

ADMINISTRATION OF DAMAN & DIU (U.T)
POLICE DEPARTMENT, DAMAN & DIU
DAMAN

Serial No....Tender No.SDPO/DMN/PMSUT AAP 10-11/Bullet Proof Jacket/2012/569

Serial No.

Price 1000/-

TENDERFORM

A) Tender reference No. : - DIGP/DMN/PMSUT AAP 09-10 & 10-11/Bullet Proof Jacket/2012/569

B) Date of issue Tender: - From 20/11/2012

C) Date of submission of Tender:-From 07/12/2012,15.00 hours during office hours

D) Date of Technical Bid opening: - From 11/12/2012, 15.30hours

E) Validity of Tender :- 120 days from the date of opening of tender

F)

Serial No.	Item Tendered	Quantity in Nos.	Tender Document Fee
1	BULLET PROOF JACKET :- AS PER SPECIFICATIONS ATTACHED ALONGWITH	06	1000/-

Terms and Conditions :-

- (1) Tenders are invited in 'Two Envelope System' (Technical Bid & Commercial Bid) Tenderer can download the tender form and specifications from the www.daman.nic.in or www.ddpolice.gov.in.
- (2) Tenderer has to submit separate Demand Drafts towards Tender Document Fees and Earnest Money Deposit (wherever applicable) in the name of "Dy. Inspector General of Police" payable at Daman on or before 15.00 hours on 07.12.2012 (The reference and equipment name should be written on envelope.) This envelope should be submitted at the O/o the Sub Divisional Police Officer, PHQ, Airport Road, Daman 396 210. The Technical Bid envelope shall accompany a scanned copy of Demand Drafts. If Tenderer fails to submit tender document fees in the form of Demand Draft, his offer will be rejected. The tender document fees will not be refunded under any circumstances.

(3) Tenderers are requested to submit their bid in two separate envelopes marked as “Technical Envelope” and “Commercial Envelope” .

(4) The various activities required to be executed by the Bidders to submit their Bids for these items have time and date limit. The Bidders are requested to execute all the activities related to their bids within the prescribed time limits. Tender Inviting Authority shall not be responsible for any delay.

TECHNICAL BID

(5) The technical bid envelope should contain the following :-

(i) The tenderer should submit following information on his letter head.

Name of Tenderer				
Name of the Directors				
Name of Authorised Signatory				
Registered office Address				
Year of Establishment				
Type of Firm	Public Ltd. Co	Private Ltd.Co.	Partnership Firm	Traders/ Authorised dealers/ Distributors
Please Tick ()Mark				
Telephone Number(s)				
E-mail Address/website				
Fax No.				
Mobile Number				
Registration Number under Indian Companies Act, 1956				
Total Annual Turnover				

Sales Tax / VAT Registration Certificate		Reg. Number		Date	
IE code (if product or parts are imported)					
Proof of EMD					
Earnest Money Deposited through	Bank Details	Amount	D.D. Number	Date	
Demand Draft					
Bank pay order					
Make of tendered item *					
Model No. of tendered item *					
*	Technical bid not mentioning the offered Make / Model of the tendered item is liable for rejection.				

- (ii) Earnest Money Deposit (EMD): The Earnest Money Deposit would be 2.5% of the value of the item tendered subject to maximum of Rs. 18,750/- by way of Demand Draft in the name of “The Dy. Inspector General of Police” payable at Daman only. Cheques will not be accepted. If the tenderer is exempted from submitting the EMD, it should be mentioned on the original letter head along with the copies of G.R. / Govt. order. The exemption must be for the tendered item i.e. the firm must have the registered with C.S.P.O. / D.G.S.& D. /NSIC / SSI unit for the tendered item.
- (iii) Registration Certificate of C.S.P.O. / D.G.S.& D. / NSIC / SSI with validity of registration mentioned clearly.
- (iv) Value Added Tax Clearance Certificate from the competent authority showing the VAT paid upto December 2011. OR If VAT clearance certificate cannot be submitted, acknowledgement of application made to the VAT competent authority for such clearance certificate should be enclosed with technical bid. However VAT clearance certificate must be produced before the opening of the commercial envelope, other wise the tender shall be treated as invalid & commercial envelop of such bidder cannot be opened. In case of tenderers from the States where VAT is not levied, they should provide the clearance certificate of Sales Tax or any other equivalent tax levied, from the competent authority. Also, last Income Tax clearance certificate from the competent authority should be attached.

- (v) The tenderer should be an authorized distributor / dealer for the tendered item and he should furnish current year valid Authorization Letter / Dealerships certificates from the Original Equipment Manufacturer (OEM). The Authorization letter should be specific for the tendered item. Xerox copy of Authorization letter should be attested with valid dates. The name of item should be clearly mentioned in Authorization Letter. (Original authorization letter should be submitted for verification at the time of commercial bid opening).
- (vi) The tenderer should obtain a letter from the manufacturer that the Model quoted in the tender conforms to the specifications of the products manufactured as on date and latest. Also the product should not be of old model and service be provided for the period as mentioned in the specifications, or upto 03 years whichever is higher from the date of acceptance of stores /date of installation. Also a letter showing that he is an authorized distributor/ dealer for a minimum period of next 3 years.
- (vii) Power of Attorney in favour of person signing the bids to be given in Technical envelope (if applicable)
- (viii) Product Brochure clearly mentioning the features, Make/Model No. etc. If Brochure is not available then Photograph of tendered product should be submitted.
- (ix) Latest Test Report alongwith letter of the tenderer giving technical specifications to the laboratory asking for latest report i.e. on or after December 2011, of the tendered item should be submitted.
- (x) Tenderer should submit Comparative chart in the following format for each item.

Sr. o.	Specification of tendered item	Specification of item offered by the tenderer

* Special / Additional feature should be mentioned below this comparative chart.

- (xi) List of clients to whom the tenderer has supplied the tendered item mentioning the quantity and date of supply. Copies of supply orders should be uploaded without disclosing commercial details.
- (6) The Dy. Inspector General of Police, Daman, reserves the right to select any vendor on the grounds of his experience, the clients, the capacity or turnover of the vendor which can infuse confidence that selected vendor can complete the work within given time.
- (7) The tenderer who qualifies in technical bid will have to submit the sample of the tendered item for testing/demonstration/ field trials, before a committee of officials selected by

Dy. Inspector General of Police, Daman within four days positively from opening of technical envelop, on 'No cost, No commitment' basis. If the tenderer fails in/ to show the demonstration/ field trials within given period, his offer will be liable to disqualify.

