



# 7.5×55mm Swiss

7.5×55mm GP 11			
			
Two 7×57 cartridges (left) next to a 7.5×55mm / GP 11 (mid), .308 Win (right) and .223 Rem (far right)			
Type	Rifle		
Place of origin	 Switzerland		
Service history			
In service	1889–present		
Used by	Switzerland		
Wars	World War II (Armed neutrality)		
Production history			
Designer	Eduard Rubin		
Designed	1889		
Produced	1889–present		
Variants	GP90, GP90/03, GP90/23, GP 11		
Specifications			
Case type	Rimless, bottleneck		
Bullet diameter	7.77 mm (0.306 in)		
Neck diameter	8.50 mm (0.335 in)		
Shoulder diameter	11.60 mm (0.457 in)		
Base diameter	12.60 mm (0.496 in)		
Rim diameter	12.65 mm (0.498 in)		
Rim thickness	1.65 mm (0.065 in)		
Case length	55.60 mm (2.189 in)		
Overall length	77.70 mm (3.059 in)		
Case capacity	4.22 cm <sup>3</sup> (65.1 gr H <sub>2</sub> O)		
Rifling twist	270 mm (1 in 10.63 in)		
Primer type	Large rifle		
Maximum pressure	380 MPa (55,000 psi)		
Ballistic performance			
Bullet weight/type	Velocity	Energy	

130 gr (8 g) SP	3,000 ft/s (910 m/s)	2,608 ft-lbf (3,536 J)
150 gr (10 g) SP	2,820 ft/s (860 m/s)	2,658 ft-lbf (3,604 J)
174 gr (11 g) GP 11	2,560 ft/s (780 m/s)	2,535 ft-lbf (3,437 J)
180 gr (12 g) SP	2,570 ft/s (780 m/s)	2,642 ft-lbf (3,582 J)
200 gr (13 g) SP	2,460 ft/s (750 m/s)	2,700 ft-lbf (3,700 J)
<i>Source(s): Cartridges of the World<sup>[1]</sup></i>		

The **7.5×55mm Swiss** or **GP 11** (or unofficially **7.5×55mm Schmidt Rubin**) is a cartridge developed for the Swiss Army by Lt. Col. Eduard Rubin for rifles based on Rudolf Schmidt's action design. The ammunition used by the Schmidt-Rubin Model 1889 rifle was one of the first to use 7.5 mm copper jacketed rounds similar to those used today. The GP90 7.5×53.5mm round designed by Colonel Rubin was revolutionary in that the most popular military calibres used in Europe at the time were around 12.7 mm as opposed to 7.5 mm of the Schmidt-Rubin ammunition. Oddly enough the round was "paper patched" meaning the actual bullet was wrapped around by a piece of paper, much like cotton patches were placed around the bullet of a musket. Paper patching the round was supposed to aid in the gas seal of the bullet.

## History of the cartridge variants

### GP90 and GP90/03 cartridges

7.5 mm Swiss cartridges have been in Swiss Army service since 1889 in their Schmidt-Rubin Model 1889 rifles. Originally using a semi-smokeless powder the cartridge was known as the Gewehrpatrone 1890 (GP90). It was discovered that the primer of GP90 ammunition was far too corrosive so it was updated in 1903 to the GP90/03 cartridge.

While the scarcity of reloadable cartridge cases makes the 7.5 mm Swiss problematic for US shooters, large numbers of surplus rifles - especially the Model 1889 - have been imported. Reloadable cases can be easily produced by reforming .284 Winchester brass. Case rims will be slightly undersized, but this presents no problems so long as the rifle's extractor is in good condition. This allows the handloader to produce a GP90 load that is safe for the Schmidt-Rubin Model 1889 rifle.

### GP90/23 the final cartridge variant for the Model 1889 rifle

Long after the discontinuation of the Schmidt-Rubin Model 1889 rifle in the Swiss Armed Forces the GP90/03 round was updated in 1923 and called the GP90/23, for use in shooting competitions. The GP90/23 discarded the paper patching around the bullet and the semi-smokeless powder was replaced by smokeless powder propellant.

### The GP 11 cartridge



Swiss Army issue 10-round GP 11 pack.

