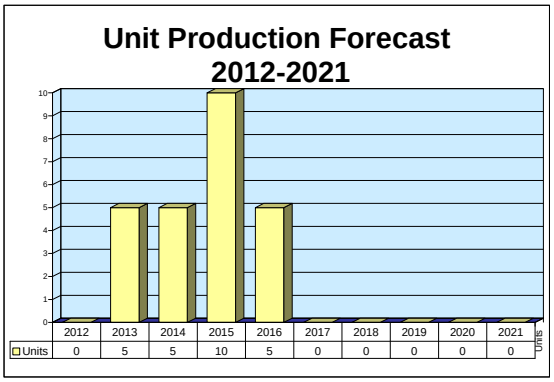
BM-22 220mm Multiple Launch Rocket System

Outlook

- Rosoboronexport no longer actively promotes the BM-22 for export sales
- 300mm BM-30 Smerch is superseding BM-22 in Russian Army service and in export sales
- Production forecast reflects decidedly limited prospects for future BM-22 sales



Orientation

Description. A self-propelled multiple launch rocket system.

Sponsor. The Ministry of Defense of the Russian Federation sponsors this legacy program of the former Soviet Union.

Licensees. None

Status. Development through low-rate serial production on an as-needed basis.

Total Produced. Through 2011, we estimate the contractor produced 1,299 BM-22 systems.

Application. A mobile, multiple rocket-based fire support system optimized for the destruction of area targets by means of multiple barrages.

Price Range. In 2012 U.S. dollars, a fully loaded (with 16 rockets) BM-22 carried a unit price of $653,000. Each 220mm 9M27 series rocket carries a unit price of $5,600.

Contractors

Prime

Federal State Unitary Enterprise, Rosoboronexport, Rosoboronexport State Corp	http://www.rusarm.ru, 27/3 Stromynka St, Moscow, 107076 Russian Federation, Tel: + 7 495 964 61 40, Fax: + 7 495 963 26 13, Prime
Motovilikha Plants Corp	http://mz.perm.ru, 1905 Goda St, Perm 35, 614014 Russian Federation, Tel: + 7 3422 60 73 01, Fax: + 7 3422 65 62 63, Email: info@artillery-mz.com, Second Prime

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Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

220mm BM-22 Multiple Rocket Launcher

Source: Rosoboronexport

Technical Data

Note on Terminology. With the advent of the Lockheed Martin M270 MLRS, *multiple launch rocket system* has become the accepted term for this class of weapon system. However, the Russians call their systems multiple rocket launchers (MRL). Essentially, the terms *MLRS* and *MRL* are interchangeable.

Crew. Four

Launch Vehicle. ZIL-135LMP 8x8 truck. Other similar-wheeled and tracked vehicles can also mount this weapon system.

Traverse & Elevation. Electrohydraulic, with manual backup.

Dimensions. The following data reflect the production-standard BM-22, mounted on the ZIL-135LMP truck.

	SI Units	U.S. Units
Launcher Vehicle		
Launch tubes	16	16
Length	9.63 m	31.59 ft
Width (traveling/firing)	2.8/10.83 m	9.18/35.53 ft
Height	3.2 m	10.49 ft
Combat weight	20.04 tonnes	22.09 tons

The following dimensional data reflect the 220mm 9M27F rocket.

	SI Units	U.S. Units
Length	5.17 m	16.96 ft
Diameter	220 mm	8.66 in
Weight	280.0 kg	616.0 lb

Performance. The following data reflect the 220mm 9M27F rocket. A full ripple-fire salvo takes 20 seconds.

	SI Units	U.S. Units
Launcher elevation	+55°	+55°
Launcher depression	0°	0°
Launcher traverse	30° left/30° right	30°left/30° right
Maximum rocket range	34,000 m	37,182 yd
Rate of fire	One rocket/s	One rocket/s

Propulsion. The 220mm 9M27-series rocket uses an unspecified solid-propellant motor.

Warhead. The 220mm 9M27-series rocket line consists of the following rocket/warhead combinations:

The 9M27F rocket mounts the 9N218F unitary High Explosive (HE) warhead. The warhead weighs 100 kilograms (220 lb) and contains 51 kilograms (112.2 lb) of HE filler.

The 9M27K1, K2, and K3 rockets can mount the following submunition-dispensing warheads:

- 9N218BK1 warhead (30 N9N210 anti-personnel / anti-materiel submunitions)
- 9N218K2 warhead (24 PGMDM anti-tank submunitions)
- 9N218K3 warhead (312 PFM-1 anti-personnel submunitions)

The 9M59 rocket mounts a warhead that dispenses nine bottom-attack anti-tank mines.

Russian sources state that a fuel-air explosive (FAE) warhead and a chemical warhead also exist for the 9M27 series rocket.

Launcher Mode. The BM-22 employs a 16-round launcher on a ZIL-135LMP 8x8 truck; the launcher configuration features one layer of four tubes above two layers of six tubes.

