

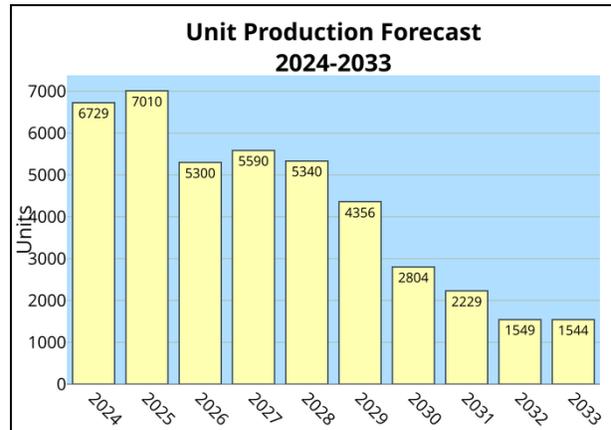
ARCHIVED REPORT

For data and forecasts on current programs please visit
www.forecastinternational.com or call +1 203.426.0800

M72

Outlook

- U.S. Marine Corps is procuring new M72E8 and M72E10 Fire from Enclosure systems
- Several countries have donated M72s to Ukraine, which could result in replacement orders
- Malaysia issued a tender for 800 M72 Enhanced Capacity (EC) variants from Nammo in July 2024



Orientation

Description. A man-portable anti-armor weapon.

Sponsor. The U.S. Army sponsored the development and U.S. procurement of the M72 LAW. Nammo Defense Systems has funded the further development of the weapon as a private venture.

Status. Development through serial production.

Total Produced. Through 2023, we estimate that the various manufacturers produced at least 7.246 million M72 series weapons.

Application. A man-portable, shoulder-fired, light anti-armor weapon optimized for use by infantrymen on the move.

Price Range. According to U.S. Department of Defense budget request documentation, the M72A7 LAW carried an FY15 unit price of \$2,931.33 for U.S. Marine Corps procurement.

Contractors

Prime

Nammo Defense Systems Inc	https://www.nammo.com , 4051 N Higley Rd, PO Box 34299, Mesa, AZ 85277-4299 United States, Tel: + 1 (480) 898-2200, Fax: + 1 (480) 898-2358, Email: marketing@nammotalley.com , Prime
Nammo Raufoss AS	https://www.nammo.com , Enggata 37, PO Box 162, Raufoss, Norway, Tel: + 47 61 15 36 50, Fax: + 47 61 15 36 20, Email: info@nammo.com , Licensee

M72**Subcontractors**

BAE Systems plc	https://www.baesystems.com , 6 Carlton Gardens, Stirling Sq, London, United Kingdom, Tel: + 44 1252 373232, Fax: + 44 1252 383991, (M72A7 LAW Insensitive Propellant)
Ensign-Bickford Aerospace and Defense Company	https://www.eba-d.com , 640 Hopmeadow St, PO Box 429, Simsbury, CT 06070-0429 United States, Tel: + 1 (860) 843-2289, Fax: + 1 (860) 843-2621, Email: ADMktg@EBA-D.com, (M73 Subcaliber Training Device)

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; rich.pettibone@forecast1.com

Technical Data

Dimensions. The following data reflect the contractors' published literature for the basic production-standard M72A4 LAW:

	<u>SI Units</u>	<u>U.S. Units</u>
Launcher carry length	77.5 cm	30.51 in
Launcher firing length	98 cm	38.58 in
Total diameter	72 mm	2.84 in
Firing weight	3.45 kg	7.59 lb
Projectile length	40.8 cm	16.06 in
Projectile diameter	66 mm	2.60 in
Projectile weight	1.5 kg	3.30 lb

Performance. The following data reflect the contractors' published literature for the M72A4, M72A5, and M72A6 munitions, respectively. The operational range data are against a moving target; the range is roughly double against a stationary target.

