

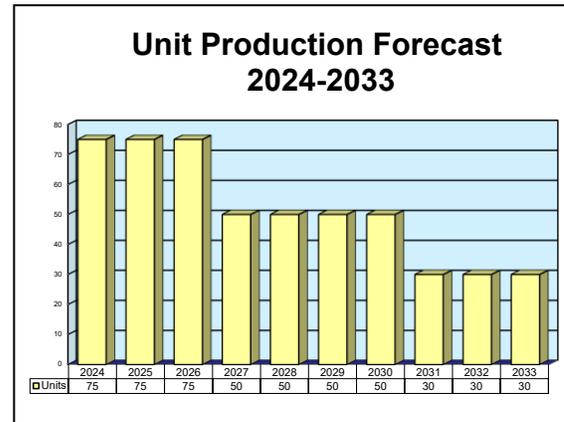
# ARCHIVED REPORT

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## Chinese Multiple Launch Rocket Systems

### Outlook

- 122mm Type 90B is the most current version of the Type 90 MLRS
- May 2019: Type 90B became fully operational with the Peruvian Army, which placed the initial order in 2013
- Forecast reflects production of 122mm Type 90 / Type 90A for PLA procurement and possible export



### Orientation

**Description.** The Type 90 is a Chinese-developed 40-round 122mm multiple launch rocket system (MLRS).

**Sponsor.** The People's Republic of China's Central Military Commission sponsors the development and People's Liberation Army procurement of multiple launch rocket systems.

**Licensees.** None.

**Status.** Development through serial production.

**Total Produced.** There is insufficient public data available to produce an estimate.

**Application.** Mobile, multiple rocket-based fire support systems optimized for the destruction of area targets by means of multiple barrages.

**Price Range.** The per unit price for the Type 90B is estimated to be \$850,000.

### Contractors

#### Prime

**China North Industries Corp (NORINCO)**

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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](mailto:rich.pettibone@forecast1.com)

## Chinese Multiple Launch Rocket Systems

### Technical Data

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

#### Type 90

**Crew.** Five.

**Launch Vehicle.** Tiema SC2030 6x6 truck. The chassis is based on a Mercedes-Benz design that is manufactured under license by NORINCO.

**Traverse & Elevation.** Electrohydraulic, with manual backup.

**Dimensions.** The following data reflects the latest production model Type 90B mounted on the SC2030 vehicle.

	<u>SI Units</u>	<u>U.S. Units</u>
<b>Launcher Vehicle</b>		
Launch tubes	40	40
Length	9.32 m	32.7 ft
Width	2.5 m	8.2 ft
Height	3.03 m	9.11 ft
Combat weight	20 tonnes	22.05 tons
Speed	85 kph	52 mph
Range	800 km	497 mi

The following dimensional data reflects the standard Chinese 122mm HE rocket.

	<u>SI Units</u>	<u>U.S. Units</u>
Length	2.87 m	9.42 ft
Diameter	122 mm	4.81 in
Weight	67 kg	147.4 lb

**Performance.** The following data reflects the standard Chinese 122mm HE rocket.

	<u>SI Units</u>	<u>U.S. Units</u>
Launcher elevation	+55°	+55°
Launcher depression	0°	0°
Launcher traverse	102° left/102° right of center	102° left/102° right of center
Maximum rocket range	40,000 m	43,744 yd
Rate of fire	40 rockets in 18-20 sec	40 rockets in 18-20 sec

**Propulsion.** The 122mm rocket uses an unspecified solid-propellant motor.

**Warhead.** The Chinese State Arsenals system produces five types of warheads for the 122mm rocket:

- HE-Frag
- HE-Frag with steel balls for enhanced fragmentation effect
- Submunition dispensing (39-, 44-, and 74-bomblet configurations available)
- Mine dispensing (six anti-tank mines)
- Steel HE-Incendiary (SHEI)

**Launcher Mode.** The Type 90 employs a 40-round hydraulically operated launcher mounted on the Tiema SC2030 6x6 truck. The truck bed carries a 40-round reload pack forward of the launcher. The automatic reloading system reportedly enables the crew to reload the launcher in less than three minutes. Hydraulically operated stabilizing jacks support the launch vehicle during firing.

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

## Chinese Multiple Launch Rocket Systems

**Fire Control.** The Type 90 features an automated fire control suite that consists of the following components:

- HJ-1 fire control computer
- Launcher direction finder
- Launcher slope sensors

- Launcher elevation and traverse sensors
- Vehicle-mounted power supply

The Type 90 launch vehicle can also accept fire control data from the central command vehicle via voice or datalink.

## Variants/Upgrades

### Variants.

**Type 90.** The Type 90 (alternate designation PHL-90) is the base model. Rockets are mounted on a SC2030 6x6 chassis.

**Type 90A.** This is an improved version. Major upgrades include the ability to launch all types of 122mm unguided rockets to a maximum range of 25 miles (40 km), and the installation of a new computerized fire control system with a GPS and north-finding device for greater accuracy. It also has a remote-control firing device. The system is mounted on a Mercedes-Benz 6x6 chassis, designated Tienna CX 2200.

**Type 90B.** The latest generation of the Type 90. It was unveiled in 2004. The Type 90B system features a reconnaissance vehicle, as well as mobility and reliability improvements. Emplacement and displacement time is seven minutes.

**Type 90B Command Vehicle.** The Type 90B command vehicle has a fully enclosed rear cabin fitted

with a message-processing system, commander's computer and operating console, operator's computer and console, status display, communication systems, differential GPS, radio, and intercom. The vehicle is fully air-conditioned and typically has a crew of five.

