



Critical duty rounds

HORNADY'S CRITICAL DUTY AMMO

BY BOB PARKER

The “perfect round,” whether fired from a pistol or rifle, will always expand equally (as large as possible relative to caliber) every time it is fired into an opponent (bad guy). It will always penetrate to the desired depth of 12 to 18 inches. It will perform consistently shot to shot. This perfect round will bring on quick incapacitation by either disrupting the central nervous system or quickly lowering the blood pressure of the bad guy. And in theory, a

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round that scores high in testing will work with equal regularity in actual field and street situations. But of course, we have real life that interferes with our perfect round. You just cannot anticipate how the many variables that affect the round's speed, path and placement will act between the time the bullet leaves the muzzle and reaches its terminal destination. There is no perfect round, but the quest for perfection continues and always will.

This pursuit of consistency and reliability is taking place on the northern plains, in the middle of the country. Hornady Manufacturing (hornady.com) in Grand Island, Nebraska is constantly striving for a better, if not perfect, handgun round. Defeating the variables (basically intervening urban barriers) has been the primary focus in development of the new "Critical Duty" round.

The real push for more effective law enforcement duty rounds came in the aftermath of what is known as the FBI Miami Shootout in 1986. The rounds the FBI agents fired at suspects Platt and Matix that day proved to be deficient in stopping the gunfight. Matix was finally killed after being shot 12 times. Before the killers died, they killed two FBI agents and wounded five.

The following year, a wound ballistics conference was convened in Quantico. The focus was on a Winchester 115-grain Silvertip round that had failed to penetrate deeply enough after traversing through the non-critical tissue of Michael Platt's arm and torso. It stopped just short (approximately an inch from his heart) of terminating the fight then and there. In fact, at his autopsy it was discovered that the wound was indeed fatal. His right lung was filled with 1.3 liters of blood. He was bleeding out with no chance of surviving.

The Quantico conference studied ammunition shortcomings at length. Lightweight, high-speed bullets fell out of favor and the outcome of the conference was the development of the 10mm pistol round. With too much muzzle flip and recoil for most agents and other cops, the 10mm had a short law enforcement service life. Long story short, the 10mm round evolved into the 10mm short, commonly known as the 40-caliber Smith and Wesson cartridge.

None of the agents in the Miami shootout had a rifle. Yet, to my knowledge, the need for rifles in the hands of law enforcement street personnel was never addressed. We'd go another ten years before the North Hollywood Bank robbery brought this issue to the forefront and we finally began to level the playing field. But that's a whole other story.

From the conference emerged new revelations about penetration. Dr. Martin Fackler was at the forefront of research and development of a ballistic gelatin test medium that simulates human muscle and tissue. It replaced swine muscle as a test medium, as controls can be put in place with the gelatin. It does not simulate skin and bones found in the human body. The FBI has since further refined the testing, which now consists of six events ranging from shooting into bare gelatin to 20-gauge steel. Contrary to the claims of some manufacturers, you cannot exceed the protocol. The penetration standard of 12 to 18 inches is either met or it isn't. (See Figure 1)

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Figure 1

FBI PENETRATION TEST

The purpose of the FBI Penetration Test is to determine the following regarding a cartridge:

1. The penetration performance of the projectile, throughout the series of six tests (depth of penetration, expansion of the projectile and retained weight of the projectile). We're looking for 12-18" penetration, uniform penetration, high bullet weight retention and 1.5 times caliber expansion.
2. Average velocity from test barrel and service weapon
3. Average accuracy from test barrel and service weapon

Tests 1 – 6 are shot at a distance of 10 feet from the muzzle to the front face of the gelatin block.

Test 1 — Bare gelatin.

Test 2 — Heavy clothing. Gelatin block is covered with four layers of clothing.

Tests 3 – 6 utilize light clothing in addition to the respective intermediate barrier.

Test 3 — Steel. Two pieces of 20-gauge, hot-rolled steel with a galvanized finish. This test simulates the weakest part of a car door.

Test 4 — Wallboard. Two pieces of ½-inch standard gypsum board are set 3.5 inches apart. Gelatin block is placed 18 inches behind the rearmost piece of gypsum to simulate a typical building interior wall.

Test 5 — Plywood. One piece of ¾-inch "AA" fir plywood is set 18 inches in front of the gelatin block. This simulates the resistance of a typical wooden door or construction timbers.

Test 6 — Auto glass. One piece of A.S.I. ¼-inch laminated automobile safety glass set at an angle of 45 degrees to the horizontal and 15 degrees to the side, resulting in a compound angle.

Hornady began a cursory stab at the development of what was to become the Critical Duty/Urban Barrier bullet in 1999 when Chief Ballistics Scientist Dave Emary used silicone caulk to fill the cavity of an XTP bullet. Over the next 11 years the project languished. In 2010, Hornady made a breakthrough with the bullet jacket design.

A FlexLock bullet with an interlock band is used for the new Critical Duty round. It is a locking, non-bonded design. The “inter-lock” is a band of jacket material that forms a ring that sticks out inside of the jacket and is imbedded into the core of the bullet. It eliminated jacket separation in all of the FBI test events.