Control & Guidance. Unguided. Several wraparound fins deploy after the rocket exits the launch tube. These fins, with the spin imparted by a rifling groove of the launch tube, provide aerodynamic stabilization. The launcher fires the rockets electrically.

Fire Control. The BM-22 launcher relies on a central command vehicle providing fire control data (azimuth and elevation) and firing orders via a radio or landline link to the fire control officer.

Variants/Upgrades

Variants. None

Modernization and Retrofit Overview. Not applicable at this time. Other than for improved rocket munitions, this system has only minimal modernization and retrofit potential.

300mm BM-30 "Smerch" Multiple Rocket Launcher

Source: FSUE Splav

Program Review

Background. For the Russians, artillery has traditionally been the god of war. Since before the Second World War, the multiple launch rocket system has served as an integral component of Soviet/Russian artillery.

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BM-21's Bigger Brother?

The 220mm BM-22 represents a significantly more powerful follow-on to the ubiquitous 122mm BM-21 multiple rocket launcher. Developed in the early 1970s, the BM-22 Uragan ("hurricane") apparently addressed the Soviet requirement for an MRL that would be more readily compatible with chemical warheads, owing to the larger diameter of the 220mm rocket.

By Any Other Name…

When the Soviet Army first publicly revealed the BM-22 in 1977, NATO initially identified the weapon system as the M1977. Subsequently, Western analysts erroneously identified the system as the BM-27. We now know the correct designation is BM-22.

Description. The BM-22 multiple rocket launcher (Soviet/Russian industrial designation 9P140) consists of a 16-round launcher mounted on a ZIL-135LMP 8x8 truck, designated BAZ-135LMP. A complete BM-22 system (designated 9K57) consists of the following:

- 9P140 launch vehicle
- One or two ZIL-135 reload vehicles (designated 9T452), each of which mounts 16 rockets in two stacks on each side of the cargo bed
- 9M27 series rockets
- Training equipment

For firing, the 9P140 launch vehicle employs four stabilizing jacks for support. The BM-22 also employs an automatic power-loading device. For reloading, the crew lowers the launcher toward the resupply truck; the power-loading device then rams each rocket into the launch tube one at a time.

Enter the 300mm BM-30 Smerch

For multiple rocket launchers larger than the ubiquitous 122mm BM-21, the Russian Army and Rosoboronexport now appear to have given up on the BM-22, concentrating instead on the 300mm BM-30 Smerch. Developed by the Splav State Research and Production Enterprise (Tula, Russian Federation) in the 1980s, the BM-30 Smerch (Tornado) reportedly entered service with the Soviet Army in 1988.

The complete 9K58 system consists of one 9A52-2 launch vehicle (mounting a 12-tube launcher) and one 9T234-2 transporter-loader (carrying one 12-rocket reload) with associated support equipment. The 9A52-2 launch vehicle and the 9T234-2 transporter-loader both feature the MAZ-543A eight-wheeled truck chassis. A BM-30 battery normally features six 9K58 systems (six launch vehicles with six transporter-loader vehicles); six firing batteries normally comprise a BM-30 regiment.

The three-man crew of the 9A52-2 launch vehicle can prepare for action and launch 12 300mm rockets in single (ripple) or salvo fire within three minutes. The two-man 9T234-2 transporter-loader vehicle crew can reload the 12 tubes of the launch vehicle in 20 minutes with the aid of the transporter-loader vehicle's hydraulic crane.

Each BM-30 battery features one command vehicle, mounting the Vivari fire control system. The Vivari FCS can operate in automatic or manual modes; the system employs the E-175 ballistic computer to generate firing data for each 9K58 system in the firing battery. The command vehicle also features satellite and radio communications links to both subordinate and higher-echelon elements in the chain of command.

Recent modernization efforts on the Smerch system have included the introduction of the Slepok-1 FCS as well as the potential to mount the 12-tube launch system on a Czech TATRA 816 truck chassis.

In 2007, SPLAV and Motovilikha Plants Corporation revealed their next-generation modernization program of the Smerch system, now dubbed the 95A2-4. Three modular variants of the system exist: the 95A2 '"Tornado-S"' mounts six 300mm launch tubes on a KAMAZ-63051 truck chassis while the Tornado-G and Tornado-U variants mount 122mm and 220mm launch systems, respectively.

The Russian Army received a number of Tornado-G variants in 2011 for general use and trial exercises. The vehicle is expected to begin production soon, with the Army looking to phase out its aging stocks of BM-21, BM-22, and BM-30 vehicles with the new Tornado variants by 2020.

300mm BM-30 Rockets

The BM-30 fires the 9M55 series of solid-fuel 300mm rockets. The basic 9M55 series rocket is 7.6 meters (24.9 ft) long, with a launch weight of 800 kilograms (1,760 lb). The warhead package of the 9M55 series rocket is about 2.05 meters (6.7 ft) long, weighing about 243 kilograms (534.6 lb).