	<u>SI Units</u>	<u>U.S. Units</u>
Muzzle velocity	200 m/sec	656.16 ft/sec
Altitude	Line of sight	Line of sight
Range	350/350/220 m	382.76/382.76/240.59 yd
Armor perforation	35.5/33/15 cm	13.97/12.99/5.90 in

The contractor optimized the M72A6 for "behind armor effects" at the expense of armor perforation performance. The A6 warhead is also effective against reinforced concrete in the "bunker-busting" application.

Propulsion. All versions of M72 LAW munitions use solid-rocket propulsion.

The M72A2 and A3 use the M54 motor. This component consists of 19 M7 Octol propellant sticks in a chamber 21.46 centimeters (8.45 in) in length and 3.27 centimeters (1.29 in) in diameter, with a maximum exit cone diameter of 5.4 centimeters (2.13 in).

The M72A4 uses a motor consisting of 37 M7 propellant sticks in a chamber 23.3 centimeters (9.17 in) in length and 4.58 centimeters (1.80 in) in diameter, with a maximum exit cone diameter of 5.8 centimeters (2.28 in). The A5 and A6 motors are essentially the same.

Launcher Mode. The shoulder-launched M72 features a disposable telescoping launch tube composed of aluminum and glass-reinforced plastic. The launch tube mounts the integral pop-up front and rear sights, as well as the firing and safety assemblies. The launch tube also mounts a carrying sling and removable end caps.

Control & Guidance. After exiting the launch tube, spring-loaded fins deploy to provide aerodynamic stabilization in flight. The M72A2 and A3 rocket features six fins; the M72A4 and later munitions feature eight fins.

M72

Warhead. The basic 66mm M18 High Explosive Anti-Tank (HEAT) warhead of the M72A2/A3 LAW exhibits a shaped-charge configuration, with 340 grams (0.748 lb) of Octol high explosive with a copper cone. The piezoelectric M412A1 fuze initiates detonation upon impact with the target.

The M72A4 and M72A5 warheads are similar in concept, retaining the M412 fuze but featuring improved shaped-charge and liner designs. The M72A6 warhead, optimized for behind armor effect and for use against structures, features a fixed probe at the nose of the warhead to achieve optimal standoff distance for proper formation of the molten jet stream.

Variants/Upgrades

Variants. The prime contractor has not developed any specific variants of the M72 LAW, per se. We discuss the currently available production models in the **Program Review** (below).

Modernization and Retrofit Overview. Generally not applicable. The contractor integrates product improvements as production cut-ins.

Program Review

Background. The M72 program began in the late 1950s to meet a U.S. Army requirement for a "light anti-tank weapon." This requirement envisioned a light, unguided HEAT warhead, which would fire from a disposable launch tube. The Hesse Eastern Co (Brockton, Massachusetts) conducted initial development; the weapon reached its definitive design by 1960. After extensive service trials, the U.S. Army type-classified the weapon as the M72 Light Anti-tank Weapon (LAW); the weapon entered serial production in 1963.

sights pop up from their housings along the top of the launch tube. The position of the sights makes the M72 LAW usable by both left- and right-handed operators without any modifications.

The U.S. Army acted as its own prime contractor through the mid-1970s. The Rock Island Arsenal (Rock Island, Illinois) procured components through the U.S. Army Missile Command; assembly occurred at the Lone Star Ammunition Plant (Texarkana, Texas). Since 1980, Talley Defense Systems has acted as the prime U.S. contractor for the M72 LAW program.

After acquiring the target through the sights, the operator disengages the manual safety and squeezes the trigger, firing the weapon. Squeezing the sealed trigger on the top of the weapon releases the spring tension on the firing pin, which strikes the percussion primer to initiate the rocket propellant.

In April 2007, Nammo AS (Raufoss, Norway) acquired Talley Defense Systems.

