

# ARCHIVED REPORT

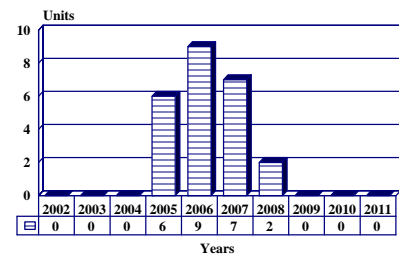
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## TH 495 - Archived 2/2003

### Outlook

- Several variants (including logistics vehicles) are being proposed
- The TH 495, including the technical data package, is being promoted on the international market
- No modernization or retrofit potential expected in the coming 10-year period

10 Year Unit Production Forecast  
2002 - 2011



### Orientation

**Description.** A tracked vehicle.

**Sponsor.** The TH 495 has been developed on a private basis, with funding provided by the prime contractor.

**Contractors.** The TH 495 has been developed and, if placed in production by the developer, will be manufactured by Rheinmetall Landsysteme (formerly Henschel Wehrtechnik), Kassel, Federal Republic of Germany. The main subcontractors on the program are Behr, Diehl Remscheid, Krauss-Maffei Wegmann, KUKA Wehrtechnik, Motoren- und Turbinen-Union, Örlikon-Contraves (owned by Rheinmetall), Otobreda, and Zahnradfabrik Friedrichshafen.

**Licensees.** None at this time, although the technical data package is being offered for licensing or possibly outright sale, maybe to Malaysia.

**Status.** The initial TH 495 development has been completed, and the vehicle is available for production orders. The development of the vehicle continues.

**Total Produced.** As of January 2002, two prototype/developmental TH 495 vehicles had been manufactured. These vehicles were in two different configurations as detailed below.

**Application.** The TH 495 is a family of armored vehicles based on a mechanized infantry combat vehicle and an armored personnel carrier for the transport of infantry to the battlefield.

**Price Range.** In equivalent 2002 United States dollars, the mechanized infantry combat vehicle version of the TH 495, armed with a 25 millimeter cannon and smoke grenade launchers, has a unit price of \$1.612 million. The armored personnel carrier version, equipped with a M2HB machine gun, has a somewhat lower unit price.

### Technical Data

#### TH 495 Mechanized Infantry Combat Vehicle

**Crew.** Three: commander, gunner and driver, plus seven infantrymen.

**Armor.** This vehicle is fabricated from steel alloy armor augmented by layers of modular spaced steel alloy armor. This protection runs over the top of the vehicle for protection from top attack weapons.

**Dimensions.** The following data are for the latest six roadwheel prototypes but are still provisional.

	<u>SI units</u>	<u>US units</u>
Length:	6.75 meters	22.15 feet
Width:	2.84 meters	9.32 feet
Height:	2.83 meters	9.28 feet
Combat weight:	26.0 tonnes	28.66 tons
Fuel capacity:	630 liters	167.56 gallons

**Performance.** The automotive performance is on a metaled road and based on the 507.1 kilowatt (680 horsepower) engine.

	<u>SI units</u>	<u>US units</u>
Maximum speed:	75 kilometers per hour	46.6 miles per hour
Maximum range:	500 kilometers	310.5 statute miles
Step:	80 centimeters	2.6 feet
Trench:	2.08 meters	6.8 feet
Slope:	31%	31%
Gradient:	60%	60%
Fording:	1.2 meters	3.94 feet

**Engine.** The TH 495 is powered by the Motoren- und Turbinen-Union 183 TE 22 eight-cylinder, super-charged, liquid-cooled, four-stroke diesel engine rated at 507.1 kilowatts (680 horsepower) at 35 revolutions per second (2,100 revolutions per minute). For the 26 tonne (28.66 ton) version of the TH 495, the power-to-weight ratio with this engine is 19.5 kilowatts per tonne (23.73 horsepower per ton). A 24 volt electrical system is fitted.

**Gearbox.** The TH 495 uses the LSG 1500 automatic gearbox from Zahnradfabrik Friedrichshafen. This gearbox has four forward and two reverse gears. Hydrostatic steering is used.

