

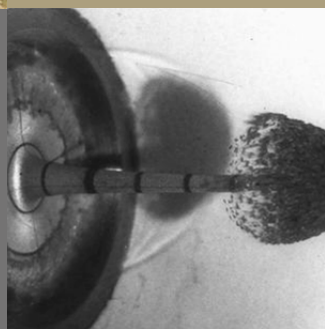
The Survivability Experts



AMAP™ –  
Advanced Modular  
Armor Protection

# Leopard 2 A4 Evolution

Legacy Platform – Future Generation Survivability



## The general Evolution Concept – Highest Protection in Conventional and Asymmetric Missions

There are many platforms which are not sufficiently protected against the threat scenarios encountered in today's actual environment, especially in urban warfare. The conventional armor concepts for these platforms are based on the situation tank vs tank (Fig. 1), and not the specific scenarios high-lighted by the use of the tank in recent international operations, which include a scenario of attacks from all-round and at close range (Fig. 2).

### Leopard 2 A4 Evolution

With the introduction of the Survivability Concept for the Leopard 2 A4 Evolution, IBD has developed a general add-on armor concept, applicable for any heavy platform as an effective and balanced high-tech solution. The intelligent synergistic effects of the different AMAP-technologies provide the best possible protection concept, considering also topics as overall costs, lead times for upgrade without changes of the platform and added weight, to achieve balanced and optimized solutions.

For the Leopard 2 A4 Evolution, with a total weight of only 60 tons – compared to 56.6 tons in the original configuration – this means that the platform is still providing a very high tactical mobility in order to perform the necessary tasks. Thereby it is possible to upgrade a legacy platform with the AMAP-technologies and at the same time create a new concept to meet the need for all-round protection against the evolving threats.

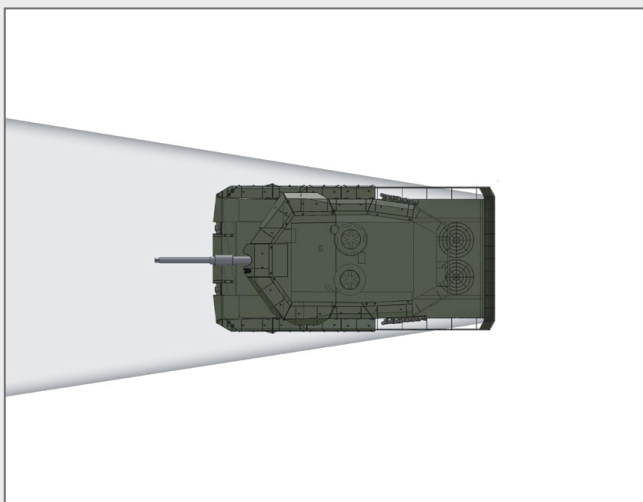


Fig. 1 Conventional situation – the tank vs tank scenario, with minimal protection at sides, at the back, roof and bottom

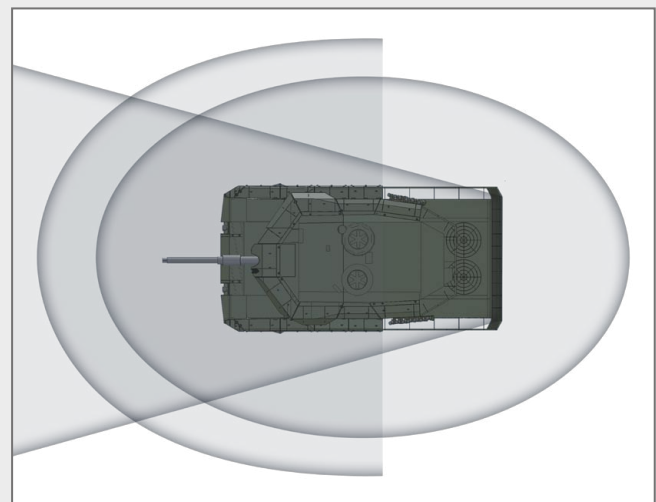


Fig. 2 The Evolution Concept – All-round protection (which also includes protection against IEDs, hand-held anti-tank weapons, kinetic energy, bomblets and mines).

#### System Advantages:

- A balanced Survivability Concept to achieve highest possible protection levels
- A synergistic modular concept – enabling customers to adapt the platform to the actual threat scenarios
- A combination of passive and active components (AMAP-ADS) is possible
- Due to the low-weight solutions used, the additional weight for the platform is minimized

#### User Benefits:

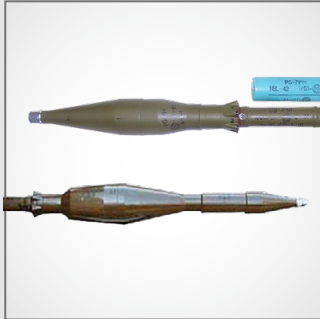
- Minimizing the risk for soldiers and vehicle at the actual all-round threat situations
- The use of heavy platforms in Urban Missions is possible
- Maximized cost efficiency due to the intelligent System Integration
- Minimized additional weight supports tactical mobility
- Minimized lead time for upgrading, maintenance and repair due to the modular system

# Evolution – The intelligent Way of synergistic Survivability

With the Evolution, IBD now has introduced a new balanced Survivability Concept for tanks that achieves unprecedented levels of protection for legacy platforms. The focal point of the Concept is the synergistic integration of the different High-Tech solutions developed by IBD. The different parts of the add-on protection kit for the heavy platform – Leopard 2 A4 – allow the rather old legacy platform to be used with minimized risk in Urban- Missions-situations with specifically high threat potential. The high cost efficiency for the System is brought about by the application of the proven High-Tech AMAP-technologies, in an add-on integration without major changes of the platform itself. The picture shows which synergistic technologies have been applied for the Leopard 2 A4 Evolution.

