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**Federal Premium Terminal Ascent Design Details**

*The following is a detailed explanation on the features and benefits of Federal’s all-new Terminal Ascent—the best hunting bullet ever built within the 98-year history of company.*

Federal has long been able to build extremely-tough, expanding bullets for hunting big game. They also load sleek, extremely accurate match-style bullets for long-range target shooting. But combining both of those qualities into a single bullet has been more complicated. However, their new Terminal Ascent successfully combines both attributes.

Federal took all the lessons learned during the past few decades building its own proprietary bullets and poured all that knowledge and experience into creating its best hunting bullet to date. Federal credits using some of its existing, time-tested bullet designs to inspire the development of this new hunting bullet. Proven designs such as Trophy Bonded Bear Claw, Trophy Bonded Tip and Edge TLR all helped pave the way to create Terminal Ascent.

The new Terminal Ascent blends the features of top match-style bullet designs with the industry’s best bonding technology and components to deliver any-range accuracy and reliable expansion even at low velocities. This outstanding bullet design provides high weight retention, deep penetration and lethal terminal performance, both up close and at extreme distances.

Terminal Ascent is simply the best all-range, all-velocity hunting ammunition available. Its design outperforms everything else in the vast Federal catalog of options, plus all the competition’s best loads.

**Innovative Design Elements**

Terminal Ascent features several key elements that make up its superior overall design.

First is the solid-shanked and bonded bullet construction. A bonded bullet has a lead core bonded to the copper jacket around that core. A solid shank means the bullet has a thick, solid copper base at the bottom of the bullet to support the lead core. Terminal Ascent's solid copper shank and bonded lead core retain weight for deep penetration and energy dump, delivering extremely effective wound channels and terminal performance. A large hollow cavity in the bullet nose, along with exterior jacket skiving, further aid expansion and penetration. Serrations allow petals to peel back on contact at velocities as low as 1,400 fps—speeds typically seen 1,200 yards downrange in the 200-grain 30-caliber loads.

Second is the AccuChannel grooving. Like many of the most versatile bullets, Terminal Ascent features grooving along the shank to improve accuracy across a range of rifles, while decreasing barrel wear and fouling. However, unlike conventional grooving, the AccuChannel’s highly technical shape accomplishes these goals with only a minimal increase in drag. No other bullet has this grooving technology.

Third is the Slipstream heat-resistant polymer tip. The Slipstream Tip features patent-pending hollow-core technology. A small cavity runs the length of the shank all the way up to just below the point itself. That point breaks free upon impact, allowing fluid to enter the hollow core, where it generates pressure and easy expansion, even at low velocities. The Slipstream Tip’s hollow core sets it apart from all other polymer tips on the market—but it’s also unique in its high resistance to the elevated temperatures a bullet experiences during flight. It is superior to all other options.

In addition to the AccuChannel and Slipstream Tip, Federal engineers incorporated other important features to boost ballistic coefficient (BC), delivering flat trajectories and less wind drift.

Finally, Terminal Ascent also features high-end nickel plating that is corrosion-resistant, to give the cartridge an outstanding appearance with smooth operation. This finishing makes Terminal Ascent look like a fine piece of jewelry. And the use of clean-burning propellant and an ultra-reliable, sealed primer—as well as its neon electric-blue polymer tip—produces a sleek-looking, high-performance cartridge that’s sure to impress.

The result of all these design elements is both close-range (higher velocity) and long-range (lower velocity) terminal performance with both accuracy and reliability, plus great looks. And with the ability to expand at the lowest velocity of 1,400 fps, the bullet is sure to be a hit with shooters using shorter-barrel rifles or hunting handguns.

The following is a summary of the in-depth details of Terminal Ascent’s high-performance design:

**Bonded Construction in a Match-Style Hunting Bullet**

The Terminal Ascent seamlessly mates a tough, bonded hunting bullet with a match-style accurate bullet without sacrificing any aspect of performance. And, unlike other so-called long-range hunting bullets that can fail to perform on impact at lower velocities, the Terminal Ascent upsets as designed at close, mid and long ranges.

The all-new Terminal Ascent bullet design is based off Federal’s proven Trophy Bonded Tip which originated from the famed Trophy Bonded Bear Claw. While each of these ammo lines differ, they share Federal’s proven history of being some of the most effective bullets on the market for hunters. The Terminal Ascent continues this tradition. Its bullet has a tapered jacket, bonded lead core, and long, solid copper rear shank to give shooters that bone crushing, hard-hitting performance they need for hunting situations. In other words, the bullet retains its weight for consistent, lethal penetration at any range.