**Suspension and Running Gear.** This vehicle has torsion bar suspension with six dual-tired roadwheels and three return rollers on each side. The first, second,

third, fourth, fifth, and sixth roadwheel stations are fitted with hydraulic shock dampers.

**Armament.** The basic armament fit of the mechanized infantry combat vehicle version of the TH 495 consists of the Örlikon-Contraves (owned by Rheinmetall) KBA 25 millimeter cannon in the Otobreda T25 turret. This cannon is fully stabilized, and all movements are electrically powered with a manual backup. A total of 170 rounds of 25 millimeter ammunition are carried in the turret. A 7.62 millimeter MG3 machine gun is coaxially mounted; 400 rounds are carried for this weapon. Also, six smoke electrically operated smoke grenade launchers are fitted, three on each side of the turret. Other armament options are described below.

**Fire Control.** The KBA cannon is aimed by periscopic sights at the gunner's and commander's positions.

### **TH 495 Armored Personnel Carrier**

**Crew.** Two: commander, driver plus eight infantrymen.

**Armor.** This vehicle is fabricated from steel alloy armor augmented by layers of modular spaced steel alloy armor. This protection runs over the top of the vehicle for protection from top attack weapons.

**Dimensions.** The following data are for the latest five roadwheel prototypes but are still provisional. The width can be reduced to 2.72 meters (8.92 feet) for air transport.

	<u>SI units</u>	<u>US units</u>
Length:	5.97 meters	19.59 feet
Width:	2.94 meters	9.64 feet
Height:	2.39 meters	7.84 feet
Combat weight:	22.4 tonnes	24.69 tons
Fuel capacity:	530 liters	140.96 gallons

**Performance.** The automotive performance is on a metaled road and based on the 447.4 kilowatt (600 horsepower) engine.

	<u>SI units</u>	<u>US units</u>
Maximum speed:	75 kilometers per hour	46.6 miles per hour
Maximum range:	523 kilometers	324.8 statute miles
Step:	80 centimeters	2.6 feet
Trench:	2.3 meters	6.91 feet
Slope:	31%	31%
Gradient:	60%	60%
Fording:	1.2 meters	3.94 feet

**Engine.** Motoren- und Turbinen-Union provides the 183 TE 22 eight-cylinder, supercharged, liquid-cooled, four-stroke diesel engine rated at 447.4 kilowatts (600 horsepower) at 35 revolutions per second (2,100 revolutions per minute). For the 22.4 tonne (24.69 ton) version of the TH 495, the power-to-weight ratio with this engine is 19.97 kilowatts per tonne (24.3 horsepower per ton). A 24 volt electrical system is fitted.

**Gearbox.** The TH 495 uses the LSG 1500 automatic gearbox from Zahnradfabrik Friedrichshafen. This gearbox has four forward and two reverse gears. Hydrostatic steering is used.

**Suspension and Running Gear.** This vehicle uses torsion bar suspension with five dual-tired roadwheels and three return rollers on each side. The first, second and fifth roadwheel stations are fitted with hydraulic shock dampers.

**Armament.** The basic armament fit of the armored personnel carrier version of the TH 495 consists of the M2HB 12.7 millimeter machine gun on a Wegmann cupola mount. A total of 800 rounds of 12.7 millimeter ammunition are carried in the turret. Also, eight electrically operated smoke grenade launchers are fitted, four on each side of the cupola.

## Variants/Upgrades

**Variants.** Despite the fact that the TH 495 has yet to be sold, the contractor Rheinmetall Landsysteme (formerly Henschel Wehrtechnik) is already developing the vehicle into a number of variants in relation to the family of vehicles concept. All these variants are based on the six-wheel chassis (as described above under TH 495 Mechanized Infantry Combat Vehicle) or the five-wheel chassis (as described under TH 495 Armored Personnel Carrier). This allows for the highest degree of flexibility in the development of new members of this family of vehicles.

### Six-Wheel Chassis

**TH 495 Mechanized Infantry Combat Vehicle.** This version is also called the TH 495 Armored Infantry Fighting Vehicle. As initially fabricated, this version is fitted with the Otobreda T25 turret armed with the KBA 25 millimeter cannon. This vehicle has been fitted with the KUKA Wehrtechnik E4A1 turret mounting an unspecified (probably Mauser MK 30F) 30 millimeter cannon. Other types of 25 or 30 millimeter cannon can be fitted to either turret. One developmental prototype is undergoing development and testing.

