



EuroSpike Family of Guided Multi-Purpose Missiles

“Superiority @ Your Finger Tips”

Fit for the New Spectrum

Recent and current military conflicts resemble an era of tectonic shifts in the way of a more distributed and diffuse type of warfare. As the nature of warfare changes, the focus is set in greater depth on improved networked solutions, improved intelligence gathering, the complexities of urban warfare, selective and surgical strike capabilities, and active protection for the survivability of platforms along with advances in the amorphous area of in particular homeland security. So, there is a totally new spectrum of requirements.

As network-enabled warfare evolves, the structure of the forces plugging into

it, will inexorably assume a more “molecular configuration”, where the decision-making components and a large part of operational assignments, which before were more hierarchical, are now diffused to a much more localised and distributed force structure. Once everybody is networked, the operational combat centre will become smaller, more flexible and autonomous. This is basically a self-contained unit, smaller than the normal military structure classifications such as platoon or company, which can plug into the network and can be enlarged or become smaller as required. This will result in a much more diffused array of battle-function units, but these will be distributed nuclei of fully autonomous units that are capable of connecting and disconnecting. In that respect, this will facilitate a much more flexible force structure that can be spread across much wider areas and, therefore, will be much more effective in many respects, although they are diffused rather than centralised. This is an inherent and natural development of the concept of net-centric warfare. Sun Tzu was right, when he said more than 2,500 years ago: “What is essential in war is victory, not prolonged operations”.

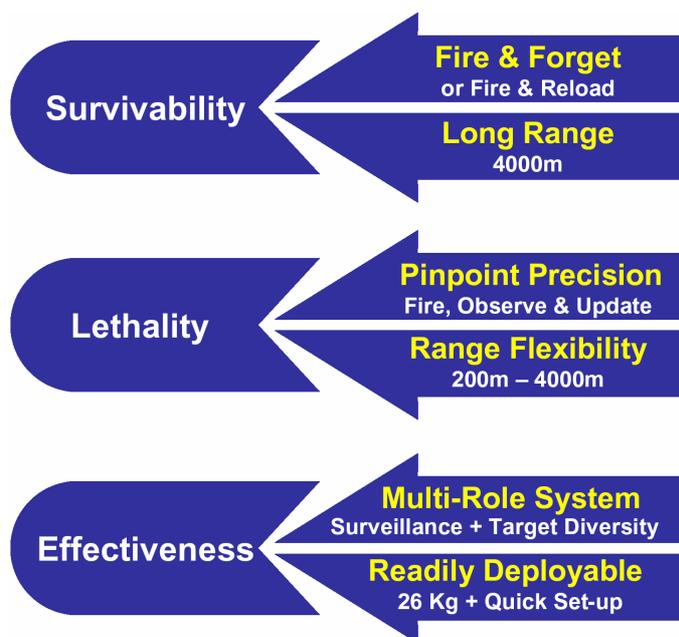
EuroSpike GmbH is an incorporated Joint Venture headquartered in Röthenbach, Germany. Share holders are Diehl BGT Defence (DBD) of Überlingen, Germany, Rheinmetall Defence Electronics (RDE) of Bremen, Germany, and Rafael Advanced Defense Systems Ltd. (Haifa, Israel). EuroSpike serves as the prime contractor for the SPIKE family of multi-purpose guided missiles for a wide range of customers in Europe.

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Superiority @ Your Finger Tips

EuroSpike missiles represent the latest generation weapon system and are the probably first solution that evolved from what in the past was an anti-tank solution to a multi-role solution for a variety of requirements in the urban and net-centric warfare arenas. Based on lessons learnt from the in-effectiveness and limitations of weapon systems such as the AT-3 Sagger, HOT, TOW and similar obsolete missile systems in large-scale combat operations, SPIKE was conceived based on lessons learnt from noted battlefields in recent history. SPIKE has performed admirably in theatre and demonstrated its capabilities in the most demanding combat environments. But SPIKE is far more than an antitank weapon. Its capabilities in disposing of direct action targets of enormous importance, from trucks ferrying terrorists across borders to other high-priority targets, such as bunkers, hideouts, shelters and command and control centres, have made it an essential tool in the global war on terror. Interoperability is another essential in the design and development of the SPIKE missiles, and so too its unrivalled combat effectiveness.



The EuroSpike Advantage

sophisticated electro-optic CCD and IIR sensors for operation in day and night as well as under adverse weather conditions. The tandem warhead system ensures penetration of the most highly developed armour. Alternatively, a penetration, blast and fragmentation warhead is also available for SPIKE ER. The lofted trajectories enable it to hit targets at the most vulnerable locations and with pinpoint precision. The entire SPIKE family has a low life cycle cost, due to high reliability and operational, logistical and production commonality.

