

# ARMOUR PRODUCTS



मिश्र धातु निगम लिमिटेड  
MISHRA DHATU NIGAM LIMITED



## ARMoured VEHICLES



Armoured Bus



Armoured Tata-407



Armoured Fortuner



Armoured Scorpio

MIDHANI undertakes Bullet Proofing /armouring of all types of Troops Vehicles (Bus, TATA-407, Scorpio, Fortuner etc.) for deployment in counter Insurgency environment. Armoured Vehicles will foil terrorist attempts to ambush, snipe and facilitate safe mobility and deployment of troops. Vehicles have also been designed to exploit full fire power in case of any misadventure by terrorist. Complete armouring of Vehicles can be easily customized as per the user requirements (like partial armouring/all around protection against level 3+/4)

### Broad Characteristics:

- Up to glass level, the protection is against 7.62 x 39mm HSC
- Above glass level, the protection is against 7.62 x 39mm MSC
- Floor gives the protection against 2 x HE36 Grenades
- All the sides are covered with different sizes of the glass and the same gives the protection against 7.62 x 39 MSC & 7.62 x 39 HSC
- Gross vehicle weight is maintained by using combination of Steel, Composite, Bullet Resistant Glass and Kevlar Blankets.
- Overlap Protection on all doors, gun ports, seals, door handles , locks etc. to help reduce risk of bullet protection.
- Gap protection at all doors and turret lid to help reduce risk of bullet penetration and increase overall protection of vehicle.
- Single plate side wall designing to eliminate joints and hence no welding joints penetration probability.
- All materials are certified by reputed Testing Laboratories across the country.
- Due to proper design, there is no change in centre of gravity.
- Weight of armouring in case of LBPV and MBPV is controlled as per MHA other agencies guidelines.

### Users:

Defense Forces, CAPFs and State Police Forces



## ARMOURING HELICOPTERS

MIDHANI is providing Composite Armouring solution for helicopters engage in military operations or any other missions.



### Benefits of Composite Armour:

- Provide protection to crew against Small Arms Fire.
- Replacing steel Armour by Composite Armour reduces the weight of Armour by 40%. Hence more no. of troops can be carried for different operations.
- Reducing the weight of Armour increases the fuel efficiency, increases the service ceiling, and increases the max. Speed etc.
- Composite Armour Panels are indigenously developed and manufactured in India
- Composite Armour Panels are better in aesthetic.
- Indigenous Armour Panels are Cheaper by 35% /set.

**User:** Air force

## BALLISTIC SHIELD

MIDHANI, "BALLISTIC SHIELDS" are developed to meet the requirements of the present threat levels of the forces. The shields are meant basically to protect starting from small arms to rifle threat levels. The ergonomics helps the forces for comfortable usage.

MIDHANI, being a manufacturer can understand the user department requirement size and threat level and design as per the requirement.

### Salient Features:-

- ✓ Shield is made in two parts
- ✓ Stand is made with alloy steel
- ✓ Rugged wheels to move on any surface
- ✓ View Port with Bullet Proof Glass
- ✓ The ballistic material is composite armor
- ✓ Ambidextrous handle

The weight and details of the models are as narrated in the table below,

Model	Threat Level	Size in Mts	Weight in Kgs
MDN 1S	Level III A	1.2 x 0.6	12-14
MDN 2S	Level III	1.0 x 0.5	11-13
MDN 3S	Level III +	1.2 x 0.6	12-14
MDN 4S	Level IV	0.8 x .45	18-20

\*Size can be changed as per user requirement in turn weight also changes

**Users:** Defense Forces, CAPFs and State Police Forces





## BULLET PROOF MORCHA

### Description

BP Morchas provide protection to the troops on surveillance duty and can also be used as an protective cover during exchange of fire with enemy/terrorist. Position of the Morcha can be changed easily by mounting castor wheels under each BR Panel.

BP Morchas can also be made in various sizes and with/without bullet resistant glasses. Depending upon the user requirements, spall liners can also be provided on the morcha.

