



A S U B A L T I J A

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# ***Armor set for Mi-17 Helicopter***

## **Modification description**

## Lightweight Composite Ballistic Protection of Mi-17 Helicopter

In case of potential danger accruing in helicopter usage area for passive protection of the crew, passengers or troops on board, as same for protecting of some electronic units, a set of ballistic protection is likely should be used. We present lightweight armoring equipment based on the modern technologies and suitable for Mi-17 helicopter.

The below described armoring set is prepared for standard Mi-17 helicopter. In case of other models/versions (for example “dolphin” nose, special equipment, etc.) some adjustments and/or changes will be done. These adjustments will not change the overall protection, but will be made to fit the specific helicopter. The exact composition will be confirmed after survey of helicopter.

### General protection equipment description

Offered protection kit provides reliable ballistic protection against most widely used light infantry carried guns and munitions (AK-47, AK-74, M16 and etc.). Usage of latest synthetic composites and high-performance polymer (ultra high molecular weight polyethylene) fibers made possible to create modern lightweight armor for use in aviation. Offered panels are corrosion and abrasive resistant. Excellent strength-to-weight ratios of these materials (in a range from 10 times higher than for steel) makes it very important feature in helicopter use due to influence to flight and fuel consumption characteristics. Protection panel mounting system improves simple remove of panels and it does not interrupt maintenance procedure.

### Aerodynamic shape

Unique thermoplastic technology provides capability to manufacture aerodynamically shaped ceramic panels. Unless usual steel armor, shaped exterior armor provides better ballistic coverage, less drag and better fuel economy performance.

### Ballistic protection levels and materials:

<i>Item</i>	<i>Quantity</i>	<i>Ballistic resistance according US NIJ 0108.01</i>	<i>Shot gun, ammunition, velocity, range</i>	<i>Material</i>
Armored steel plates (floor protection)	2 pcs	III+	308 Winch 7.62x51 nato ball 15m AK-47 7.62x39 MSC 715m/s 20m M-16 5,56x45 SS109 1000m/s 20m AK-74 5,56x39MSC 870m/s 20m	Armox 500Carbon steel
Bullet proof glass (front protection)	1 pcs	III	308 Winch 7.62x51 nato ball 15m AK-47 7.62x39 MSC 715m/s 20m AK-74 5,56x39MSC 870m/s 20m	Multilayer armored glass
Ceramic composite panels (side protection)	6 pcs	III+	308 Winch 7.62x51 nato ball 15m AK-47 7.62x39 MSC 715m/s 20m M-16 5,56x45 SS109 1000m/s 20m AK-74 5,56x39MSC 870m/s 20m	SIC aramid
Dyneema panels (floor protection)	12 pcs	III+	308 Winch 7.62x51 nato ball 15m AK-47 7.62x39 MSC 715m/s 20m M-16 5,56x45 SS109 1000m/s 20m AK-74 5,56x39MSC 870m/s 20m	Dyneema HB26/HB50
Dyneema panels (overhead protection)	2 pcs	III+	308 Winch 7.62x51 nato ball 15m AK-47 7.62x39 MSC 715m/s 20m M-16 5,56x45 SS109 1000m/s 20m AK-74 5,56x39MSC 870m/s 20m	Dyneema HB26/HB50

<b>Ceramic composite (overhead protection) panels</b>	<b>4 pcs</b>	<b>III+</b>	<b>308 Winch 7.62x51 nato ball 15m AK-47 7.62x39 MSC 715m/s 20m M-16 5,56x45 SS109 1000m/s 20m AK-74 5,56x39MSC 870m/s 20m</b>	<b>SIC aramid</b>
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<b>Description</b>	<b>Weight, kg</b>	<b>Protection area m2</b>
<b>Overhead compartment protection</b>	<b>108</b>	<b>3,52</b>
<b>Cockpit (sides, floor and front) protection</b>	<b>180</b>	<b>5,5</b>

Ballistic protection panels are made of lightweight ceramics SIC/aramid and Dyneema polyethylene fiber.

Four ceramic composite panels provide side protection of the helicopter crew and are placed on special mounts outside the cockpit, fixed by screwed fixers. Also two composite plates are fixed by screws on both sliding pilot's windows from the inside (Figure 1; 2).

Twelve Dyneema and two ArmoX steel panels installed on the cockpit floor. Bulletproof glass is installed on special frame inside the cockpit between the front windows and instrument panels (Figure 3; 4; 5). That gives pilots front protection and good visibility.

12 Dyneema panels are placed on the cockpit floor and fixed by screws. Two armored steel plates provide protection underneath the control pedals (Figure 4).