The 9M55K rocket delivers 72 High Explosive-Fragmentation submunitions out to ranges between 20 and 70 kilometers (12.5-43.5 statute miles). The 9M55K1 rocket (delivering five sensor-fuzed submunitions) and the 9M55K4 (delivering 25 anti-tank mine scattering submunitions) feature the same range envelope.

The 9M55K5 delivers 646 shaped-charge fragmentation submunitions out to ranges between 25 and 70 kilometers (15.5-43.5 stat mi).

The 9M55F (delivering a separable HE-Frag warhead) and the 9M55C (delivering a fuel-air explosive warhead) feature the same range envelope as the 9M55K.

The 9M528 delivers a unitary HE-Frag warhead out to ranges between 25 and 90 kilometers (15.5-55.9 stat mi).

Related News

Venezuela Acquiring Russian Long-Range Rocket Launchers – Venezuela is purchasing new long-range multiple rocket launchers (MRLs) from Russia. The Venezuelan Army will receive the first 300mm 9K58 Smerch MRLs by mid-year. Each launcher can fire 12 rockets at the same time. The range of the rocket is 70 kilometers. The value of this contract is unknown. Venezuela could receive up to 12 systems. These MRLs will be delivered to the new Multiple Rocket Launcher Artillery Group of the 43rd Artillery Brigade of the Fourth Armored Division, located in Guarico state (central west Venezuela). (El Universal, 5/12)

India Informs Moscow of Smerch MRL Problems – Problems have surfaced with the Indian Army's Smerch multiple rocket launchers. In a complaint to Moscow, the Indian Army claims that difficulties exist with the weapons firing system and that securing spare parts is difficult. Despite the problems, India wants to purchase additional units.

India purchased the Smerch rocket launchers in 2005 and 2006. In addition to acquiring the weapons, India also wanted technology transfer. (*Defense News*, 11/11)

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Funding

The Ministry of Defense of the Russian Federation continues to fund this legacy program of the former Soviet Union.

Contracts/Orders & Options

Not available, as the Ministry of Defense of the Russian Federation and the prime contractor have not released contractual information regarding this program.

Timetable

Month	Year	Major Development
Early	1970s	Development begins
	1975	Initial Operational Capability with the Soviet Army
	1977	USSR publicly reveals BM-22
	1979-1984	Combat debut in Afghanistan
	2012	Production line available for Russian Army procurement and export orders

Worldwide Distribution/Inventories

Export Potential. The Soviet Army intended the BM-22 to be a more powerful follow-on to the BM-21 multiple rocket launcher. However, despite the extremely liberal arms export policies of the former Soviet Union and a proven combat record in Afghanistan, the BM-22 has not achieved a significant market impact outside the states of the former Soviet Union. A product of Cold War doctrine, the BM-22 is fast approaching dinosaur status. With a unit price nearly twice that of the highly successful – and far more flexible – BM-21 multiple rocket launcher, the BM-22 simply may be unable to remain viable on the international market.

Countries. **Afghanistan** (18; status unknown), **Belarus** (84), **Kazakhstan** (50), **Moldova** (14), **Russian Federation** (887), **Syria** (5), **Turkmenistan** (54), **Ukraine** (139), **Uzbekistan** (48).

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Forecast Rationale

Open-source reporting suggests that the 220mm BM-22 production line fell dormant in 2006 after a limited Russian Army procurement that had restarted the line in 2005. Nevertheless, the prime contractor still holds out hope for at least some minimal production.

Relegated to the Sidelines

The BM-22 program has become virtually a lost cause. For multiple rocket launchers larger than the ubiquitous 122mm BM-21, the Russian Army and Rosoboronexport now appear to have given up on the BM-22, concentrating instead on the 300mm BM-30 Smerch.

Although a robust, combat-proven design, the BM-22 may simply be a weapon system without a viable market in the post-Cold War world. The 220mm BM-22 simply cannot compete with the unit price and tactical flexibility of its predecessor, the 122mm BM-21. In terms of heavy MLRS capability, the 300mm BM-30 Smerch has effectively superseded the 220mm BM-22.

Minimal Modernization & Retrofit

The BM-22 and its associated 220mm 9M27 series rockets offer only limited modernization and retrofit opportunities. The lack of significant export sales effectively discourages modernization and retrofit investment in what is otherwise a functional, effective weapon system.

A Program without a Future?

The contractor maintains decidedly modest expectations for future BM-22 sales, yet even this minimal level of sales may be unduly optimistic. While we continue to forecast at least a chance for limited export sales (most likely to states of the former Soviet Union), the BM-22 has clearly become a dead end as a moneymaker for the Russian Federation.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program		**High Confidence**				**Good Confidence**			**Speculative**			
	Thru 2011	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**Total**
Federal State Unitary Enterprise, Rosoboronexport												
BM-22 (9K57)												
	1,299	0	5	5	10	5	0	0	0	0	0	25
Total	1,299	0	5	5	10	5	0	0	0	0	0	25