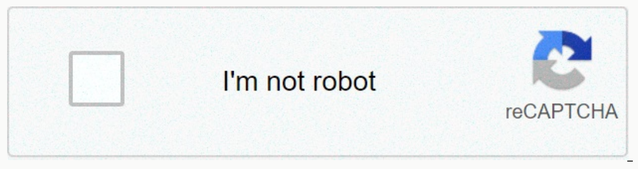

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12 gauge sabot slugs vs rifled slugs

Type of ammunition mainly used in hunting game Shotgun snail A modern shotgun snail is a heavy projectile made of lead, copper, or other material and fired from a shotgun. Snails are designed for hunting big game, self-defense, and other uses. The first effective modern shotgun snail was introduced by Wilhelm Brenneke in 1898, and its design remains in use today. Most shotgun snails are designed to be fired through a cylinder bore or an improved cylinder choke, rifled choke tubes, or fully rifled bores. Snails differ from round-ball lead projectiles in that they are somehow stabilized. In the early development of firearms, smooth-bored barrels were not differentiated to fire one or more projectiles. Some projectiles were used for larger game, but shot can be loaded as needed for small game and birds. Since the firearms became specialized and differentiated, shotguns could still fire round balls although rifled muskets were much more accurate and efficient. Modern snails emerged as a way to improve the accuracy of round balls. Early snails were heavier up front than in the rear, similar to a Minié ball to provide aerodynamic stabilization. Rifled vessels, or rifled choke tubes were later developed to stabilize gyroscopic spin instead of or in addition to aerodynamic stabilization. Many of these snails are sabotaged sub-caliber projectiles, resulting in vastly improved external ballistic performance. A shotgun snail is usually more massive than a rifle bullet. As an example, a common .30-06 bullet weighs 150 grains (0.34 oz; 9.7 g). The lightest common 12 gauge shotgun snail of 7/8 oz. weighs 383 grains (0.875 oz; 24.8 g). Snails made of low-density material, such as rubber, are available as less lethal special ammunition. Used Shotgun snails are used to chase medium-large game at close range by firing a single large projectile instead of a large number of smaller ones. In many populated areas, hunters are limited to guns, even for medium to large game, such as deer, due to concerns about the range of modern rifle bullets. In such cases, a snail will provide a greater range than a load of buckshot, which was traditionally used at ranges up to about 25 meters (22.8 m), without approaching the range of a rifle. In Alaska, professional seasoned guides and wildlife officials use pump action 12-foot shotguns loaded with snails for bear defense against brown bears as a formidable weapon under 50 feet. Law enforcement officers are often equipped with shotguns. In To traditional buckshot, snails offer benefits of accuracy, range, and increased wound potential over longer distances, while avoiding stray pellets. Furthermore, a shotgun allows selecting a desired shell to meet the needs at hand in a variety of situations. Examples include a less lethal cartridge in the form of a beanbag round or other deadly bullets. A traditional rifle would offer a greater range and accuracy than snails, but without the ammunition choices and versatility. [1] [2] [3] Design considerations The mass of a shotgun snail is held within SAAMI pressure limits for shot loads in a certain shotgun shell load design. Snails are designed to be safe by open chokes and should never be fired by tight (or unknown) vessels. The internal pressure of the shotshell load will actually be slightly higher than the equivalent mass snail projectile load, due to increased resistance that occurs from a phenomenon known as shot setback. Common 12 gauge snail masses are 7·8 oz, 1 oz, and 1 1·8 oz, the same as regular birdshot payloads. Comparisons with rifle bullets A typical 1 oz. (437.5 grain) 2 3/4 Foster shotgun slug (12 meters) reaches a speed of about 1,560 fps with a muzzle energy of 2,363 ft. lbs. The 3 snails travel at about 1,760 fps with a muzzle energy 3,105 ft-lbs. By contrast, a .30-06 bullet weighing 150 grains at a speed of 2,600 fps reaches an energy of 2,250 ft-lbs. A 180 grains bullet at 2775 meters per second that is a common 30-06 load and does not reach the true maximum potential 3079 ft-lbs of energy. Due to the larger caliber and shape of the snail, a shotgun snail has a greater air resistance to slow down much faster than a bullet. It slows down to less than half the muzzle energy at 100 feet, which is below the minimum recommended energy threshold for big game (1,000 ft lb is recommended for deer, 1,500 for elk, and 2,000 ft lbs for elk). A snail is also becoming increasingly inaccurate with distance; up to 100 meters, it drops about 5 and has a maximum range of about 400 meters. In contrast, centerfired projectiles of rifles can travel miles. Shotgun snails are best suited for short-range use. Compared to a 30.06, which is 30cal., a snail that is .729 caliber, a snail is