

Safe Use of Smokeless Powder for Small Arms

Propellant is designed to create gas when burned. The speed by which it creates gas is what we call, "Burn Rate". You will hear about "faster powders" or "slower powders". These descriptions refer ONLY to the rate at which relative propellants create gas.

The burn rate of a propellant is controlled by surface area of the individual grains, density, particle size, energetic content, and burn rate modifiers (deterrents). It is impossible to tell the burn rate of a propellant by its physical traits alone.

Burn rates of a propellant must be matched to the chamber and bore dimensions of a firearm, and the weight and resistance of a projectile. Many additional variables contribute to the correct balance of propellant burn rate and firearm requirements. Experts test these variables, using pressure-test barrels, and fired remotely. It is unwise and potentially dangerous for individuals to develop loads outside of established recipes. We call this, "Tickling the dragons belly", and strongly advise against the practice.

The ballistic output of your loaded rounds WILL change from many variables. Among them: Case length, case volume, primer type and brand, primer seating depth, temperature, altitude, atmospheric pressure, projectile weight, projectile seating depth, projectile form, projectile material, internal case capacity, propellant burn rate, charge weight, moisture contamination, residual solvent, bore conditions, case hardness, mouth crimp, bullet-pull, load length, powder lot, primer lot, projectile lot, firing pin or hammer force, and firearm.

Propellants that look very similar, when loaded in a cartridge, can lead to disastrous results. Therefore, ensure your own safety by diligently following safe reloading practices.

The following include good guidelines for the safe use of propellants:

1. Follow only reliable and safe reloading recipes.
2. Start every load development at the recommended starting charge weight. Work up slowly.
3. Always wear safety glasses when reloading and shooting.
4. Handle primers and propellant with caution and respect.
5. Double-check your work: Ensure you are loading the correct propellant, correct primer, correct load length, and correct projectile; all according to the recipe.
6. Know the signs of high pressure. Any one may be evidence of danger:
 - a. Flattened primer
 - b. Cratered primer
 - c. Pierced primer
 - d. Shiny rub marks on case head

- e. Difficult extraction
 - f. Permanent case diameter change of 0.001" or more when fired; measured at a point just in front of the extractor groove or rim.
 - g. Cracked cases
 - h. Noticeably higher or sharper recoil
7. Ensure you are using good reloading components, of known history. Multi-fired cases can and do split and fail. Inspect and cull anything questionable.
 8. Understand and follow the standard methods to de-prime & size, clean, inspect, re-prime, charge propellant, and seat new projectiles.
 9. Maintain a clean and orderly work environment.
 10. Keep only one propellant in your loading area at a time.
 11. Keep accurate records and label all your reloads according to the chosen recipe.
 12. Know that a load developed in one firearm may not perform similarly in another firearm.
 13. Know that the deliberate over-pressuring of any hand load will NOT significantly increase the rounds velocity. Rather, pressure increases significantly faster than velocity, given a charge weight increase. If you're looking for more velocity than a published recipe reports, it's often best to consider a slower burn rate propellant.
 14. Stay focused. If you become distracted, stop loading. Unintentional over-charging of a case with propellant can cause irreparable harm to the firearm and the shooter.
 15. Follow published reloading recipes. Don't be foolish and risk destruction of your firearm, permanent alteration any of your body parts, or death.
 16. Should you ever suspect that a projectile failed to leave the barrel when fired, know that this is a dangerous situation. Immediately render the firearm completely safe, and inspect the bore. IF a projectile is lodged in the barrel, DO NOT shoot another round. Bring the firearm to a competent gunsmith for removal.

Additional information regarding ammunition specifications and safe practices is available at:

http://www.saami.org/specifications_and_information/index.cfm