

# .223 Remington

## .223 Remington



A variety of .223 Remington cartridges and a .308 Winchester (right) for comparison. Bullets in .223 cartridges (left to right): Montana Gold 55 grain Full Metal Jacket, Sierra 55 grain Spitzer Boat Tail, Nosler/Winchester 55 grain Combined Technology, Hornady 60 grain V-MAX, Barnes 62 grain Tipped Triple-Shock X, Nosler 69 grain Hollow Point Boat Tail, Swift 75 grain Scirocco II.

<b>Type</b>	Rifle/varmint		
<b>Place of origin</b>	United States		
<b>Production history</b>			
<b>Designer</b>	Remington Arms		
<b>Designed</b>	1964		
<b>Variants</b>	.223 Ackley Improved, 5.56×45mm NATO		
<b>Specifications</b>			
<b>Parent case</b>	.222 Remington		
<b>Case type</b>	Rimless, bottleneck		
<b>Bullet diameter</b>	.224 in (5.7 mm)		
<b>Neck diameter</b>	.253 in (6.4 mm)		
<b>Shoulder diameter</b>	.354 in (9.0 mm)		
<b>Base diameter</b>	.376 in (9.6 mm)		
<b>Rim diameter</b>	.378 in (9.6 mm)		
<b>Rim thickness</b>	.045 in (1.1 mm)		
<b>Case length</b>	1.76 in (45 mm)		
<b>Overall length</b>	2.26 in (57 mm)		
<b>Rifling twist</b>	1 in 12 inch (military style rifles use 1:7 to 1:10 to stabilize longer bullets)		
<b>Primer type</b>	Small rifle		
<b>Maximum pressure</b>	55,000 psi (380 MPa)		
<b>Ballistic performance</b>			
<b>Bullet weight/type</b>	<b>Velocity</b>	<b>Energy</b>	
36 gr (2 g) JHP	3,750 ft/s (1,140 m/s)	1,124 ft·lbf (1,524 J)	
55 gr (4 g) Nosler ballistic tip	3,240 ft/s (990 m/s)	1,282 ft·lbf (1,738 J)	
60 gr (4 g) Nosler partition	3,160 ft/s (960 m/s)	1,330 ft·lbf (1,800 J)	
69 gr (4 g) BTHP	2,950 ft/s (900 m/s)	1,333 ft·lbf (1,807 J)	

77 gr (5 g) BTHP	2,750 ft/s (840 m/s)	1,293 ft·lbf (1,753 J)
<i>Test barrel length: 24 inches (61 cm)</i> <i>Source(s): Federal Cartridge<sup>[1]</sup></i>		

The **.223 Remington** is a cartridge with almost the same external dimensions as the 5.56x45mm NATO military cartridge. The name is commonly pronounced either two-two-three or two-twenty-three. It is loaded with a 0.224-inch (5.7 mm) diameter jacketed bullet, with weights ranging from 40 to 90 grains (2.6 to 5.8 g),<sup>[citation needed]</sup> though the most common loading by far is 55 grains (3.6 g).<sup>[citation needed]</sup>

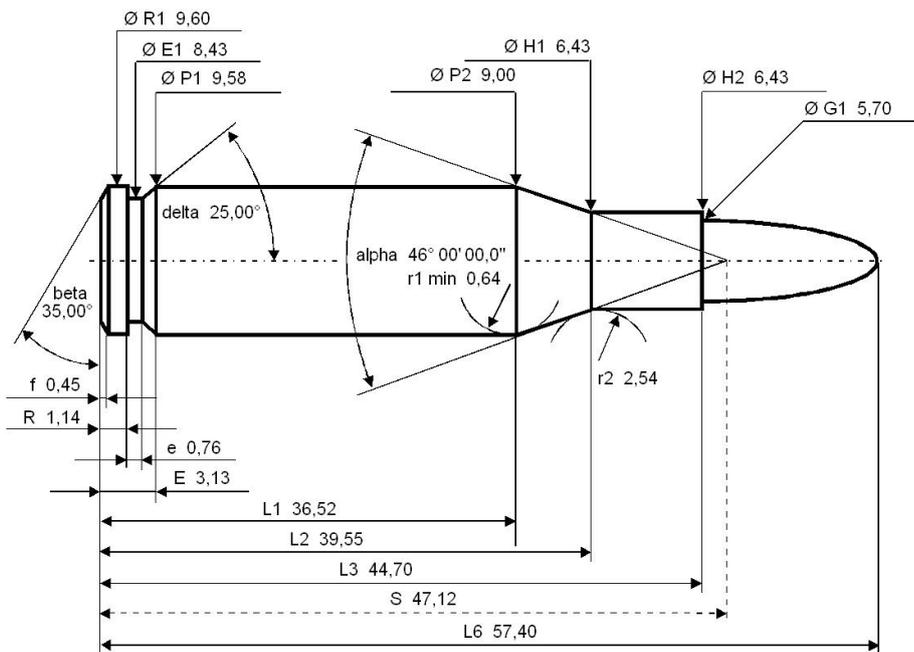
While the external case dimensions are very similar, the .223 Remington and 5.56x45mm differ in both maximum pressure and chamber shape. The maximum and mean pressures for some varieties of the 5.56 mm (different cartridge designations have different standards) exceed the SAAMI maxima for the .223 Remington, and the methods for measuring pressures differ between NATO and SAAMI.<sup>[1]</sup> The 5.56 mm chamber specification has also changed since its adoption, as the current military loading (NATO SS-109 or US M855) uses longer, heavier bullets than the original loading. This has resulted in a lengthening of the throat in the 5.56 mm chamber. Thus, while .223 Remington ammunition can be safely fired in a 5.56 mm chambered gun, firing 5.56 mm ammunition in a .223 Remington chamber may produce pressures in excess of even the 5.56 mm specifications due to the shorter throat.<sup>[2]</sup>