more than twice as large. Taylor Knock Out Factor The Taylor knockout factor (TKOF) was developed as a measure of stopping power against the biggest game in Africa,[citation needed] and is defined as the product of bullet mass, speed and diameter, using the granules of imperial units (equivalent to 64.79891 mg), feet per second (equivalent to 0.3048 m/s) and inch (equivalent to 25.4 mm): TKOF = MASS (Weight in grains) × VELOCITY(Feet Per Second) × DIAMETER (Caliber in Inches) × 1 7000 {\displaystyle {\text{TKOF}}}={{{MASS(Grains)}}\times weight {\text{VELOCITY(Feet Per Second)}}\times {\text{DIAMETER (Caliber in Inches)}}}\times {\frac {1}{7000}} , Some TKOF sample values for shotgun snails are: 71 TKOF for a 70 mm (2 3/4) snail (i.e. 437.5 grain oz) X 1,560 FPS X 0.729 caliber /7000 = 71.07 TKOF) 80 TKOF for a 75 mm (3.3 000) snail (i.e. 437.5 grain (1 oz) X 1,760 FPS X 0.729 caliber /7000 = 80.19 TKOF) To compare with rifles, some TKOF sample values for rifle are: Stopping power Cartridge Bullet weight (grams) Bullet weight (grains) Muzzle velocity (m/s) Muzzle velocity (fps) Muzzle energy (joule) Muzzle energy (ft lbs) 19.6 TKOF 7mm Remington Magnum 10.9 g 168 gr 878 m/s 2,880 ft/s 4,201 J 3,098 ft·lbf 21.8 TKOF .30-06 Springfield 11.7 g 181 gr 838 m/s 2,750 ft/s 4,108 J 3,030 ft·lbf 25.7 TKOF .300 Remington Ultra Magnum 11.7 g 180 gr 988 m/s 3,240 ft/s 5,710 J 4,210 ft·lbf 35.2 TKOF .45-70 Government 26.2 g 404 gr 405 m/s 1,330 ft/s 2,149 J 1,585 ft·lbf 40.7 TKOF .375H&H 19.4 g 300 gr 760 m/s 2,500 ft/s 5,644 J 4,163 ft·lbf 47.0 TKOF .378 Weatherby Magnum 19.4 g 299 gr 892 m/s 2,930 ft/s 7,718 J 5,693 ft·lbf 57.1 TKOF .416 Rigby 26 g 400 gr 720 m/s 2,400 ft/s 6,739 J 4,970 ft·lbf 70.0 TKOF .458 Winchester Magnum 32.4 g 500 gr 652 m/s 2,140 ft/s 6,887 J 5,080 ft·lbf 140.7 TKOF 12,12,7×99mm NATO (.50 BMG) 42.0g 648 gr 928m/s 3,040 ft/s 18,050 J 13.3 310 ft·lbf 159.4 TKOF .600 Nitro Express 58.3g 900 gr 610 m/s 2,000 ft/s 10.0 847 J 8,000 ft·lbf Types Full-bore snails Full-bore snails such as the Brenneke and Foster types use a shuttle method of stabilization by placing the mass at the front of the projectile. The lightweight rear automatically corrects by using aerodynamic forces to keep the nose facing forward. Sabotaged snails are designed for rifled shotgun barrels and are stabilized by gyroscopic forces of their spider. Brenneke snails A 12 meter per hour Brenneke bullet The Brenneke snail was developed by the German weapons and ammunition designer Wilhelm Brenneke (1865-1951) in 1898. The original Brenneke snail is a sturdy lead snail with ribs cast on the outside, just like a rifled Foster snail. There is a plastic, felt or cellulose fiber wad attached to the base that remains attached after firing. This mudflat serves both as a gas seal and as a form of drag stabilization. The ribs are used to swerve through choking drills from improved cylinder to full. The lead swages and fills the grooves. It doesn't give a spider at all. Many manufacters have used marketing tricks to imply that it is a form of rifling, but that is incorrect. Since the Brenneke snail is solid, rather than hollow like the Foster snail, the Brenneke will generally deform less on impact and provide a deeper penetration (see terminal ballistics). The sharp shoulder and flat front of the Brenneke (similar in dimensions of a wading bullet) mean that external ballistics limit to short-range use, as the accuracy is similar to that of an American Foster snail while maintaining the enhanced penetration and snail integrity of the Brenneke design. Foster snails A Remington 870 12 feet with observed cylinder bore barrel suitable for Foster Slugs and Buckshot. A snail, invented by Karl M. Foster in 1931, and patented in 1947 (U.S. Patent 2,414,863) is a species of Snail designed to be fired through a smoothbore shotgun barrel. It was designed to allow deer hunting in the Great Depression using smoothbore, suffocated rifles. Foster threw them by hand from soft lead, submitted grooves on their exteriors, and sold them to his neighbors to enhance hunting potential to feed their families. The Foster is the standard U.S. domestic shotgun snail; they are sometimes referred to as American snails to distinguish them from the standard European snail design popularized earlier by Brenneke. Some sportswriters have consistently referred to these snails as a Forster slag, conflating the name with the Forster Brothers who manufactured reloading tools during the same time frame, so Forster snail is an alternative spelling that is often seen in the popular press of the 1930s for describing these snails. The defining feature of the Foster snail is the deep cavity at the rear, which places the center of mass very close to the front tip of the snail, just like a shuttle or a pellet of an air rifle. If the snail starts to yawn