

SPECIFICATION FOR BULLET PROOF JACKETS

DESIGN PARAMETERS FOR BP JACKETS

- A. Shall confirm to NIJ standard of Baltictc standard Resistance of personnel Body Armour (NIJ Standard -01010.4 updated revision A'&B')
- B. Projection against all of the following weapon:
- (I) 9MM BULLET FIRED THROUGH STEN Machine carbine from a distance of 5 meters
 - (II) 12 bore shot(soild slug) fired through ful length shotgun from a distance of 10meters
 - (III) 7.62 mm bullet NATO ball ammunition fired through 7.62 mm SLR from a distance of 10 mters and
 - (IV) 7.62 mm mild steel core bullet fired through AK series rifles from a distance of 10 meters .
- C. Vast should have the components mentioned in para E below, Each. Component should be made of multi layers of same material .each layer be in single piece and of equal shape and size to maintain uniform.
- D. Sizes of soft armour panle (SAP) STANDARD AND LARGE
- E. AREAS OF COMPONENTS OF SOFT ARMOU PANEL
Coveage area of the soft Armour Panel as per the sizes will be as under:-

s No.	PANEL	STANDARD SIZE ✓ (sq.Mtr.)	LARGE SIZE (Sq. Mtr.)
1.	FRONT	.15	.18
2.	BACK	.24	.26
3.	COLLAR (TOTAL)	0.06	0.06
4.	SHOULDER (TOTAL)	0.04	0.04
5.	GROIN	0.06	0.06
	TOTAL	.55	0.60

However, dawings of the varoious componebnts of BP jacket are enclosed as Appendix-"A" for guidance purpose in respect of its dimentions.

- (i) Negative tolerance in terms of area measurement is not permissible.
- (ii) Measurements will be made with the help of sealed dwawing on graph paper and using planimeter.

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F. WEIGHT OF THE JACKET

Total weight of BP Jacket including HAPs, SAPs, trauma pads and outer carrier should not exceed as mentioned below :-

- (i) Standard size - 6.31 Kg ✓
- (ii) Large size - 6.62 Kg

Positive tolerance in weight is not permissible.

G. SIZE OF HARD ARMOUR PANEL : - 305 mm X 254 mm.

For both sizes negative tolerance in dimensions of HAP is not permissible.

- H. Shall consist of an outer carrier, removable Soft Armour Panels of aramid Fibre and two High Performance Polyethylene Plates.

BP JACKET - CONSTRUCTION :

- (i) It shall provide projection to front, back torso and groin, full sides, upper Shoulders, neck and collar. Besides, neck & collar protection, it should not Restrict the vertical movement of the neck of the wearer.
- (ii) Shall be light weight and comfortable providing optimum mobility and Speed.
- (iii) Adjustable at the shoulders, waist and groin with appropriate fasteners (Velcro's). An adjustable nylon belt of minimum 10 cm width should be provided with double locking of jacket with Velcro.
- (iv) The vendor has to declare the type of materials, number of layers and their aerial density in technical bid of tender and they have to maintain the same in bulk supply.
- (v) SAP should be encased in polyurethane coated materials so as to make it water proof.
- (vi) **VELCRO FASTENERS**
All the clothing flaps of the jackets should have high quality Velcro fasteners, so that it can be worn and taken off easily/quickly. The peel and shear strength of the Velcro used shall not be less than 250 Newton/Cm² and 1300 newton/Cm² respectively when tested as per IS:8156-1994 (The IS:8156-1994 may be available in the office of Bureau of Indian Standards).
- (vii) **POCKET WITH FLAPS**
The jacket should be provided with two external pockets in outer carrier to house two magazines of 5.56mm LMG in each pocket. Two pockets should also be provided to accommodate one grenade (HE36) in each pocket. The size of each magazine is 19cm x 7.6cm x 3.5cm and size of HE 36 grenade is 100 mm x 65mm.

- (viii) **BELT/KAMARBANDH**
An additional belt of nylon/polyester weaving with minimum width of 10cm should be provided around the waist to properly secure the B.P.Jackets with the body of the wearer around waist., so that weight of jacket is distributed on waist/shoulders. Kamarbandh should be of same material as outer carrier with Velcro.
- (ix) Two pouches (one each on front and rear of outer carrier) should be provided to accommodate two 305 mm x 254 mm Hard Armour plates so that jacket protects vital organs of body.
- (x) Ballistic panels (SAPs & HAPs) shall be removable from outer carrier
- (xi) Outer carrier shall be machine washable.
- (xii) **TRAUMA PAD FOR TRAUMA ATTENUATION**

- (a) Trauma pad must be provided behind the SAPs, so that it remains to body surface to provide proper cushioning.
- (b) It must cover uniformly upto edge level of the SAPs.
- (c) Trauma pad will be made of "Non-woven 100% polyester synthetic wadding. Placement of trauma pad/additional layer at any other place is not permissible.
- (d) Trauma level should not exceed 25mm in plasticine block at 30+29 degree centigrade temperature of plasticine.
- (e) Drop test will be carried out as specified in NIJ standards.

MATERIALS

- The outer carrier shall be made of high tenacity, heavy duty, abrasion resistant and 100 vest integrity fabric PU coated Nylon.
- The fabric shall be treated for protection against eater, fire (fire retardant) and ultra violet ray's exposure
- The fabric must be suitable to wear in the Indian conditions of heat, rain and humidity.
- The inner cover (body side) shall also be of similar fabric and shall be treated for moisture and water repellency.
- The cloth of the carrier must be pre-shrunk before stitching.

Note :

- i. The methods of testing criteria for measuring the properties of outer carrier shall be as per IS:11871-1986, IS:3417-1979 (reaffirmed 1997) IS:392-1989 and IS391-1975.
- ii. BP Jackets should be UV resistant.