- (8) The tenderer shall give an undertaking for supply of spare parts / batteries for the period specified in specifications of the tendered item.

Note: - The tenderer should submit all above mentioned compulsory documents in specified format from Sr.1 to 5 (xi) If the tenderer fails to submit any single document in the technical envelope the tender shall be treated as invalid / rejected.

NO information related to Price bid should be furnished/disclosed in the Technical Bid Envelope otherwise the Bid shall be disqualified.

COMMERICAL BID

- (9) Tenderers should submit separate Commercial bid for each item in the following format clearly mentioning each and every details of the price bid online.

Sr. No.	Name of item (Make/ Model No.)	Basic Price	Transport	VAT/ Equivalent Tax	Insurance	Education Cess	Forwarding/ Handling	Packing	Custom Duty	Excise Duty	Installation	Training Charges	Final price including of all these charges

- (i) The price quoted must be in figures and in words.
- (ii) The price quoted must be inclusive of supplying the item anywhere in Maharashtra or Gujarat. No request of extra payment of transportation charges will be entertained afterwards.
- (iii) The warranty period should be mentioned in the Commercial envelope.
- (iv) Conditional offers and offers qualified by such vague and indefinite expression such as "Subject to immediate acceptance, "Subject to prior sale" etc. will not be considered.
- (10) Warranty period of the equipment / item will be as per the specifications of the tendered equipment/item and will start from date of receipt/ acceptance of equipment / item. In case the warranty period is not mentioned in the specifications of the item, warranty period of 3 years shall be applicable.

- (11) Comprehensive and Non-comprehensive Annual Maintenance Contract (AMC) rates (if applicable) must be mentioned after lapse of warranty period in Commercial envelope.
- (12) Quantity of tendered item may vary subject to the final availability of funds.
- (13) The selected vendor should be in position to supply the equipment **within sixty days** or earlier from the date of placing of technically clear order / custom duty exemption certificate
/ license copy etc.
- (14) The testing charges for Government approved laboratories, if any of the samples tendered will have to be paid by the shortlisted Bidders after the shortlisting of Technical Bids. The rates of testing charges are likely to vary & the tenderer will have to pay the current charges before sending the samples for testing. The samples will not be returned to the tenderer.
- (15) Octroi Exemption Certificate, if required, will be provided from this office on the requirement and intimation by the tenderer.
- (16) The commercial envelopes of only those participants will be opened who have passed in demonstration/ laboratory tests/ field trials.
- (17) Though any vendor can participate in the tender, the Dy. Inspector General of Police, Daman reserves the right to select the vendor who has a manufacturing facility, service center or repair workshop in Maharashtra or Gujarat.
- (18) Participant should have after sales and service facilities at major cities in Maharashtra, Gujarat wherever applicable.
- (19) The Dy. Inspector General of Police, Daman, reserves the right to inspect the manufacturing unit where ever found necessary, while considering the tender.
- (20) It is responsibility of the vender to take back Earnest Money Deposit (EMD) after finalization of the tender. No interest will be paid at any cost on Earnest Money Deposit.

- (21) The Dy. Inspector General of Police, Daman, reserves the right to reject any part or the whole tender, or all tenders without assigning any reason.
- (22) The right to ignore any tender which fails to comply with the above instruction is reserved.
- (23) Tenderers have liberty to remain present or to authorize their representative at the opening of technical or commercial tender at the time and date specified. Dates quoted for opening of technical and commercial tender are subject to changes in case there is any holiday abruptly declared by the Government or under certain unavoidable circumstances.
- (24) The Dy. Inspector General of Police, Daman does not pledge himself to accept the lowest or any tender and reserves to himself the right of accepting the whole or any part of the tender or portion of the quantity offered against any item and tenderer should supply the same at the rate quoted.
- (25) In the event of the order being placed against any of the tenderers and if such tenderers fails to supply any stores according to specifications or the terms and conditions of Acceptance of Tender or fails to replace any stores rejected by the Dy. Inspector General of Police, Daman. or by any person on his behalf within such time as may be stipulated, the Dy. Inspector General of Police, Daman, reserves the right to purchase such stores from any other sources and at such price as the Dy. Inspector General of Police, Daman shall in his sole discretions thinks fit.

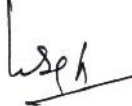
If action as stipulated above is taken

- (i) The offer of the defaulting contractor will not be considered.
- (ii) The defaulting contractor will be penalized to the extent of the differences in the rates or 10% of the value of the earlier orders whichever is higher.
- (iii) If the defaulting contractor fails to pay the penalty he will be permanently de-listed from the list of approved contractors of the Dy. Inspector General of Police, Daman and the registration deposit of the contractors will be forfeited to Government .

- (26) In case of no delivery and /or delayed delivery against an order placed after Acceptance of Tender the Dy. Inspector General of Police, Daman reserves to himself the right to impose such penalty in his sole discretion as he thinks fit.
- (a) Successful Tenderer will be required to pay security deposit as fixed by the Dy. Inspector General of Police, Daman and enter in to agreement for the performance of the contract.
- (b) Tenderers convicted or involved in any criminal offence shall be considered ineligible for awarding contract.
- (27) As soon as is apparent that contract dates cannot be adhered to, an application shall be sent to the Dy. Inspector General of Police, Daman.
- (28) Without prejudice to the foregoing rights, if such failure to delivery in stipulated time as aforesaid shall have arisen from any cause, which the Dy. Inspector General of Police, Daman may admit as a reasonable ground for an extension of the time (and his decision shall be final), he may allow such additional time considering the circumstances of the case, which are justified. However, the decision taken by the Dy. Inspector General of Police, Daman will be final.
- (29) Provided always that any failure or delay on the part of sub-contractors through their employee shall not be admitted as a reasonable ground for any extension of time or for exempting the tenderer from liability for any such loss or damage, as aforesaid and provided further that no extension shall be allowed unless applied for and if shall, in the opinion of the Dy. Inspector General of Police, Daman. (Which shall be final) have been made and in his opinion, are justified.
- (30) Any statutory increases or decreases as an Act of State or the Central Government relating to Sales Tax and other taxes shall be to the account of the contractor.
- (31) Tenderers should state the place of inspection of the stores offered, if the goods are offered for inspection outside Maharashtra State, the tenderer will have to bear all expenditure of inspection carried out by this office.

