.45 ACP

.45 ACP



.45 ACP cartridg	ges full metal jacket (left) and hol	low-point (right), with a ruler for	comparison.						
Туре	Pistol								
Place of origin	United States of America								
Service history									
Used by	United States and others								
Wars	World War I-present								
Production history									
Designer	John Browning								
Designed	1904 [1]								
Variants	.45 ACP +P, .45 Auto Rim, .45 HP, .45 Super, .450 SMC .460 Rowland, .45 GAP, .45 Winchester Magnum								
Specifications									
Case type	Rimless, straight	Rimless, straight							
Bullet diameter	.452 in (11.5 mm)								
Neck diameter	.473 in (12.0 mm)								
Base diameter	.476 in (12.1 mm)								
Rim diameter	.480 in (12.2 mm)								
Case length	.898 in (22.8 mm)								
Overall length	1.275 in (32.4 mm)								
Case capacity	25 gr H ₂ O (1.6 cm ³)								
Rifling twist	1 in 16 in (406 mm)								
Primer type	Large pistol								
Maximum pressure	21,000 psi (140 MPa)								
Ballistic performance									
Bullet weight/type	Velocity	Energy							
185 gr (12 g) Bonded Defense	1,225 ft/s (373 m/s)	616 ft·lb:	f (835 J)						

185 gr (12 g) Speer Gold Dot JHP	1,050 ft/s (320 m/s)	453 ft·lbf (614 J)		
200 gr (13 g) Speer Gold Dot JHP +P	1,080 ft/s (330 m/s)	518 ft·lbf (702 J)		
230 gr (15 g) Federal Hydra-Shok	900 ft/s (270 m/s)	414 ft·lbf (561 J)		
230 gr (15 g) US Army Ball FMJ	830 ft/s (250 m/s)	352 ft·lbf (477 J)		
	Test barrel length: 5 in			

The .45 ACP (11.43×23mm) (Automatic Colt Pistol), also known as the .45 Auto by C.I.P. or 45 Auto by SAAMI, is a cartridge designed by John Browning in 1904, for use in his prototype Colt semi-automatic .45 pistol and eventually the M1911 pistol adopted by the United States Army in 1911.

Design and history

The U.S. Cavalry had been buying and testing various handguns in the late 1890s and early 20th century. The .45 Colt Single Action Army (SAA) had largely been replaced, even by some double action versions of the same. The Cavalry had fielded some double action revolvers in .38 Long Colt. They determined the .38 caliber round was significantly less effective against determined opponents, such as the warriors encountered in the Moro Rebellion of the Philippine—American War, than the .45 Colt. The current issue rifle at the time, the .30-40 Krag, had also failed to stop Moro warriors effectively;^[2] the British had similar issues switching to the .303 British, which resulted in the development of the *dum-dum* bullet. This experience, and the Thompson-LaGarde Tests of 1904 led the Army and the Cavalry to decide a minimum of .45 caliber was required in the new handgun. Thompson and Major Louis Anatole LaGarde of the Medical Corps arranged tests on cadavers and animal remains in the Chicago stockyards, resulting in the finding that .45 was the most effective pistol cartridge. They noted, however, training was critical to make sure a soldier could score a hit in a vulnerable part of the body.

Colt had been working with Browning on a .41 caliber cartridge in 1904, and in 1905 when the Cavalry asked for a .45 caliber equivalent Colt modified the pistol design to fire an enlarged version of the prototype .41 round. The result from Colt was the Model 1905 and the new .45 ACP cartridge. The original round that passed the testing fired a 200 grain (13 g) bullet at 900 ft/s (275 m/s), but after a number of rounds of revisions between Winchester Repeating Arms, Frankford Arsenal, and Union Metallic Cartridge, it ended up using a 230 grain (15 g) bullet fired at about 850 ft/s (260 m/s). The resulting .45-caliber cartridge, named the .45 ACP, was similar in performance to the .45 Schofield cartridge, and only slightly less powerful (but significantly shorter) than the .45 Colt cartridges the Cavalry was using.

By 1906, bids from six makers were submitted, among them Browning's design, submitted by Colt. Only DWM, Savage, and Colt made the first cut. DWM, which submitted two Parabellum P08s chambered in .45 ACP, withdrew from testing after the first round of tests, for unspecified reasons.^[3] One of the DWM pistols, serial number 1, was destroyed in testing; the remaining example, serial number 2, is one of the most desirable collectors' handguns in existence.^[4]

In the second round of evaluations in 1910, the Colt design passed the extensive testing with no failures, while the Savage design suffered 37 stoppages or parts failures.^[3] The resulting weapon was adopted as the Model 1911.

