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SPORTING ARMS AND AMMUNITION MANUFACTURERS' INSTITUTE, INC.

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**A Technical
Overview of
Ammunition
Types,
Characteristics
and Issues**

Background Paper #6

INTRODUCTION

This background paper is offered as a source of basic technical information on ammunition, with an emphasis on ammunition designed for use in handguns. It is intended to provide media, legislators and other interested parties with factual information on which to review and analyze issues and proposed legislation related to handgun ammunition. Media coverage of ammunition-related issues has led to the belief that the past few years have seen dramatic technological changes in the manufacture and lethality of handgun ammunition. There is little technical basis for these claims. There is no ammunition marketed for handgun, rifle or shotgun that is significantly different than ammunition that has been in production for decades.

While most attention and concern revolve around issues of hollow-point or armor-piercing ammunition, this paper also includes a discussion of conventional target, hunting, military and law enforcement ammunition to provide a reference for the reader.

OVERVIEW

Ammunition is broadly classified into two groups-rimfire and centerfire.

Rimfire ammunition is characterized by a “primer” that completely encircles the rim of the cartridge. The primer is what ignites the powder in the cartridge which in turn propels the bullet down the gun’s barrel. Nearly all rimfire ammunition is manufactured in 22 caliber and is interchangeable between 22 caliber handguns and rifles.

Centerfire ammunition is characterized by a primer in the center of the base of the cartridge. Centerfire cartridges are produced in many different calibers and are usually designed specifically for use either in handguns or rifles. Some centerfire cartridges can be used in both rifles and handguns, but most cannot.

Centerfire ammunition is further classified as: metallic, which is used in rifles and/or handguns; and shotshells, which are used in shotguns.

Bullet Types

Handgun ammunition is basically of three bullet types—lead bullet, partially jacketed and full metal jacketed ammunition. The bullet jacket consists of a thin layer of copper alloy covering all or part of the bullet for various reasons, as described below. Lead bullets and partially jacketed bullets may have a flat or a rounded tip or nose, or the tip may be hollow in its center, depending on whether they are designed for target shooting, hunting, personal protection or military uses.

TARGET AMMUNITION

For most calibers, all-lead bullets are generally best suited for target ammunition. The bullet is driven at relatively low velocity, and the shape of the bullet is a compromise between correct feeding (so as to avoid firearm malfunction) and accurate ballistic performance. It is often designed to produce clean round holes in paper targets to facilitate scoring. Ironically, all-lead bullets often deform severely upon impact with a target. Sometimes, in order to optimize the functional reliability of low-velocity target ammunition, the lead is either partially or completely covered with a bullet jacket of relatively harder metal, usually copper alloy.

HUNTING AMMUNITION

Hunting ammunition is generally driven at high velocity out of magnum-caliber handguns. Although a handgun's short barrel, and the relatively short cartridge case of handgun ammunition preclude handguns from reaching the same power level as typical hunting rifles, modern ammunition has made handgun hunting for big game a practical reality. This hunting ammunition is loaded to higher pressures than target ammunition, and the bullet must be partially covered by a jacket in order to prevent excessive lead from being left in the rifling of the gun barrel when the bullet is fired at such high velocity.

LAW ENFORCEMENT PERSONAL DEFENSE

As with hunting ammunition, cartridges designed for personal defense are generally loaded to higher velocities than target ammunition. However, velocity and energy are secondary to absolute functional reliability in the pistol. For this reason, this type of ammunition usually has at least part of the lead core covered by a harder jacket. Handgun ammunition designed for personal defense, since it is far less powerful than rifle ammunition (and, by definition, is intended for use when the person firing it is in imminent danger), must be designed to perform a number of seemingly contradictory functions. It must give absolute reliability, accuracy, maximum stopping effect, and minimize the danger of over-penetration and ricochets. It has been found that the best compromise for this use is semi-jacketed ammunition with some lead left exposed at the point. Such ammunition transfers the maximum possible energy to the target in order to optimize the stopping impact of the shot, while minimizing the possibility of over-penetration and ricochets. The ammunition industry has responded to the requests and comments of local, state and federal law enforcement agencies in the development of law enforcement/personal defense ammunition.

HOLLOW POINT BULLETS

Hollow point bullets, characterized by a small hollow cavity in the nose, were first introduced for use in rimfire hunting ammunition nearly a century ago. They were intended to provide expansion on impact, imparting maximum energy to a small projectile. Hollow-point bullets are often used in hunting ammunition to provide a clean and humane kill, reducing crippling and lost game. Their use in law enforcement and personal defense ammunition is to enhance the stopping effect and reduce the danger of over-penetration.

Despite recent claims, hollow-point

handgun bullets are not specifically designed to cause more injury to victims. Rather, they are designed to transfer energy from the bullet to the target to maximize the stopping effect and minimize the unintended consequences if someone must regrettably fire a bullet at another human being in self-defense. When such a course of action becomes necessary, the private citizen, law enforcement agent or soldier needs to have the appropriate ammunition. It is simply not possible to design handgun ammunition that adequately does its job under appropriate circumstances that cannot be misused by violent felons to their own end. Responsible manufacturers produce ammunition to be used by law enforcement personnel and for civilian use in self-protection. The optimal design for handgun ammunition is generally a partially jacketed bullet with some lead exposed, often with a hollow-nose cavity, and such ammunition has been manufactured for decades.