The Flex Tip in the bullet cavity eliminates the hollow point clogging with materials. Hollow point ammunition fired through barriers such as wood and drywall have a tendency to fill with the material it penetrates. Hollow point passing through steel

will close down. Both of these phenomena will generally eliminate the desired expansion of the round. The Flex Tip will keep out the detritus and allow for uniform expansion of the bullet. Nickel-plated cases are used to increase corrosion resistance and to aid in low light chamber checks. Low flash powder is utilized to reduce muzzle flash signature.

Initially, the Critical Duty round will be available in a 135-grain 9 X 19mm and a 175-grain 40 S&W round. Both rounds average 1010 feet per second (fps). A +P 9mm should follow shortly.

Demonstration at Hornady

In September 2011, I was invited, along with several other firearms writers, to the Hornady facility in Grand Island for a briefing and demonstration of the Critical Duty round. Both the 9mm and 40 S&W rounds were put through the battery of FBI gelatin testing. Note that most ammunition



Cutaway shot of FlexLock bullet jacket



9mm FlexLock bullet fired through sheet metal



9mm FlexLock bullet fired through glass



40 S&W FlexLock bullet fired through glass



40 S&W FlexLock bullet fired through sheet metal (Glass and metal most difficult to penetrate deeply in target after passing through these two)

manufacturers conduct penetration testing of the 40 S&W rounds using a Glock pistol. The faster twist (1–9.8") of the Glock chambered in the 40-caliber round is far superior to the twist (1–16" to 1–18") of other pistols in penetrating and defeating barriers. The faster twist increases bullet stability and prevents bullets from yawing when traversing barriers.

All protocols were adhered to with the gelatin. The gelatin blocks are cured for 36 hours in a refrigerator at 39.2 degrees F. (I will not go into the recipe for the gelatin, but if anyone wants it, email me.) All blocks were calibrated with a .177-caliber BB at 590 fps. The BB must penetrate between 2.95" and 3.74".

Both the 9mm and 40 S&W rounds proved to be very consistent and performed well in the six events. Penetration, expansion and bullet weight retention were all more than within the desired range. We (writers) were all on the firing line to

observe the loading and discharge of the rounds. We also watched the measuring to the penetration of the projectiles in the gelatin blocks. The spread in penetration for both the 9mm and 40 S&W FlexLock bullets was only 15.80" to 13.50". Just about all of the bullets retained 98 to 99 percent of their original weight. Of course, the toughest barrier proved to be the auto glass, where 76 to 77 percent recovered weight was the norm. **See Figure 2** for all of the test results, including expansion measurements.

We also had a chance to fire 100 rounds of both calibers on the range. It was a cold, rainy, windy day and I did not observe any muzzle flash in the low light of the cloudy day. All of my rounds were at least close to my intended point of impact.

Hornady's Critical Duty rounds certainly pass muster in the six iterations of the FBI protocol for testing ammunition. This practice exists as a benchmark to quantify the

performance and reliability of the ammunition used by law enforcement in an assortment varied field operations. But let's make one thing clear. This testing or any other will only quantify the predicted performance and reliability. There are just too many variables involved in a firefight to make any sort of absolute statement.

As I stated at the beginning of this column, there is no perfect round: too many angles, a round penetrating and expanding to desirable levels but still not stopping the threat, and seemingly insignificant intervening barriers conflicting with the path of the bullet. The low-level criminal mindset of the bad guys can invoke a visceral response that may require more shots or more friends. This realistic view is always important to remember, because as soon as a particular round does not put the suspect down quickly enough, the anecdotal legends begin to appear on the Internet and go viral, spreading a lot of misinformation based on very little supporting data.

But we can test and we can predict. Hornady has come up with a round that is about as good as it's going to get at this point. For defeating urban barriers you will be hard-pressed to find a better pistol round to defeat urban barriers than the new Hornady. But no matter what kind of ammunition you choose, always carry a dependable weapon on- and off-duty. «

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Figure 2

Critical Duty FlexLock Bullet Ballistic Gelatin Tests

	9mm, 135-grain	40 S&W, 175-grain
Bare gelatin	15.80" penetration Expansion .501 99.5% recovered weight	13.85" penetration Expansion .577 99.3% recovered weight
Heavy clothing	15.80" penetration Expansion .487 99.6% recovered weight	15.10" penetration Expansion .530 99.4% recovered weight
Sheet metal	13.95" penetration Expansion .458 98.9% recovered weight	13.10" penetration Expansion .568 97.9% recovered weight
Wallboard	14.50" penetration Expansion .551 98.7% recovered weight	13.79" penetration Expansion .586 99.1% recovered weight
Plywood	15.40" penetration Expansion .485 99.6% recovered weight	15.35" penetration Expansion .595 99.1% recovered weight
Glass	13.50" penetration Expansion .489 77.1% recovered weight	15.00" penetration Expansion .507 76.3% recovered weight