Its match-style features include a secant ogive and AccuChannel groove technology for the best possible long-range ballistics. Its boat-tail angle and length are optimized for peak ballistic coefficient and stability.

The match-style hunting bullet also features a small meplat for better aerodynamics. Meplat is the technical term for the flat or open tip on the nose of a bullet. The shape of the meplat is important in determining how the bullet moves through the air. This meplat helps result in its excellent ballistics and accuracy.

**AccuChannel Grooving**

Grooving on a bullet shank improves accuracy across a greater range of rifles while reducing fouling and barrel wear. However, typical grooving can cause aerodynamic drag, resulting in more bullet drop and wind drift. AccuChannel groove technology used in Terminal Ascent is different.

When developing the bullet, Federal engineers ran a series of accuracy experiments testing both the number and location of grooves.

During that series of experiments, these engineers made a breakthrough and discovered that by strategically placing one or two grooves, they could achieve the same benefits and accuracy as three grooves used in Federal’s older bullet designs. Conventional grooves cause approximately a 5 percent BC drop per groove.

To improve the groove even further, Federal engineers used computational fluid dynamics modeling (CFD) to change the groove geometry to reduce drag. The industry’s average groove has 90-degree steep walls, whereas Federal’s AccuChannel has a sloped rear wall, which lets the air flow in and out of the groove, reduces the pressure on that point, and reduces drag on the bullet.

The result is a bullet that can perform better across a greater range of rifles without sacrificing wind drift or drop, making it easier than ever to make extreme range shots.

**Slipstream Tip**

Polymer tips are a common feature on modern bullets. But the Slipstream tip used in new Terminal Ascent is completely different than other designs, and it has a huge effect on what the bullet is able to do. Most importantly, Federal has a patent on the tip’s hollow core that initiates expansion even when the bullet is traveling at lower velocities.

Federal engineers arrived at the unique design after testing of other tipped bullets revealed they failed to expand consistently at distances past about 600 yards. A new approach was needed to ensure all-range performance.

The inspiration came when the Federal engineering team drilled a hole all the way through the center of the tip. Upon impact, that hole would allow target media into the front end of the bullet to initiate expansion. The engineers tested that concept and it worked perfectly. It extended the performance range by a few hundred yards.

Further testing and development lead to another breakthrough—one that not only improved terminal performance but also improved accuracy and decreased drag. The engineers found that they could actually close up the front end of the tip and still get a high BC. The bullet would still expand on those low velocity impacts, because the front end of the tip would break off and reveal the channel, allowing media to enter.

This discovery allowed Federal engineers to maintain the small, aerodynamic meplat of a solid polymer tip while getting the same guaranteed expansion at distances where other bullets fail to open consistently.

The Slipstream Tip’s hollow core sets it apart from all other polymer tips on the market—but it’s also unique in its resistance to the elevated temperatures a bullet experiences during flight. The tip’s high-tech material is actually the same one Federal has used for a decade in the popular Trophy Bonded Tip bullet. It has a glass transition temperature—or softening point—of 434 degrees Fahrenheit. This unmatched heat resistance gives shooters the extremely consistent ballistics needed to make accurate long-range shots.

**High Ballistic Coefficient**

Extreme-range hunting and target shooting is getting more popular every day. Concurrently, shooters are giving more attention to their bullets’ ballistic coefficient (BC) than ever before.

While a lot of people know about ballistic coefficients, there is some common confusion about what it actually means. Simply put, ballistic coefficient is a measurement of how well the bullet cuts through air. The higher the BC, the better the bullet cuts through air. It can also define how well the bullet maintains its velocity downrange. More velocity and energy equates to less wind drift, flatter trajectories and better terminal performance.

Every aspect of the new Terminal Ascent bullet profile has been engineered to maximize ballistic coefficient. For example, high ballistic-coefficient bullet design features include: AccuChannel groove(s) design and placement, secant ogive, maximum boat-tail length, optimized boat-tail angle, heavy-for-caliber bullet weights, and the Slipstream Tip’s extremely small meplat diameter. The shape of the meplat is important in determining how the bullet moves through the air.

Terminal Ascent’s sleek, elongated boat-tail profile and designs are critical parts of the performance package, and like the rest of the bullet’s design, it didn’t happen by accident. Longer boat-tails yield higher BCs. The tradeoff is lengthy tails can reduce stability. To conquer this, Federal engineers determined the optimal boat-tail angle and extend the length as far as possible without taking a bite out of bullet stability.