VEST FIT :

- The overall length of the BP jacket shall be such that there is no "ride up" while sitting.
- The overlapping degree of front and rear panels shall be such as to provide for maximum freedom of movement.

COLOUR :

CAMO : The bidders will submit samples of BP jackets of any camo colour. However, before placement of bulk supply order, exact camo colour alongwith modifications required, if any, in outer carrier will be intimated.

LABELLING : The outer carrier and the two soft Armour panels must be as per NIJ standards giving the following details.

Name of the Manufacturer :
Name of the Product :
Date of Manufacturing :
Date of Issue :
Threat level :
Size :
Serial No.
NIJ Standard :
Strike face of jacket should be clearly marked

SOFT ARMOUR PANEL (SAP)

- SAP shall be able to withstand NIJ threat level III A in respect of the notified weapons Calibre, bullet weight and velocity.
- Shall protect both front and back torsos.
- Shall be made of 100% Aramid air entangled fiber.
- Shall be balanced plain weave fabric to maximize the number of crossover points for maximum dispersal and absorption of impact energy of the bullet.
- The weight of the Aramid Filament, denier and type of weave should be so balanced as to make the SAP lightweight, breathable, soft and pliable.
- The aerial density of the panels shall be such as to provide the rated ballistic and trauma protection.
- No tears, rips, worn spots, discolorations, loose or from stitching and set wrinkles on the SAP shall be allowed.
- The panel shall be treated with approved and durable water repellent.
- The SAP shall be removable from outer carrier to allow for periodic cleaning.
- The SAP shall be placed in tightly sealed, water repellent and PU coated heavy duty fabric so as to make it completely waterproof.
- The aramid fiber layers shall be stitched in a rows and columns pattern with a distance gap of minimum 12.5 ± 0.5 mm.
- The design given with this specification is for illustrative purpose only.

Note : Tenders must declare number of layers and type of material (aerial density of material) used for fabricating Soft Armour Panel and Hard Armour Panel as per original manufacture of the material. Raw Material Assurance Certificate (RAMC) must be given from original manufacturer in respect of material for SAP and HAP, valid for a period of six months from the closing

date of tender. The vendor has to declare the numbers of layers used for fabricating SAP and HAP of tender samples and they have to maintain the same in bulk supplies.

HARD ARMOUR PLATE (HAP)

- Shall be made of high performance polyethylene fiber :
- Shall provide NIJ threat level III protection against fire of 7.62mm SLR and 7.62 mm AK Rifles from a distance of 10 meters in conjunction with Soft Armour Panel.
- Each plate should not weight more than 1.5 Kg.
- Shall be of size minimum size 305mm x 245 mm to cover the vital parts of the body.
- Curvature of the HAP shall be suitable to fit the body contour.
- HAP shall be shielded in tightly sealed, water repellent and PU coated heavy duty fabric so as to make it completely water proof.

OTHER STIPULATIONS

JACKET STYLE	:	POLICE
SERVICEABILITY	:	10 YEARS (HAP,SAP & trauma pad)
GUARANTEE	:	The Outer Carrier alongwith trauma padding shall be guaranteed for a period of 2 years against all manufacturing defect.
TEMPERATURE	:	-50° C TO + 50° C
HUMIDITY	:	95% at 40° C
STORAGE	:	Normal Room Temp.

IMMUNITY LEVEL :

- (a) **Hard Armour Plates** : The HAPs are to be tested in conjunction with SAPs.

Six bullets NATO ball (9.6 gms) fired from 7.62MM SLR from a distance of 10 meters at zero angle of incidence.

- Six bullets (mild steel core) fired from 7.62mm of AK rifle from a distance of 10 mtrs. At zero angle of incidence on separate plates.
- It should stop the single shot (rigle slug) fired centrally on HAP through 12 bore full length shot gun.

- (b) **Soft Armour Plates** :

Six shots fired through 9 mm Sten Machine Carbine from a distance of 5 meters.

- The velocities of bullets fired through weapons are given as follows :

Armour Type	Test Bullet	Bullet weight	Reference Velocity (9.1 m/s)	Hits per Armour part at 0° Angle of incidence	BFS* Depth Maximum	Shots per Panel
IIIA	9mm FMJ	8.2 g	436 m/s	4	25 mm	6 ✓
III	RN					
	7.62 mm NATO FMJ	9.6g	838 m/s	6	25 mm	6
	7.62 mm mild steel core bullet	7.91 g	715 m/s	6	25 mm	6
Shot Gun	12 Bore solid Slug	28.4 g	435 m/s	1	25 mm	1

- BFS – Back Face Signature on Plasticine.
- Selected weapon and lot of ammunition, for which reference velocity has been once achieved, will remain the same throughout ballistic testing of all tender samples of various firms.

Testing Criteria :-

- Scientific inspection/ballistic trial of these BP jackets will be conducted as per NIJ standard 0101-04 incorporating revision 'A' & 'B' for BP jackets.
- Groin Pad will be tested ballistically with 9 mm SMG. Three evenly spaced fair hits at zero degree angle of incidence shall be taken and BFS should not exceed 25 mm.

Miscellaneous

- The supplier/manufacturer shall provide one number of BP jackets of the ordered size along with HAP at their cost from the lot of every 500 numbers but minimum four nos. per lot of jackets for the purpose of the ballistic test/evaluation of the tendered specifications at the time of materializing the supply. These will be selected prior to dispatch at random in the factory premises.
- While submitting the samples for tender, the supplier shall mentioned that exact area of SAP and HAP and give the template of the jackets as per the area, so that import of raw materials of the BP jackets will be allowed accordingly.
- Five tender samples are required for technical evaluation from a firm.
- Each model/brand of BP jackets should be submitted against a separate tender from.

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