- (32) Goods should be dispatched at carrier's risk failing which they should be properly covered by transit insurance with Govt. Insurance Fund, Mumbai – 400 032. However, the supplier will be responsible till the entire Stores contracted for arrive in good condition at destination.
- (33) The tenderer should specifically mention whether they are licensed under Industries Development and Regulation (IDR) ACT 1951 for the production of the item in quotation and if not, how prescribed and from whom they proposed to procure the material and what arrangements are proposed for assembly to supply.

I agree with all the above terms and conditions.

 16.11.12
Sub Divisional Police Officer
Police Head Quarter
Daman

Date and Place

(Name , Signature and Rubber seal of Bidder)

SPECIFICATION FOR BULLET PROOF JACKETS

DESIGN PARAMETERS FOR BP JACKETS

- A. Shall conform to NIJ Standard of Ballistic Resistance of Personal Body Armour (NIJ Standard – 0101.04 updated revision ‘A’ & ‘B’) Protection against all of the following weapons:
- (i) 9x19 mm cartridge fired through Sub Machine Gun (Such as Sten Machine, MP5, Carbine, any other variant) from a distance of 5 meters to achieve a muzzle velocity 430 ± 15 m/s and the weight of the bullet between 7.4 gm to 8.2 gm.
 - (ii) 7.62x51 mm cartridge NATO ball ammunitions fired through 7.62mm SLR/Bolt action rifle from a distance of 10 meters to achieve a muzzle velocity $838\text{m/s} \pm 15$ m/s and the weight of the bullet 9.4g to 9.6g.
 - (iii) 7.62x39 mm (mild steel core bullet) cartridge fired through AK series rifles from a distance of 10 meters to achieve a muzzle velocity $715 \text{ m/s} \pm 15$ m/s and the weight of the bullet 7.45g to 8.05g.
- B. Vest should have the components mentioned in para D below. Each component should be made of multi layers of same material. Each layer will be in single piece and of equal shape and size to maintain uniform thickness all over area up to edge level.
- C. **SIZES OF SOFT ARMOUR PANEL (SAP): STANDARD AND LARGE.**
- D. **AREAS OF COMPONENTS OF SOFT ARMOUR PANEL**

Coverage 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	0.15	0.18
2	BACK	0.24	0.26
3	COLLAR (TOTAL)	0.06	0.06
4	SHOULDER (TOTAL)	0.04	0.04
5	GROIN	0.06	0.06
	TOTAL	0.55	0.60

However, drawings of the various components of BP jacket are enclosed as appendix-‘A’ for guidance purpose in respect of its dimensions.

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

E. 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

F. Size of Hard Armour Panel –305mm X 254mm

Negative tolerance in dimensions of HAP is not permissible.

G. Shall consist of an outer carrier, removable Soft Armour Panels (SAP) of aramid fiber/suitable material and Hard armour panel (HAP) made of High Performance Polyethylene.

H. BP JACKET - CONSTRUCTION:

- (i) It should be in the form of jacket to provide protection against 9mm bullet (Threat level IIIA of NIJ). It should not restrict overall vertical movement of the neck of the wearer.
- (ii) It should have provision to accommodate two HAP plates in front and back as per dimensions specified in tender documents. Shall be lightweight 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 quality and report of Velcro including shears strength and peel strength should be as per Bureau of Indian Standards specification **IS: 8156-1994**. The IS: 8156-1994 may be available in the office of Bureau of Indian Standards. Vendors will submit test reports on Velcro from any NABL accredited lab or DMSRD (MoD), Kanpur.

(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 (HE 36) in each pocket. The size of each magazine is 19 cm X 7.6cm X 3.5cm and size of HE 36 grenade is 110 mm X 65 mm.

(viii) BELT/KAMARBANDH

An additional belt of nylon/polyester weaving with minimum width of 10 cm 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 up to edge level of the SAPs.
 - (c) Back face Signature (BFS) should not exceed 25 mm in plasticine block at 30 ± 2.9 degree centigrade temperature of plasticine.
 - (d) Drop test will be carried out as per NIJ standards.

I. MATERIALS

- The outer carrier shall be made of high tenacity, heavy duty, aBPasion Proof and 100% vest integrity fabric PU coated Nylon.
- The Fabric weight should not be less than 95 gm/m².
- The fabric shall be treated for protection against water, fire (fire retardant) and ultra violet rays' exposure.
- The fabric must be suitable to wear in the Indian conditions of heat, rain and humidity.
- The inner side (body side) shall also be of a similar faBPic and shall be treated for moisture and water repellency.
- The cloth of the carrier must be pre-shrunk before stitching.
- BP Jackets should be UV Proof.

Note:

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 IS 391 – 1975.

- Duration of flame after removal of burner-maximum 5 seconds (Test Method IS11871)
- Duration of flame afterglow- maximum 5seconds (Test method IS11871)
- Hydrostatic Head-Minimum 100 cms of water (Test Method IS391-1975)
- Water penetration should be zero (Test Method IS392-1989)
- Mean Ultra Violet Penetration Factor- Minimum 100 (Test Method IS 3417)
- **Important** - Vendor should supply 3 meters of each faBPics used both at the time of tender and from actual production for testing.

The tests specified will be conducted at a government institute, having required technical expertise. The institute will be selected by Technical Evaluation Committee in consultation with experts. All tests will be in accordance with the SOP. Any changes in the SOP will be decided by Technical Evaluation Committee.

