



September 3, 2003

TECHNICAL NOTE 57, AMMUNITION RELIABILITY

Purpose: To correct common misconceptions about ammunition.

Background: ArmaLite is continually amazed by civilian shooters who purchase high quality rifles and then fire the cheapest ammunition possible through them without regard to its source. These customers often say “This looks like a military rifle... it should be able to fire *anything*.” Worse yet, we often hear from Police departments that have trouble with ammunition purchased from the lowest bidder by purchasing officers who know nothing of the suitability of the ammunition for the rifle. We often find that political decisions or secondary technical decisions (i.e., to reduce ricochet or “over-penetration”) result in the selection of soft-point or other ammunition that is poorly suited to a self-loading firearm.

Facts:

Military grade rifles are not built to work reliably with “any” ammunition. In fact, quite the opposite is true in the U.S. When a firearm is designed for a U.S. military service it is specially tuned to provide optimum reliability with specific NATO standard cartridges. Any future use of another load (bullet weight, powder, velocity, etc) can reduce the ability of the rifle to work under stressful conditions such as fouling, sand, dust, mud, or moisture.

Example: ArmaLite recently was contacted by an element deploying for the Middle East that had been provided a commercial 147 grain full metal jacket cartridge that *looked* like military ammunition. Unfortunately, the ammunition’s brass was soft, which can interfere with extraction under adverse conditions. In addition, the bullets were seated approximately 1/10th of an inch too deep. This error interfered with feeding. The ammunition was suitable for training, but not suited for duty.

Different rifle types may perform differently with the same ammunition. We occasionally hear that “My FAL fires surplus ammunition reliably.” That’s normally because the FALs are produced largely of used, surplus parts that are loose by their very nature. In addition, problematic FALs can often be made to function merely by adjusting their gas mechanism to overpower the problem, albeit at the expense of reduced life expectancy.

The FAL was made and sold by a commercial firm throughout the world when no competitors were present, and thus was found in the hands of many third-world forces. The adjustable FAL gas system was installed to allow the rifle to function with ammunition built in third-world factories, and the FAL Armorers tools and gages were designed to accommodate this variety. It was a system well suited to their market.

The non-adjustable M-14 and M-16 (Stoner system) were designed to accommodate normal variations in high-quality NATO-standard ammunition without manual adjustment. There is no free lunch: the adjustable FAL piston system (and the system of the M14) is imbalanced and prone to disruptive vibration, and is thus not as accurate as the Stoner system used in the ArmaLite. U.S. weapons are not generally adjustable to prevent user error in adjustments and shortened life of the rifle.

While the FAL and its adjustable gas system were among the best available in their time, no nation in the world that can afford to convert to a modern design like the Stoner system has continued to use the FAL as a first-line rifle.

Even different specimens of a single model may behave differently, especially with poor quality ammunition. A rifle with looser fitting but compliant parts, for example, may function with weak ammunition differently than an identical rifle with compliant parts that happen to be tighter. These differences normally work themselves out as the rifles both are broken in.

Different lots of a single type of ammunition can perform differently in even a single rifle. That's why military forces maintain strong "surveillance" programs over ammunition and control it by lot. Lot to lot variations are especially important in surplus ammunition (which generally consists of rejected lots).

There's a reason surplus ammunition was surplus. While some lots may be wonderful, others may be horrible. The purchaser is well advised to sample small lots of surplus ammunition, and then purchase additional quantities *of the same lot number* if it proves reliable.

Both ammunition and rifles change over time. When ammunition ages or is updated over time, its performance with some rifles may change. When rifles are updated, their performance with some loads may change.

When AR-10s were first shipped to the Middle East in late 2002, for instance, ArmaLite conducted a series of evaluations that led to fine-tuning that has made our rifles very tolerant of adverse conditions when using the military ammunition used by the U.S. Armed Forces and NATO. We also tested important commercial rounds that are commonly used by Police forces. The 2003 ArmaLites therefore may function differently with some ammunition, especially weakly-loaded surplus ammunition, than earlier rifles did. The advantages gained are worth the effort.

Recommendations:

A rifle is part of a gun-ammunition-shooter system. Use only high quality, NATO Specification ammunition in your ArmaLite, especially if you use it as a duty rifle.

Avoid the use of soft-point ammunition in self-loading rifles if possible. If not, then select ammunition from a lot that proves as reliable with the rifle as possible.