The EuroSpike family of missiles combines Fire & Forget & Fire Observe & Update capabilities with pinpoint accuracy over the full range of 2,500m for SPIKE Medium-Range (MR), 4,000m for SPIKE Long Range (LR) and up to 8,000m for SPIKE Extended Range (ER). Due to its extremely low weight, the weapon system can swiftly be carried across enemy lines on the backs of long-range reconnaissance teams, as well as deployed on combat vehicles and attack helicopters. Establishing the firing position and missile launch, including the ability of launching from enclosed rooms, take only a few seconds.

The missiles in this family have

A Multi-Role Weapon for a Multi-Mission Army

The SPIKE's basic mode of operation is Fire & Forget. Following target acquisition through an optical or thermal sight, the gunner activates the missile, locks the seeker-head on the target and presses the fire button to launch the missile. The missile autonomously pursues and hits the target with its sophisticated dual-mode seeker head (CCD and IIR) and sophisticated tracking algorithms in the guidance unit.

In addition to the Fire & Forget mode, the SPIKE LR and SPIKE ER offer the unique Fire Observe & Update mode by a bi-directional fibre optic communication link. This data link transmits the video image from the missile's seeker head as it approaches the target, allowing the gunner

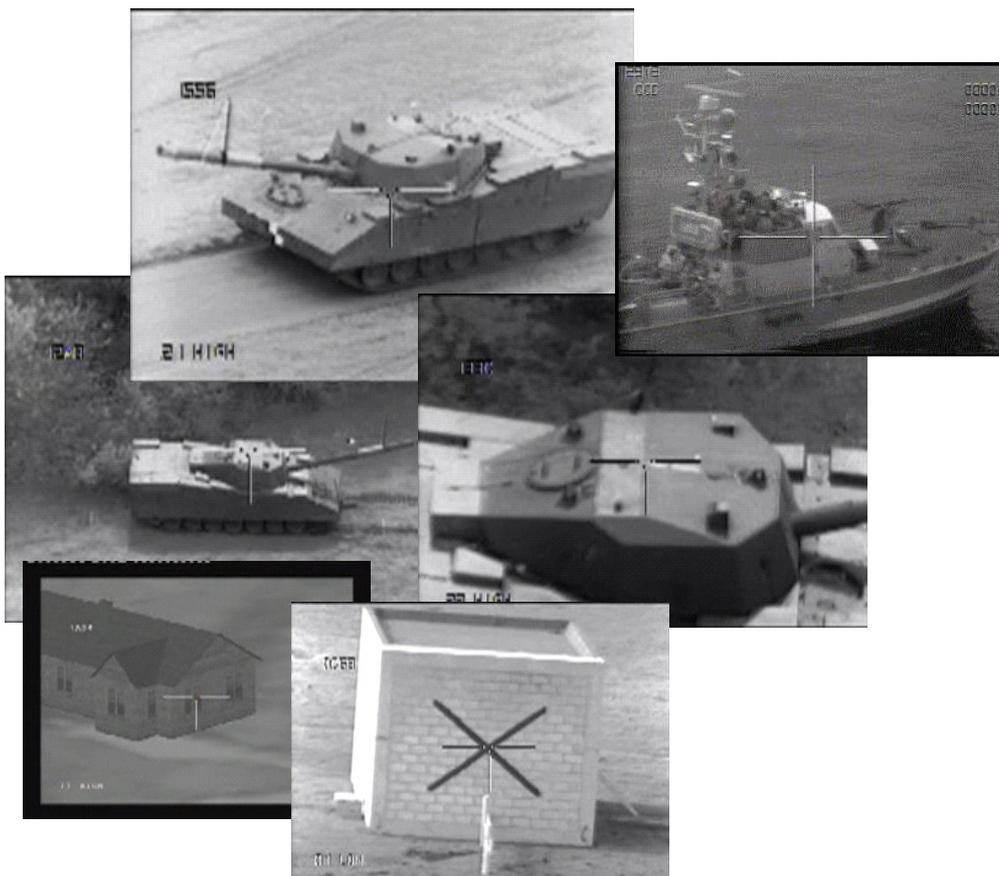
- to engage line-of-sight and non-line of sight (NLOS) targets,
- to lock-on to the target before (LOBL) or after launch (LOAL) (the gunner has the option of launching the SPIKE missile in manual mode without first locking onto a target, and then selecting and locking on to the target in flight),
- to strike the original target, change to another target in flight, or abort the mission,
- to precisely refine and optimize the exact point of aim, in particular during combats in urban and complex terrain,
- to break off an engagement in the Fire, Observe and Update and immediately revert to a Fire & Forget firing,
- to avoid engaging friendly troops or civilians,
- the ability to complete real-time Battle Damage Assessments (BDA), while also contributing to the intelligence picture through high trajectory imaging, and
- to convert between the missile system and the Surveillance System in seconds.

