

Long Range Shooting Secrets

Bullets Tips

The twist rate of the barrel determines the best bullet weight for your gun and is the single, most important factor for rifle accuracy (see included twist rate chart). The manufacturer cuts the rifling to a twist rate that will stabilize the bullet designed and tested for that cartridge. The smaller the bore diameter, the more difficult it is to stabilize a bullet. Heavy bullets cannot be driven to the same velocities as lighter bullets in the same barrel, so they are also not spinning as fast leaving the muzzle and may not stabilize down range. **Bullet spin is a product of twist rate and velocity.** A sure sign of a bullet not spinning fast enough is a target with oval or keyhole hits. Using a light bullet in a fast twist rate barrel may cause the bullet to skip across the rifling and literally file itself, thus larger groups. Excess copper residue in the barrel is a clue. Try to duplicate factory loads. They have been extensively tested for best results. **Matching the bullet weight to the twist rate and velocity is essential for accuracy.** If you need a heavier bullet than your twist rate will handle, you are probably using the wrong rifle.

Bullet parameters: Besides weight, there are five measurements that should be considered when selecting a bullet. **Sectional Density:** A weight to length ratio measurement. The longer and heavier the bullet, the higher the sectional density thus the deeper it will penetrate. This parameter is not important for target and varmint loads but is very important for game hunting loads. **Ballistic Coefficient (BC):** The higher the BC, the more aerodynamic the bullet, thus it will drop less at long ranges and will be less affected by cross winds. Due to air density, small diameter bullets such as a .224" typically have poor BCs. 6mm bullets and larger start getting higher BCs. A BC of .400 is considered very good, .500 and higher is excellent. **Balance:** All rifle bullets are heavier in the rear than the front and therefore are naturally unstable. The more balanced, the more stable it will be. **Bore Surface** is the length of the bullet that actually touches the bore. The longer the bore surface, the more it dampens effects from bullet jump shock and the more stable the bullet will be going down the barrel. This parameter is very important for accuracy. **Ogive** is the point on the nose where the bullet first measures full diameter. This important parameter will dictate bullet seating depth, bullet jump and cartridge overall length. All bullets must be seated at optimum depth for best accuracy. This usually occurs where the ogive is .010" from the rifled bore.

Conclusion: Analyze before loading. Always stay within the bullet weight intended for your twist rate. Try to select a bullet with the longest bore surface, best balanced, shortest ogive to tip measurement, highest ballistic coefficient, and best sectional density, in that order. A good place to start is a boat tail with a blunt nose or hollow point. Most reloading manuals list BC, sectional density, and have pictures of bullets so you can compare important parameters. Don't skimp on bullets; buy the best quality you can find. Most bullets sold in bulk packs are not uniform weight. Stay with boxes of 100. Use a **Bullet Depth Gauge** to determine proper bullet seating depth. These tools are very easy to use and come with simple instructions. Unfortunately, they are only available for guns with direct in-line chamber access such as a bolt action, single shot, AR-15, etc.

Next in Series: Long Range Shooting Secrets: [Powder Tips](#).

Rifle Twist Rates

Caliber	Twist Rate	Bullet Weight
.172	1:10	all weights
.222 Rim Fire	1:16	all weights, lead bullets
.224 / 5.56mm	1:16	up to 55 grains, 4300 fps or more
	1:15	up to 55 grains, 4100 – 4300 fps
	1:14	up to 55 grains, less than 4100 fps
	1:12	55 – 63 grains
	1:9	63 – 70 grains
	1:8	70 grains or more
.243 / 6mm	1:15	up to 70 grains
	1:14	70 - 75 grains
	1:13	75 – 85 grains
	1:12	85 – 100 grains
	1:10	100 grains or more
.257	1:14	up to 70 grains
	1:13	70 – 80 grains
	1:12	80 – 90 grains
	1:10	90 – 100 grains
	1:9	100 grains or more
.264 / 6.5 mm	1:9	up to 130 grains
	1:8	130 grains or more
.270	1:10	all weights
.284 / 7mm	1:11	up to 140 grains
	1:10	Magnum velocities
	1:9.5	140 grains or more
.308 / 7.62mm	1:15	up to 150 grains
	1:14	150 – 168 grains
	1:12	168 – 170 grains
	1:10	170 – 220 grains
	1:8	220 grains or more
.311 / 7.65 mm	1:10	all weights
.321	1:16	all weights
.323 / 8mm	1:10	all weights
.338	1:10	all weights
.348	1:12	all weights
.358	1:12	all weights
.375	1:12	all weights
.411	1:14	all weights
.416	1:14	all weights
.429	1:38	all weights
.458	1:20	all weights up to 2000 fps
	1:14	all weights above 2000 fps