### Six- or Five-Wheel Chassis

**TH 495 Reconnaissance Vehicle.** This member of the TH 495 family is armed similar to the mechanized infantry combat vehicle.

**TH 495 Armored Combat Vehicle.** Also called the TH 495 Armored Gun System, this proposed vehicle would mount the Rh 105, 105 millimeter tank cannon, probably in the 105SLR reduced recoil form.

### Five-Wheel Chassis

**TH 495 Armored Personnel Carrier.** This vehicle is also called the TH 495 Infantry Combat Vehicle. One developmental prototype is undergoing development and testing.

**TH 495 Anti-Aircraft Defense Vehicle.** This proposed version of the TH 495 will mount a launcher for the FIM-92 Stinger surface-to-air missile. An unspecified number of reload missiles will be stored in the vehicle's hull.

**TH 495 Anti-Tank Vehicle.** This member of the TH 495 family of vehicles will mount a launcher for the BGM-71 TOW anti-tank guided missile system. An

unspecified number of reload missiles will be stored in the vehicle's hull. This vehicle will be also offered with the new PARS-3 anti-tank guided missile system.

TH 495 Ambulance. This proposed member of the TH 495 family of vehicles will accommodate at least three stretcher-borne patients and an orderly.

Other proposed members of the TH 495 family of vehicles are in the early stages of development. Among these are a cargo carrier and a version fitted as an armored recovery vehicle.

Modernization and Retrofit Overview. This is not applicable at this time.

## Program Review

**Background.** The TH 495 family of armored vehicles was developed as a private venture intended for export as well as the domestic market. Henschel Wehrtechnik envisioned the TH 495 program as filling the requirement for a light tracked vehicle with good armor protection, a high degree of mobility and firepower, and the ability to be transported by a C-130 aircraft. Such a requirement is anticipated from the NATO Rapid Reaction Force as well as from comparable forces of other countries. The new vehicle could also fill the gap between the elderly M113 and the newer and more expensive and sophisticated mechanized infantry combat vehicles such as the Dardo (Veicolo Corazzato de Combattimento-80) and FV510 Warrior.

Development of the TH 495 commenced in the late 1980s. Henschel Wehrtechnik built upon its extensive experience in armored vehicles, gained over 70 years, including such highly successful programs as the Transportpanzer 1 (Fuchs) and Schützenpanzer Marder.

The first prototype TH 495 vehicle, the mechanized infantry combat vehicle based on the six-wheel chassis, was completed in 1992. This vehicle has since been integrated and tested with at least two different turrets having two different armament suites. A version of this vehicle was offered to Norway for its recent evaluation program, which was subsequently won by a version of the Swedish Stridsfordon 90. By late 1993, a second developmental prototype, this time of the armored personnel version based on the five-wheel chassis, had been completed. The marketing effort for the TH 495 began in 1992. The vehicle has generated a good deal of interest, but no sales have been reported. However, the technical data package has been offered for licensing or possibly outright sale, possibly to Malaysia.

In 2000, Henschel Wehrtechnik became a component of the new Rheinmetall Landsysteme group. But, as opposed to some of the company's other TH vehicle designations, which were changed to H (as in the H 400), the TH 495 has kept its original designation.

**Description.** The TH 495 hull is constructed entirely of welded steel alloy armor. The base armor is supplemented with modular-spaced steel alloy armor, including on the top of the vehicle as a defense against top attack weapons.

The vehicle is manned by a crew of two or three and can carry up to eight fully equipped infantrymen in the rear troop compartment in the armored personnel carrier version. The driver sits at the front to the left side of the vehicle. This position is equipped with a single-piece hatch cover and three periscopes for external observation. The center periscope can be replaced with an infrared or passive vision device for night operations. The engine and gearbox are mounted in a compartment placed opposite the driver. The commander and gunner (in the mechanized infantry combat vehicle version) are seated in the center of the hull. The center point of the vehicle mounts a turret in the mechanized infantry combat vehicle version, and in the armored personnel carrier, a commander's cupola capable of traversing 360 degrees. This cupola mounts a M2HB machine gun which can be fired from within the vehicle.

