

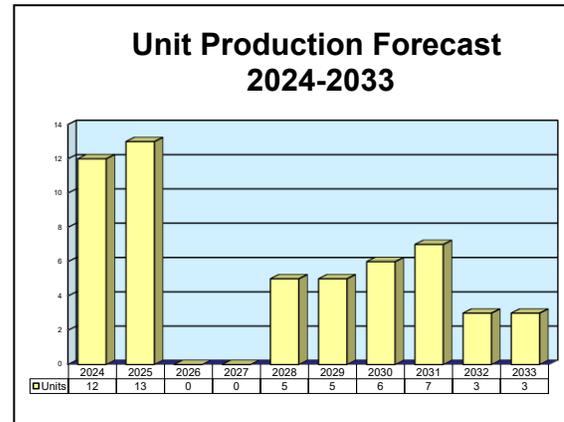
ARCHIVED REPORT

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Wiesel

Outlook

- Wiesel 2 production line remains available for new orders on an as-needed basis
- Rheinmetall continues to promote the Wiesel 2 on the international market; however, export prospects for the vehicle are increasingly scarce
- Forecast reflects expectations of Wiesel 2 production for Bundeswehr procurement and possible export



Orientation

Description. Tracked infantry combat vehicle.

Sponsor. The Bundeswehr sponsors the development and German Army procurement of the Wiesel.

Licensees. None.

Status. Development and marketing ongoing. Production on an as-needed basis.

Total Produced. Through 2023, we estimate the contractor produced 698 Wiesel vehicles (375 Wiesel 1s and 323 Wiesel 2s).

Application. Air-transportable armored vehicles optimized to support German airborne units.

Price Range. In 2024 U.S. dollars, the basic Wiesel 1 Waffenträger LL/MK vehicle carries an estimated unit price of \$1.047 million.

The basic Wiesel 2 currently carries an estimated unit price of \$1.177 million.

Wiesel variants can carry significantly higher price tags.

Contractors

Prime

Rheinmetall Landsysteme GmbH	http://www.rheinmetall-defence.com , Heinrich-Ehrhardt-Strasse 2, Unterlues, Germany, Tel: + 49 5827 8002, Fax: + 49 5827 6810, Email: rls-info@rheinmetall.com , Prime
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Subcontractor

Airbus SE	http://www.airbus.com , Mendelweg 30, PO Box 32008, Leiden, Netherlands, Tel: + 31 71 52 456 00, Fax: + 31 71 52 328 07 (HOT Anti-tank Modular Turret)
Atlas Elektronik GmbH	http://www.atlas-elektronik.com , Sebaldsbrücker Heerstrasse 235, Bremen, Germany, Tel: + 49 421 457 02, Fax: + 49 421 457 3699, Email: info@atlas-elektronik.com (Atlas Short Range Air Defense System)

Wiesel

Audi AG	http://www.audi.de , Postfach 100457, Ingolstadt, Germany, Tel: + 49 841 89 0, Fax: + 49 841 89 32524, Email: kundenbetreuung@audi.de (TDI Diesel Engine)
Raytheon	http://www.rtx.com/raytheon , 1151 E Hermans Rd, Tucson, AZ 85706 United States, Tel: + 1 (520) 794-3000 (BGM-71 TOW Anti-tank Guided Missile System)
Volkswagen AG	http://www.volkswagenag.com , VHH 11th Fl, PO Box 1849, Wolfsburg, Germany, Tel: + 49 5361 9 86622, Fax: + 49 5361 9 30411, Email: rheinhold.kopp@volkswagen.de (075.2 Diesel Engine)
Zahnradfabrik Friedrichshafen AG	http://www.zf.com , Graf von Soden Platz 1, Friedrichshafen, Germany, Tel: + 49 07541 77 0, Fax: + 49 07541 77 908000, Email: postoffice@zf.com (3 HP22 and LSG 300/4 Automatic Gearboxes)

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

Waffenträger LL/MK (Wiesel 1)

Crew. Three: commander, driver, and gunner.

Dimensions. The following data reflect the definitive production model. The height includes the armament.

	<u>SI Units</u>	<u>U.S. Units</u>
Length	3.55 m	11.65 ft
Width	1.82 m	5.97 ft
Height	1.83 m	6.00 ft
Combat weight	2.8 tonnes	3.09 tons
Fuel capacity	80 liters	21.27 gal

Performance. The maximum speed and range data reflect use on a paved road.