**Type 90B Reconnaissance Vehicle.** The WZ 551 6x6 reconnaissance vehicle has a raised rear superstructure with driver and commander positions at the front. It features a roof-mounted reconnaissance pod with an optical sensor and laser rangefinder, retractable under armor protection. The laser rangefinder has a range of 492 feet to 32,808 feet (150 m-10,000 m), accurate to 16 feet (5 m). The thermal viewer offers narrow and wide fields of view, detecting targets up to 16,400 feet (5,000 m) away and identifying them at 8,200 feet (2,500 m). Equipped with a message processor, display, differential GPS, radio, and intercom, it is armed with a roof-mounted 12.7mm machine gun and eight smoke grenade launchers. The vehicle has a crew of four.

## Program Review

**Background.** Development of the Type 90 began in the mid-1990s as a successor to the Type 81 122mm rocket system. The improved Type 90B was unveiled in 2004.

**Description.** A standard Type 90B battalion would consist of three WZ 551 6x6 reconnaissance vehicles; a battalion command vehicle based on a Mercedes-Benz 4x4 chassis; meteorological radar on two Steyr 4x4 vehicles; two Steyr 4x4 maintenance vehicles, one for mechanical and one for electronic maintenance; and three missile batteries.

Each missile battery consists of a Mercedes-Benz 4x4 command vehicle, six 122mm rocket launchers on a Mercedes-Benz 6x6 chassis, and six rocket resupply vehicles on a Mercedes-Benz 6x6 chassis.

The 40-round 122mm rocket launcher system is mounted on a Beifang Benchi 2629 series 6x6 truck chassis, which is based on a Mercedes-Benz design.

Onboard equipment includes the launch tubes, automatic operational and laying system, display terminal, radio, differential GPS, north-finding gyro, automatic loading system, and a semi-automatic collapsible awning system.

The 122mm Type 90B multiple launch rocket system (MLRS) serves as a mobile fire support unit, capable of launching up to 40 rockets in a single salvo to destroy various targets. It can transition to a combat position, fire, and relocate within seven minutes.

The Peruvian Army has 27 of these systems, ordered from China in 2013 and delivered in 2015. The Indonesian Marine Corps also utilizes the Type 90B.

The 122mm rocket launcher can fire all NORINCO unguided solid-propellant rockets with a minimum range of 12 miles (20 km) and a maximum range of 25 miles (40 km).

## Chinese Multiple Launch Rocket Systems

### Funding

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The Ministry of National Defense of the People's Republic of China funds the development, production, and PLA procurement of multiple launch rocket systems.

### Contracts/Orders & Options

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In January 2002, it was reported that Oman had taken delivery of several Type 90 rocket systems.

In July 2013, a Peruvian military delegation visited China, where NORINCO presented the Type 90B and the AR-3 370mm caliber rocket launchers. On Dec. 13, 2013, Peru's Parliament confirmed a \$39 million bid for Chinese-made artillery systems, including 40 launch vehicles, support vehicles, and rockets.

Twenty-seven Type 90B rocket launchers officially entered Peruvian Army service on July 20, 2015, according to a Peruvian Embassy news release. Army Recognition reported on Dec. 29, 2016, that the Indonesian Marine Corps recently had taken delivery of a batch of four Type 90B 122mm multiple launch rocket systems from China. The four artillery systems were handed over under a contract signed in 2015 between Indonesia and the Chinese defense contractor NORINCO.

On May 25, 2022, videos and photos surfaced online showing Chinese-manufactured military vehicles, particularly truck-mounted artillery systems, being unloaded at Sihanoukville Port in Cambodia, reported Shephard Media. The Royal Cambodian Army received SH1 155mm truck-mounted howitzers, AR2 300mm, and Type 90B 122mm multiple rocket launchers (MRLs), all produced by Chinese state-owned NORINCO.

Army Recognition reported on Dec. 16, 2022, that soldiers of the 1st Rocket Battalion of the Indonesian Marines conducted gun drill exercises with the 90B multiple launch rocket system at the 1st Yonroket Apple Field in North Jakarta, indicating that the system was operational with the Indonesian armed forces.

### Worldwide Distribution/Inventories

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**Export Potential.** Although NORINCO aggressively promotes Chinese multiple launch rocket systems on the international market, distribution outside the People's Republic of China has generally been limited to Chinese military aid programs. Direct export sales of these systems have been minimal.

**Countries.** Burma, Cambodia, China, Indonesia, Peru, and the United Arab Emirates.

## Forecast Rationale

Forecast International predicts limited production of the Type 90B MLRS over the next decade due to performance issues.

In December 2013, Peru selected the Type 90B to replace its BM-21 MLRS, purchasing 40 units in a \$38.6 million deal. However, significant operational failures arose. Engine oil leaks were reported even in new trucks, and during the 2022 Patriota operation, some launch tubes exploded midfiring, endangering the crew. Unofficial reports suggest the tubes' bores are not chrome-plated, reducing their lifespan. By April 2024,

Peru had reconsidered further purchases due to these reliability concerns.

### *Limited Export Prospects*

Although NORINCO aggressively promotes a variety of multiple launch rocket systems on the international market, the Chinese systems simply cannot effectively compete with significantly less expensive surplus systems from Russia. The Forecast International Weapons Group believes that most exports of Chinese multiple launch rocket systems will remain tied to Chinese foreign military aid programs.

## Chinese Multiple Launch Rocket Systems

### 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	
<b>China North Industries Corp (NORINCO)</b>												
<b>Type 90B</b>												
	480	75	75	75	50	50	50	50	30	30	30	515
<b>Total</b>	480	75	75	75	50	50	50	50	30	30	30	515