The troop compartment is located directly behind the commander's cupola or turret. The number of personnel is related to the version of the vehicle. The infantrymen are provided with individual seats; they can be adjusted so that four men (two on each side) can sleep. The vehicle is accessed through two doors at the rear of the vehicle or through two roof-mounted hatches. The two doors are each fitted with a spherical observation device and firing port. A special feature is the provision of an electro-optic viewing system for the infantrymen. A camera is located on each side of the vehicle and a monitor is inside the troop compartment.

The vehicle comes with an advanced fire detection and extinguishing system for both the engine and fighting compartments as standard equipment. Also standard equipment are explosion-proof fuel tanks, anti-spall linings, and digital vehicle electronics.

## Funding

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The development of the TH 495 is being privately funded by the contractor, Rheinmetall Landsysteme (formerly Henschel Wehrtechnik).

## Recent Contracts

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Not available, as contractual information is not released.

## Timetable

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<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1989-1990	Development begun
October	1991	Fabrication of first prototype begun
September	1992	First prototype completed
Late	1993	Second prototype completed
Mid	2002	Development and testing ongoing; vehicle awaiting production orders

## Worldwide Distribution

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**Export Potential.** The TH 495, especially in its mechanized infantry combat form, is one of the more technologically advanced programs of its type available today. The vehicle has earned good reviews for its protection, mobility, and versatility. The TH 495 was mainly designed for the export market; however, the sophistication of the vehicle comes at a fairly high unit price, putting it out of the reach of many buyers. The vehicle has also entered the market at a time of glutted market conditions with an ever-growing number of players. The marketing of the TH 495 will be a difficult task, and a hard-selling campaign will be necessary in order to break even on the program.

It is possible that Germany will opt for a moderate purchase of this vehicle in its basic form for international peacekeeping missions. This procurement would go a long way in aiding the vehicle's export sales.

**Countries.** **Federal Republic of Germany** (two prototype/developmental vehicles with the contractor).

## Forecast Rationale

Despite the reputation of the contractor, fairly impressive performance statistics and a rather competitive unit price, the TH 495 program has yet to make its first sale. There is just so many fine vehicles available on the market that any real interest in the TH 495 is hard to detect.

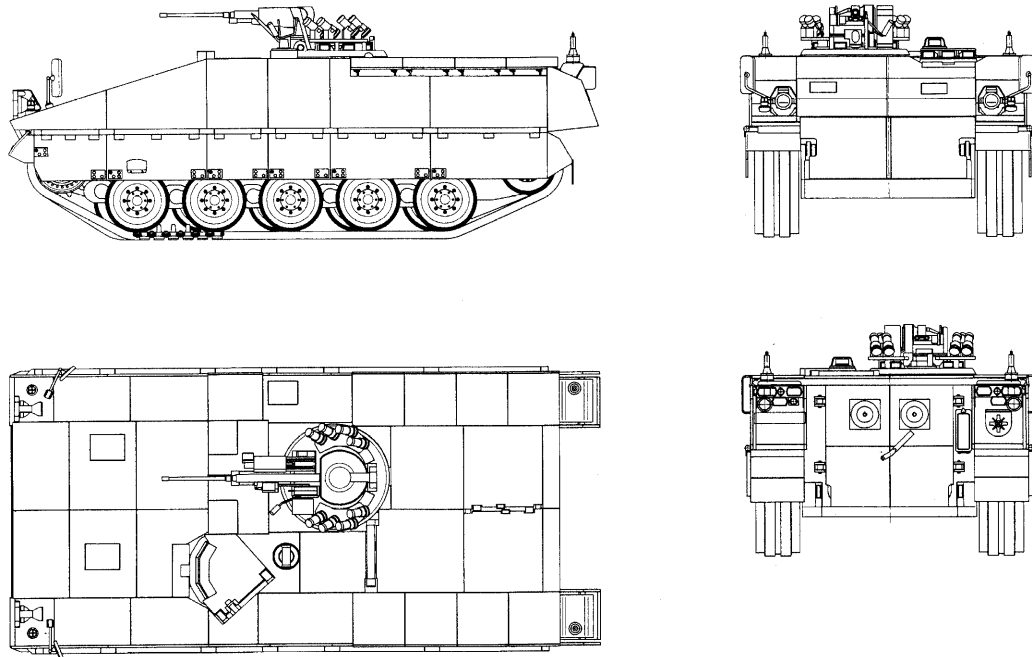
We still believe that any sales of the TH 495 will be limited to the export market and for a rather small number of vehicles. Although a large order from a major nation remains a possibility, market conditions are such that we are not currently forecasting any such sale. In summary, 25 TH 495 vehicles are likely to be sold, probably under some sort of technology transfer program.