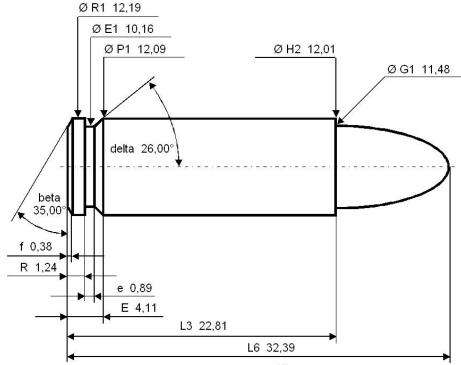
The cartridge/pistol combination was quite successful but not satisfactory for U.S. military purposes. Over the next few years a series of improved designs were offered, culminating in the adoption in 1911 of the "Cal. .45 Automatic Pistol Ball Cartridge, Model of 1911", a 1.273 in (32.3 mm)-long round with a bullet weight of 230 grains. The very first production, at Frankford Arsenal, was marked "F A 8 11", for the August 1911 date.

The cartridge was designed by John Browning of Colt, but the most influential person in selecting the cartridge was Army Ordnance member Gen. John T. Thompson. Thompson insisted on a real "man stopper" pistol, following the poor showing of the Army's .38 Long Colt pistols during the Philippine-American War (1899–1902).

Cartridge dimensions

(Diagram not to scale)

The .45 ACP has 1.62 ml (25 grains H₂O) cartridge case capacity.



.45 ACP maximum C.I.P. cartridge dimensions. [5] All sizes in millimeters (mm).

The common rifling twist rate for this cartridge is 406mm (1 in 16 in), 6 grooves, \emptyset lands = 11.23mm, \emptyset grooves = 11.43mm, land width = 3.73mm and the primer type is large pistol. The cartridge headspaces on the mouth of the case at the L3 datum reference. [6]

According to the official Commission Internationale Permanente pour l'Epreuve des Armes à Feu Portatives guidelines the .45 ACP case can handle up to 130 MPa (19,000 psi) piezo pressure. In C.I.P. regulated countries every pistol cartridge combo has to be proofed at 130% of this maximum C.I.P. pressure to certify for sale to consumers. The SAAMI pressure limit for the .45 ACP is set at 21,000 psi (140 MPa), piezo pressure, [7] while the SAAMI pressure limit for the .45 ACP +P is set at 23,000 psi (160 MPa), piezo pressure.

Performance

The .45 ACP is an effective combat pistol cartridge that combines accuracy and stopping power for use against human targets. The cartridge also has relatively low muzzle blast and flash, as well as moderate recoil. The .45 ACP also operates at a relatively low maximum chamber pressure rating of 21,000 psi (145 MPa) (compared to 35,000 psi/240 MPa for 9mm Parabellum and .40 S&W, 37,500 psi/260 MPa for 10mm Auto, 40,000 psi/280 MPa for .357 SIG), which due to a low bolt thrust helps extend service life of weapons in which it is fired.

Like many pistol cartridges, it is a low-velocity round, and thus ineffective against body armor. Another drawback for large scale military operations is the cartridge's large size, weight, and the increased material cost of manufacture compared to the smaller 9×19mm Parabellum cartridge.

Even in its non-expanding full metal jacket (FMJ) version, the .45 ACP cartridge has a reputation for effectiveness against human targets because its large diameter creates a deep and substantial permanent wound channel which lowers blood pressure more rapidly. The wounding potential of bullets is often characterized in terms of a bullet's expanded diameter, penetration depth, and energy. Bullet energy for .45 ACP loads varies from roughly 350 to 500 ft·lbf (470 to 680 J). ATOMIC Ammunition produces a new load that pushes a 185 grain copper bonded hollow

point bullet to 1225 feet per second and achieves over 616 foot pounds of energy. This load safely conforms to SAAMI specifications for 45 ACP+P and outperforms certain 10mm and 357 Magnum loads by other manufacturers. [citation needed]

The table below shows common performance parameters for several .45 ACP loads. Bullet weights ranging from 185 to 230 grains are common, and bullets as light as 125 grains exist, as well as a 255 grain hardcast made by Buffalo Bore. Penetration depths from 11 inches to over 27 inches are available for various applications and risk assessments.

