

# 9 mm Ammunition

The family of 9 mm ammunition produced by SNC TEC shown in Figure 3 includes NATO ball cartridges, jacketed hollow-point, subsonic and blank cartridges.

## CDN MK1 ball and jacketed hollow-point cartridges

Intended for use with military and paramilitary weapons, including MP5 machine-guns, 9 mm ammunition is available in ball, full-metal jacket (FMJ) and jacketed hollow-point (JHP) projectiles [7.5 g (115 grains)]. A special double-base smokeless propellant is used to minimize muzzle flash as well as the amount of unburnt powder. Ballistic performance conforms to military specifications and can easily be adjusted to meet highly specific law enforcement requirements.



## Subsonic cartridge

Jacketed hollow-point [9.5 g (147 grains)] and full-metal jacket [10.3 g (158 grains)] projectiles were developed to increase penetration depth into gelatine blocks and other target materials. The sound of a cartridge fired from a test barrel fitted with a suppressor does not exceed 133 decibels even at extreme temperatures. Measured at 5 metres (16 ft.) from the muzzle, the average velocity in the air is less than the speed of sound. The velocity varies between 260 and 303 m/s (852-993 ft./s). This subsonic ammunition is often used with a silencer.



## Star C30 blank cartridge

Meeting Canadian military specifications, the Star C30 blank has been developed for use with pistols and sub-machine guns fitted with a blank-firing attachment. Producing no perforation from metal particles and no paper screen perforation greater than 2.5 mm (0.1 in.) at 4.6 metres (15 ft.), its sound level is 80% of that produced by the CDN MK1 ball cartridge.



## Packaging

### Standard military packaging for all products:

- 64 cartridges/cardboard box
- 15 boxes in M19A1 ammunition metal can
- 3 cans/wirebound crate
- 24 wirebound crates/pallet for a total of 69,120 cartridges

### Other standard packaging:

- 50 cartridges/cardboard box
- 20 cardboard boxes into a master cardboard box for a total of about 70,000 rounds/pallet



# 5.56 mm, 7.62 mm and 9 mm Ammunition

In its various incarnations since the early 20th century, SNC Technologies Inc. (SNC TEC) has produced hundreds of millions of small-calibre cartridges for use with military and paramilitary weapons.

During World War II, it produced 0.303 calibre ammunition for the Canadian Army and Allied Forces. Then, in the early 50s, a NATO panel adopted 7.62 mm calibre ammunition as the new NATO Standard for small arms. Since that time, SNC TEC, or Canadian Dominion Arsenals as it was known, has produced huge quantities of 7.62 mm ball and tracer ammunition, particularly during the Korean War.

For years, SNC TEC also produced 9 mm parabellum ammunition, first introduced by George Luger in 1902. Today, it continues to manufacture 9 mm ball and blank ammunition on a regular basis.

In the mid 60s, in response to the needs of the Vietnam War, SNC TEC produced the first generation of 5.56 mm ammunition — the M193 ball and the M196 tracer — by the millions. In 1976, another NATO panel adopted a new family of 5.56 mm ammunition, with SNC TEC producing no fewer than 300 million of these cartridges since 1986. Designed to meet STANAG requirements (4172) and NATO specifications [Manual AC-225 (Panel III/SP.1) D.200], this ammunition is available in three types: the C-77 ball with steel penetrator, the C-78 tracer and the C-79 star crimp metal blank. Both the C-77 ball and the C-78 tracer cartridges are NATO qualified. As a result, this Canadian ammunition can be fired from all NATO-nominated 5.56 mm assault rifles and machine guns.

Lead-free Improved Penetrator (IP) and Controlled Penetration Ammunition (CPA) were recently added to the line of 5.56 mm ammunition which, thanks to the use of non-toxic primers, allows SNC TEC to offer “green” ammunition for both training and operational uses.

Production is supported by metrology, chemical and metallurgical laboratories well equipped with modern instrumentation needed for the complete and reliable inspection of top-quality products. Combined with statistical process control methods, these facilities ensure the high-quality products and improved productivity that guarantee a favourable price/performance ratio.

Committed to Total Quality Management, SNC TEC is ISO 9001:2000 certified.