In 1911 the metallurgy and bolt design in Swiss military rifles had advanced enough that a more powerful cartridge could be used in the Model 1911 rifles and Schmidt-Rubin 1896/11 rifles. The 7.5 mm Swiss round was updated to the completely non-corrosive Gewehrpatrone 1911 (GP 11). Besides being used in the Model 1911 rifles and Schmidt-Rubin 1896/11 rifles, GP 11 ammunition was also used in the MG 11 machine gun, K11 and K31 carbines as well as in the Stgw 57 battle rifle. The cartridge saw extensive service until the

early 1990s with the standard rifles of Swiss servicemen, and still sees use by Swiss Army reservists, and sport shooters, of which there are many. Furthermore, it is still the standard ammunition for the MG 51 general purpose machine gun used on many Swiss armored vehicles such as the Pz 87 "Leopard 2" tank or the MOWAG Eagle Reconnaissance Vehicle. In this role, it is usually belt fed with GP 11 full metal jacket and GP 11 tracer rounds.

The 11.3 gram (174 grain) Full Metal Jacket GP 11 spitzer bullet offered good aerodynamic efficiency and ballistic performance with a ballistic coefficient (G1 BC) of 0.505 to 0.514 (ballistic coefficients are somewhat debatable). At 780 m/s (2560 ft/s) muzzle velocity the standard GP 11 ball bullet retained supersonic velocity up to 800 m (875 yards) ( $V_{800} \approx \text{Mach } 1.1$ ) under ICAO Standard Atmosphere conditions at sea level (air density  $\rho = 1.225 \text{ kg/m}^3$ ). Even by contemporary (2007) standards 800 m (875 yards) typical effective range is quite remarkable for a standard military rifle round.<sup>[1]</sup>

GP 11 is regarded as highly accurate and well-manufactured ammunition. Due to the increased availability of K31 rifles on the civilian market, a number of cartridge manufacturers, including Prvi Partizan and Hornady, now produce 7.5×55mm rounds in full metal jacket, soft-tip, and ballistic tip configurations.

In addition to the standard Full Metal Jacket GP 11 rounds, specialty rounds were produced as well. Armor-piercing steel-cored rounds can be identified by their violet bases. These rounds can easily pierce 5 mm (0.2 in) of steel plate at 500 m (550 yards). Tracer rounds burn out to 800 m (875 yards), and can be identified by their red tips.<sup>[2]</sup>

Despite its nomenclature, the 7.5×55mm Swiss can with proper care use the same 7.62 mm (.308 in) bullets as conventional Western 7.62 mm (.308 in) cartridges that have slightly wider land and groove diameters. This allows for ease of handloading and custom competition or hunting loads, as nearly any .308 diameter bullet may be used. However, most Swiss match shooters use standard GP 11 ammunition, a testament to the accuracy of the GP 11 round.

## Specifications

### Variants overview



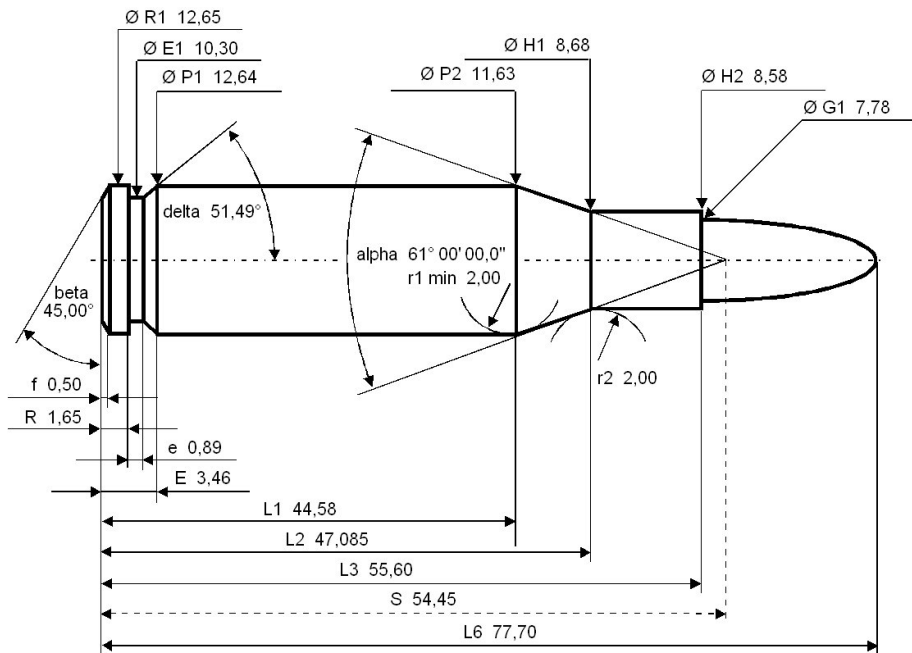
Stripper clip with 7.5×55mm Swiss GP 11 cartridges.