### History

The .223 Remington (5.56x45mm) is a cartridge that is ballistically in-between its predecessors, the .222 Remington, and the .222 Remington Magnum. The 223/5.56x45 was developed to fit the action length of the new M16 service rifle. The 223/5.56mm quickly became popular as a civilian cartridge because of the availability of brass, and the chambering of commercial varmint rifles in that caliber. Shortly after military acceptance of the M16, the semi-automatic version, the AR-15 became available, making the .223 cartridge even more popular. As of January 2013, after political discussion regarding assault weapons bans, there is a shortage of .223/5.56 ammo in the United States.<sup>[citation needed]</sup>

### Cartridge dimensions

The .223 Remington has 28.8 grains (1.87 ml H<sub>2</sub>O) cartridge case capacity.



**.223 Remington maximum C.I.P. cartridge dimensions.** All sizes in millimeters (mm).<sup>[3]</sup>

Americans would define the shoulder angle at  $\alpha/2 = 23$  degrees. The common rifling twist rate for this cartridge is 305 mm (1 in 12 in), 6 grooves,  $\emptyset$  lands = 5.56 millimetres (0.219 in),  $\emptyset$  grooves = 5.69 millimetres (0.224 in), land width = 1.88 millimetres (0.074 in) and the primer type is small rifle.

According to the official Commission Internationale Permanente pour l'Epreuve des Armes à Feu Portatives (C.I.P.) guidelines the .223 Remington case can handle up to 430 MPa (62,366 psi) piezo pressure. In C.I.P. regulated countries every rifle cartridge combo has to be proofed at 125% of this maximum C.I.P. pressure to certify for sale to consumers. This is equal to the NATO maximum service pressure guideline for the 5.56x45mm NATO cartridge.

The SAAMI pressure limit for the .223 Remington is set at 379.212 MPa (55,000 psi), piezo pressure.<sup>[4]</sup>

## Uses

The .223 Remington is one of the most common rifle cartridges in use in the United States, being widely used in two types of rifles: (1) varmint rifles, most of which are bolt action and commonly have 1-in-12 rifling twist suitable for bullets between 38 to 55 grains (2.5 to 3.6 g), and (2) semi-automatic rifles such as the AR-15 and the Ruger Mini-14, which are commonly found to have twist rates of 1-in-7, 1-in-9, or 1-in-8. (Most modern AR-15s use 1-in-9 which is suitable for bullets up to 69 grains or 4.5 grams or 1-in-7 which is suitable for slightly heavier bullets, but older M16's used 1-in-12 twist rates, making them suitable for use with bullets of 55 grains or 3.6 grams.) The semi-automatic rifle category is often used by law enforcement, for home defense, and for varmint hunting. Among the many popular modern centerfire rifle cartridges, .223 Remington ammunition is among the least expensive and is often used by avid target shooters, particularly in the "service rifle" category or 3 gun matches. The .223 is also used in survival rifles.

## .223 Remington versus 5.56 mm NATO

While the 5.56mm NATO and .223 Remington cartridges and chamberings are very similar, they are not identical.

While there is a myth that 5.56 NATO cases are thicker and hence have less capacity than commercial .223 cases, this has been shown to be false. Each brand of case and each manufacturing lot has a slightly different case capacity; 5.56 NATO and .223 commercial cases tend to have nearly identical case capacity when measured using the water test.<sup>[5]</sup> The NATO specification allows a higher chamber pressure.

NATO EPVAT test barrels made for 5.56mm NATO measure chamber pressure at the case mouth, as opposed to the location used by the United States civil standards organization SAAMI. The piezoelectric

sensors or transducers NATO and SAAMI use to conduct the actual pressure measurements also differ. This difference in measurement method accounts for upwards of 137.9 megapascals (20,000 psi) difference in pressure measurements. This means the NATO EPVAT maximum service pressure of 430 megapascals (62,000 psi) for 5.56mm NATO, is reduced by SAAMI to 379.21 megapascals (55,000 psi) for .223 Remington.<sup>[6]</sup> In contrast to SAAMI, the other main civil standards organization C.I.P. defines the maximum service and proof test pressures of the .223 Remington cartridge equal to the 5.56mm NATO.