Training Devices

Description. The M72 has gone through a number of successive models that are similar in appearance, with a basic launcher consisting of two concentric tubes:

M73 Training Device. This subcaliber training system consists of the following components:

- The outer tube of glass-reinforced plastic mounts the pop-up sights and the firing mechanism
- The inner aluminum tube contains the 66mm HEAT rocket

- An expended M72 LAW launcher
- The M190 subcaliber launcher, which mounts inside the expended M72 tube
- The 21mm subcaliber training rocket

Sequence of Operation. The operator readies the M72 LAW for firing by pulling the pin that secures the rear end cap; he then removes the end caps and attached sling. The sling, attached to both end caps, provides tension to keep the front end cap in place during storage and carrying. As the operator extends the launch tube by pulling the front and rear sight housings in opposite directions, the firing mechanism cocks itself and the

This system provides a cost-effective, reloadable training device with the look, feel, and handling characteristics of the full-caliber M72 LAW. The 21mm rocket contains a red tracer, which burns out to 400 meters.

M72-S21 Training Device. The Makina ve Kimya Endustrisi Kurumu organization of Turkey also developed the M72-S21 training device for the M72. This device consists of a 21.45mm subcaliber rocket and a reusable adapter that fits inside the standard launcher. The subcaliber tracer rocket follows the same trajectory of the warshot rocket out to 400 meters (437.4 yd).

Licensed and Unlicensed Production. In 1964, the (then) Raufoss A/S firm began licensed production of the M72 LAW under the auspices of a government-to-government agreement between the U.S. and Norway.

M72

Nammo Raufoss continues serial production of the M72 LAW under this licensing agreement.

In the late 1980s, Makina ve Kimya Endustrisi Kurumu of Turkey began unlicensed production of the M72A3. Baris Elektrik Endustrisi AS was the contractor actually doing the work. This unlicensed program has apparently fallen dormant.

M72 LAW Production Models. The current generation of production models is as follows. All new 66mm M72 rocket munitions fire from the same disposable launcher.

Prototype M72A4 (M72-750). The original production-standard M72A2/A3 was adequate against the armor threat of the 1950s; it remains effective against all armored vehicles except the current generation of main battle tanks. Nevertheless, the basic system still has a good deal of development potential. The contractor's first major development was the M72-750.

While outwardly identical to the M72, the M72-750 exhibits greatly enhanced performance. The rocket features 18 additional propellant sticks; the larger (longer) warhead incorporates a more efficient shaped-charge design.

In the mid-1970s, the U.S. Army sought a more capable replacement for the M72. With the failure of the Viper program, Congress ordered the Army to evaluate several competing systems, including several from Europe. The M72A2 was to be the baseline system for the evaluation. Among the competitors was the M72-750. In 1983, the U.S. Army announced that the Swedish AT4 had emerged as the best of the entrants. However, the Army initially did not fully commit itself to the AT4. For more information on this system, see the "AT4/M136 and AT12T" report.

M72A4. Shortly after completion of the initial test program, the U.S. Army directed the Missile Command at Redstone Arsenal to define and develop improvements to the existing M72 to increase performance with a minimum increase in cost. In January 1984, the program received approval and funding. In June, the U.S. Army awarded Talley Defense Systems a contract for the development of the M72 product improvement, designated the M72A4 (also referred to as the M72E4). The contract also called for the delivery of 1,000 weapons for further testing.

The M72A4 is essentially an enhanced M72-750 that has been optimized to meet the U.S. Army requirement for maximum performance at the lowest price in accordance with Army weight and noise limitations. Talley Defense Systems achieved those goals with the M72A4.

Problems with the A4 propulsion components led to a four-month delay in the program, foiling Talley Defense System's effort to test the system by the August 1985 deadline. Repeated delays in the decision-making and funding processes within the U.S. Army postponed the final testing program until August 1988. The type classification of the M72A4 was finally completed in 1993, at which time the U.S. Army also type classified the M72A5 and M72A6.