	<u>SI Units</u>	<u>U.S. Units</u>
Maximum speed	75 kmph	46.58 mph
Maximum range	300 km	186.3 stat mi
Step	40 cm	1.31 ft
Trench	1.21 m	3.97 ft
Slope	32%	32%
Gradient	60%	60%
Fording	40 cm	1.31 ft

Engine. Volkswagen 075.2 liquid-cooled, six-cylinder diesel engine. This powerplant generates 64 kilowatts (85.82 hp), with a power-to-weight ratio of 22.86 kilowatts per tonne (27.78 hp/ton). The 24-volt electrical system features two 12-volt/45-ampere-hour batteries.

Gearbox. Zahnradfabrik Friedrichshafen 3 HP 22 automatic gearbox, with six forward and two reverse gears and a torque converter. The Wiesel 1 employs hydrostatic cross-drive steering.

Suspension and Running Gear. Torsion bar suspension, with three dual-tired roadwheels and one return roller on each side. The drive sprocket mounts to the front. A spring assembly provides constant tension on the endless rubber track.

Armament. The basic personnel carrier version features a single pintle-mounted machine gun – either a 7.62x51mm NATO (.308 Winchester) MG3 or a 12.7x99mm (.50 cal) M2HB – at the commander's cupola. Mission-specific variants mount other ordnance options.

Wiesel

Wiesel 2

Crew. Two: commander and driver. The vehicle can also carry four fully equipped infantrymen.

Dimensions. The following data reflect the initial Wiesel 2 prototype; production vehicles vary depending on the application. The height includes the armament.

	<u>SI Units</u>	<u>U.S. Units</u>
Length	3.77 m	12.37 ft
Width	1.82 m	5.97 ft
Height	2.16 m	7.09 ft
Combat weight	4.1 tonnes	4.52 tons
Fuel capacity	122 liters	32.45 gal

Performance. The maximum speed and range data reflect use on a paved road.

	<u>SI Units</u>	<u>U.S. Units</u>
Maximum speed	70 kmph	43.47 mph
Maximum range	550 km	341.6 stat mi
Step	48 cm	1.57 ft
Trench	1.51 m	4.95 ft
Slope	32%	32%
Gradient	60%	60%
Fording	50 cm	1.64 ft

Engine. Audi TDI liquid-cooled, five-cylinder diesel engine. This electronically controlled powerplant generates 85 kilowatts (113.98 hp), with a power-to-weight ratio of 20.73 kilowatts per tonne (25.21 hp/ton). The 24-volt electrical system features two 12-volt/45-ampere-hour batteries.

Gearbox. Zahnradfabrik Friedrichshafen LSG 300/4 automatic gearbox, with four forward and two reverse gears. The Wiesel 2 employs hydrostatic cross-drive steering.

Suspension and Running Gear. Torsion bar suspension with four dual-tired roadwheels and two

return rollers on each side. The additional roadwheel and return roller on each side accommodate the lengthened hull. The drive sprocket mounts to the front. A spring assembly provides constant tension on the Diehl 622 endless rubber track.

Armament. The basic personnel carrier version features a single 7.62x51mm NATO (.308 Winchester) MG3 in a Wegmann mount at the commander's cupola. The commander can fire this machine gun from within the vehicle. Mission-specific variants mount other ordnance options.

Variants/Upgrades

Production Models and Variants. The prime contractor developed a number of Wiesel 1 variants; development of Wiesel 2 variants continues. The following table summarizes Wiesel variant development thus far.

Wiesel 1 (Standard Chassis) Variants

<u>Designation</u>	<u>Description</u>
Wiesel/Rh 202	Waffenträger LL/MK. Features a multipurpose Rheinmetall 20mm Mk 20 Rh 202 cannon in a one-man turret.
Wiesel/RMK 30	Possible future variant, mounting Mauser-Werke 30mm RMK case-telescoped ordnance.
Wiesel/TOW	Waffenträger LL/TOW. Integrates a single BGM-71 TOW anti-tank guided missile launcher, mounted between the commander and the gunner.
Wiesel/HOT	Integrates a single or twin HOT anti-tank guided missile launcher in an unmanned HOT anti-tank modular turret.
Wiesel Armored Mortar Vehicle	Mounts 60mm mortar and MG3 machine gun in a BTM 208 turret.
Wiesel Command Vehicle	Features additional C4I equipment.

Wiesel

Designation

Wiesel Battlefield Radar Vehicle

Description

Mounts LMT Radio Professionnelle RASIT battlefield radar system with 4-meter (13.12-ft) hydraulic mast. A similar version mounts RATA-C-S battlefield surveillance radar.

Wiesel Recovery Vehicle

Features a 2-tonne (2.2-ton) crane and a 2.7-tonne (2.97-ton) winch.

Wiesel Minelayer

Proposed variant. Carries 120 anti-tank or anti-personnel mines in a dispenser trailer behind the vehicle. Further development unlikely.

Wiesel Troop Carrier

Proposed variant. Carries a two-man crew and two fully equipped infantrymen. Further development unlikely.

