

.50 Cal Lightweight Ammunition

Innovation to lighten the load

by the Program Manager for Ammunition Team, Portfolio Manager
Logistics Combat Element Systems, Marine Corps Systems Command

Battle-hardened Marines will testify that the M2 .50 Caliber Heavy Machine Gun and its Armor Piercing Incendiary/Armor Piercing Incendiary-Tracer ammunition is decisively effective against personnel and material targets. Those same Marines are also aware that a can containing a 100-round belt of this ammunition weighs 35lbs. The M2 has a voracious ammunition appetite, and this associated weight takes a physical toll on personnel, vehicles, aircraft, and a financial toll on transportation costs.

To support “lightening the load” for Marines, the Program Manager for Ammunition (PM Ammo), one of five program management offices (PMOs) within the Logistics Combat Element Systems portfolio, researched innovative ideas to reduce the weight of ammunition. The maturation of polymer technology led to the development of a

>The Program Manager for Ammunition at Marine Corps Systems Command supports the FMF by procuring and safely providing and sustaining ammunition to enable success across the range of military operations.

An initial contract was subsequently awarded in January 2020 to procure approximately 2.5M rounds to conduct a thorough user evaluation. Shortly after this contract award, Marine Corps Systems Command Commander BGen A. J. Pasagian shared his enthusiasm for this innovative project with the Assistant Secretary of the Navy for Research, Development, and Acquisition and senior Marine Corps leaders, calling it a “game changer.”

PM Ammo is also pursuing the development of a collapsible lightweight ammo can (CLAC) through a partnership with the Irregular Warfare Technical Support Directorate and the Arizona

equates to a 864 lb reduction per warehouse pallet and a 3,456 lb reduction per 463L cargo pallet.

The new ammunition/packaging design and associated weight savings will translate into the following logistical, transportation, and operational impacts:

- Less pallet weight translates into less “wear and tear” on Material Handling Equipment at the depots and ammunition supply points (ASPs).
- Ammunition shipping costs from manufacturer to depot and depot to ASPs are greatly reduced because of the significant weight reduction. For example, a commercial vehicle transporting the legacy .50 cal ammunition from manufacturer to depot or from depot to ASPs can only load approximately ten pallets before the weight limit of the trailer is reached, with an average cost of nearly \$4K per vehicle. The lighter ammunition/packaging will enable approximately fourteen pallets per vehicle, thus eliminating the need for every fourth vehicle.
- Every third 20 ft International Organization for Standardization shipping container, which costs approximately \$22K per container to ship, would be eliminated for surface movement in support of contingency operations. Transportation cost savings are realized by all modes of transportation.

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polymer/nylon material to replace the traditional brass cartridge case and steel links. This innovative technology will reduce the weight of a 100 round belt of linked ammunition by 7 lbs.

In November 2019, the team received a favorable decision to proceed into the production and deployment phase.

State University Research Enterprise. The new CLAC will reduce the packaging weight by a few more pounds. Coupled with the lighter ammo and links, this would achieve an overall weight savings of a fully loaded can (100 round belt) from 35 lbs to approximately 26 lbs. To put this in perspective, that



Images of the new Marine Corps .50 cal polymer-cased lightweight ammunition prototypes of the Ball Linked and the Armor Piercing Incendiary-Armor Piercing Incendiary-Tracer linked. (Source: PM Ammo.)

- Aircraft employing this ammunition can remain “on station” longer since the overall weight reduction lessens the aircrafts fuel consumption. Cargo aircraft transporting this new configuration save a tremendous amount of fuel and can travel further distances.
- The prototype CLAC is collapsible, reusable, and completely recyclable. This will save space when retrograding cans and the reuse capability will

lower the annual costs of CLAC procurements. When the cans become unserviceable, they can be recycled into new cans.

- Lighter ammunition/packaging will support future resupply via UAS for munitions delivery to Marines conducting distributed combat operations.
- The polymer case acts like an insulator rather than a conductor; thus,

heat reduction will extend the barrel life of the service weapons employing this new ammunition.

- Ultimately, lighter ammunition and packaging enhances combat readiness for the individual Marine, who will have the capability to carry more ammunition with less fatigue in combat.

The Marine Corps is leading the way in the conventional use of polymer-cased ammunition. With limited field

user evaluations scheduled to take place this year, conventional ground forces will receive first-hand experience on the effectiveness and performance of .50 cal lightweight ammunition. Marines will be able to see and feel the difference in weight as well as observe the capabilities of this new cartridge. A part of the evaluation will allow Marines to employ and observe both the current .50 cal ammunition as compared to the new lightweight ammunition.

As confidence builds in the employment of the polymer ammunition, the evaluations will progress through a phased approach toward a fully qualified and certified status. These evaluations will include both static and maneuver ranges in different training

environments. Additionally, Marines from the School of Infantry, Advanced Machine Gunners Course, and infantry battalions will provide feedback under the observation from the infantry “Gunner” community, Expeditionary Systems Engineering Division (NSWC Corona), and PM Ammo. The Marine Corps’ .50 cal polymer ammunition not only boasts a reduction in weight but matches the ballistics and performance of the legacy brass-cased cartridges. This is truly an innovative program as PM Ammo continues its modernization efforts in support of increasing lethality and capability to the FMF.

Since all small arms ammunition is procured from the Single Manager for Conventional Ammunition, once

fully fielded, this capability will be made available to the other services as well. The Army is pursuing similar technology for 7.62mm munitions and is expected to reach a fielding decision for that capability in fiscal year 2024.

In summary, this new lightweight ammunition will save a tremendous amount of transportation and logistical costs. More importantly, its operational benefits will exponentially enhance combat effectiveness and lethality for the Marines on the pointy “tip of the spear!”