**NOTES:**  
All metal boxes are waterproof and reusable. Wirebound crates are designed to prevent shock transmission to metal boxes/ammunition. Boxes can be specially treated for overseas transportation. Other packaging configurations could be used to meet customers' requirements.  
N.B.: Dimensions and weights are nominal.



FIGURE 1: Family of 5.56 mm ammunition

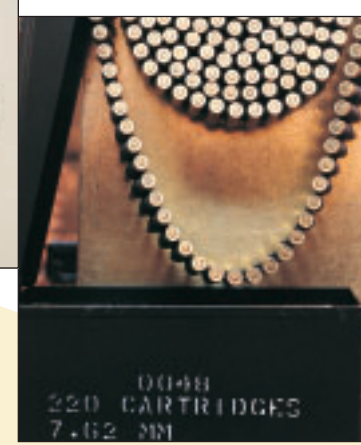


FIGURE 2: Family of 7.62 mm ammunition



FIGURE 3: Family of 9 mm ammunition



When it comes to innovative and safe products, SNC TEC is *Always on target!*

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## 5.56 mm Ammunition

The family of 5.56 mm ball, tracer and blank ammunition is depicted in Figure 1. General characteristics are shown in Table 2.

### C-77 Ball

C-77 ball projectiles deliver outstanding accuracy. The average standard deviation measured at 550 m (600 yd.) is approximately 50% lower than maximum permissible NATO limits for that distance. Accuracy maintained over the production of 60 million rounds is shown in Figure 4.

The hardness of the steel penetrator and the assembly of the projectile components are such that 100% penetration is obtained under the conditions shown in Table 1.

	Thickness of target		Distance from the gun	
	mm	in.	m	yd.
NATO 1020 steel plate (55/70 R <sub>B</sub> )	3.5	0.14	570	623
Structural steel plate (80 R <sub>B</sub> )	3	0.12	700	766
Structural steel plate (80 R <sub>B</sub> )	5	0.20	400	437
2219 aluminum alloy armour plate	12.5	0.50	400	437
2219 aluminum alloy armour plate	19	0.75	300	328

Note that penetration capability decreases at temperatures below -10°C (14°F)

Table 1: 100% penetration into various targets

Residual velocity and kinetic energy, as a function of the distance from the muzzle of the gun, are presented in Figure 5.

Maximum chamber pressure is maintained well below maximum permissible NATO limits [380 MPa (55,100 psi)], (see Figure 6) ensuring that the ammunition is safe to use and functions properly in all weapons. Moreover, the propellant is selected to keep the flame temperature as low as possible. The combination of these two factors accounts for the fact that barrel wear and erosion problems have never been experienced by any customer.

### C-78 Tracer

The tracer projectile is designed for the trajectory and mean point of impact at 600 m (656 yd.) to be comparable to data obtained with NATO reference ammunition. The trace distance exceeds 600 m (656 yd.), and recent tests still show good visibility at 775 m (848 yd.) and beyond. The tracer colour is red.

Tracer projectiles are loaded with appropriate pyrotechnic igniter/tracer compounds on unique, highly efficient, automated tracer-loading equipment, so a high-quality product can be produced at a most competitive price.

### C-79 Blank

The overall cartridge length is 48 mm (1.89 in.), (which is equivalent to the U.S. M200 version). The length, propellant charge and star crimp design were optimized to ensure good functioning in all 5.56 mm weapons equipped with an appropriate blank-firing attachment.

	C-77 ball	C-78 tracer	C-79 blank
Weight of cartridge	12.5 g 192 grains	12.5 g 192 grains	7 g 108 grains
Weight of projectile	4 g 62 grains	4 g 62 grains	—
Velocity at 24 m (78 ft.)	910 ± 15 m/s 2,985 ± 50 ft./s	895 ± 15 m/s 2,936 ± 50 ft./s	—
Chamber pressure (piezo)	< 380 MPa < 55,100 psi	< 380 MPa < 55,100 psi	—
Port pressure	> 88 MPa > 12,760 psi	> 88 MPa > 12,760 psi	—
Accuracy [average standard horizontal and vertical deviations at 550 m (600 yd.)]	10-12 cm 3.9-4.7 in.	< 30 cm < 12 in.	—
Sound level	—	—	Min. 80% of C-77 ball
Trace range	—	600-800 m 656-875 yd.	—
Perforation	See Table 1	—	No paper screen perforation greater than 2.5 mm (0.1 in.) at 4.6 m (15 ft.)
Primer	Boxer style, non-corrosive		

Table 2: Characteristics of 5.56 mm ammunition

## Packaging

### C-77 ball

#### Standard carton pack:

10 rounds/plastic clip, 3 clips/cardboard box, 30 cardboard boxes/M2A1 metal box, 2 M2A1 metal boxes/wirebound crate, 36 wirebound crates/pallet, for a total of 65,520 cartridges.