Wiesel 1 Robotic Vehicles

Robotic technology demonstrators. The U.S. Army purchased seven vehicles as part of Future Combat Systems (FCS) technology investigation / development. Further development unlikely.

Wiesel 2 (Stretched Chassis) Variants

Designation

Leichtes Flugabwehrsystem

Description

Features Atlas Short Range Air Defense (ASRAD) system, consisting of a quad launcher station for the FIM-92 Stinger surface-to-air missile. In 1995, the Bundeswehr ordered 50 units.

Wiesel Half Squad Carrier

The initial developmental prototype Wiesel 2 vehicle. Carries a two-man crew and four fully equipped infantrymen.

Wiesel 2/ARGUS

Proposed reconnaissance vehicle. Features a retractable mast-mounted sensor assembly. Developed to full-scale mock-up level.

Wiesel Scout/
Reconnaissance Vehicle

In development. Mounts a Rheinmetall TF20.15 turret with a single Rh 202.

Wiesel Engineer/
Reconnaissance Vehicle

In development for Bundeswehr's six-vehicle requirement.

Wiesel Air Defense Vehicle

Mounts a single Bofors RBS70 surface-to-air missile launcher.

Wiesel Command Vehicle

Developed for a nine-vehicle Bundeswehr requirement. Features two HEROS workstations, several UHF and VHF radios, and a GPS receiver.

Wiesel Observation Vehicle

Variant of Wiesel Command Vehicle. Features additional navigational and communications equipment; optimized for the artillery fire support team (FIST) mission.

Wiesel Ammunition
Resupply Vehicle

Developed for a 13-vehicle Bundeswehr requirement. Features a 540-kilogram (1,188-lb) cargo capacity.

Wiesel Missile Resupply Vehicle

Carries 12 BGM-71 TOW anti-tank guided missiles, supporting Wiesel/TOW vehicle (see Wiesel 1 variants, above).

Wiesel 2 Armored
Mortar Vehicle

Also known as the Airborne Mortar Combat System. Mounts a Rheinmetall 120mm muzzle-loading mortar. The Bundeswehr has a requirement for 65 vehicles.

Wiesel Mortar Towing Vehicle

Tows either an 81mm or 120mm mortar. Vehicle carries 75 rounds of 81mm ammunition or 20 rounds of 120mm ammunition.

Wiesel Minelayer

Carries 120 anti-tank or anti-personnel mines in a dispenser trailer behind the vehicle. Supersedes Wiesel 1 model.

Wiesel Flame Thrower

Proposed variant; would supersede Wiesel 1 model. Mounts a flame thrower conversion kit and a single MG3 machine gun.

Wiesel Casualty Evacuation
Vehicle

Carries four litter patients, four sitting patients, or one sitting and two litter patients. The Bundeswehr had a requirement for 18 vehicles.

Wiesel/SYRANO

Integrates French GIE SYRANO robotic reconnaissance system.

Wiesel

Modernization and Retrofit Overview. To date, Wiesel modernization and retrofit activity has been rather limited.

In 1999, the Bundeswehr awarded Rheinmetall Landsysteme a contract to modify 10 Wiesel 1 TOW vehicles to reconnaissance vehicles. In 2001, the Bundeswehr contracted with Rheinmetall Landsysteme to upgrade 30 Wiesel 1 vehicles with night vision equipment.

There has not yet been any modernization and retrofit requirement for the Wiesel 2.

In 1998, Rheinmetall delivered two digitized Wiesel 2 vehicles to the Bundeswehr for evaluations. Both of these vehicles serve as testbeds for the PRIMUS robotic vehicle concept. Rheinmetall has also modified a Wiesel with an electric drive system for evaluation. The vehicle, designated LLX, is a light air-transportable reconnaissance vehicle.



Wiesel 2 Airborne Mortar Combat System

Source: Rheinmetall Defence

Program Review

Background. In response to a Bundeswehr requirement for an air-transportable light tracked vehicle for airborne units, Porsche began development of the Wiesel in 1970.

Air-Transportable Armor

The Bundeswehr issued the initial requirement in 1972. However, budget constraints and contractual disputes delayed initial procurement of the Wiesel/TOW variant

for Bundeswehr airborne units until November 1984. Selection of the Wiesel/Rh 202 variant followed shortly thereafter. The Bundeswehr finally issued the initial production contract in December 1988. The first production units of that initial 345-vehicle order were rolled out about a year later.

