

EDUCATIONAL & PROMOTIONAL MATERIALS

FOR MORE INFORMATION, VISIT OUR SHOOTING SPORTS AND EDUCATION SECTION AT:
WWW.FEDERALPREMIUM.COM



**FEDERAL
PREMIUM®**
AMMUNITION



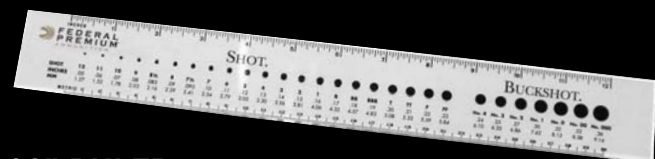
SHOTSHELL ID KIT

Box of unprimed color-coded shotshell tubes includes 10, 12, 16, 20, 28 and .410 gauges. 12 gauge is cut away to show the wad. Beginners easily learn the different shell diameters. (\$3.00 per set)



AMMUNITION 101 DVD

A 25 minute DVD hosted by Jim Scoutten. Rimfire, Centerfire and Shotgun chapters highlight how each product is made and its basic function. Includes animated graphics for visual demonstration. Excellent tool for learning names of ammunition parts, their function and overall safety in knowing your ammunition types.



12" RULER

The clear, 12 inch ruler shows actual sizes of 28 shot pellets from #12 to 000 Buck. (\$3.00 each)



PAPERWEIGHT

This is a great tool you can use to help learn about shot sizes. This shot size paperweight is a clear acrylic display of actual pellet sizes. (\$13.00 each)



FOUR IN ONE DVD

A 70.5 minute DVD. You'll get:

- 1) Basic Rifle Shooting - A Better Way
- 2) Basic Pistol Shooting - A Better Way
- 3) Basic Shotgun Shooting - A Better Way
- 4) Flying Targets - From Basic BB to Successful Shotgun Shooting.



**FEDERAL
PREMIUM®**
AMMUNITION

FEDERAL CARTRIDGE COMPANY • 900 EHLEN DRIVE • ANOKA, MINNESOTA 55303

AMMUNITION BASICS

ANATOMY OF A SHOTSHELL

Federal loads six different gauges of shotshells: 10, 12, 16, 20, 28 and .410. Their lengths and shot charges vary from the 2½ inch–½ oz. .410 to the 3½ inch–2¼ oz. 10 gauge. They are loaded with lead, steel, High Density® and HEAVYWEIGHT® shot, as well as slugs and buckshot.

There are similarities and differences in the component parts and construction of a shotshell. The head and primer are similar in all shells. The tube and base wad are either paper or plastic. The shot wad design and powder vary with the type of shotshell.

Lead Shot: Pellets and buckshot are formed by pouring melted lead through a sieve or swaged (formed in a die). Wads for lead shot ammunition are molded from flexible, low-density polyethylene plastic and have a cushion section on the bottom which collapses on firing. The cushion helps reduce the number of deformed pellets and recoil.

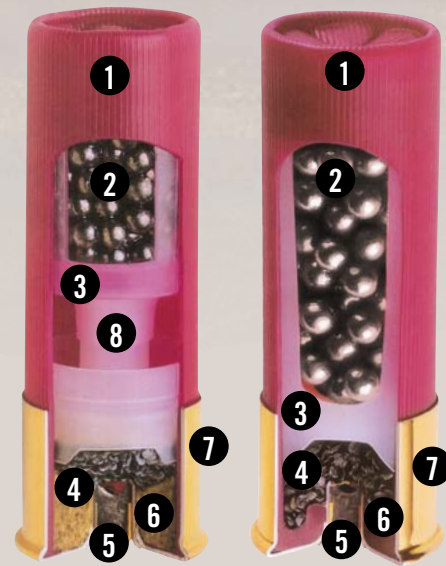
Steel Shot: Made by cutting soft steel wire into short lengths which are formed and ground. The shot is then annealed and coated with a rust inhibitor. Wads for steel shot ammunition are molded from high-density polyethylene. They have thick sidewalls to prevent the pellets from contacting the shotgun bore surface.

The new **FLITESTOPPER™** shot is an all-steel pellet that features a ring to cut on impact and optimize patterns. Steel shot ammunition requires large charges of special slow-burning powders to give the large shot column a gentler start but a faster exit from the bore.

High Density® Shot: Formed from powdered tungsten and powdered iron. They are blended together and pressed into a pellet, then sintered (bonded) together by a heating process. The shot is then coated with rust inhibitor. High Density has a similar density to lead, but is similar in hardness to steel.