J. 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.

K. 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.

L. LABELLING: The outer carrier and the two soft Armour panels must be labeled 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

M. SOFT ARMOUR PANEL (SAP)

- SAP shall be able to withstand NIJ threat level III A In respect of the caliber & the weapon selected for trial and other parameters such as weight & velocity of the bullet in ammunition selected for trials.
- Shall protect both front and back torsos.
- Shall be made of Aramid /suitable material.
- The weight of the Aramid/suitable Filament, denier and type of weave shall be so balanced as to make the SAP lightweight, 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 torn stitching and set wrinkles on the SAP shall be allowed.
- The panel shall be treated with approved and durable water repellant.
- The SAP shall be removable from outer carrier to allow for periodic cleaning.
- The SAP shall be placed in tightly sealed; water repellant and PU coated heavy-duty fabric so as to make it completely waterproof.
 - (a) Hydrostatic Head-Minimum 100 cms of water (Test Method IS391-1975)
 - (b) Water penetration should be zero (Test Method IS392-1989)
- The aramid fiber layers shall be stitched in a suitable pattern in case SAP is made of aramid. The design given with this specification is for illustrative purpose only.

Note: Tenderers must declare number of layers and type of material (aerial density of material) used for fabricating Soft Armour Panel and Hard Armor Panel as per original manufacturer 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 vender 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.

N. HARD ARMOUR PLATE (HAP)

- Shall be made of high performance polyethylene fiber.
- Shall provide NIJ threat level III protection against cartridge 7.62x51 mm ammunition and 7.62x39 mm ammunition (mild steel core bullet) from a distance of 10 meters in conjunction with Soft Armour Panel.
- Each plate should not weigh more than 1.5 kg.
- Shall be of minimum size 305mm x 254mm to cover the vital parts of the body.
- Curvature of the HAP shall be suitable to fit the body contour.
- HAP shall be shielded water repellant and PU coated heavy-duty faBPic so as to make it completely water proof.

O. OTHER STIPULATIONS

JACKET STYLE : POLICE

SERVICEABILITY : 10 YEARS (HAP, SAP & trauma pad)

GUARANTEE : The Outer Carrier along with trauma padding shall be guaranteed for a period of 2 years against all manufacturing defects

TEMPERATURE : -50⁰ C to +50⁰ C (Operating temperature)

HUMIDITY : 95% at 40⁰ C

STORAGE : Normal Room Temp.

P. IMMUNITY LEVEL:

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

- Six bullets NATO ball (9.4g to 9.6gms) fired from 7.62 MM SLR/bolt action rifle from a distance of 10 meters at zero angle of incidence.
- Six bullets (mild steel core), from 7.62 mm of AK rifle from a distance of 10 Mts. at zero angle of incidence on separate plates.

(b) Soft Armour Panels:

- Six shots fired through 9mm Sub Machine Gun (Such as Sten Machine, MP-5, Carbine, any other variant) from a distance 5 meters. with a muzzle velocity 430 ± 15 m/s and the weight of the bullet between 7.4 gm to 8.2 gm as specified in standard.

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

Armour Type	Test Bullet	Bullet weight	Reference Velocity m/s	Hits per Armor part at 0° angle of incidence	BFS* Depth Maximum	Shots per Panel
III A	9mm FMJ RN	7.4gm to 8.2 gm	430 ± 15	4+ 2 at 30 ⁰ angle	25 mm	6
III	7.62mm NATO FMJ	9.4 to 9.6g	838 ± 15	6	25 mm	6
	7.62mm mild steel core	7.45g to 8.05g	715 ± 15	6	25 mm	6

- **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.**

All tests will be in accordance with the SOP. Any changes in the SOP will be decided by Technical Evaluation Committee.

Q. Testing Criteria

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

R. Miscellaneous

- The supplier /manufacturer shall provide one number of BP jackets of the order size along with HAP at their cost from the lot of every 500 numbers but minimum four numbers 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 mention the 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/BP and of BP jackets should be submitted against a separate tender form.

S. Testing facilities

Ballistic trials as per the QRs will be held at TBPL, Chandigarh or any other facility as decided by Technical Evaluation Committee.

STANDARD OPERATING PROCEDURES (SOP) FOR TESTING OF LIGHT WEIGHT BULLET PROOF JACKET.

A. General Information:

- Before commencement of ballistic trial vendors shall be briefed about test procedures. They will be asked to sign certain certificates (Annexure A). Tests will be conducted as per laid down procedure. No deviation shall be allowed.
- The decision of Technical Evaluation Committee as appointed by the MHA will be final and binding. The test results will be recorded on the same day and firms' signatory shall be required to sign Compliance Test Report (CTR) Annexure-B1 & B2. No re-testing of tested samples on the firm's request will be undertaken.
- Test sequence will be decided through draw of lots.
- Fair and unfair shots will be given due weightage.
- Ballistic trial will be conducted firstly on wet samples for each weapon (AK-47 Rifle, 7.62mm SLR/bolt action rifle and 9 mm Sub Machine Gun (Such as Sten Machine, MP-5, Carbine, any other variants), followed by dry test.

6. Physical examination of the tender sample would be carried out by a Group of Officers nominated by the Chairman of Technical Evaluation Committee.
7. A vendor or his authorized representative would be present during the physical examination which would include physical parameter and weight, comfort and checking of the documents.
8. A vendor or his representative must submit, in writing, any objections or representation with regards to these trials, to the officer In charge of the team, within half an hour of the completion of evaluation of his sample.
9. Ballistic trials as per the QRs will be held at TBPL, Chandigarh or any other facility as decided by Technical Evaluation Committee. The entire proceedings of the preparation of various equipments such as plasticine box or chronometer, mounting etc., standardization, reading of these instruments and their mounting and conduction of the ballistic trials, will be carried out by the expert of the laboratory.
10. The final results would be made available to the vendor or his representative at a designated place and time, decided by the Chairman of the Technical Evaluation Committee.
11. Any representation with regards to these trials will have to be submitted in writing to the Officer In charge by the vendor or his authorized representative within half an hour of the receipt of these reports. No subsequent representation will be entertained.
12. The decision of the Chairman, Technical Evaluation Committee shall be final on the representation of vendor or their authorized representative.

B. Acceptance criteria:

From each group of 5 standard samples, submitted by the vendor, only one-piece chosen at random, will be put through test for all the physical parameter including workmanship and labelling requirements. If that sample meets the physical requirements, the entire group would be deemed to have passed for physical parameters. If the sample chosen at random doesn't meet the physical requirements, the entire group will be rejected.