Manufacturer	Load	Mass	Velocity	Energy	Expansion ^[9]	Penetration ^[9]	PC ^[9]	TSC ^[9]
ATOMIC	Bonded Match	15 g	300 m/s	690 J	21 mm	410 mm	0 mL (0 cu in)	0 mL
AMMUNITION	Hollow Point	(230 gr)	(1,000 ft/s)	(510 ft·lb)	(0.82 in)	(16.0 in)		(0 cu in)
Federal	HydraShok JHP	15 g	260 m/s	500 J	20 mm	300 mm	93.9 mL	465 mL
		(230 gr)	(850 ft/s)	(369 ft·lb)	(0.78 in)	(12.0 in)	(5.73 cu in)	(28.4 cu in)
Remington	Golden Saber	15 g	267 m/s	530 J	19 mm	360 mm	103.6 mL	416 mL
	JHP	(230 gr)	(875 ft/s)	(391 ft·lb)	(0.75 in)	(14.3 in)	(6.32 cu in)	(25.4 cu in)
ATOMIC	Bonded Match	12.0 g	373 m/s	835 J	21 mm	410 mm	0 mL (0 cu in)	0 mL
Ammunition	Hollow Point	(185 gr)	(1,225 ft/s)	(616 ft·lb)	(0.82 in)	(16.0 in)		(0 cu in)
Cor-Bon	JHP	12.0 g	350 m/s	738 J	18 mm	290 mm	71.3 mL	469 mL
		(185 gr)	(1,150 ft/s)	(544 ft·lb)	(0.7 in)	(11.3 in)	(4.35 cu in)	(28.6 cu in)
Winchester	Silvertip JHP	12.0 g	300 m/s	557 J	20 mm	300 mm	96.4 mL	495 mL
		(185 gr)	(1,000 ft/s)	(411 ft·lb)	(0.79 in)	(12.0 in)	(5.88 cu in)	(30.2 cu in)
Winchester	Ranger SXT	15 g	270 m/s	561 J	20 mm	330 mm (13 in)	101.8 mL	416 mL
		(230 gr)	(900 ft/s)	(414 ft·lb)	(0.78 in)		(6.21 cu in)	(25.4 cu in)
Remington	FMJ	15 g	255 m/s	483 J	11 mm	690 mm (27 in)	70.3 mL	150 mL
		(230 gr)	(835 ft/s)	(356 ft·lb)	(0.45 in)		(4.29 cu in)	(9 cu in)

Key:

Expansion: expanded bullet diameter (ballistic gelatin).

Penetration: penetration depth (ballistic gelatin).

PC: permanent cavity volume (ballistic gelatin, FBI method).

TSC: temporary stretch cavity volume (ballistic gelatin).

(gr for grains, and g for grams)

The .45 ACP's combination of stopping power and controlled penetration makes it practical for police use, although numerous issues, including the resulting decrease in magazine capacity and the larger size and weight of pistols chambered in this caliber, have led more police departments in the USA to adopt sidearms in 9×19mm, .40 S&W, and .357 SIG. With standard (not extended) single-stack magazines, pistols chambered in .45 ACP usually hold 8 rounds or less (an exception to this is the .45 ACP version of the Smith & Wesson SW99, which holds 9). However, many modern versions of .45 ACP handguns have double-stack magazines capable of holding as many as 14 cartridges, such as the HS2000, and the FN FNP-45 Competition (standard barrel) and Tactical (threaded barrel) both hold 15, though this greatly increases the pistol's bulk and with that lowers maneuverability. []

Many US tactical police units still use the .45 pistol round, including the FBI's Hostage Rescue Team. While high capacity firearms are available in .45 ACP, the greater length and diameter of the .45 ACP means that the grip of the pistol must be longer and wider than the grip of a comparable pistol of a smaller caliber; this increase in grip size can make the pistol difficult to use for shooters with smaller hands.

Today, most NATO militaries use sidearms chambered for the 9×19mm Parabellum cartridge, but the effectiveness of the .45 ACP cartridge has ensured its continued popularity with large caliber sport shooters, especially in the United States. In addition, select military and police units around the world still use firearms firing the .45 ACP. In 1985, the .45 ACP M1911A1 pistol was replaced by the Beretta M9 9mm pistol as the main sidearm of the U.S. military, although select Special Operations units continue to use the M1911A1 or other .45 ACP pistols.

Because standard pressure and load .45 ACP rounds fired from handguns or short barreled submachine guns are inherently subsonic, it is one of the most powerful pistol calibers available for use in suppressed weapons since subsonic rounds are quieter than supersonic rounds. The latter inevitably produce a highly compressed shock wave, audible as a loud "crack", literally a small sonic boom, while they travel through the air. Suppressors reduce the audible "report" by slowing and channeling the high speed gas generated by the burning/expanding gunpowder before it exits the muzzle resulting in a



.45 ACP hollowpoint (Federal HST) with two .22LR cartridges for comparison



Side on view of Sellier & Bellot .45 ACP cartridge with a metric ruler for scale

muffled "cough". Suppressors cannot act on a supersonic shock wave continuously generated by a bullet exceeding the 1,100 ft/s (340 m/s) speed of sound, as this shock wave is continuously produced throughout the entire flight path over which the bullet is supersonic, which extends long after it exits the barrel. The downside to the use of .45 ACP in suppressed weapons is that increasing the diameter of the passage through a suppressor decreases the suppressor's efficiency; thus, while .45 ACP is among the most powerful suppressed pistol rounds, it is also one of the loudest. Most .45 suppressors must be fired "wet" (with an ablative medium, usually water) to bring sound levels down to "hearing-safe" (under 140 dB, generally). [11]