MILITARY

Manufactured to military specifications, such bullets are generally not as accurate as civilian handgun ammunition but are optimized toward the reliable functioning of the firearms for which they are designed. Therefore, they are loaded to moderate operating pressure and are usually equipped with a “full metal jacket” completely enclosing their lead core. This is primarily to enhance functioning reliability, although the Geneva and Hague conventions have also mandated such ammunition. The unique requirements of military use, where the wounding of an enemy combatant may be a desirable goal, mandate that military handgun ammunition is, paradoxically, not the best choice for personal defense. This fact is illustrated by the almost universal use of semi-jacketed handgun ammunition by all federal and state agencies and police departments that use defensive handguns. Full metal jacketed ammunition simply offers too much possibility of over-penetration through the target, resulting in the danger of injury to innocent bystanders beyond the intended target. Ricochets may also occur

since, if such a bullet hits a hard surface, it does not immediately deform and break up as lead or semi-jacketed ammunition usually does.

“ARMOR-PIERCING” AMMUNITION

The opposite extreme of exposed lead ammunition is, in effect, to “super jacket” the bullet’s lead core with very tough material, or replace the lead core completely with an extremely hard metal to maximize penetration. This ammunition, often known as “armor-piercing,” has only very limited application even in military or law enforcement contexts. Since 1984, Federal law restricts the manufacturing and importation of such ammunition, and limits its sale to the military and law enforcement. Its ownership and use by civilians is illegal.

A great deal of controversy has arisen over the years regarding armor-piercing ammunition and the threat it reportedly poses because of its ability to penetrate the soft body armor or so-called “bulletproof” vests worn by police officers. Most firearm assaults on police involve handguns, and most body armor is intended to protect officers from that level of harm. However, there is no such thing as a completely bulletproof vest. Even though not designed to do so, most conventional rifle ammunition used for over a century in big game hunting due to its power and velocity will penetrate body armor. Because of this, even though it has rarely been used against police officers, such traditional ammunition has been erroneously labeled as “armor-piercing.”

The members of SAAMI share the concern of law enforcement over armor-piercing ammunition, and the firearm and ammunition industry supported the original Federal ban on handgun projectiles that, according to the government’s definition, are designed and constructed “specifically to defeat protective body armor.” SAAMI representatives subse-

quently worked with Federal authorities and supported their efforts to expand the definition of armor-piercing ammunition under the Violent Crime Control and Law Enforcement Act of 1994. Since that time, even though certain politicians have resurrected the “armor-piercing” bullet controversy in an attempt to ban more and more ammunition including traditional hunting types, Federal law enforcement officials have made it clear that “because the existing laws are working, no additional legislation regarding such laws is necessary.”

“HI-TECH” BULLETS

In late 1994, the media sensationalized reports of a new “hi-tech” bullet that combined the penetration characteristics of armor-piercing ammunition and the expansion characteristics of hollow-point ammunition.

The manufacturer alleged that this “Black Rhino” bullet would penetrate body armor and then would rapidly expand, maximizing damage to body tissue. Upon hearing of this ammunition, representatives of the Sporting Arms and Ammunition Manufacturers’ Institute commented that “... although we have not seen or had an opportunity to test this ammunition, we seriously question these performance claims.” Subsequent testing by other organizations indicated that, indeed, the performance claims were grossly exaggerated, and the ammunition, though never marketed, was determined by the Bureau of Alcohol, Tobacco and Firearms to be essentially the same as conventional ammunition. Only the manufacturer’s performance claims were “high-tech.” Also, a popular television drama series sensationalized a new type of “devastator bullet” that would explode after entering the body. No such bullets are being manufactured.

SHOULD THE SALE OF AMMUNITION BE REGISTERED?

When the Federal Gun Control Act of 1968 was originally enacted, it required licensed firearm dealers to record the sale of handgun ammunition and certain types of rifle ammunition if interchangeable with handguns. In 1976, testimony before the

Committee on the Judiciary in the U.S. House of Representatives indicated that the requirement had “not been proven to be a very effective law enforcement tool,” and the record-keeping requirements covering the sale of 22 caliber ammunition were then amended. In 1985, additional testimony was offered by the then Deputy Assistant Secretary of the Department of the Treasury. Recording the sale of ammunition was described as having “no substantial law enforcement value.” The Bureau of Alcohol, Tobacco and Firearms described the practice as “needless.” Ultimately, the ammunition record-keeping provisions were repealed.

The Sporting Arms and Ammunition Manufacturers’ Institute opposes registration as a wasteful bureaucratic requirement that is of no value in crime prevention.

The Sporting Arms and Ammunition Manufacturers’ Institute is a trade association of the nation’s leading manufacturers of sporting firearms and ammunition. Founded in 1926 at the request of the federal government, SAAMI has been actively involved in the publication of industry standards, coordination of technical data, and the promotion of safe and responsible firearms use. SAAMI currently publishes more than 700 standards related to firearm and ammunition quality and safety. For a listing of SAAMI members, please write to:



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