C. Test Sequence:

The compliance test report (CTR) form shall be used to record and document the results of the tests. Sequence of testing for BP Jacket will be as under:

- i. Submission of all certificates prescribed in tender inquiry.
- ii. Measurement of weight and other physical dimensions
- iii. Visual inspection for checking physical deformity and other parameter
- iv. Ballistic Trial

(Note: In case of non-conformity with any of the parameters of the tests mentioned above, the next sequence of test will not be conducted.)

D. Visual Inspection

D₁. Workmanship

Each sample of ballistic resistance armour (herein after called armour) shall be free from wrinkles, blisters, cracks, crevices fabric tears, crazing, chipping or sharp corners and edges as well as evidence(s) of inferior workmanship. Furthermore, all samples shall be identical in appearance, size and construction.

D₂. Labeling

Each set of sample of ballistic Proof armour shall be durably and clearly marked /labelled in a readable type and font. The marking/label shall be depicting following information of indelible nature permanently attached to either exterior surface of the panel.

- (a) Name of the manufacturer. XYZ
- (b) Name of the product. aabb
- (c) Date of manufacturing dd:mm:yyyy
- (d) Date of Issue (to be filled by user)
- (e) Protection level III/ IIIA
- (f) Size standard/ Large
- (g) Identification Number ABCD.....
- (h) NIJ Standard 0101.04 (Revision A & B)

Note: Strike face of jacket should be clearly marked.

E. TEST METHODS

E₁. Workmanship Examination

a) Armour Carriers

All armour samples carriers and ballistic panel coverings received for compliance testing will be visually and individually inspected for damage, material flaws, or poor workmanship as defined in specifications. All flaw(s) will be noted on the CTR form.

b) Ballistic Panels

Pre-test:- Before testing, all armour samples ballistic panels and inserts received as tender sample will be individually inspected for damage, material flaws, or poor workmanship as defined in specifications. All identified flaws will be noted on the CTR form(s) for use in deficiency notification reporting.

F. Conduct of Test –

i. Preparation of Plasticine and drop test

Backing Material Calibration

Calibration of the Plasticine clay backing material will be accomplished before and after each sequence of firing of six shot. Calibration will be accomplished using the equipment and techniques specified below:

- a) Drop weight: Steel Sphere
- b) Drop weight size: 63.5mm \pm 0.05mm in diameter
- c) Drop weight mass: 1043 g \pm 5 g
- d) Drop height: 2.0 m
- e) Drop spacing: Minimum of 51 mm from fixture edge to indent edge and a minimum of 152 mm between indent centres.

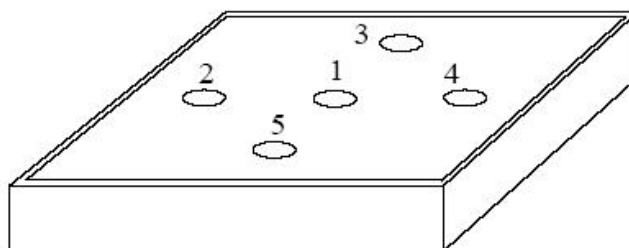


Figure-1 drop tests
Each

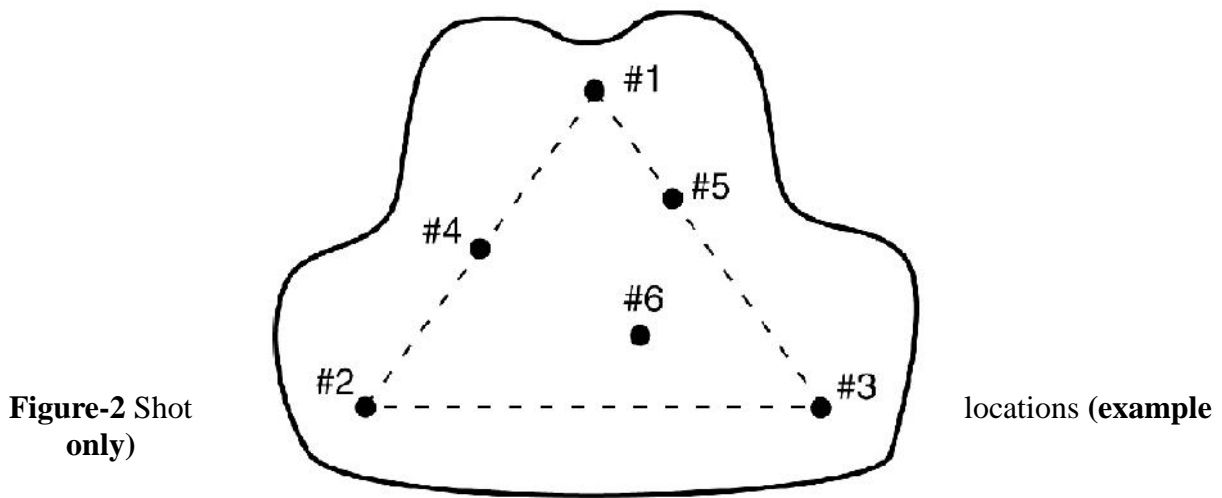
will consist of a free fall of the steel sphere onto the conditioned backing material. A minimum of five drops will be completed with the five drop arithmetic mean depth of depression to be 20 ± 3 mm at 30 ± 2.9 degree centigrade.

(Example only)
calibration drop
fall of the steel

ii. Armourer strapping

a) Shot Location Marking

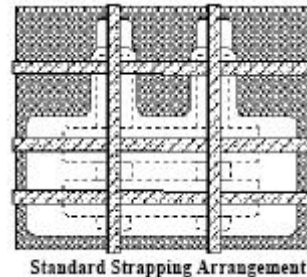
Shot locations will be clearly marked directly on the sample(s) as per criteria.



b) Armour Strapping

Armour sample(s) or panel(s) will be secured to the backing material fixture using 51 mm wide elastic straps, held together using Velcro attachments. Figure illustrates the details, type and location of the strapping devices. The placement of the straps will be such that they do not interfere with the impact points on the panels.