High Density shotshells use a standard steel shotcup wad that delivers reliable patterns and protects the bore of the shotgun. High Density can be used in any barrel that is designed for steel shot. Powder used for High Density loads is similar to that used in steel shotshells.

HEAVYWEIGHT® Shot: Pellets are made of tungsten-alloy and coated with a rust inhibitor. The FLITECONTROL® wad protects bore from hard pellets. HEAVYWEIGHT shot is 35% denser than lead. Powder for these shells is similar to that used in steel shotshells, and this shot can be used in a steel safe barrel.



LEAD SHOT STEEL SHOT

- | | |
|-----------|-------------|
| 1. TUBE | 5. PRIMER |
| 2. SHOT | 6. BASE WAD |
| 3. WAD | 7. HEAD |
| 4. POWDER | 8. CUSHION |

FLITECONTROL® WAD

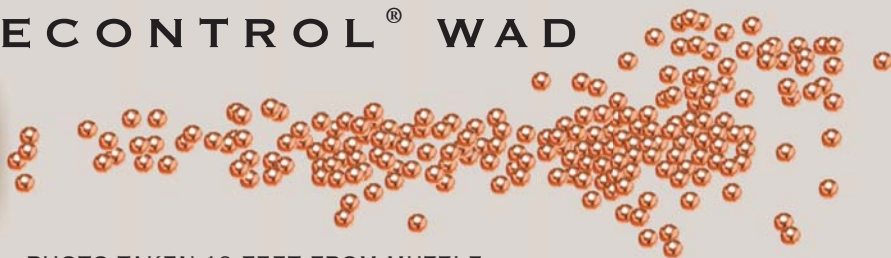


PHOTO TAKEN 19 FEET FROM MUZZLE

The FLITECONTROL® wad opens at the rear, creating an air brake that pulls the wad off the shot string. The pellets are released at the optimum moment for accuracy and power. Available in Mag•Shok® turkey, select Vital•Shok® Buckshot and Black Cloud® Waterfowl loads.

Note: Black Cloud 12-gauge loads feature all-black hulls.



10 GAUGE 12 GAUGE 16 GAUGE 20 GAUGE 28 GAUGE .410 GAUGE

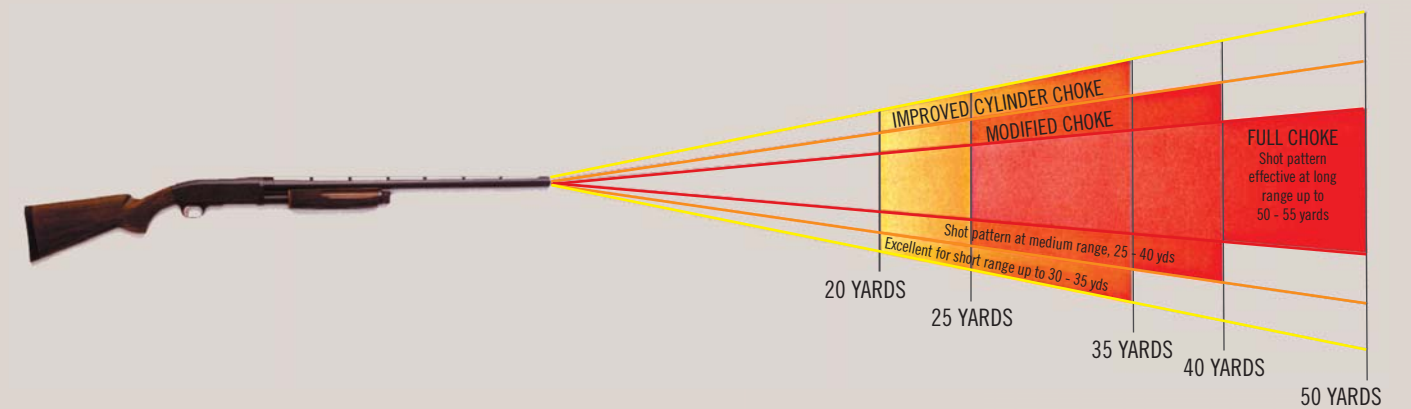
PATTERNING A SHOTGUN

USE THIS PROCESS TO PATTERN YOUR GUN BEFORE TAKING TO THE FIELD:

1. Select an area that provides a safe backdrop.
2. Wear a good pair of shooting glasses and hearing protection.
3. Set up patterning paper at least 40 inches square and mark an aiming point near the center of the paper.
4. Select the shotgun/load combination to be tested and measure off the distance you usually shoot in the field.
5. Shoot at least five test patterns, each on a separate pattern sheet.
6. Outline a 30-inch circle around the densest portion of the pattern.
7. Check the pattern for evenness and uniformity.
8. Determine if the pattern is dense enough for the game you are hunting. Remember, small game requires dense patterns with small shot and larger game needs bigger pellets with a less dense pattern.