	GP90	GP90/03	GP90/23	GP 11
Cartridge	7.5×53.5mm	7.5×53.5mm	7.5×54.5mm	7.5×55mm
Case length	2.106 in	2.106 in	2.15 in	2.185 in
Rim diameter	0.492 in	0.492 in	0.5 in	0.496 in
Head diameter	0.488 in	0.488 in	0.496 in	0.493 in
Neck diameter (w/ paper patch)	0.362 in (0.362 in)	0.362 in (0.335 in)	0.328 in	0.334 in
Bullet	211 gr	211 gr	190 gr	174 gr
Bullet diameter (w/ paper patch)	0.3208 in (0.3075 in)	0.3208 in (0.3086 in)	0.3075 in	0.306 in
Bullet length	1.14 in	1.14 in	1.165 in	1.378 in
Muzzle velocity	1968 ft/s	1980 ft/s	2050 ft/s	2560 ft/s
Powder measure	27-31 gr semi-smokeless	31 gr semi-smokeless	33.7 gr smokeless	49.35 gr smokeless
Max. service load chamber pressure (Swiss standards)	36,970 psi	36,970 psi	38,390 psi	45,500 psi

Due to the greater pressure produced by the GP 11 round, it is not safe to fire GP 11 rounds in Model 1889 Schmidt-Rubin rifles.

### 7.5×55mm Swiss / GP 11

The 7.5×55mm Swiss cartridge has 4.22 ml (65 grains) H<sub>2</sub>O cartridge case capacity. The exterior shape of the case was designed to promote reliable case feeding and extraction in bolt action rifles and machine guns alike, under extreme conditions.



**7.5×55mm Swiss maximum C.I.P. cartridge dimensions.** All sizes in millimeters (mm).

Americans would define the shoulder angle at  $\alpha/2 \approx 30.5$  degrees. The common rifling twist rate for this cartridge is 270 mm (1 in 10.63 in), 4 grooves,  $\varnothing$  lands = 7.51 mm,  $\varnothing$  grooves = 7.77 mm, land width = 3.75 mm and

the primer type is large rifle.

According to the official C.I.P. (Commission Internationale Permanente pour l'Epreuve des Armes à Feu Portatives) guidelines the 7.5×55mm Swiss case can handle up to 380 MPa (55,114 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.

Switzerland is not a C.I.P. member state and therefore does not recognize any C.I.P. rulings and proofed its military 7.5×55mm rifles chambered in the GP 11 version of their service cartridge at 150% of the GP 11 load pressure of 313.717 MPa (45,500 psi). This means a Swiss military proof test would be executed at  $1.5 * 313.717 = 470.57$  MPa (68,250 psi) and a C.I.P. proof test would be executed at  $1.25 * 380 = 475$  MPa (68,892 psi). Swiss 7.5×55mm GP 11 proof tests are therefore not recognized in C.I.P. member states in their turn.

## Gallery



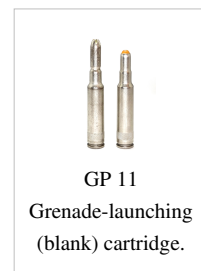
GP90 (left) and  
GP90/23  
ammunition.



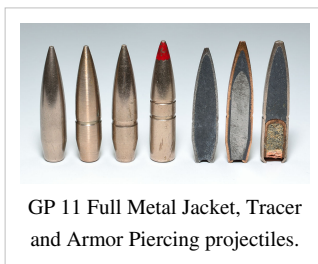
GP90 and GP90/23  
ball projectiles.



GP 11 ammunition.



GP 11  
Grenade-launching  
(blank) cartridge.



GP 11 Full Metal Jacket, Tracer  
and Armor Piercing projectiles.

## References

[1] Maximum effective rifle range

[2] Swiss Army Sturmgewehr 57 Manual (German) (<http://www.gunmanuals.ch/source01a/stgw57swiss.pdf>)

- C.I.P. CD-ROM edition 2003
- 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>))

## External links

- The History The 7.5 Swiss Cartridge (<http://www.swissrifles.com/ammo/#7.5>)
- 7,5×55 Swiss information (<http://www.norma.cc/content.asp?Typ=59&Lang=2&DocumentID=280&Submeny=4&Rubrik=Calibers&Title=7,5x55 Swiss>) from Norma
- 7.5 × 55 Swiss (<http://www.reloadersnest.com/frontpage.asp?CaliberID=215>) at [www.reloadersnest.com](http://www.reloadersnest.com)
- Gian-Marchet 7,5 × 55 Schweizer Patronen Page (including images) (<http://www.gian-marchet.ch/GM-Geschosse-Laborierung-GM-7555-e.htm>)

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