Meanwhile, the prime contractor continued to develop and market the A4 on its own. Talley placed a version of the M72E4 into serial production for export to Finland. In addition, an unspecified agency of the U.S. government also procured the M72E4 before it received U.S. Army type classification.

M72A5. A slightly modified version of the M72A4 in production for a Finnish Army procurement of 70,000 units. Norway has also type qualified this model.

M72A6. While the technical details are still sensitive, the contractor promotes this weapon as exhibiting greatly enhanced spalling ("behind armor") performance at the expense of armor perforation. This model of the M72 is optimized for use against light armored vehicles up to the BMP class. Qualification tests were completed in 1990; production is ongoing.

M72A7. This version of the M72 features insensitive propellant (by BAE Systems) as a replacement for the standard M7 propellant. This became the production-standard model for U.S. DoD procurement.

M72ASM-RC. Anti-structure munition, employing reduced-caliber warhead filled with aluminized PBX explosive. Nammo is the primary developer of this variant, which would reduce the risk of unintentional casualties in urban environments by using a penetration-triggered composite warhead to minimize fragmentation.

M72A9 ASM. Talley developed this variant; Nammo is producing units for European customers. The M72A9 incorporates the same motor and fuze section as the M72A7 while optimizing penetration of structures and maximizing fragmentation. To accomplish this, the M72A9 ASM employs a PBX-6 explosive encased in a heavy aluminum warhead. The U.S. DoD qualified the M72A9 ASM for employment by U.S. forces in 2005.

M72A8/A10 FFE. Produced by Nammo, the M72 Fire From Enclosure (FFE) comprises two configurations: the M72A8 anti-armor and the M72A10 multi-purpose, anti-structure munition. The M72A8 is outfitted with a high-explosive charge warhead that provides improved armor penetration against vehicles, concrete walls, and light armored personnel carriers. The M72A10 is equipped with an autonomous dual-mode fuze, and it is

M72

intended for use against structures and earthen fortifications, as well as technical vehicles. The reduced backblast of the FFE provides warfighters the ability to fire from cover, including from inside a room.

Proven Combat Record

The M72, even in the enhanced versions, *cannot* destroy a tank over the frontal arc or effectively deal with

explosive reactive armor (ERA). Nevertheless, the M72 LAW boasts a proven combat record worldwide against thin-skinned and lightly armored vehicles. It has also proven to be moderately effective against fixed structures and bunkers. Furthermore, the simplicity, reliability, and relatively low unit price of the M72 LAW continue to make this weapon system a popular product on the international market.



M72 LAW with Warhead Options

Source: Nammo Talley Defense Inc

Worldwide Distribution/Inventories

Export Potential. The M72 LAW enjoys a worldwide reputation such that it needs no real introduction to any prospective customer. The M72 has been one of the most successful programs of its type for several years. The weapon's main selling points are its light weight, tactical flexibility, and relatively low unit price. While the M72 series is ineffective against the frontal arc of a modern tank, the M72A4 exhibits an armor perforation capability that is essentially equivalent to that of the AT4/M136, yet the much lighter M72A4 carries a unit price of about half that of the AT4/M136.

Countries. At least 34 countries currently operate the M72 in some form, including the following: **Argentina, Australia, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Denmark, Ecuador, El Salvador, Finland, Germany, Greece, Guatemala, Israel, the Republic of Korea, Mexico, Morocco, Norway, Peru, the Philippines, Portugal, the Republic of China (Taiwan), Thailand, Turkey, Ukraine, the United Kingdom, the United States, Venezuela, and Yemen.**

M72**Forecast Rationale**

Over its half-century of service, the M72 LAW has earned a proven combat record for effectiveness against older-generation tanks and lightly armored vehicles, as well as against fixed structures and bunkers.

U.S. Procurement Resumes

Despite its extensive combat record, the M72A7's service in Afghanistan and Iraq did not lead to extended U.S. procurement. The Army and Marine Corps initially funded their final orders in FY12 and FY15, respectively.