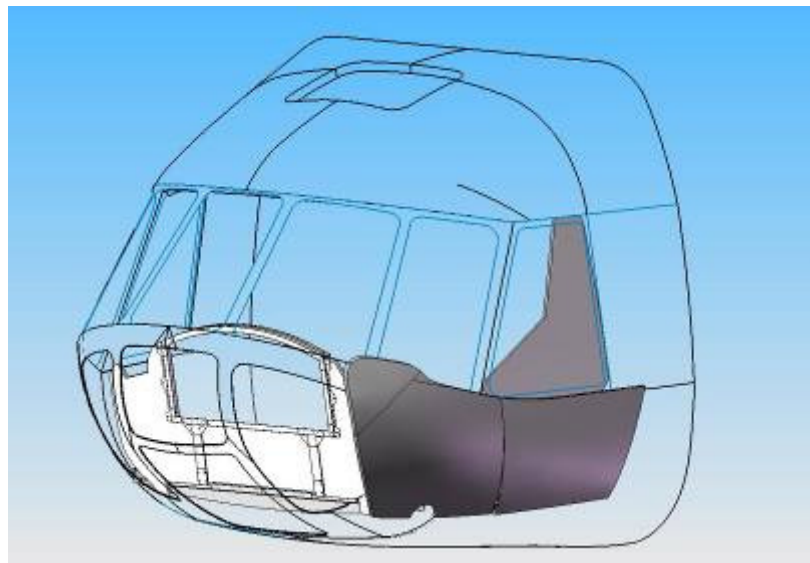


Fig.1 Outside ceramic composite panels (right side symmetrical to the left side and did not shown)



Fig.2 Outside ceramic composite panels installed

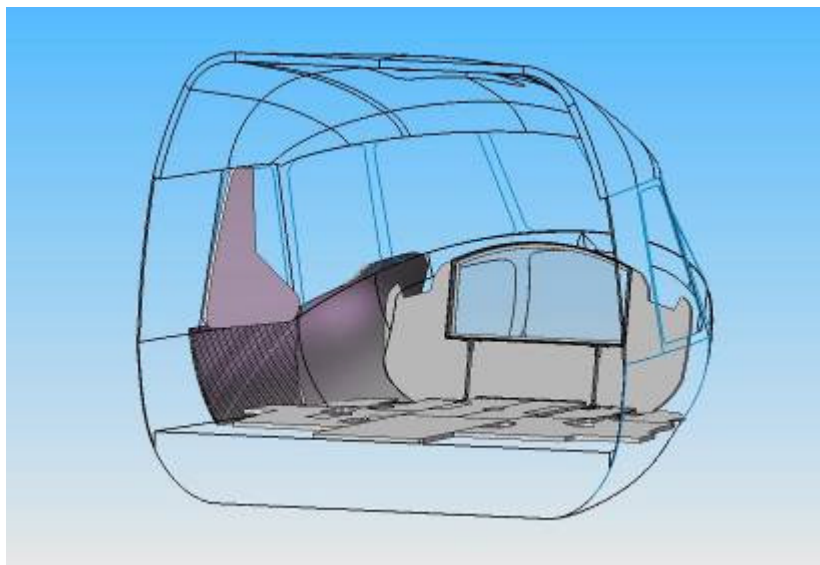


Fig.3 Protection panels and bulletproof glass inside the cockpit

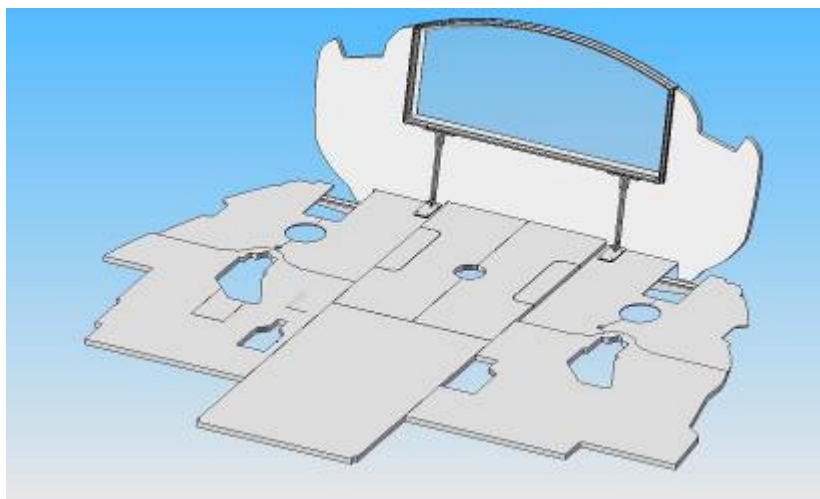


Fig.4 Layout of Dyneema panels and armored steel plates on the cockpit floor;  
Front panel with bulletproof glass



Fig.5 Front panel with bulletproof glass

Additional protection:

- for cockpit roof (against shooters at higher altitude, for example when flying in mountain regions) – see below Figure 6;
- for power plant (main gearbox, hydraulic unit, etc.) – see below Figure 7.