during flight, drag will tend to push the lightweight back of the snail back in straight flight, stabilizing the snail. This gives the Foster snail stability and allows for accurate shooting through smoothbore barrels out to a range of about 75 meters (69 m). Most Foster snails also have rifling, which consists of ribs on the outside of the snail. Like the Brenneke, these ribs give a rotation on the snail to correct for manufacturing irregularities, improving precision (i.e. group size.) [4] Unlike traditional rifling, the rotation of the snail does not give significant gyroscopic stabilization. [5] The ribs also minimize friction on both the barrel and projectile and allow the snail to be safely swung when stung by a choke. Foster snails can be safely hurled down much more than Brenneke snails when fired through a choke, hollow, but recommendations are generally for cylinder bore or improved cylinder chokes. Roll-crimping is traditionally used to close a shotgun shell with a Foster snail. This increases the difficulty of handing over Foster snails. During the 1930s, though, many if not most shotgun shells were roll-plopped over an overshot card, and hand tools for putting a roll of fold on a paper shell were readily available and very cheap. Saboted snails Sabotaged snails are shotgun projectiles smaller than the bore of the rifle and supported by a plastic sabot. The sabot is traditionally designed to barrel the rifling into a shotgun and give a ballistic twist the projectile. This distinguishes them from traditional snails, which are not designed to take advantage of a rifle barrel (although neither does the other damage). Due to the fact that they do not make contact with the bore, they can be made from a variety of materials, including lead, copper, brass, or steel. Steel. snails can vary in shape, but are usually bullet-shaped for an increased ballistic coefficient and greater range. The sabot is generally plastic and serves to seal the bore and keep the snail centered in the barrel while it rotates with the rifling. The sabot separates from the snail after it leaves the snout. Saboted snails fired from rifled bores are superior in accuracy over smoothly bored snail options with accuracy approaching those of low speed rifle calibers. Sabot variations BRI Brenneke Rubin Gualandi / Palla Gualbo Wad snails From left, plumbata throw away sabot (#1); plumbata snails (#2, #5); wad snail (#3), sabot snails (#3, #4) A modern variant between the Foster snail and the sabot snail is the mudflat snail. This is a type of shotgun snail designed to be fired through a smoothbore shotgun barrel. Like the traditional Foster snail, a deep cavity is located in the back of this snail, which serves to preserve the center of mass near the front tip of the snail just like the Foster snail. However, unlike the Foster snail, a mudflat snail additionally has a key or web wall poured over the deep cavity, spread across the cavity, which serves to increase the structural integrity of the snail, while also reducing the amount of expansion of the snail when firing, reducing the stress on the shot wad in which it drives into a barrel. Also, unlike Foster snails that have thin fins on the outside of the snail, just like those on the Brenneke, the mudflat snail is formed with an ogive or bullet shape, with a smooth outer surface. The wading snail is loaded using a standard shotshell wad, which acts as a sabot. The diameter of the wading snail is slightly less than the nominal drilling diameter, which is around 0.690 inches (17.5 mm) for a 12-gauge wadslak, and a mudflats are generally cast exclusively of pure lead, necessary for increasing safety if the snail is ever fired by a suffocated shotgun. Common 12 gauge snail masses are 7·8 oz, 1 oz, and 1 1·8 oz, the same as regular birdshot payloads. Depending on the specific stack-up, a map wad is sometimes also located between the snail and the shotshell wad, largely depending on which hull is specified, with the primary purpose of improving folding folds on the loaded mudflat shell that serves to regulate fired shotshell pressure and improve accuracy. It is also possible to fire a mudflat snail through rifled snail barrels, and, unlike with the Foster snail where lead fouling is often a problem, a mudflats usually cause no significant pipe, being nestled in a traditional shotshell wad functioning like a sabot as it travels down the gun barrel. load recipes for mudflats are available on the Hodgdon website under shotshell reloading, as well as from Lee Precision, which additionally sells molds for pouring drive key snails of pure lead. Accuracy of mudflats quickly falls to a range of more than 75 meters (70 m), largely ranges possible with promotion snails, while not yet reaching the ranges possible with traditional sabots slag using thicker-walled