



March 27, 2019

PolyFrang 5.56mm Frangible Ammunition Barrel Wear Testing in Armalite Rifles

We received a request for information on barrel wear testing using PolyFrang frangible ammunition from Exelon Nuclear Security. They requested information on barrel wear using PolyFrang ammunition specifically with Armalite rifles. Over a three-month period, we conducted testing to determine the wear characteristics of PolyFrang brand ammunition on Armalite barrels.

Testing Protocols:

Testing was performed on a new 1 in 7 twist Armalite chrome lined, barreled upper and PolyFrang 5.56mm production ammunition.

The test was continued until 10,000 rounds was fired.

The rifle was shot at a sustained rate of fire with no more than 30 rounds per minute being fired. It was cleaned* and lubed after each 1000 rounds.

Gas Port and chamber temperature was measured after every five 30 round magazines being fired (150 rounds total).

Throat erosion measurements was taken after every 1000 rounds.

The bore was slugged at the start (0 rounds) of the test and at the end (10,000) of the test for measurement comparison.

The bore was visually inspected using a bore scope after every 1000 rounds to determine wear or damage to the throat, rifling or gas port.

Accuracy testing, consisting of bench rest 5 shot groups was performed at the start of the test and after every 1000 rounds.

*Cleaning Defined: Bolt Carrier was removed, bore brush pushed down the barrel, Bolt and Carrier were wiped clean, lubed and replaced.

Test Results

1. Rifle was shot to 10,000 rounds
2. No throat erosion was detected.
3. No rifling wear was detected.
4. No gas port distortion was detected.
5. No deterioration in accuracy was detected.
6. Barrel chamber and gas port never exceeded 400 degrees during shooting.
7. No ammunition related cycling issues were observed during the test.
8. After 10,000 rounds the barrel slugging revealed no dimensional change to the bore.

Recommendations

1. Since no perceivable wear to the barrel was detected during testing and the ammunition functioned properly in the rifle, I see no issue with recommending it's use in Armalite rifles.
2. Continue testing rifle and ammunition to reach 20,000 rounds.

For more information on the testing or the results please contact me through my email Bruce@sacfirearms.com.

A handwritten signature in black ink that reads "Bruce D Park". The signature is written in a cursive, slightly slanted style.

Bruce D. Park, Lead Armorer Instructor