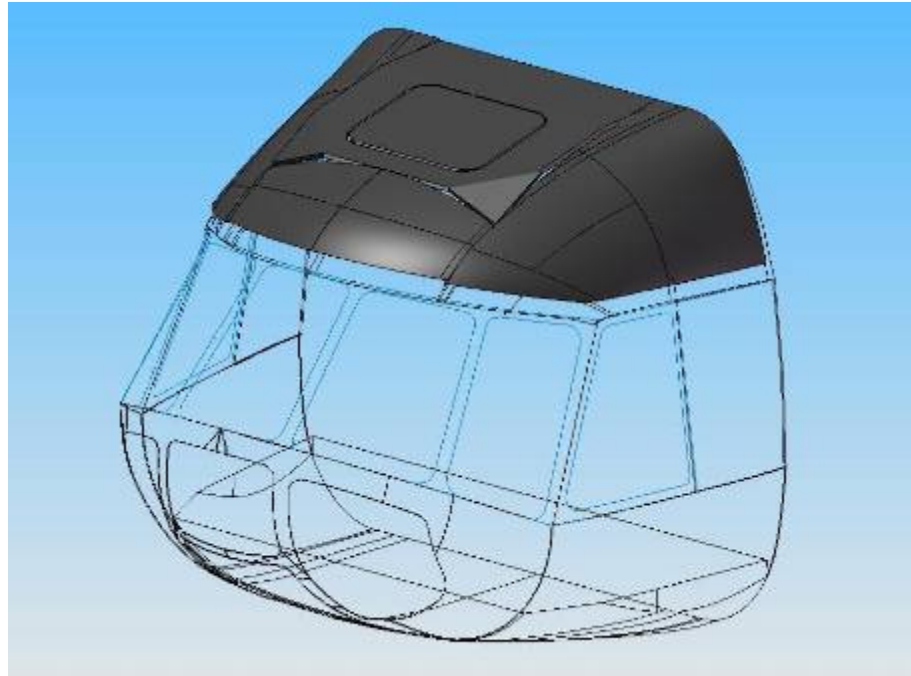


Fig.6 Two Dyneema and four SIC aramid ceramic panels provide cockpit overhead protection for pilots

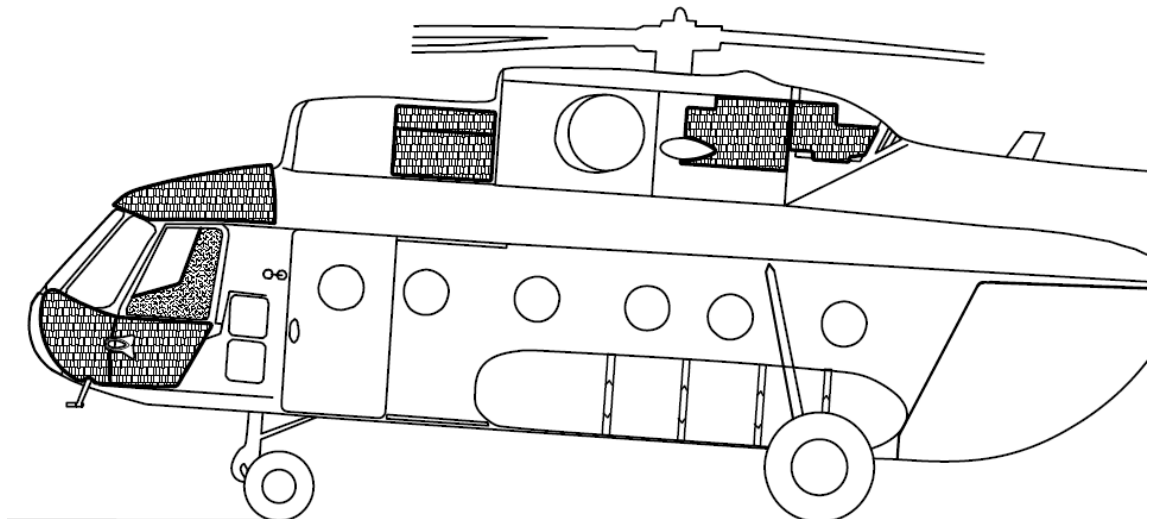


Fig.7 Dyneema and SIC aramid ceramic panels provide protection for powerplant

Figure 7 illustrates all external armor panels for powerplant and cockpit, including cockpit roof.

Powerplant protection covers the following equipment: engine (turbine part), hydraulic unit, generator, main gearbox (partially).



Recently we have installed the cockpit armor upgraded for the “dolphin nose”, and FLIR camera installation (Figure 8).



Fig. 8 Ceramic composite armor panel reworked for the installation of FLIR camera

*Also available:*

- *Armor Kevlar carpets for cargo compartment;*
- *Dyneema panels for cargo compartment.*

*Please contact us for more information or in case you have special requirements.*



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