sabots. Unlike the Foster snail which is traditionally roller-folded, the wadslak is folded-pleated. Because of this important difference, and because it uses standard shotshell wads, a mudflat snail can be easily reloaded using a standard modern shotshell reload press without specialized roll-crimp tools. Plumbata snails A plumbata snail has a plastic stabilizer attached to the projectile. The stabilizer can be mounted in a cavity in the bottom of the snail, or it can fit over the snail and into external notches on the snail. The first method allows the removal of sabots to be added. And with the second, the stabilizer can act as a sabot, but remains attached to the projectile and is commonly known as an Impact Discarding Sabot (IDS). Plumbata variations Brenneke plumbata Dangerous game (a.k.a. Gualandi boar) Impact Discarding Sabot (IDS) Steel snails There are a number of types of all-steel subcaliber snails supported by a plastic sabot (the projectile would damage the vessel without a sabot). Examples include Russian Tandem wadcutter-type snail (the name is historic, as early versions consisted of two spherical steel balls) and ogive UDAR (Strike) snail and French coil-like Balle Blondeau (Blondeau snail) and Balle fleche Sauvestre (Sauvestre flechette) with steel sabot within expanding copper body and plastic posterior empen. Made of non-distorting steel, these snails are great for shooting into brush, but can produce over penetration. They can also be used to disable vehicles by firing in the engine compartment or for defeating hard body armor. Makeshift snails Wax snails Another variant of a Great Depression-era shotgun slug design is the wax snail. These were made by hand by cutting the end from a standard birdshot loaded shotshell, shortening the shell very lightly, pouring the lead shot out, and melting paraffin, candle wax, or crayons into a pan on a stovetop, mixing the lead birdshot into the melted wax, and then using a spoon to pour the liquified wax with part of the birdshot back into the shotshell , all this while not overfilling the shotgun shell. Once the shell cooled, the birdshot was now held in a mass by the chilled paraffin, and formed a snail. No roll or folding scribble was needed to keep the wax snail in the hull. These were often used to hunt deer during the Depression. Cut shell snails Yet another opportune shotgun slug design is the cut shell. These are made by hand from a stand Shell by cutting a ring around and through the hull of the shell that almost surrounds the shell, with the cut traditionally located in the middle of the mudflat separating the powder and shot. A small amount of the shell wall is preserved, which equates to about a quarter of the perimeter of the shotshell shotshell When setting fire, the end of the fuselage separates from the base and travels through the bore and the bottom range. Cutting scales have the advantage of opportunity. They can be handmade on site if the need arises during a small game hunt when a larger wild animal such as a deer or a bear appears. In terms of safety, part of the shell can remain in the barrel, causing potential problems if not noticed and erased before another shot is fired. [6] [7] Rifles for use with snails Many hunters hunt with shotgun snails where rifle use is not allowed, or as a way to save the cost of a rifle by getting additional use from their shotgun. A barrel for shooting snails may require some special considerations. The biggest drawback of a rifled shotgun barrel is the inability to fire buckshot or birdshot accurately. While buckshot or birdshot won't quickly damage the gun (it can carry the rifling of the barrel with long-term repeated use), the shot's spread increases nearly four times compared to a smooth bore, and pellets tend to form a ring-shaped pattern due to the pellets' tangential velocity moving them away from the drill line. In practice, the effective range of a rifled shotgun loaded with buckshot is limited to 10 feet or less. [8] Iron sights or a low magnification telescopic face are needed for accuracy, rather than the bead face used with shot, and an open choke is best. Since most current production shotguns are equipped with observation ribs and interchangeable choke tubes, converting a standard shotgun to a snail gun can be as easy as attaching clamp-on sights to the rib and switching to a skeet or cylinder choke tube. There are also rifled choke tubes of cylinder bore. Many repeating shotguns have barrels that can be easily removed and replaced in less than a minute without tools, so many hunters simply use an extra barrel for shooting snails. Slug barrels will generally be slightly shorter, have rifle type sights or a base for telescopic vision, and can be either rifled or smooth bore. Smooth-bore shotgun barrels are quite a bit less expensive than rifled shotgun