Using a pencil or other appropriate tool, lightly trace the outline of the sample on to the backing material to document the original position of the sample.



iii. Samples preparations/mounting/firing

Firing sequence

Wet panel will be fired upon followed by dry testing.

G. Firing Sequence for Level III A Armour

G₁. Requirements

- (a) One complete BPJ sample, consisting of front and back set of armour panels. Front and back panels are to be used for dry and wet tests respectively.
- (b) Six fair hit impacts per armour panel for compliance test.

G₂. Acceptance Criteria for Penetration and BFS Compliance

- (a) No perforation through the panel, either by the bullet or by any fragment of the bullet.
- (b) No measured BFS depression depth greater than 25 mm.

G₃. Test Range Configuration

- (a) Position the front face of the backing material 5 m \pm 25 mm from the muzzle of the test barrel.
- (b) Fire a sufficient number of pre-test rounds (minimum of three) to ensure that the test round will strike the armour with a velocity within the specified velocity range.
- (c) Ensure for proper placement of the test bullet.

G₄. Sample Preparation, Mounting and Firing

- i. Start with the wet conditioned back panel of armour sample. Place the exposed surface of the calibrated backing material in intimate contact with the back face of the armour panel under test and restrict the movement of the panel from its original position by securing it with two vertical and three horizontal elastic straps, 51 mm wide with Velcro closures. Using a pencil or other appropriate tool, lightly trace the outline of the sample onto the backing material to document the original position of the sample.
- ii. The straps shall be positioned to restrict the movement of the panel from its original position, leaving the strike face impact area(s) exposed.
- iii. Position the backing material fixture to assure proper impact placement and angle of incidence (0 degree) of the test round at location one, as shown in figure 2.
- iv. **Measurement of Back Face Signature :-**
 - (a) Measure the BFS of first shot.
 - (b) Measure the BFS of 2nd or 3rd shot (which is having higher velocity).
 - (c) The maximum value of Back Face Signature (BSF) will be necessarily recorded on Compliance Test Report (CTR) form between (a) and (b) which is having higher value.
- v. **Fire Shot No. 1:** Fire the first test round against the armour panel at location one (fig. 2). Examine the armour panel and the backing material to determine whether the bullet made a fair hit and whether complete penetration occurred. If no complete penetration (CP) occurred and the bullet made a fair hit, measure and record the BFS depression. Record the BFS on the CTR.
- vi. If no complete penetration occurred and the bullet made an unfair hit, a second attempt will be made to attain a fair hit. This second attempt will be made to impact **the same general area** of the panel as the first shot but more than 51 mm from the previous shot and more than 51 mm from any edge of the panel. **If a fair hit is still not attained, the firing sequence will be terminated. No more than a total of eight impacts are permitted on any armour panel.**
- vii. **Remount Armour Sample:** Adjust the armour panel back to its original condition (i.e. smooth and manipulate the ballistic material to return it to its original configuration) and replace it on the backing material in its original position using the traced outline in the backing material as a guide. Do not recondition the backing material; **do not remove the test bullet if it is trapped in the panel.** When conducting the remaining firing sequence, inspect the armour panel following each impact to verify that the impact was a fair hit with no complete penetration, and **smooth out the panel in preparation for the next shot.**
- viii. **Fire Shot No. 2:** Reposition the backing material fixture with the armour panel in position so that the shot will impact the panel at location two. Fire the test round. Do not change the position of the armour panel on the backing material, but adjust the panel and mounting straps as necessary to restore its original condition. **Do not remove any trapped bullets from the panel.**
- ix. **Fire Shot No. 3:** Reposition the backing material fixture with the armour panel in position so that the shot will impact the panel at location three. Fire the test round. Do not change the position of the armour panel on the backing material, but adjust the panel and mounting straps as necessary to restore its original condition. **Do not remove any trapped bullets from the panel.**
- x. **Fire Shot No. 4:** Reposition the backing material fixture with the armour panel in position so that the shot will impact the panel at location four. Fire the test round. Do not change the

position of the armour panel on the backing material, but adjust the panel and mounting straps as necessary to restore its original condition. **Do not remove any trapped bullets from the panel.**

- xi. **Fire Shot No. 5:** Reposition the backing material fixture with the armour panel in position so that the shot will impact the panel at location five. Fire the test round. Do not change the position of the armour panel on the backing material, but adjust the panel and mounting straps as necessary to restore its original condition. **Do not remove any trapped bullets from the panel.**
- xii. **Fire Shot No. 6:** Reposition the backing material fixture with the armour panel in position so that the defined angle of incidence between the perpendicular to the armour and the line of flight of the test round is 0 degree and the bullet will impact the armour at location six. Fire the test round. **Remove and thoroughly examine the armour panel and backing material for complete penetrations by bullets or fragments.**
- xiii. **Post Test Drop Calibration:** Perform five drop tests on the backing material in the general areas of figure 1. Post test drop locations shall be at least 51 mm away from any other drop impact. Record all measurements on the CTR and determine compliance with drop calibration criteria. If the backing material meets post test drop specifications, repair the backing material and repeat the pre-test drop calibration. If the repaired backing material fixture passes the pre-test calibration, it may be reused for the second panel firing sequence, subject to passing another post test drop upon conclusion of the firings.
- xiv. **Test Front Panel:** Mount the front panel of the armour sample to a pre-test drop calibrated backing material fixture, and repeat the test sequence above using the same ammunition. Record all results on the CTR.
- xv. **Record Results:** Record the results of all testing in the CTR (appendix-B₂).

H. P-BFS Test for Groin Pad

Groin pad shall be impacted with three fair hits evenly spaced not less than 51 mm apart, and not less than 51mm from an edge, at 0 degree obliquity. The BFS due to the first fair hit shall be measured to determine compliance. **Any fair hit bullet that penetrates the groin pad, the complete jacket shall be rejected.**

I. Firing Sequence for Level III Armour

I₁. Requirements

- (a) Two complete BPJ sample or two each- front and back SAP and four HAP.
- (b) Front panel with plate and back with plate will be put to dry and wet tests respectively.
- (c) Six fair hit impacts against each of front and back SAP and HAP combine.