#### Standard operational pack:

10 rounds/plastic clip, 3 clips/opened cardboard box, 3 cardboard boxes + one 10-round clip/cloth bandoleer, 6 bandoleers/M2A1 metal box, 2 metal boxes/wirebound crate, 36 wirebound crates/pallet, for a total of 43,200 cartridges.

#### Standard link pack and 4B/1T link pack:

200 rounds linked/plastic ammo box in bandoleer, 4 plastic boxes/PA108 metal box, 2 PA108 metal boxes/wirebound crate, 32 wirebound crates/pallet, for a total of 51,200 cartridges.

### C-78 tracer

#### Standard carton pack:

10 rounds/plastic clip, 3 clips/cardboard box, 30 cardboard boxes/M2A1 metal box, 2 M2A1 metal boxes/wirebound crate, 36 wirebound crates/pallet, for a total of 64,800 cartridges.

#### Standard link pack and 4B/1T link pack:

200 rounds linked/plastic ammo box in bandoleer, 4 plastic boxes/PA108 metal box, 2 PA108 metal boxes/wirebound crate, 32 wirebound crates/pallet, for a total of 51,200 cartridges.

### C-79 blank

#### Standard carton pack:

10 rounds/plastic clip, 3 clips/cardboard box, 35 cardboard boxes + 1 mag filler/M2A1 metal box, 2 M2A1 metal boxes/wirebound crate, 45 wirebound crates/pallet, for a total of 95,400 cartridges.

#### Standard link pack:

200 rounds linked/plastic ammo box in bandoleer, 4 plastic boxes/PA108 metal box, 2 PA108 metal boxes/wirebound crate, 21 wirebound crates/pallet, for a total of 51,200 cartridges.

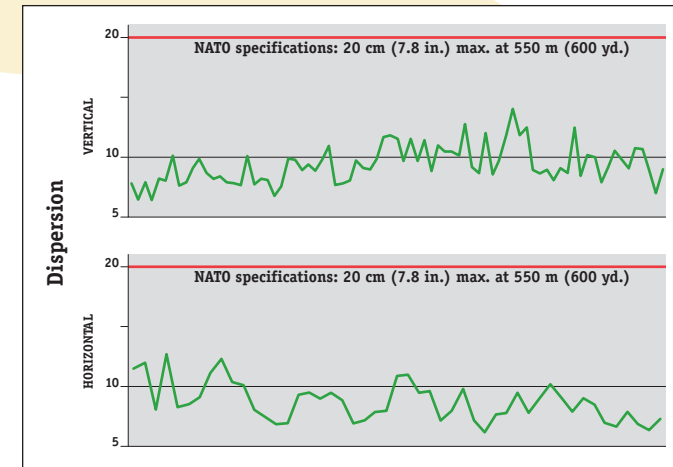


FIGURE 4: 5.56 mm — Example of excellent accuracy compared to NATO limit over a 3-year period