To further boost BC, engineers selected bullet weights that are as heavy for caliber as possible while still maintaining stability, even in extreme conditions, through the different barrel twist rates common in today’s wide array of hunting rifles.

All this equates to shooters getting the flattest trajectories, the least wind drift and the highest confidence to know they are going to make their shot. For example, the 155-grain 280 Ackley Improved bullet has a .586 G1 BC, and the 130-grain 6.5 Creedmoor bullet has a .532 G1 BC which is are two of the best for hunting bullets within the industry.

**High-Velocity, Close-Range Terminal Performance**

With the growing popularity of long-range big game hunting, it’s not hard to find ammunition *claimed* to offer the accuracy and downrange terminal performance to do the job. However, to even come close to filling this tall order, these options are often built like varmint bullets, with thin jackets to encourage expansion at the low velocities experienced at longer ranges.

Unfortunately, when the bull or buck of a lifetime steps out of the brush at 20 yards, such single-purpose projectiles can completely blow apart under the high velocities of close-range impact, resulting in shallow penetration, low weight retention and poor terminal performance.

Terminal Ascent doesn’t make such sacrifices, combining its extreme range expansion capabilities and accuracy with the bonding and heavy-duty construction of the world’s toughest hunting bullets. Its robust bonding and copper shank consistently provide 90 percent weight retention upon high-velocity, close-range impact for deep wound channels. With the Slipstream polymer tip, the design still expands reliably at the longest distances. There's no other bullet on the market that has this wide of a velocity spectrum. Photos are of prototype Terminal Ascent bullet upsets taken at a velocity of 2,757 feet-per-second.

**Low-Velocity, Long-Range Terminal Performance**

Deadly terminal performance has to penetrate straight through its target and transfer energy along the way. But, lethal expansion doesn’t always look the same at every range, and a large expanded diameter is not always required for a bullet to make a clean kill. Bullets accomplish terminal performance not through sheer expansion but by opening the nose consistently and creating a uniform frontal surface. Most bullets don’t do this at extreme long range, however. A typical bullet will fail to expand symmetrically, causing it to veer off target within the animal, or tumble. The distance at which it begins to tumble is very unpredictable. Sometimes it will travel a great distance before it does and sometimes it will tumble immediately.

The new Federal Premium Terminal Ascent is completely different. Its engineers designed the Terminal Ascent for flawless expansion at a wide range of velocities, from blistering speeds at the muzzle all the way out to extreme ranges where velocity falls off. At all distances within this vast range of velocities, the round reliably expands within the first couple inches of entering the target and punches deep or straight through, dumping devastating amounts of energy in the process.

The bullet’s ability to open up at lower velocities is also helpful to shooters using short-barrel rifles or handguns which leave the muzzle at lower velocities than normal to begin with.

Its externally skived nose, exclusive hollow point shape and Slipstream polymer tip work together to expand immediately and consistently. From the muzzle velocities all the way out to 1,350 feet per second, Terminal Ascent gives frontal expansion. It’s why this ammunition stands apart from all other bullets, transferring its energy into the animal and carving straight, lethal wound channels that bring down big game at any range. Photos are of prototype Terminal Ascent bullet upsets taken at a velocity of 1,484 feet-per-second.

**The Lineup of Loads**

In a marketplace filled with competitor loads that make tradeoffs—sacrificing short-range terminal performance for long-range expansion, or toughness for accuracy—Terminal Ascent does it all and stands alone.

The new line of ammunition will be initially launched in 11 cartridge options. This list includes: 6.5 Creedmoor 130-grain, 6.5 PRC 130-grain, 270 Win. 136-grain, 270 WSM 136-grain, 280 Ackley Improved 155-grain, 28 Nosler 155-grain, 7mm Rem. Magnum 155-grain, 308 Win. 175-grain, 30-06 Spring. 175-grain, 300 Win. Mag. 200-grain, and 300 Win. Short Mag. 200-grain. All are sold in 20-count boxes.

Federal also offers its Premium Terminal Ascent as components for handloaders. These bullets are available 130-grain .264, 136-grain .277, 155-grain .284. 175-grain .308, and 200-grain .308. All are packaged in 50-count boxes.

There’s never been a hunting bullet that compares. In fact, Federal already touts Terminal Ascent as being its best hunting bullet ever made in the 98-year-old history of the company. Learn more about Terminal Ascent ammunition at www.federalpremium.com.

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