I₂. Acceptance Criteria for Penetration and BFS Compliance

- (a) No perforation either by the bullet or any fragment of the bullet through the armour (SAP and HAP combine).
- (b) No measured BFS depression depth greater than 25 mm.

I₃. Test Range Configuration

- (a) Position the front face of the backing material 10m±25 mm from the muzzle of the test barrel.
- (b) Fire a sufficient number of pre-test rounds (minimum of three) to ensure that the ammunition will strike the armour with a velocity within the specified velocity range.
- (c) Ensure for proper placement of the test bullet.

I4. Sample Preparation, Mounting, and Firing

- i. For armour that utilizes a rigid plate or plates such that the armour panel does not make full contact with the backing material surface, the backing material will be built up in a manner that conforms to the armour panel's shape. This build up will require use of additional clay backing material conditioned in the same manner as the backing material fixture.
- ii. Mark the front armour panel, plate for six impacts, evenly spaced on the panel according to the spacing criteria of a minimum of 51 mm from any edge to armour and 51 mm from any previous impact. Start with Wet conditioned back armour panel and plate.
- iii. Place the exposed surface of the conditioned and drop test caliBPated backing material in intimate contact with the back face of the armour panel, plate and secure it with two vertical and three horizontal elastic straps, 51 mm wide with Velcro closures.
- iv. The straps shall be positioned to leave the strike face impact areas exposed while not permitting the armour to shift on the backing material when impacted.
- v. Firing Sequence: Conduct all six of the firings in accordance with the sequence specified in figure 3 below. All shots for Type III armour samples will be at zero degree obliquity.
- vi. Front Panel Testing: Repeat the above tests on dry front ballistic panel and plate combine.
- vii. Record Test Results: Record the result of all testing in the CTR (appendix-B₂).



Figure-3 (Example only)

viii. Measurement of Back Face Signature (BFS):-

- (a) Measure the BFS of all shots.
- (b) The highest value of Back Face Signature (BSF) will be recorded on Compliance Test Report (CTR) form.

J4. Sample Preparation, Mounting, and Firing

- i. For armour that utilizes a rigid plate or plates such that the armour panel does not make full contact with the backing material surface, the backing material will be built up in a manner that conforms to the armour panel's shape. This build up will require use of additional clay backing material conditioned in the same manner as the backing material fixture.
- ii. Mark centrally the plate for an impact according to the spacing criteria of a minimum of 51 mm from any edge of armour. Start with wet conditioned and followed by dry.
- iii. Place the exposed surface of the conditioned and drop test calibrated backing material in intimate contact with the back face of the armour panel, plate and secure it with two vertical and three horizontal elastic straps, 51 mm wide with Velcro closures.
- iv. The straps shall be positioned to leave the strike face impact areas exposed while not permitting the armour to shift on the backing material when impacted.

- v. Firing Sequence: Conduct a test shot centrally on HAP with zero degree obliquity.
- vi. Front Panel Testing: Repeat the above tests on dry front SAP and HAP combine.
- vii. Record Test Results: Record the result of all testing in the CTR (appendix-B₂).

K. Fair Hit:

A bullet that impacts the armour sample or panel at an angle of incidence no greater than $\pm 5^\circ$ from the intended angle of incidence, no closer to the edge of the ballistic panel than 51 mm and no closer to a prior hit than 51 mm at an impact velocity within ± 15 m/s of the required reference test velocity.

A bullet that impacts the sample of panel at an angle of incidence no greater than $\pm 5^\circ$ from the intended angle of incidence, no closer to the edge of the ballistic panel than 51 mm and no closer to a prior hit than 51 mm at an impact velocity less than 15 m/s below the required reference test velocity which produces a penetration or an excessive back face signature.

A bullet that impacts the armour sample or panel at an angle of incidence no greater than $\pm 5^\circ$ from the intended, no closer to the edge of the ballistic panel than 51 mm and no closer to a prior hit than 51 mm at an impact velocity more than 15 m/s above the required test velocity which does not produce a penetration or an excessive back face signature.

Note: Selected weapon and lot of ammunition for which reference velocity has been once established, will be deemed standardised throughout the ballistic testing for all the subsequent tests of all tenderers.

L. Post test: - each armour samples ballistic components (e.g., front and back panels) will be physically inspected immediately after testing and their respective configuration reported for layer, weave, stitching, material, etc.

(a) Label Examination:

The complete armour sample and each part (carrier and ballistic panels) will be examined for conformance to the labelling requirements of specifications. Note any deviations from requirements will be recorded in the CTR form.

(b) Inspection Deficiency Notifications

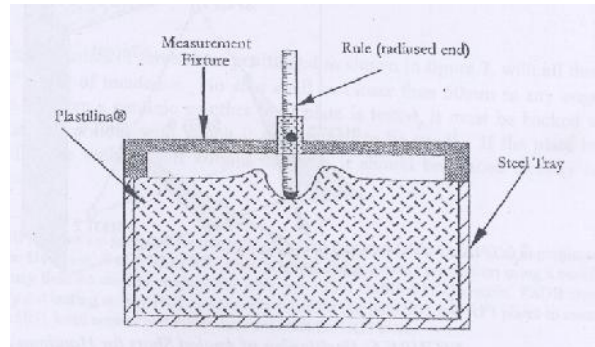
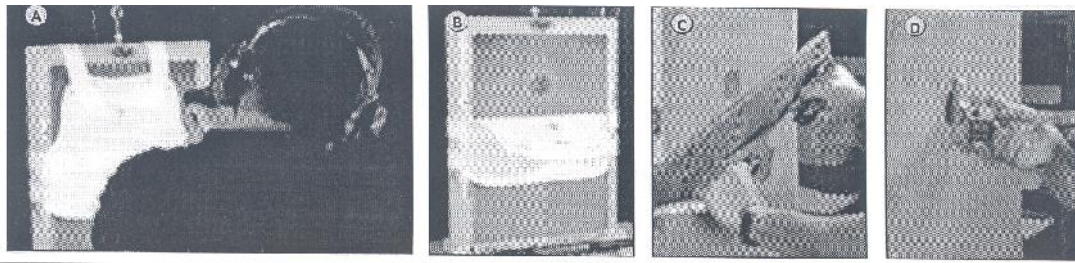
The MHA/Competent Authority will be informed within two (2) working days of discovery of any shipping damage, major product flaws, or poor quality workmanship, or label inconsistency. Such discoveries and notice will result in suspension of the compliance test until approval of MHA/ Competent Authority is received by the testing Committee to further proceed with the tests/ evaluation.