CHOKES

Constriction in a shotgun's muzzle is referred to as "choke." The three most common chokes are full, modified and improved cylinder. Lead, steel and tungsten pattern differently in each of these chokes. To determine which load provides the best pattern density and most even pellet distribution, make sure to pattern a variety of loads at different distances.



SHOTGUN GAUGES

The gauge of a shotgun was first determined by a simple method that used lead balls. A gun maker would use lead balls the same diameter of the shotgun bore, count how many of those balls it takes to equal one pound of weight, and that would be the gauge of the gun. For example, it will take 12 lead balls the size of a 12 gauge shotgun bore to weigh a pound. The only exception is the .410, which is measured in inches. Shotguns and shotgun shells should also be matched. Failure to properly match the ammunition to the firearm can cause firearm damage and/or personal injury.



10 GAUGE 12 GAUGE 16 GAUGE 20 GAUGE 28 GAUGE .410 GAUGE

SHOTGUN SLUGS

Barnes® Expander® is a highly accurate, hollow point sabot style slug constructed of solid copper. It's enclosed in a single piece polyethylene sleeve. It delivers expansion up to 150% greater than conventional sabot slugs. It is recommended for use in fully rifled barrels.

Barnes® Tipped Expander® uses a polymer tip for flatter trajectory and better accuracy. This slug is capable of 4" groups at 200 yards.

Sabot is a hour-glass shaped lead slug is enclosed in a two-piece polyethylene sleeve that grips the rifling to provide spin and increased accuracy.

Rifled or "Foster" slug has helix ribbing to enhance stability through the bore. It has a hollow point that is designed for maximum expansion. The rifled slug is recommended for smooth bore shotgun barrels.

TruBall® Rifled Slug is the most accurate slug ever made for smooth bore shotguns. The unique TruBall locks the slug and wad in place, to punch out as tight as 2-inch groups at 50 yards with up to 75% improvement in group size consistency over standard rifled slugs.



BARNES EXPANDER SABOT SLUG TIPPED EXPANDER SABOT SLUG

SABOT SLUG

RIFLED "FOSTER" SLUG

TRUBALL RIFLED SLUG

SHOT SIZES

SHOT

PELLET DIAMETER	T	BBB	BB	1	2	3	4	5	6	7	7½	8	8½	9
INCHES	.20	.19	.18	.16	.15	.14	.13	.12	.11	.10	.095	.09	.085	.08
MM	5.08	4.83	4.57	4.06	3.81	3.56	3.30	3.05	2.79	2.54	2.41	2.29	2.16	2.03

BUCKSHOT SIZES

PELLET DIAMETER	NO.000	NO.00	NO.0	NO.1	NO.2	NO.3	NO.4
INCHES	.36	.33	.32	.30	.27	.25	.24
MM	9.14	8.38	8.13	7.62	6.86	6.35	6.10



AVERAGE PELLET COUNT

HIGH DENSITY® WEIGHT OF SHOT IN OUNCES (GRAMS)			
SHOT SIZE	1 (28.35)	1-3/8 (38.98)	1-5/8 (46.06)
4+	169	233	275
2+	108	149	176
BB+	—	85	100

HEAVYWEIGHT® WEIGHT OF SHOT IN OUNCES (GRAMS)				
SHOT SIZE	1-1/4 (35.44)	1-3/8 (39.98)	1-5/8 (46.07)	1-7/8 (53.16)
2	72	80	—	—
4	111	123	—	—
5	—	—	206	231
6	184	203	270	312
7	—	—	253	408

STEEL-WEIGHT OF SHOT IN OUNCES (GRAMS)										
SHOT SIZE	3/4	7/8	15/16	1	1-1/8	1-1/4	1-3/8	1-1/2	2	2-1/4
7	316	369	395	422	475	527	580	633	—	—
6	236	276	295	315	354	394	433	472.5	—	—
5	182	213	228	243	273	304	334	364.5	—	—
4	144	168	180	192	216	240	264	288	—	—
3	118	138	143	158	178	197	217	237	—	—
2	94	109	117	125	141	156	172	187.5	—	—
1	77	90	97	103	116	129	142	154.5	—	—
BB	54	63	67	72	81	90	99	108	—	—
BBB	46	54	58	62	70	77	85	93	—	—
T	39	46	49	52	58	65	71	78	—	—
F	30	35	37	40	45	50	55	60	—	—

