

The Survivability Experts

IBD
Deisenroth Engineering



AMAP™ -M
Intelligent Modular Mine Protection



AMAP™ – the High-Technology Protection System

AMAP is a synergistic modular High-Technology protection system. Developed and continuously improved by IBD (Ingenieurbüro Deisenroth / Germany), it is designed as a protection for all kinds of platforms: light vehicles up to heavy main battle tanks, vessels and aircrafts.

The central goal of our AMAP-philosophy is the highest possible effectiveness. In order to achieve this we focus on high performance and flexible next-generation technologies in vehicle protection research and development.

Based on our experience in delivering 30,000 protection kits we know what actual challenges man and material are facing all over the world. Through AMAP we provide accurate, scalable and modular protection concepts for a wide range of vehicles, mission areas and threat scenarios.

We always focus on one prime goal: to protect human lives in military operations and missions.

IBD has developed suitable AMAP concepts for almost every threat coming from conventional or unconventional weapon systems. We individually adapt these concepts to each platform and mission. Compared to conventional protection systems, the unmatched flexibility and performance of AMAP technologies substantially contribute to the optimization of our customers' survivability concepts.



System Advantages:

- Highest level of protection due to application of advanced technologies (e.g. nano-technologies, composite materials)
- Synergistic modular design – flexible protection concepts for almost every threat scenario
- Individually adaptable to each vehicle
- Considerable reduction in areal density due to combination of passive and active protection systems
- Easy integration of new solutions into vehicle concepts due to the modular approach

User Benefits:

- Highest survivability for soldiers due to substantially reduced threat and risk potential
- AMAP significantly improves the protection of all kinds of platforms (land vehicles, vessels, aircrafts)
- High tactical mobility and payload due to the low weight of the AMAP system
- Substantially reduced damage related costs due to easy maintainability
- Top-of-the-line concepts due to continuous feedback from missions in operational areas

The Challenges from unpredictable Mine Threats call for intelligent Solutions

Mines pose a severe and unpredictable threat in conventional and asymmetric warfare. They threaten every vehicle - from the lightest truck to the heaviest MBT. AMAP-M is the intelligent solution that is able to provide reliable protection against this challenge. It covers protection against a broad range of mine threats including effects solely or in combination such as:

- Blast
- Fragments
- Projectiles

The design of the Mine Protection system AMAP-M considers the high variability of conditions. This includes amount and type of explosives, placement and casing of the mine charges. The concept of AMAP-M was established to cope with the different mine scenarios and at the same time ensures the demands of high mobility and payload. Therefore it is an important contribution to the survivability of the vehicle crews.

Threats:

- Anti-Personnel Mines (AP)
- Anti-Tank Mines (AT)
- IED-Mines (IEDs)
- Projectile-forming IED-Mines (EFPs)
- UXO



155 mm Artillery Shells



EFP-Mines



IED-Mines

AMAP-M – most effective Mine Protection

The modular intelligent system of AMAP-M is a broadband approach to meet the complex demands of a complete Mine Protection concept. With the use of the latest technologies and advanced materials, AMAP-M offers a reliable protection to counter mine attacks. It keeps the mobility of the vehicles high due to low additional weight and smart designs.

The design of the of AMAP-M protection kits normally uses the vehicle structure as the integral part (base level) in combination with an additional part (add-on level), that can also be applied in field if necessary. This general approach is usable for almost all types of platforms – from trucks, APCs to IFVs and MBTs. It can be visualized by protection parts that are mounted both inside and outside the vehicle.