### Some of the variants of BP Morcha

Large Morcha (750mmx1900mm)-260kgs  
(Without BR Glass Viewing Port)

Large Morcha (750mmx1900mm)-278kgs  
(With BR Glass Viewing Port)

Small Morcha (700mmx1200mm)-154 kgs  
(With BR Glass Viewing Port)

Small Morcha (700mmx1200mm)-172 kgs  
(Without BR Glass Viewing Port)



### Capability

Armour protection against 7.62 x 39mm HSC and the same can be customized as per the user requirements (protection against 7.62 x39 API & 7.62 X 51 API are also available)

### Users:

Defense Forces, CAPFs and State Police Forces

## BHABHA KAVACH

### Description

Light Weight bullet resistant jackets (Bhabha Kavach) has been manufactured using the latest technology by dispersing CNT on the Poly Ethylene Sheets . Depending upon the protection level and the weight, different kinds of ceramic are being used on the facing side. Multi-hit capabilities of BRJs are achieved through proper designing of Ceramics.

### Broad Characteristics

Level 3+/-7.1 kgs (Large Size) - Without 360° protection, BFS:25mm

Level 3+/-9.0 kgs (Large Size) - Without 360° protection, BFS:25mm

### Capability

Presently, the light weight jackets gives the protection against level 3+and the same can be increased to level 4 depending upon the user requirements.

### Users:

Defense Forces, CAPFs and State Police Forces





## BULLET PROOF PATKA

### Description

MIDHANI has developed BP Patka as per BP(R&D) Specifications using special armoured steel. Ergonomic features and trauma pad have been provided to absorb shocks. Availability of this proven product with paramilitary forces will ensure protection of troops and still confidence to undertake operations without any apprehension.

### Broad Characteristics

BP Patka (Steel) (Without Skull Protection) -1.4 kg+10%

BP Patka (Steel) (With Skull Protection) -1.5 kg+10%

### Capability

Front Armour Protection : 7.62 x 39 mm HSC

Rear Protection : 9 x 19 mm Ball

**Users:** Defense Forces, CAPFs and State Police Forces



## BULLET PROOF VEST



### Description

Bulletproof vests are made of many layers of woven or laminated fibers and can protect the wearer from small-caliber handgun and shotgun projectiles, and small fragments from explosives such as hand grenades.

### Broad Characteristics (44mm BFS)

Standard size - 1.5 kgs

Large size - 1.7 kgs

Extra size - 1.85 kgs

### Capability

Armour Protection 9x19mm Ball ammunition (Level IIIA)

**Users:** Defense Forces, CAPFs and State Police Forces

## SENTRY POST

### Description

Bullet Resistant sentry post and the Bullet Resistant Machan is mainly for the group protection in the naxal infested areas. These structures can be customized and made as per the user requirements with the incorporation of various features like Bullet Resistant Glasses, Composites, Mobile Structures, etc.,

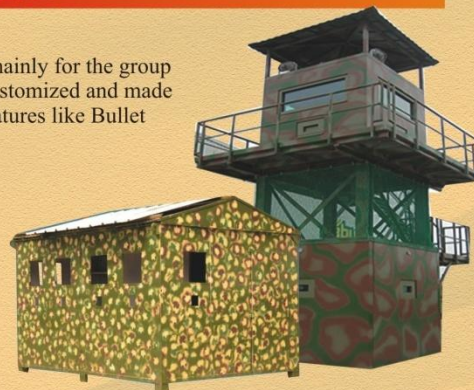
### Broad Characteristics Capability

Armour Protection (Protection against 7.62 X 39 HSC)

### Capability

Depending upon the user requirements, the structure can be made against any protection level.

**Users:** Defense Forces, CAPFs and State Police Forces





## BALLISTIC STEELS

Grade	Properties	Application
MDN 45	Hardness: 480 -520 HB	Blast and IED protection, Bottom side of medium vehicles
MDN 1700	Hardness: 480 - 520 HB, K1c=80 MPa m <sup>1/2</sup>	Flat part for whole vehicle, Heavy armour for MBT protection
MDN RHA Steel	Charpy Impact (J)=80 at RT Hardness: 290 -340 HB	Ammunition proofing, Construction of submarine hull/ structure and naval surface ships
Super Bainite Steel	Hardness: 600 HB, K1c=70 MPa m <sup>1/2</sup>	Light & medium combat vehicle structures
High Nitrogen Steel (HNS)	%EL= 35, CVN@RT=200	Infantry Combat Vehicle, Helicopter, Naval boats etc