barrels, and Foster type snails, as well as mudflats, can work well up to 75 feet in a smooth-drilling barrel. For achieving accuracy at 100 meters and beyond, however, a special rifled snail barrel usually offers significant benefits. Another option is to use a rifled choke in a smooth-drilling barrel, at least for shotguns with a removable choke tube. Rifled chokes are significantly less Then a rifled shotgun barrel, and a smooth-bore barrel combined with a rifled choke is often almost as accurate as a rifled shotgun barrel dedicated for use with snails. There are many options when selecting shotguns for use with snails. Improvements in the performance of the snail have also led to some highly specialized snail cannons. For example, the H&R Ultra Slug Hunter,[9] uses a heavy rifle barrel (see (see to obtain a high accuracy of snails. Reloading shotgun snails Shotgun snails are often hand-loaded, primarily to save costs, but also to improve performance over that potentially with commercially manufactured snail shells, which often cost more than US$35 (2013) for a small box. In contrast, it is possible to reload snail shells with hand-cast lead snails for less than $0.50 (2013) each. The recurring costs depend heavily on which published recipe is used. Some published recipes for hand loading 1 oz. 12 go. snails require as many as 49 grains of powder each, while other 12 go. snail recipes for 7·8 oz. snails require only 25 grains of powder. Shotguns operate at much lower pressure than pistols and rifles, typically working at a pressure of 10,000 psi, or less, for 12-foot shells, while rifles and pistols are routinely operated at pressure of more than 35,000 psi, and sometimes more than 60,000 psi. The SAAMI maximum allowable pressure limit is only 11,500 psi for 12 feet 23/4 inch shells, including snail shells, so the typical operational pressure for many shotgun shells are only slightly below the maximum permitted pressure allowed for safe ammunition. [10] This small safety margin, and the possibility of pressure ranging through more than 4,000 psi with small changes in components, require great care and consistency in hand-loading. Legal issues Shotgun snails are sometimes subject to specific regulations in many countries in the world. The legislation varies from country to country. Netherlands Large game (deer and wild boar) hunting is only allowed with large caliber rifles; Shotguns are only allowed for small and medium game, up to foxes and geese. However, when a shotgun has a rifle barrel, it is considered a rifle, and it becomes legal for hunting deer, minimum caliber 5.56 mm and 980 joules at a 100 meter, and deer and wild boar, minimum caliber 6.5 mm and 2200 joules at 100 meters. Sweden Snails fired from a single-barrel shotgun are allowed for hunting wild boar, fallow deer and mher, but when hunting injured game there are no restrictions. The shot must be fired at a range of no more than 40 meters. The hunter must also have the legal right to use a rifle for such a game to hunt with shotgun snails. United Kingdom Ammunition containing no less than five projectiles, none of which exceed 0.36 inches (9 mm) in diameter, is legal with a Section 2 Shotgun Certificate. The snails, which contain only one projectile and usually exceed 0.36 inches in diameter, are controlled under the Firearms Act, and require a firearms certificate to possess, which is very strictly regulated. Legal in the UK are, but are not limited to, practical shotgun enthusiasts as members of clubs and at competitions such as those run by or affiliated with the UKPSA.. [11] United States Rifled barrels for shotguns are an unusual legal issue in the U.S. States of America. Firearms with rifle cask are designed to fire single projectiles, and a firearm that is designed to fire a single projectile with a diameter greater than 0.50 caliber (12.7 mm) is considered a destructive device and as such is severely limited. However, the ATF has ruled that as long as the gun was designed to fire shot, and modified (by the user or manufacturer) to fire some projectiles with the addition of a rifle barrel, then the firearm is still considered a shotgun and not a destructive device. In some areas, guns are prohibited for hunting animals such as deer. This is generally due to safety concerns. Shotgun snails have a much shorter maximum range than most rifle cartridges, and are safer for use near populated areas. In other areas there are special shotgun-only seasons for deer. This can be a modern snail shotgun, with rifled barrel and high performance sabot snails, which provides rifle-like power and accuracy to reach more than 150 meters (140 m). References ^ Bill Campbell (July 4, 2007). The Police Shotgun: Versatile, Powerful & Still The Great Intimidator. The

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