larger than 0.177 cal,

5.2.2.2 has a rifled barrel,

5.2.2.3 has a minimum overall barrel length of 6 in. (152 mm),

5.2.2.4 has a minimum weight of 1.75 lb (0.8 kg),

5.2.2.5 has a rear sight adjustable for windage and elevation,

5.2.2.6 has a front sight, and

5.2.2.7 has an adjustable or two-stage trigger.

5.3 *Training Guns*—Training guns are special-purpose guns intended for use in organized educational shooting programs. Training guns are distributed through restricted programs under which they are made available only to clubs and organizations for use in their non-powder gun training programs.

6. Description of Terms Specific to This Standard

6.1 *Propellant System Terms*:

6.1.1 *spring-type*—a propulsion system in which the projectile is placed into motion by direct contact with a spring or a carrier moved directly by a spring.

6.1.2 *spring-piston* (also known as a spring-air or adiabatic system)—a propulsion system in which the projectile is propelled by air pressure that is created by a piston moved by a spring.

6.1.3 *pneumatic*—a propulsion system in which compressed air is stored under pressure and, when released, provides the energy to propel the projectile. A pneumatic gun normally has a pump system to provide the compressed air.

6.1.4 *CO₂ (carbon dioxide)*—a propulsion system in which the energy is provided by

CO₂ (carbon dioxide) usually stored in a removable cylinder. The release of the CO₂ gas provides the energy to propel the projectile.

6.1.5 *combination system*—a propulsion system in which a combination of spring, spring-piston, pneumatic, and CO₂ systems can be used to provide the energy to propel the projectile.

6.2 *Non-Powder Gun Terms*:

6.2.1 *adult gun*—a non-powder gun that meets the design characteristics of 5.2.

6.2.2 *antique air gun*—a non-powder gun that is more than 50 years of age.

6.2.3 *backstop*—an object intended to stop a projectile.

6.2.4 *barrel*—that portion of a non-powder gun through which the projectile is discharged.

6.2.5 *cocking mechanism*—a device that allows the user to store manual energy.

6.2.6 *custom gun*—a non-powder gun designed or made to the specifications of an individual consumer.

6.2.7 *feed mechanism*—a mechanism that stores, transports, and loads projectiles. It may be manual, repeater, or automatic in its actions.

6.2.8 *hammer*—a device which, when released, discharges the stored energy.

6.2.9 *magazine*—a device used in a gun to store projectiles.

6.2.10 *non-powder gun*—a device specifically designed to discharge BB's, pellets, or darts by the release of energy stored by compressed air, compressed CO₂, mechanical springs, or a combination thereof.

6.2.11 *piercing assembly* (CO₂ gun)—a device that is used to release gas from the CO₂ cylinder after the CO₂ cylinder has been correctly positioned in the gun.

6.2.12 *pumping mechanism* (pneumatic gun)—a mechanical device used to compress air.

6.2.13 *match precision gun*—a non-powder gun that meets the performance characteristics in 5.1.

6.2.14 *receiver*—the main body of a rifle, shoulder gun, or long gun that houses all or most of its operating mechanisms.

6.2.15 *replica gun*—a functional non-powder gun manufactured to duplicate an antique non-powder gun.



6.2.16 *ricochet*—rebound or deflection of a projectile from a surface.

6.2.17 *safety, automatic*—a safety mechanism that is activated when the cocking mechanism is operated in a normal manner and must be manually deactivated by an independent action of the shooter to allow the gun to be fired by the movement of the trigger.

6.2.18 *safety, manual*—a safety mechanism that must be activated by an independent and deliberate action of the shooter and must be similarly released to allow the gun to be fired by the movement of the trigger.

6.2.19 *safety mechanism*—a device which, when activated either automatically or manually, locks a part of the non-powder gun, usually the trigger, to prevent unintentional firing in normal use. The device is sometimes referred to as a safety, safety button, or safety lever.

6.2.20 *sear*—the catch that holds the mechanism in the ready-to-fire position until released by the user, through trigger movement.

6.2.21 *shot-start force*—the force that is required to insert a non-powder gun projectile into a cavity of standard size for a given caliber.

6.2.22 *single-shot gun*—a gun that requires individual manual loading for each shot.

6.2.23 *striker*—see *hammer*.

6.2.24 *target*—the object at which the projectile is discharged.

6.2.25 *training gun*—a non-powder gun that meets the requirements in 5.3.

6.2.26 *trigger*—a device operated by the user to fire a gun.

6.2.27 *trigger, adjustable*—a trigger mechanism in which the trigger pull is adjustable.

6.2.28 *trigger, double-action*—a trigger mechanism in which a single continuous action of the trigger moves the hammer to the firing position and then releases it to discharge the projectile.

6.2.29 *trigger guard*—a rigid component of a non-powder gun that, together with the receiver frame or stock, completely encircles the trigger.

6.2.30 *trigger pull*—the force required to move the trigger from its fully engaged position to a position that fires the gun.

6.2.31 *trigger, single-action*—a trigger mechanism in which the hammer must be manually cocked for each shot.

6.2.32 *trigger, two-stage*—a trigger mechanism

in which the first stage movement allows the trigger to be moved with minimum force until it encounters a resistance. The second stage requires an increased force to cause disengagement and firing of gun.

6.2.33 *valve*—a device used to release CO₂ or air from a storage chamber into the barrel during a firing cycle.

7. General Requirements

7.1 *Literature*—Literature shall be provided with each non-powder gun and shall include, as applicable, the instructions and cautionary statements specified in Section 10.

7.1.1 *Muzzle Velocity*—The muzzle velocity of the projectile of the non-powder gun shall be included in the muzzle velocity statement (10.4.1.4) and shall be determined in accordance with 9.7.

7.1.2 *Maximum Distance*—The maximum distance shall be included in the distance statement (10.4.1.4) and shall be determined in accordance with 9.8.

7.2 *Packaging*—Packaging shall be labeled in a prominent and conspicuous manner in accordance with the provisions of Section 10.

7.3 *Finish*—The exposed metal and plastic edges of all non-powder guns shall be smooth and free of sharp edges and burrs. The exposed surface of all wood parts shall be smooth and free of splinters.

7.4 *Shipping*:

7.4.1 Each non-powder gun shall be shipped in an unloaded, uncharged, and uncocked condition.

7.4.2 All non-powder guns with adjustable triggers shall have their triggers adjusted to fire at more than 2 lbf (8.9 N) and less than 16 lbf (71.2 N) at the time of shipment by the manufacturer.

7.5 All non-powder guns with an exposed, mechanical trigger shall have a trigger guard equal to or greater in width than the trigger.

8. Performance Requirements

8.1 *Gun Function*—The cocking or pumping mechanism of a non-powder gun shall not cause a gun to discharge unintentionally while the gun is being cocked in accordance with the manufacturer's instructions. The feed mechanism of a non-powder gun shall not cause unintentional discharge of a projectile when a gun is used in accordance with the