The 5.56mm NATO chambering, known as a NATO or mil-spec chamber, has a longer leade (also referred to as the throat), which is the distance between the mouth of the cartridge and the point at which the rifling engages the bullet. The .223 Remington chambering, known as SAAMI chamber, is allowed to have a shorter leade, and is only required to be proof tested to the lower SAAMI chamber pressure. To address these issues, various proprietary chambers exist, such as the Wylde chamber (Bill Wylde)<sup>[7]</sup> or the ArmaLite chamber, which are designed to handle both 5.56mm NATO and .223 Remington equally well. The dimensions and leade of the .223 Remington minimum



These 5.56x45mm NATO cartridges are identical in appearance to .223 Remington. They are, however, not completely interchangeable.

C.I.P. chamber also differ from the 5.56mm NATO chamber specification.

Using commercial .223 Remington cartridges in a 5.56mm NATO chambered rifle should work reliably, but until recently, it was believed this was less accurate than when fired from a .223 Remington chambered gun due to the longer leade.<sup>[8]</sup> Although that may have been true in the early 1960s when the two rounds were developed, recent testing has shown that with today's ammunition, rifles chambered in 5.56mm can also fire .223 ammunition every bit as accurately as rifles chambered in .223 Remington, and the 5.56mm chamber has the additional advantage of being able to safely fire both calibers.<sup>[9]</sup> Using 5.56mm NATO mil-spec cartridges (such as the M855) in a .223 Remington chambered rifle can lead to excessive wear and stress on the rifle and even be unsafe, and the SAAMI recommends against the practice.<sup>[10][11]</sup> Some commercial rifles marked as ".223 Remington" are in fact suited for 5.56mm NATO, such as many commercial AR-15 variants and the Ruger Mini-14, but the manufacturer should always be consulted to verify that this is acceptable before attempting it, and signs of excessive pressure (such as flattening or gas staining of the primers) should be looked for in the initial testing with 5.56mm NATO ammunition.<sup>[12]</sup>

## Related cartridges

P.O. Ackley created an improved version of this cartridge, called the .223 Ackley Improved.<sup>[13]</sup> It has the straight sides and steep shoulder, typical of the Ackley design improvements, yielding about 5% extra case volume. This, in turn, provides longer case life, less stretching, and up to 100 ft/s (30 m/s) faster velocities.<sup>[citation needed]</sup>

Wildcat cartridge developers have for a long time necked this cartridge up to create the 6mm/223 or 6×45. At one time this round was very popular for varminting and competition, but has been replaced by current popular competition cartridges using short, fat cases, such as the 6 mm PPC and the 6mm Norma BR.<sup>[citation needed]</sup>

The Thompson/Center Ugalde family of wildcat cartridges are also made by necking up .223 Remington cases, for use in the Thompson/Center Contender target pistol.<sup>[citation needed]</sup>

## References

- [3] C.I.P. decisions, texts and tables free current C.I.P. CD-ROM version download (ZIP and RAR format) (<http://www.cip-bp.org/index.php?id=tdcc-telechargement>)
- [7] Rock River Arms (<http://www.rockriverarms.com/images/wylde.jpg>)
- [8] Winchester (<http://www.winchester.com/lawenforcement/news/newsview.aspx?storyid=11>)
- [9] Patrick Sweeney, "Chamber Reality Check", *Peterson's Rifle Shooter*, Volume 16, Issue 2, March/April 2013, pp. 32–36.
- [10] TECHNICAL DATA SHEET UNSAFE FIREARM - AMMUNITION COMBINATIONS ([http://www.saami.org/specifications\\_and\\_information/publications/download/SAAMI\\_ITEM\\_211-Unsafe\\_Arms\\_and\\_Ammunition\\_Combinations.pdf](http://www.saami.org/specifications_and_information/publications/download/SAAMI_ITEM_211-Unsafe_Arms_and_Ammunition_Combinations.pdf)) at SAAMI web site. (accessed 2012-07-15) Archived (<http://www.webcitation.org/5g9cFMcHL>) 2009-04-19.
- [11] The Gun Zone (<http://www.thegunzone.com/556v223.html>)
- [12] TECHNICAL NOTE 74: 5.56 NATO vs SAAMI .223 REMINGTON vs WYLDE CHAMBERS (<http://www.armlite.com/images/TechNotes/TECH NOTE 74 5.56 vs 223 vs Wylde 090817 Rev 0.pdf>), dated April 4, 2011 Rev 1

## External links

- .223 Remington Cartridge Guide (<http://www.6mmbr.com/223rem.html>) by AccurateShooter.com
- A 5.56x45mm "Timeline" (<http://www.thegunzone.com/556dw.html>) by Daniel Watters
- Ballistics By The Inch .223 Remington results. (<http://www.ballisticsbytheinch.com/223rifle.html>)

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