LEAD-WEIGHT OF SHOT IN OUNCES (GRAMS) (3% ANTIMONY)															
SHOT SIZE	1/2	11/16	3/4	7/8	1	1-1/8	1-1/4	1-3/8	1-1/2	1-5/8	1-3/4	1-7/8	2	2-1/4	
9	292	402	439	512	585	658	731	804	877	951	1024	1097	1170	1316	
8½	249	342	373	435	497	559	621	683	745	808	870	932	994	1118	
8	205	282	307	359	410	461	512	564	615	666	718	769	820	922	
7½	175	241	262	306	350	394	437	481	525	569	613	656	700	787	
6	112	155	169	197	225	253	281	309	337	366	394	422	450	506	
5	85	117	127	149	170	191	212	234	255	276	298	319	340	382	
4	67	93	101	118	135	152	169	186	202	219	236	253	270	304	
2	43	60	65	76	87	98	109	120	130	141	152	163	174	196	
BB	25	34	37	44	50	56	62	69	75	81	88	94	100	112	

ANATOMY OF A PISTOL BULLET

1. BULLET
2. CASE
3. POWDER
4. PRIMER



CUTAWAY

RIMLESS

RIMMED

There are two types of handgun cartridges: those used in semi-automatic pistols and those used in revolvers or single-shot pistols. Semi-automatic cartridges are either rimless or semi-rimmed to facilitate feeding through the clip. Revolver cartridges are generally rimmed, although some revolvers can use rimless or semi-rimmed centerfire cartridges.

The smallest Federal centerfire handgun cartridge is the 25 automatic and the largest is the 500 S&W. Federal has 12 varieties of bullet styles and shapes.

Hydra-Shok®: Features a unique, patented center post design and notched jacket. Delivers reliable, controlled expansion for efficient energy transfer and stopping power. Designed for law enforcement, home defense and personal protection.

Expanding Full Metal Jacket: This revolutionary barrier-penetrating design combines a scored full metal nose over an internal rubber tip that collapses on impact. It never fills with barrier material and assures expansion on every shot. A lead core at the base maintains weight retention.

CastCore®: Features hard cast lead bullets that do not expand or break upon impact. Designed to break through heavy skeletal structure of medium to large game animals and also to maximize penetration.

Lead Round Nose: Dates back to the early part of this century. Bullet is 100% lead with no jacket. Provides excellent accuracy and is very economical.

Full Metal Jacket: Jacket extends from the nose to the base, preventing bullet expansion and barrel leading. Used primarily as military ammunition and for recreational shooting.

Jacketed Hollow Point: Creates quick, positive expansion with proven accuracy. Specially designed jacket ensures smooth feeding in autoloading firearms.

Jacketed Soft Point: Designed for deep penetration when hunting small to medium-sized game.

Lead Semi-Wadcutter: The most popular all-around choice for target and personal defense. A versatile design which cuts clean holes in targets and efficiently transfers energy.

Semi-Wadcutter Hollow Point: A good combination for both small game and personal defense. Hollow point design promotes uniform expansion.

RHT®: The BallisticClean® RHT® bullet is designed to break up on hard targets for reduced backslash. Eliminates airborne lead and reduces barrel fouling.

TMJ®: The TMJ® bullet jacket completely encases the lead core and eliminates exposure of the core to hot powder gas. It also produces less gun fouling and cleaner fired cartridge cases.

Barnes® Expander®: Delivers superior expansion for maximum energy transfer and ideal performance. Non-toxic all-copper design provides 100% weight retention for great stopping power.

BULLET STYLES



ANATOMY OF A RIFLE CARTRIDGE

Federal has two types of rifle ammunition: Rimfire and Centerfire. The primary difference between these two is the location of the priming mixture which ignites the powder. Rimfire has a priming mixture placed around the inside of the case rim where the firing pin strikes. Centerfire has a separately made primer placed in the center of the head of the case.

Centerfire cartridges are available in numerous calibers with different bullet weights, designs and velocities. The caliber of a rifle is usually expressed in inches or millimeters. For example a .22 caliber bullet is approximately .22 inches in diameter and an 8mm bullet is approximately 8-millimeters in diameter.