Load variants

Several manufacturers market preloaded .45 ACP rounds in sizes ranging from 117 to 250 grains (8 g to 16 g), with the most popular commercial load being the standard military loading of a 230-grain (15 g) FMJ bullet at around 850 ft/s (259 m/s). Specialty rounds are available in weights under 100 grains (6.5 g) and over 260 grains (16.8 g); popular rounds among reloaders and target shooters include 185-grain and 230-grain (12 g and 15 g) bullets. Hollow-point rounds intended for maximum effectiveness against live targets are designed to expand upon impact with soft tissue, increasing the size of the permanent cavity left by the bullet as it passes through the target.

Tracer ammunition for the .45 ACP was manufactured by Frankford Arsenal and by Remington Arms. This ammunition was available to the United States Border Patrol as early as 1940 and was used through World War II for emergency signalling by downed United States Navy and Marine Corps air crew. Tracer ammunition was identified by painting the bullet tip red. [12]

Most ammunition manufacturers also market what are termed "+P" (pronounced "plus P") loadings in pistol ammunition, including the .45 ACP. This means the cartridge is loaded to a higher maximum *pressure* level than the original SAAMI cartridge standard, generating higher velocity and more muzzle energy. In the case of the .45 ACP, the standard cartridge pressure is 21,000 PSI and the SAAMI .45 ACP +P standard is 23,000 PSI. This is a common practice for updating older cartridges to match the better quality of materials and workmanship in modern firearms. []



Base of Sellier & Bellot .45 ACP cartridge, showing lacquered primer



Several .45ACP variants: Hollow Point, FMJ, WW2 Era Military Issue Birdshot

The terminology is generally given as ".45 ACP +P", and appears on

the headstamp. It is important to note that +P cartridges have the same external dimensions as the standard-pressure cartridges and will chamber and fire in all firearms designed for the standard-pressure loadings. However, It should be noted that the inner dimensions of the +P cartridge are different than the standard-pressure cartridge dimensions and thus allows for higher pressures to be safely achieved in the +P cartridge. If +P loadings are used in firearms not specifically designed for them they may cause damage to the weapon and injuries to the operator.

Popular derivative versions of the .45 ACP are the .45 Super and .460 Rowland. The Super is dimensionally identical to the .45 ACP, however, the cartridge carries a developer established pressure of 28,500 PSI and requires minor modification of quality firearms for use. The Rowland case is 0.057" longer specifically to prevent it from being chambered in standard .45 ACP firearms. The Rowland operates at a developer established 40,000 c.u.p. and may only be used within a select group of firearms significantly modified for this purpose. Brass cases for each of these cartridges carry the applicable name within the headstamp. The Super provides approximately 20% greater velocity than the .45 ACP +P; the Rowland approximately 40% greater velocity than the .45 ACP +P.

Timeline

- 1899/1900: Self-loading pistols test: Colt M1900 of .38 caliber entered.
- 1904: Thompson-LaGarde Tests—caliber of new handgun should be at least .45.
- 1906–1907: Handgun trials—Colt enters with .45 ACP design.
- 1910: Final tests—Colt pistol (designed by John Browning) out-performs Savage.
- March 29, 1911: The Colt pistol is officially adopted as the Model 1911—and with it, the .45 ACP cartridge.

Synonyms

- .45 Auto
- 45 Automatic
- 45 Auto
- 11.43×23mm

Related rounds

- .38/.45 Clerke
- .400 Corbon
- .45 G.A.P.
- .45 Winchester Magnum
- .45 Peters-Thompson shot cartridge^[13]
- .50 GI
- .45 Auto Rim

References

- [2] 1911 History (http://www.sightm1911.com/1911 History.htm)
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- [12] Andrews, Dave 45 ACP Tracers on page 20 of February 2002 American Rifleman magazine
- $[13] \ (http://www.saf.org/LawReviews/PSharpe1.html)$
- Massad Ayoob's 2003 article on the approaching 100th anniversary of the .45 ACP (http://www.findarticles.com/p/articles/mi_m0BQY/is_10_49/ai_107488554)

External links

- .45 ACP Videos (http://stoppingpower.info/index.php/.45)
- Ballistics By The Inch .45ACP results. (http://www.ballisticsbytheinch.com/45auto.html)
- SAAMI Specification (http://www.saami.org/PubResources/CC_Drawings/Pistol/45 Automatic.pdf)

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