

M829A4 (formerly M829E4) Armor Piercing, Fin Stabilized, Discarding Sabot – Tracer (APFSDS-T)

Executive Summary

- The M829A4 120 mm cartridge is a line-of-sight kinetic energy cartridge designed for the Abrams M1A2 System Enhancement Program version 3 (SEPV3) Main Battle Tank (MBT).
- In FY15, the Army implemented changes to the M829A4 cartridge production processes, after multiple test-fix-test iterations to address in-bore structural failures observed in early testing.
- In February 2015, the Army conducted Verification #2 testing at Yuma Proving Ground, Arizona, in order to validate that the newly configured cartridge met reliability requirements.
- In May 2015, the Army completed the seven remaining live fire test events, representing various engagement scenarios against threat target surrogates.
- In October 2015, the Army type-classified the M829E4 cartridge as the M829A4, establishing the cartridge's acceptability for Army use and enabling the Program Office to begin official planning for production and fielding of the cartridge.
- In December 2015, DOT&E submitted the classified M829A4 combined OT&E/LFT&E report and assessed the following:
 - The M829A4 cartridge is lethal and operationally effective. The cartridge's lethality and operational effectiveness are dependent on engagement conditions that are discussed in the classified combined OT&E/LFT&E report.
 - The M829A4 cartridge is suitable. It met its reliability requirement as a point estimate.
 - In comparison to previously fielded kinetic energy cartridges, the M829A4 cartridge is not expected to increase the vulnerability associated with the stowed ammunition in the Abrams M1A2 SEPV3 MBT, if engaged by an overmatching threat.
- The Army's Full-Rate Production decision was in December 2015.

System

- The M829A4 120 mm cartridge is a line-of-sight kinetic energy cartridge designed for the Abrams M1A2 SEPV3 MBT. It is the materiel solution for the Abrams' lethality capability gap against threat vehicles equipped with third-generation explosive reactive armor.
- The M829A4 cartridge is an Armor-Piercing, Fin-Stabilized, Discarding Sabot, with Tracer cartridge consisting of a depleted uranium long-rod penetrator with a three-petal composite sabot.

Ammunition Data Link (ADL) interface rings on base of the M829A4.



- The flight projectile includes a low-drag fin with a tracer, windshield, and tip assembly.
- The propulsion system of the M829A4 cartridge is a combustible cartridge case similar to that of the currently fielded suite of Abrams' 120 mm tank cartridges.
- The M829A4 has comparable characteristics to its predecessor, the M829A3, in length, weight, and center of gravity. The visible difference between the two cartridges is the Ammunition Data Link (ADL) interface rings on the base of the M829A4. The rings serve as the interface between the Abrams' fire control system and the M829A4. The ADL enables the Abrams' fire control system to send information to the M829A4.

Mission

Commanders will employ units equipped with Abrams MBTs that use the M829A4 120 mm cartridge to defeat current and projected threat tanks that are equipped with third generation explosive reactive armor and active protection systems. The Army intends the M829A4 to provide lethality beyond its predecessor, the M829A3, enhancing the Joint Forces Commander's capability to conduct decisive operations during Unified Land Operations.

Major Contractor

Alliant Techsystems Inc. (ATK) – Plymouth, Minnesota

FY15 ARMY PROGRAMS

Activity

- The Army proposed changes in design configuration and production processes to address in-bore structural failures observed in FY14 testing and improve the cartridge's reliability. After multiple test-fix-test iterations and failure analyses, the Program Office implemented four production process changes.
- In February 2015, the Army conducted Verification #2 testing at Yuma Proving Ground, Arizona, to validate that the newly configured cartridge met reliability requirements.
- The outcome of the second phase of verification testing in February 2015 enabled the Army to resume production of the cartridge and First Article Acceptance Testing.
- In May 2015, the Army completed the seven remaining live fire test events, representing various engagement scenarios against multiple threat target surrogates.
- DOT&E assessed data resulting from ammunition vulnerability testing conducted in FY14.
- The Army type-classified the M829E4 cartridge in October 2015 as the M829A4 establishing the cartridge's acceptability for Army use. This enabled the Program Office to begin official planning for production and fielding of the cartridge.
- DOT&E submitted the classified M829A4 combined OT&E/LFT&E report in December 2015.
- The Army's Full-Rate Production decision was in December 2015.

Assessment

- DOT&E assessed the following in the December 2015 OT&E/LFT&E report:
 - The M829A4 cartridge is lethal and operationally effective. The cartridge's lethality and operational effectiveness are dependent on engagement conditions that are discussed in the classified combined OT&E/LFT&E report.
 - The M829A4 cartridge is suitable. It met its reliability requirement as a point estimate.
 - If engaged by an overmatching threat, the M829A4 cartridge is not expected to increase the vulnerability associated with the stowed ammunition in the Abrams M1A2 SEPv3 MBT in comparison to previously fielded kinetic energy cartridges.

Recommendations

- Status of Previous Recommendations. The Army addressed all previous recommendations.
- FY15 Recommendation.
 1. The Army should address the recommendations detailed in the classified December 2015 Combined OT&E/LFT&E report.