It is essential that the ammunition matches the rifle in which it will be fired. The caliber is stamped on the head of the cartridge and the barrel of the rifle. Failure to properly match the ammunition to the firearm can cause firearm damage and/or personal injury.

There are several different types of rifle bullets available today. Some have lead cores, others are lead-free, some have tips and expand explosively, others don't expand at all. In this text we'll look at a few different varieties to learn the general properties of these different bullets. Federal Premium® has a full line of Premium® ammunition that can be seen in our catalog, or online at www.federalpremium.com.

The **Full Metal Jacket (FMJ)** gets its name because it has a jacket that extends from the nose to the base of the bullet. Commonly used for plinking or target shooting, it does not expand and gives the shooter a flat trajectory. On impact, it generally leaves a small entrance and exit wound. The term "Ball" ammo refers to the same type of bullet.

Another bullet that does not expand is a **solid**. These bullets are designed to provide deep penetration on tough animals

1. BULLET
2. CASE
3. POWDER
4. PRIMER
5. PRIMER MIX



RIMFIRE CENTERFIRE



like the cape buffalo or elephant. One of the solids Federal Premium® loads is the **Trophy Bonded® Sledgehammer® Solid**. It has a solid lead core bonded to a copper jacket and does not lose its core, even when striking bone.

Standard **Soft Points** are specially tapered, thinning toward the nose to ensure penetration and mushroom expansion up to 200% of the original bullet diameter. Federal's Power-Shok® line is loaded with these bullets. **Fusion®** is a competitively-priced soft point that features a unique construction. The jacket is joined to the core one molecule at a time to prevent jacket/core separations.

The **Nosler® Ballistic Tip®** is an example of a tipped bullet designed for explosive expansion. Penetration is limited, as it explodes soon after impact. The color-coded polycarbonate tip makes it easy to identify this low-drag, flat-shooting bullet that is accurate and well-suited for long range shooting.

The **Sierra® GameKing®** is an example of a Premium® **soft point** with a **boat-tail** design and a lead core. A boat-tailed bullet is narrowed (tapered) at the back or end of the shank. This provides less wind drag for flatter-shooting and less drop and wind drift. An example of a Premium soft point lead core with the boat-tail is the **Nosler® Partition®**.

Barnes® Bullets loads a few different **non-lead options**. The **Triple-Shock® X-Bullet™** is an all-copper bullet that boasts near 100% weight retention and reliable expansion. This lead-free option gives deep penetration and is designed to reduce pressure and barrel fouling. For varmints, the lead-free **Speer® TNT Green** provides explosive performance in rimfire and centerfire options.

The **Trophy Bonded® Tip** combines a few different features from other bullets. This polymer tipped bullet doesn't explode like some tipped options, but is a **bonded** bullet for high weight retention and deep penetration. This means extra measures were taken to join the core to the jacket—and prevent them from separating. The **Trophy Bonded Bear Claw®** is one of the most famous bonded bullets available. The Trophy Bonded Tip has replaced it in several calibers smaller than .338 Win Mag. However, it is still available to large and dangerous game hunters in Federal's Cape-Shok® line. The tip helps make the bullet shoot flatter and more accurately. Tipped bullets are also known to improve the **ballistic coefficient** of a bullet. This term is used to measure the wind-drag of a bullet. The less drag, the higher the number and the better the bullet flies.

NOTE : Rifle bullets may perform differently in different rifles. To ensure the best possible results try various rifle bullet styles and weights to determine which round performs best in your rifle.