However, in December 2021, the Marine Corps awarded Nammo Defense Systems a firm-fixed-price contract worth up to \$498 million for full-rate production of M72 LAW FFE variants, comprising the M72A8 and M72A10. The contract has an estimated completion date of December 19, 2026. The initial order was valued at \$96.9 million.

The Marine Corps plan to buy 5,500 M72A8s and 12,000 M72A10s, which will replace an estimated inventory of 18,000 legacy M72s. The Marine Corps announced in May 2024 that it planned to field the new weapons by the end of the calendar year. The new M72s are expected to be fully fielded by 2027.

The U.S. Air Force has also allocated funding for several M72A8 FFE weapons that will be used to protect forward operating bases. FY25 budget documents outline a total of 598 weapons funded in FY24.

The U.S. procures all its shoulder-fired rocket munitions through the Army Joint Munitions Command, which allows the military to combine orders from multiple services, when applicable, to take advantage of economic order quantity pricing.

Ukraine War Helps Drive Export Potential

Nammo Defense Systems and Nammo Raufoss expect a sustained level of M72 LAW export sales throughout the next decade. The war in Ukraine is expected to

increase near-term demand in production, and a 2023 annual report from Nammo noted strong order intake for M72 systems to several nations.

Shortly after Moscow's invasion of Ukraine in February 2022, several NATO countries began donating portions of their M72 inventories to Kyiv. Canada announced a donation of around 4,200 M72A5-C1 weapons in March 2022; Denmark delivered 2,700 M72s to Ukraine in early 2022; Norway donated 4,000 M72s from its inventory in 2022 and also outlined plans to spend 280 kroner (\$26.7 million) to purchase new M72s and M141 rocket launchers for Ukraine; and Finland shipped 1,500 M72s to Ukraine in March 2022. It's possible that M72s have been donated from other operators as well. The influx of donations opens the door for countries to place orders to replace donated weapons, though one-for-one replacement from every donor isn't a guarantee.

The NATO Support and Procurement Agency (NSPA) announced on May 12, 2022, that it had recently awarded a three-year outline agreement for the acquisition of M72 LAW anti-tank weapons. The accord covered several variants of the system, including the enhanced capacity (EC) and anti-structure (ASM) munitions, as well as training launchers, ammunition, and spare parts. In 2022 alone, the agency had received contracts worth 120 million euros (\$128 million) for M72s. The NSPA noted that the system was in service with 13 NATO member states at the time.

In September 2022, reports revealed the Finnish military received approval to purchase an unspecified number of M72 LAW EC Mk 1 weapons (Finnish designation 66 KES 12). A deal with Nammo Laupa was valued at 58 million euros (\$56.8 million), and deliveries were slated to begin in 2023.

In July 2024, Malaysia issued a tender for 800 M72 EC variants from Nammo. The weapons will be delivered to the 10th Para Brigade to replace legacy RPG-7 weapons. The total value of the contract was not disclosed. Malaysia had previously taken delivery of M72s in 2015.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program	High Confidence					Good Confidence			Speculative			Total
	Thru 2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	
Nammo AS												
M72 A10 FFE												
	200	1,280	1,280	2,300	2,300	2,300	2,300	980	680	0	0	13,420
M72 A8 FFE A8												
	0	324	890	1,050	1,340	1,340	556	324	324	324	324	6,796
Subtotal	200	1,604	2,170	3,350	3,640	3,640	2,856	1,304	1,004	324	324	20,216
Nammo Defense Systems Inc												
M72 LAW Tube A 4/A 5/A 6												
	308,044	1,600	1,390	750	750	500	500	500	225	225	220	6,660
Nammo Raufoss AS												
M72 LAW Tube A 4/A 5/A 6												
	112,512	3,525	3,450	1,200	1,200	1,200	1,000	1,000	1,000	1,000	1,000	15,575
Total	420,756	6,729	7,010	5,300	5,590	5,340	4,356	2,804	2,229	1,549	1,544	42,451