For the Bundeswehr, the following air-transport options are available for the Wiesel:

Wiesel

- UH-60 or Super Puma utility helicopter (1 sling-loaded Wiesel)
- CH-53 heavy-lift helicopter (2 Wiesels)
- C-130 transport aircraft (3 Wiesels)
- C-160 Transall transport aircraft (4 Wiesels)

Enter the Wiesel 2

In 1994, Rheinmetall introduced the Wiesel Extended Base Vehicle, the Wiesel 2. This stretched version of the basic Wiesel design features enhanced powerpack and drivetrain components. It also boasts twice the internal capacity of the original Wiesel 1 design. Concurrent with the Wiesel 1 program, the Wiesel 2 represents the current production standard.

Description. The Wiesel hull features all-welded XH 129 armored steel, providing protection from ballistic fragments and 7.62mm projectiles. The driver sits to the right-front of the hull; the engine compartment occupies the left-front. The driver's station

features a single-piece hatch cover and three periscopes; the center periscope is interchangeable with a passive night vision device. The driver employs Cletrac-type hydraulic steering brakes for directional control.

Rugged and Flexible

The fighting compartment occupies the rear of the vehicle. As discussed in **Variants/Upgrades** (above), the Wiesel can mount a wide variety of turret and fighting compartment options.

Overall, the Wiesel design is optimized for ease of operation and field maintenance. In addition to its wire-reinforced endless rubber track, the Wiesel can also mount conventional caterpillar-type metal link track. The Wiesel's survivability is enhanced by its small size, low silhouette, high speed and maneuverability, and low noise signature. The externally mounted fuel tank on the rear of the vehicle consists of a glass-reinforced plastic shell, filled with polyurethane foam to retard explosions.

Funding

Germany's Ministry of Defense, through the Bundeswehr, funds the development and Bundeswehr procurement of the Wiesel.

Contracts/Orders & Options

In Jul 2004, the Bundeswehr awarded Rheinmetall Landsysteme GmbH a contract worth about \$40 million for 32 Wiesel 2 mobile command post vehicles. Deliveries occurred from mid-2005 through 2007. The contract contained an option for an additional 16 vehicles, delivered in 2008.

In Dec 2006, the Bundeswehr awarded Rheinmetall Landsysteme GmbH a contract for a batch of 13 Wiesel 2 casualty evacuation vehicles. Under a separate contract, the Bundeswehr ordered two Wiesel 2 training vehicles and logistical materiel to provide training support for German Army maintenance units. Together, these two contracts carried a value of \$11.95 million.

In 2009, the Bundeswehr awarded Rheinmetall Landsysteme GmbH a EUR54 million contract for eight Wiesel 2 120mm armored mortar variants. A follow-on order for two command vehicles costing a total of EUR7.5 million was also negotiated.

Worldwide Distribution/Inventories

Export Potential. The Germans have demonstrated the Wiesel in Greece, Indonesia, Malaysia, Norway, Singapore, Thailand, the United Arab Emirates, and the United Kingdom.

Despite such wide exposure, the Wiesel has thus far failed to generate any real export sales. The Wiesel brings a unique capability to the battlefield in the form of a highly maneuverable tracked vehicle optimized for airborne operations and a wide variety of air-transport options. However, unless the contractor can develop armor that is more effective without significantly increasing the vehicle's weight or dimensions, the Wiesel may never find its niche in the international market.

Countries. Germany, France, United States.

Forecast Rationale

The Wiesel 2 production line remains available on an as-needed basis for Bundeswehr follow-on orders and export. The Forecast International Weapons Group believes the German Bundeswehr will pursue a small quantity of follow-on orders at some point.

Domestic Challenges

As a result of considerable budgetary shortfalls, the Bundeswehr faces a near-perennial struggle to maintain baseline operational readiness and fulfill its core maintenance and acquisition requirements. Although a number of high-priority procurement programs are continuing apace after minor quantity reductions, other programs face uncertainty.

Although Germany has largely fulfilled its acquisition requirements for the Wiesel series, periodic follow-on orders from the Bundeswehr for low quantities of specialized subvariants are still possible.

Limited Export Prospects

Despite the Wiesel 2's affordable unit and maintenance costs, the good reputation of the participating contractors, and the vast array of variants, the vehicle has yet to secure any significant export sales.

Although Rheinmetall continues to promote the Wiesel, the vehicle's overall market potential is restricted by the low levels of European defense spending and a niche design philosophy based largely around conventional engagement scenarios that serves to limit its appeal to potential customers in much of the developing world.

Barring the emergence of significant export interest in the near future, the window of opportunity for the Wiesel to find its niche on the international market may soon draw to a close. In such an event, the program's future will remain exclusively dependent on Bundeswehr follow-on orders.

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	
Rheinmetall Landsysteme GmbH												
Wiesel 2												
	323	12	13	0	0	5	5	6	7	3	3	54
Total	323	12	13	0	0	5	5	6	7	3	3	54