BULLET STYLES

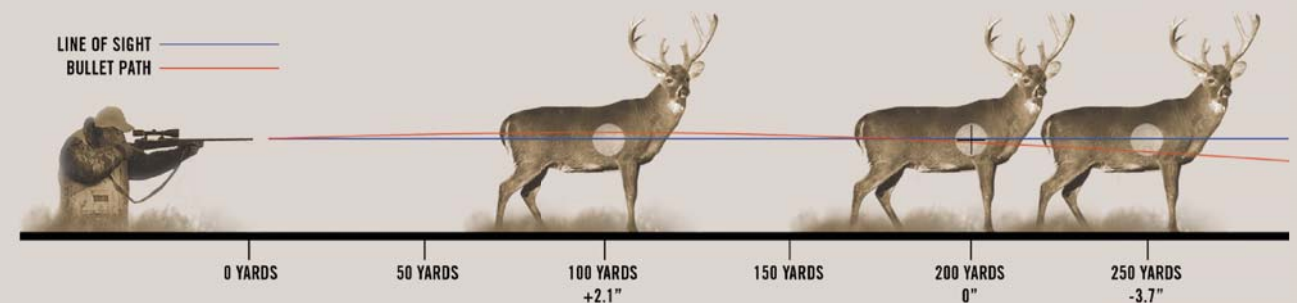


SIGHTING IN A RIFLE

THE PROCESS OF "SIGHTING IN" OR "ZEROING" CONSISTS OF MAKING THE RIFLE AND ITS SIGHT "AGREE" ABOUT WHERE THE BULLETS STRIKE. WITH PROPER PROCEDURES, SIGHTING IN IS NEITHER MYSTERIOUS NOR DIFFICULT.

1. Your rifle and its sight should be in good condition and properly assembled. Check action screws and scope mounts. Bore sighting or the use of a collimator is not a substitute for actually sighting in by shooting on a range.
2. Select ammunition for its intended purpose. Be sure to start with enough ammunition to complete the sighting-in process and also to use in the field.
3. Pick a safe area to shoot with an adequate backstop to stop your bullets. Wear shooting glasses and hearing protection.
4. Shoot from a solid rest, such as a benchrest or sand bags. Shoot at close range to get "on paper" but verify the final zero at expected hunting ranges.
5. From the solid rest, carefully squeeze off three aimed shots. The center of this group of bullet holes is the rifle's point of impact. Adjusting the sight moves this point of impact to your desired zero. Move open rear sights in the same direction you want the group to move. Adjust scopes following directions on the dials. Continue this process until the group is where you want it. (Do not adjust sights on the basis of single shots. An "odd shot" can lead to sight adjustment errors and ultimately wastes ammunition.)
6. Different ammunition brands and/or bullet weights may change the point of impact and necessitate re-sighting. If your rifle gets bumped or dropped, be sure to re-verify your zero so you can bag your game with one shot.

TRAJECTORY



Note: 1. Drawing not to scale. 2. This example: Federal Load No. 3006B with "zero" at 200 yds.

"Trajectory" is the arc of the bullet from the firearm's muzzle. Bullets appear to "rise" because the barrel is angled up. The bullet's path crosses the line of sight twice – going up near the muzzle and going down through the downrange zero. The mid-range trajectory is the bullet's highest point above the line of sight. It usually

occurs halfway between the muzzle and the zero range.

Velocity and bullet design determine trajectory. Low-velocity cartridges with round-nosed bullets, if sighted for long ranges, will have a very high mid-range trajectory—possibly high enough to cause a miss on close-range targets. For big game hunting, a trajectory

height of 3-4 inches is considered acceptable. For small varmints, about 2 inches is maximum. Consult Federal's ballistic tables for velocity, trajectory and appropriate downrange zero for your specific cartridge/bullet. For real time charting and quick comparison, go to our Online Ballistics Catalog at www.federalpremium.com.

MAXIMUM RANGE

LOAD	VELOCITY	DISTANCE
No. 9 Lead	1200 ft/sec	570 ft/225 yds
No. 7 1/2 Lead	1200 ft/sec	649 ft/250 yds
No. 4 Steel	1375 ft/sec	689 ft/260 yds
No. 4 Lead	1330 ft/sec	848 ft/283 yds
No. BB Lead	1330 ft/sec	1082 ft/361 yds
No. T Steel	1450 ft/sec	972 ft/324 yds
No. BBB Tung. Alloy	1450 ft/sec	1160 ft/387 yds
No. 4 Buck	1325 ft/sec	1336 ft/445 yds
No. 000 Buck	1325 ft/sec	1782 ft/594 yds

LOAD	VELOCITY	DISTANCE
12 ga. 1 oz Slug	1550 ft/sec	1260 ft/420 yds
22 Long Rifle	1255 ft/sec	4870 ft/1 mile
38 Special	755 ft/sec	5500 ft/1 mile
41 Rem. Mag.	1180 ft/sec	7500 ft/1.4 mile
30-30 Win. 150 gr.	2370 ft/sec	9,030 ft/1.7 mile
270 Win. 130 gr.	3050 ft/sec	14,380 ft/2.7 mile
7mm Rem Mag. 165 gr.	2940 ft/sec	19,790 ft/3.8 mile

Source: SAAMI charts at 30° inclination—at sea level elevation and 0 wind movement. It will vary for other conditions.