# Ten-Year Outlook

## ESTIMATED CALENDAR YEAR PRODUCTION

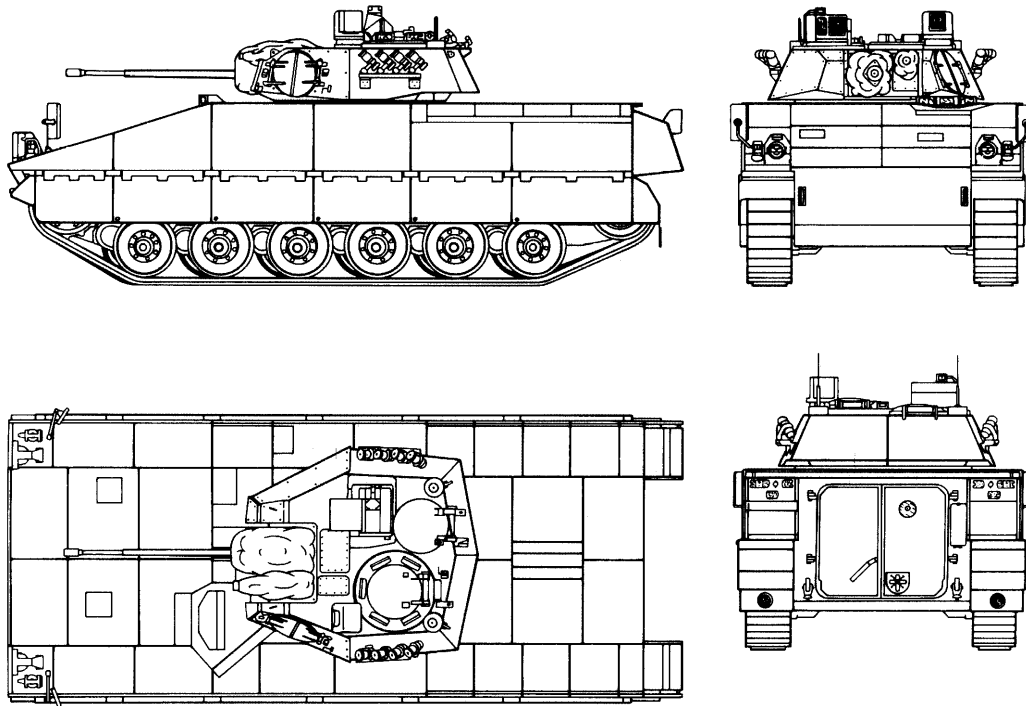
Vehicle	(Engine)	through 01	High Confidence Level				Good Confidence Level				Speculative		Total 02-11
			02	03	04	05	06	07	08	09	10	11	
RHEINMETALL LANDSYSTEME													
TH 495 (a)	MT 183 TE 22	2	0	0	0	6	9	7	2	0	0	0	24
Total Production		2	0	0	0	6	9	7	2	0	0	0	24

(a) The through 2001 production is for the initial developmental prototypes in two slightly different configurations. It is possible that additional prototypes in different configurations will be fabricated. The forecast production may well be undertaken by some other nation under some sort of technology transfer program.



**TH 495 ARMORED PERSONNEL CARRIER**

Source: Henschel Wehrtechnik



TH 495 MECHANIZED INFANTRY COMBAT VEHICLE

Source: Henschel Wehrtechnik