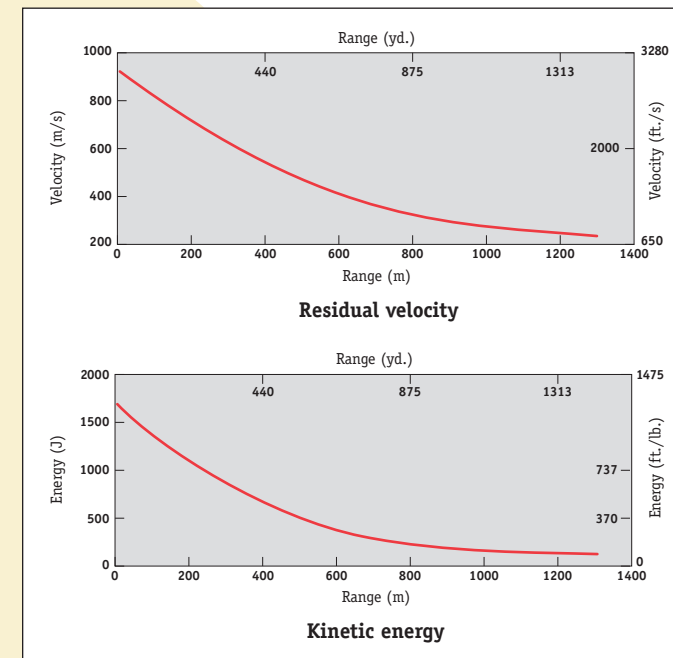


FIGURE 5: 5.56 mm — Residual velocity and kinetic energy as a function of the distance from the muzzle of the gun

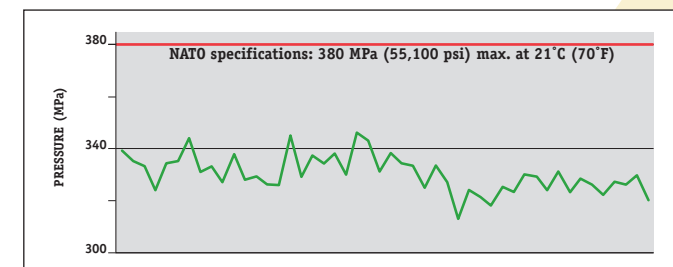


FIGURE 6: 5.56 mm — casemouth pressure variation compared to NATO limit over a 3-year period

## 7.62 mm Ammunition

The family of conventional 7.62 mm ammunition includes C-21 ball, C-19 tracer and C-24 blank cartridges. Primed or unprimed brass cartridge cases are also available. Manufactured on state-of-the-art equipment, this ammunition features the characteristics shown in Table 3.

### C-21 Ball

C-21 ball projectiles deliver approximately 3,340 joules of muzzle energy compared to 1,500 joules for 5.56 mm NATO projectiles. These projectiles contain a lead core. A non-toxic version will be available in the near future.

### C-19 Tracer

A perfect match, tracer and ball projectiles have the same trajectory. The trace is visible to approximately 775 m.

Tracer projectiles contain appropriate pyrotechnic igniter/tracer compounds loaded on unique, highly efficient, automated equipment. The result is high-quality product produced at a most competitive price.

### C-24 Blank

The propellant charge and star crimp design were optimised to ensure proper functioning in all 7.62 mm weapons equipped with an appropriate blank-firing attachment. There is no paper perforation greater than 2.5 mm at 4.6 m.

	C-21 ball	C-19 tracer	C-24 blank
Weight of cartridge	24.8 g 382 grains	24.8 g 382 grains	16.4 g 252 grains
Weight of projectile	9.4 - 9.6 g 144-148 grains	9.1 - 9.5 140-146 grains	—
Velocity at 24 m (78 ft.)	838 m/s 2,748 ft./s	814 m/s 2,670 ft./s	—
Chamber pressure (copper crusher)	< 345 MPa < 50,000 psi	< 345 MPa < 50,000 psi	—
Port pressure	69 - 96 MPa 10,000-14,000 psi	69 - 96 MPa 10,000-14,000 psi	—
Accuracy [average mean radius at 550 m (600 yd.)]	< 20 cm < 7.8 in.	< 38 cm < 7.8 in.	—
Trace range	—	min. 775 m min. 846 yd.	—
Perforation	—	—	No perforation due to metal particules No paper screen perforation greater than 2.5 mm (0.1 in.) at 4.6 m (15 ft.)
Primer	Boxer style, non-corrosive		

Table 3: Characteristics of 7.62 mm ammunition

## Packaging

#### Standard ball link pack and 4B/1T link pack:

- 220 rounds/belt
- 1 belt/metal box M19A1
- 4 boxes/wirebound crate
- 27 wirebound crates/pallet for a total of 23,760 rounds

#### Standard blank link pack:

- 200 rounds/belt
- 1 belt/M19A1 box
- 4 boxes/wirebound crate
- 26 wirebound crates/pallet for a total of 31,680 rounds