SPIKE's outstanding single shot kill probability (SSKP) is achieved through its high hit precision at the weakest points of a tank or a bunker. SPIKE's IIR seeker has day and night capability, for precision in adverse weather and low visibility conditions. The CCD seeker has excellent capability during daytime, including functionality during high humidity or snowy conditions.

The guidance system of the SPIKE exhibits a robust countermeasure capability. It is based on a passive electro-optic seeker and the gunner's ability to intervene during difficult



scenarios. Enhancing gunner survivability by either the Fire & Forget or the NLOS capability is one of the most important factors contributing to the SPIKE's success during recent missions. This is accomplished, because the gunner can launch the missile under NLOS conditions with maximum protection. Under LOS conditions, he can immediately reposition after launch, subsequently taking cover or reloading the next round. The system's extended range, minimal gunner exposure and low missile signature further improve the survivability of the gunner, which enhances the amount of time a hunter team can remain operational behind enemy lines.



**Above collage illustrates the unique feature of SPIKE of transmitting the video image of the seeker head to the gunner and enabling unprecedented hit accuracy.
(typical gunner views just prior to impact)**

The firing post for the infantry consists of a Command and Launch Unit (CLU), a Thermal Sights (TS) and a tripod. The firing post is identical for both the SPIKE MR and LR. SPIKE ER is suited for deployment on helicopters as well as on light combat vehicles and naval vessels. One of the unique elements of SPIKE is its simplicity of use and combat adaptability.



Typical Infantry SPIKE Team and a Vehicle Solution

Additionally, the SPIKE LR can be mounted on tracked or wheeled combat vehicles such as the German SPz PUMA, the Czech Pandur, the Romanian MLI-84 and other vehicles.

The German MoD has selected the SPIKE LR to become the cross-sectional missile system for the SPz PUMA, the infantry, the Kommando Spezialkräfte (KSK, Special Forces of the Army) and the Marine-Schutz-Kräfte (MSK, navy Special Forces). EuroSpike is under contract for the development and delivery of missile launch system for the PUMA as well as for the delivery of missiles for the PUMA and the KSK.



**SPz PUMA with SPIKE Missile Launcher
(on left side of turret)**



Infantry Firing Post



The fibre optic link enables the combat pilot precision attack manoeuvres within urban areas, mask down capability and real-time surveillance. The SPIKE ER can be installed in the AH-1S Cobra, Agusta A-129, MD-500 Defenders, Gazelle, Mi-24 Hind and many more.

Low Ownership Costs

Besides meeting the exacting demands of modern warfare while maintaining low costs of ownership, the EuroSpike missile system provides

- the capability to conduct surveillance missions of extended duration in the most demanding environmental conditions,
- a training system that is low cost and allows for continuous refinement of gunner skills when deployed or in garrison.
- a multi-role system that is inter-changeable in-between infantry, vehicle or airborne launch platforms, thus reducing capital, operational, maintenance and training costs,
- a simple maintenance support philosophy,
- high reliability on principal components and commonality of major components as well as maintenance and training for all users within the EuroSpike family of missiles,
- high overall system availability,

- savings in terms of significantly fewer rounds and follow-on savings (e.g. logistics) due to “on-line” battle damage assessment and a high system kill probability.

EuroSpike GmbH: Efficiency and Performance

EuroSpike and its partners have successfully delivered or are about to deliver soon the SPIKE weapon system to many customers around the world and to the North Atlantic Treaty Organization (NATO) nations such as The Netherlands, Finland, Poland, Italy, Spain, Romania, Czech Republic, Slovenia and Germany, where the operational and technical requirements were exceptionally demanding and the customer required a system that offered lethality, range advantage, and the latest technological growth potential. The approach builds upon the considerable strength of EuroSpike and its share holder companies and provides detailed plans and processes that have been applied internationally to a variety of different customers.

The EuroSpike brand name enjoys a diverse and loyal community of customers, which participate in a collaborative forum that facilitates product knowledge at all levels and information exchange through a SPIKE Users' Club.

EuroSpike missiles have become an indispensable weapon for modern armed forces, ranging from infantry and army aviation to naval defence forces. It is the only guided missile system that has applied, realised and also demonstrated its multi-mission capability in the modern battlefield scenarios.