MPV Chassis

## Product Range

Product	Applications	Protection Level	Variants
Vehicle Armouring	Group protection & Transportation of troops in hostile environment	Level 3+ and above BR the glasses are protected against level 3+ Floor is protected against 2xHE36 Grenades	-Partial armouring - Complete protection with level 3+ - Run Flat Tyres
Panels for Mi 17 Helicopters	Group Protection	Protection against Level 4 (7.62 API)	- Light weight panel
Bullet Proof Sentry Post	Group Protection	Protection against level 3+	-Sentry post with level 4 protection - Customised designs
Bhabha Kavach	Personal Protection	360 degree level 3+	-BR jacket with level 4 protection, etc..
Bullet Proof Vest	Personal Protection	Protection against level 3A	-Stab Resistant Vest -Light weigh Vest
Bullet proof Patka	Personal Protection	Fore head against level 3+ & rear against level 3	-All around level 3 protection -Light weight Patka
Bullet Proof Morcha	Group Protection	All around level 3+	-Morcha with BR Glass -BR Morcha with Spall liners -Light weight Morch -Morcha with level 4 Protection
Spall Liner	Group Protection	Level 3A	-Light weight panels
BP Shield	Group Protection	Level 3+ and above	-Light weight solutions - Customised designs

Note:- Other customised products can be developed

Tracked Vehicle Armoring Contact: [ashwanikumar@midhani-india.in](mailto:ashwanikumar@midhani-india.in) for discussion



## Milestones

Mishra Dhatu Nigam Limited (MIDHANI) has over 30 years of experience in providing Defence equipments and Armour solutions for various applications. Wide spectrum of Armour solution were provided by MIDHANI to Indian armed force.

**Our products are as follows:-**

### Personal and Group protection Equipments:-

MIDHANI has started with manufacture of Jackal armour steel for personal and Group protection. The Jackal steel were much superior in quality and gives level 3+ ballistic protection later, Kanchan armour steel was also developed for armoured vehicles such as Tanks, LBPVs, MBPVs etc., The weight of kanchan armour steel is around 10% less than Jackal armour steel for the same coverage area due to its higher hardness. Due to this particular characteristic, Kanchan armour was widely used in Main battle tanks and other Combat Vehicles.

Unlike land systems, the weight of armour solutions for air systems shall be very less, In order to meet the requirement of air systems, composite armour panels (Combination of Ceramic and Titanium) were developed by MIDHANI. The developed armour solution was more reliable against various ammunition compared to other conventional composite, Excellent strength to weight ratios of these materials makes it very important feature for avionics and fuel consumption characteristics.

With the development of technology, the requirement of weight of the personal protection equipments to be used by troops in combat role reduce significantly for the better comfort and maneuverability. MIDHANI has been working with various R&D institutes for the development of light weight armour solutions for personal protection. This has resulted into development of lightest weight bullet resistance Jackets "Babha Kavach", comprising of CNT dispersed PE sheets and ceramics.

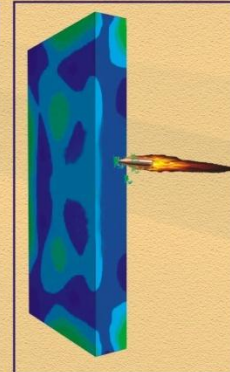
To be a World leader in the armour domain, MIDHANI is closely working with various world class R&D institutes for the development of much lighter solutions. In addition to this MIDHANI is also setting up its captive armour unit at IMT, Rohtak for manufacturing various kind of armour solutions & the dedicated R&D facilities.

**Vehicle Armouring:-** MIDHANI undertakes up-armoring of troops carrier, armoured fighting vehicles and light vehicles we offer solutions for various Ballistic level and use world class material for vehicle armour.

**Helicopter Armoring:-** MIDHANI is providing composite Armouring solution for helicopters engine in military operations or any other Missions.

## Ballistic Standards

Standards	Type of Bullets	Velocity (Mini.)	Nominal Plate Thickness
NIJ Level - III	7.62X51M80 NATO Ball	838±15m/sec	6.00 mm
NIJ Level - IV	0.30 Caliber AP M2	868±15m/sec	14.50 mm
STANAG 4569 Level -I	5.56X45mm NATO Ball(M193)	937±20m/sec	9.20 mm
	5.56X45mm NATO Ball(SS109)	900±20m/sec	6.50 mm
	7.62X51mm NATO Ball (M80)	833±20m/sec	6.50 mm
STANAG 4569 Level -II	7.62X39 API BZ	695±20m/sec	12.20 mm
EN1522 FB6	7.62X51M80 NATO Ball	830±10m/sec	6.00 mm
EN1522 FB7	7.62X51P80 NATO AP	820±10m/sec	14.50 mm



## मिश्र धातु निगम लिमिटेड MISHRA DHATU NIGAM LIMITED

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