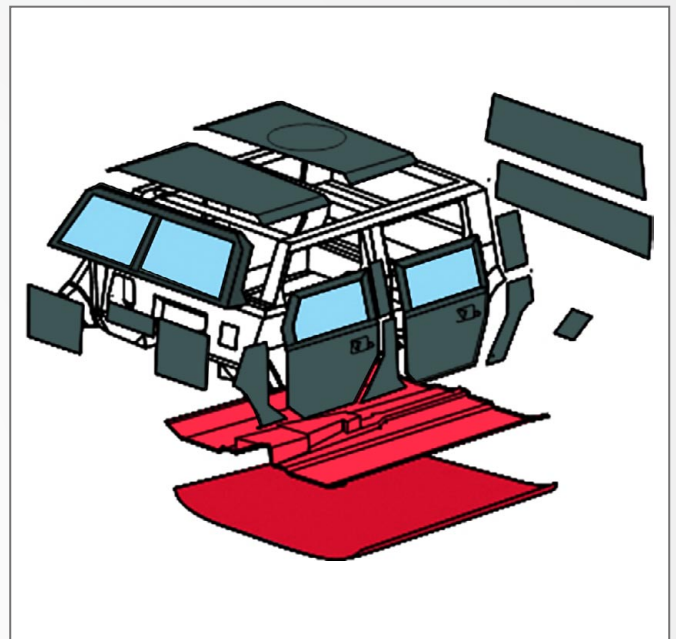
The function of the AMAP-M system can basically be described as follows:

- Absorption of the major portion of the explosion energy by the ultra-strong bottom protection
- Prevention of penetration – fragments and projectiles – by the use of specific materials
- Protecting the crew from secondary effects – by installation of special seats, special fixtures for equipment and decoupling from shock effects.

AMAP-M meets the different STANAG-levels. But it is also developed and tested to meet the real broadband-situations that can be caused by mines beyond the standard levels. AMAP-M has been applied on several thousand vehicles and has actually proven its effectiveness in Iraq and Afghanistan.



LMV with AMAP-M



Typical Mine Protection Kit

External Protection

The External Protection absorbs and deflects the major portion of the blast energy to minimize the effects that are transferred into the vehicle and to the crew. Specific design, in combination with the selection of appropriate materials, is fundamental for the ability to counter the effects of mines.



Leopard 2 A4 Evolution with AMAP-M

Internal Protection

Special installations inside the vehicle are designed to handle the remaining effects of the detonated mine. Application of a double or decoupled floor, additionally filled with shock absorbing material, further decreases the transmitted energy.

AMAP-MPS (Multi-Purpose Seat concept) is a seat that can be mounted in the vehicle to support the non-injury of personnel. It is decoupled from the bottom and supports the body. The 5 point safety harness of the seat is adjustable and is equipped with a quick release.



AMAP-MPS – Multi-Purpose-Seat

Special fixtures for interior equipment, developed by IBD, protect the crew from flying objects in the vehicle under a mine attack (any loose object could cause severe injury).

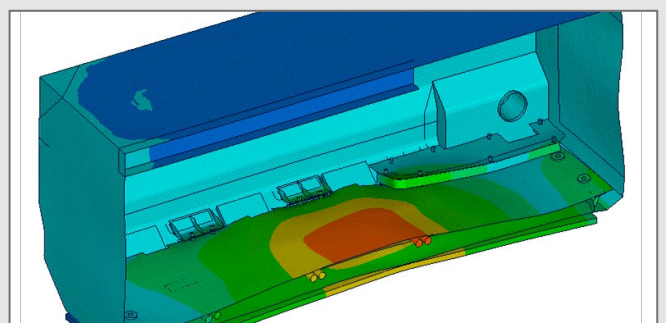
AMAP-M counters the complex scenario of mine attacks. It is designed to meet the toughest demand – the non-injury level for personnel.



Special Fixtures for Equipment

Full Measurement Service

In support of developing Mine Protection, IBD has built up a test department that is wholly devoted to these tasks and to qualify systems. The department is fully equipped with high-tech Measurement systems. The specialists are experienced to perform complete test scenarios to qualify in accordance with STANAG as well as real warfare scenarios from theatre. IBD has performed several complete qualifications for authorities until today and is offering these services to support the creation of a qualified Mine Protection concept.



FEM Simulation of Mine Blast

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