## Horizontal Protection

Tanks can be attacked from all directions. By combining the technologies of the AMAP-Family (AMAP-B, AMAP-SC and AMAP-IED) the Evolution achieves an unprecedented protection against side-attacks by different threats – which includes the threats from the RPG family, IEDs and EFPs.



### AMAP-SC Shaped Charge Protection

Threat examples:  
RPGs and EFPs



### AMAP-B Ballistic Protection

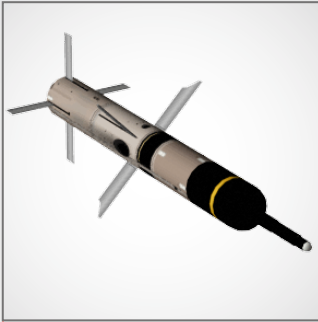
Threat examples:  
KEs (caliber up to 125 mm),  
ATGMs and RPGs



### AMAP-IED Improved Explosive Device Protection

Threat examples:  
155 mm artillery shells,  
VBIEDs, RSIEDs, SCs,  
EFPs and Mines





**AMAP-ADS**  
Active Defence  
System

Threat examples:  
ATGMs, RPGs,  
KEs and EFPs



**AMAP-L**  
Liner Systems

Threat examples:  
Spall and Fragments



**AMAP-R**  
Roof Protection

Threat examples:  
Fragments, Bomblets  
and EFPs



### Fast and easy Integration

The Evolution kit doesn't change the integral and original parts of the vehicle – here exemplified by the track-skirts - but uses the applications of a low weight add-on kit with specific consideration of function and maintenance. The complete kit of the Evolution can be applied within one week to minimize the lead time for the platform.

Mounting of the kit is done by standardized welded attachment points on the vehicle. There is no drilling done in the base armor to maintain the original structural strength of the vehicle as well as the ballistic, IED and mine protection.

### High Flexibility and Modularity

All components of the Evolution are designed not to interfere with the vital functions of the vehicle and at the same time assure modularity (if there is a need to replace a module or with the potential to change technology for the future). Examples of maintaining the functions are: getting access to the tracks at the hull (Fig. 3), accessing the refill of fuel via opening of turret module (Fig. 4), open the engine hatch for maintenance (Fig. 5) or use of the escape hatch at the bottom.

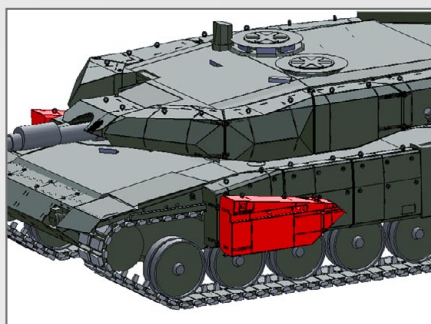


Fig. 3

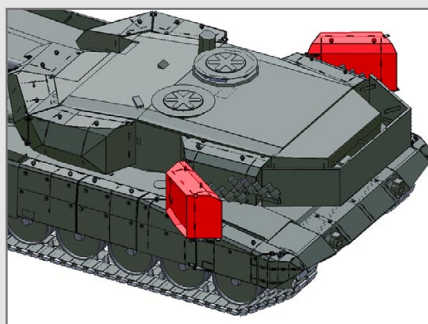


Fig. 4

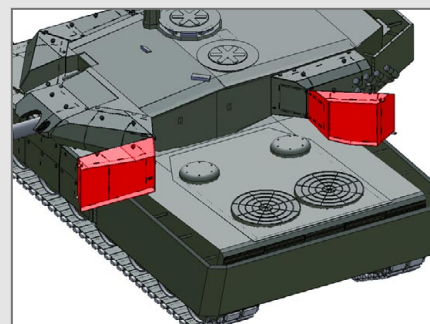
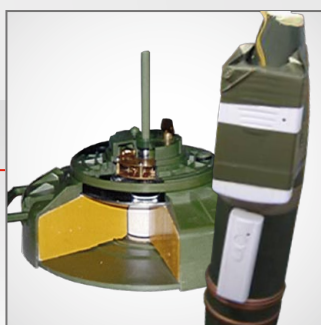


Fig. 5

### Maximized Protection

The different interfaces between the Evolution-kit and the vehicle itself as well as between the kit for the turret and the hull respectively, are specifically adapted to give maximum protection (both the protection levels against different threats and the protected area – minimizing ballistic holes). An example is the overlapping of the hull and turret to protect the turret-ring.



#### AMAP-M Mine Protection

Threat examples:  
AP-Mines, AT-Mines,  
EFP-Mines, IEDs and UXO

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