M. Sampling:

Out of five tender samples, one will be used for physical dimension measurement and from remaining four samples; for every ballistic test one will be selected randomly.

N. Ballistic Penetration and Back face Signature Test (P-BFS):

- i. All armour samples submitted to compliance testing will undergo a series of ballistic impact tests using the ammunition specified in specifications. Depth of back face signature will be measured by using callipers after removing the deformation in the clay with the help of metal scrappers. A measurement of 25 mm or less is a passing test.
- ii. Average of two reading by placing measuring instrument putting horizontally across the back face material will be recorded in CTR.



O. Velocity Measurement Equipment (Example only)

Test round velocities will be determined using a velocity measurement equipment.

P. Wet Conditioning

Body armour undergoing P-BFS performance testing will be tested in a wet condition. Dipping armour panel under test for thirty minutes in a large vessel where vertical column of water is minimum 15 centimetres will produce this condition.

Q. Test Duration

After wet conditioning the first shot must be fired within ten minute and entire shots fired within 30 minutes. Test start and stop times will be recorded in the CTR form.

R. Backing Material Fixture Preparation

a) Backing Material Fixtures

A minimum of three backing material fixtures filled with appropriate backing material is required. The inside dimensions of the backing material fixture shall be 610 mm x 610 mm x 140 mm \pm 2 mm deep. The tolerance on all dimensions will be \pm 2 mm.

b) Surface Preparation

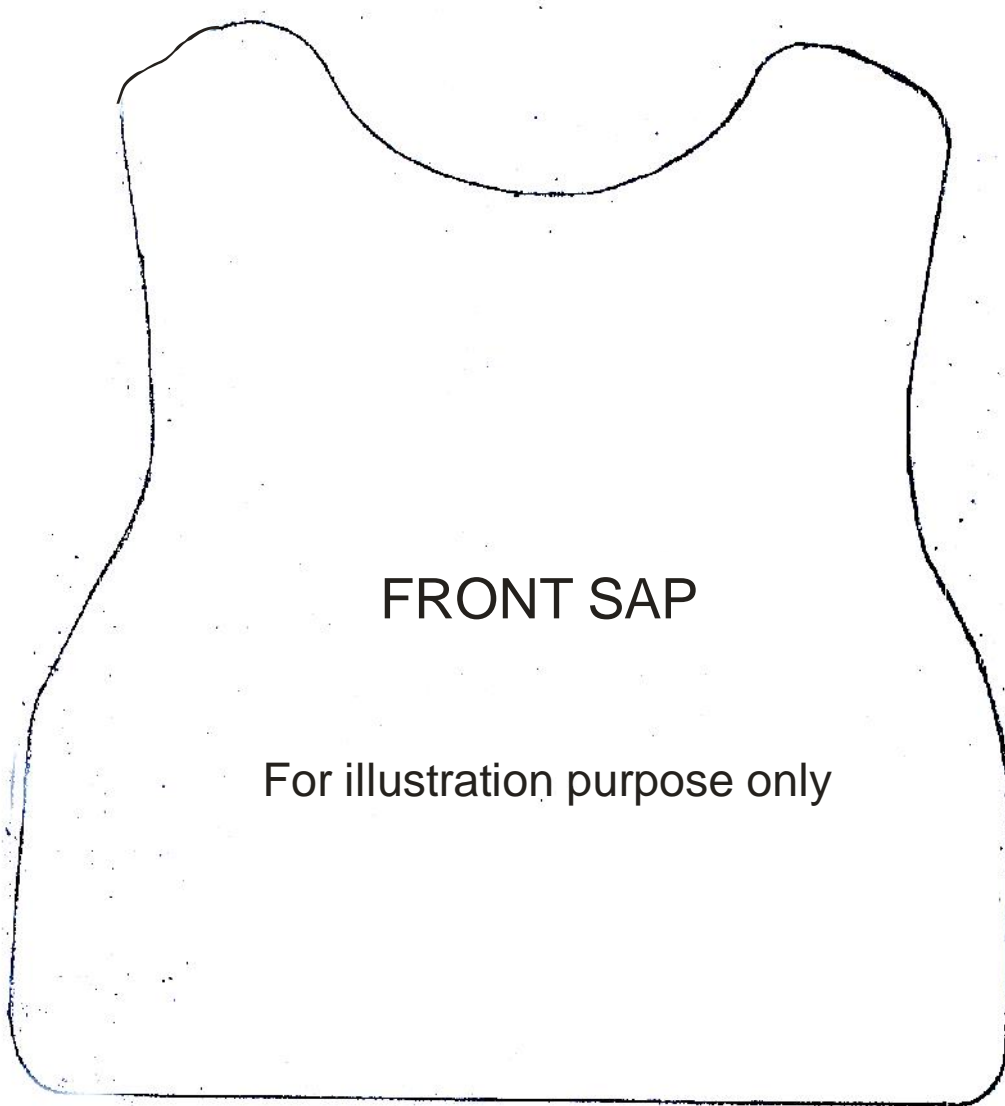
The clay in each BMF will be manipulated to produce a block free of voids, and with a smooth, flat front surface for the accurate and consistent measurement of depression depths. The front surface of the backing material shall be even with the surface plane defined by the fixture edges. Additional clay, conditioned along with each BMF, shall be used to fill voids and restore the front surface as needed.

c) Backing Material Conditioning

The clay of backing material shall be initially conditioned at a temperature of 30 ± 2.9 degree centigrade. The actual conditioning temperature and recovery time between uses will be determined by drop test results. The failure to meet drop test result will require reconditioning of back face material.

d) **Backing Material Fixture Rotation:**

In case back face material is not giving prescribed drop test result, then it should be replaced with newly conditioned material. All drop test calibration results will be recorded in the CTR. It is recommended that a minimum of two fixtures be rotated between the test and conditioning cycles to ensure fulfilment of these requirements.



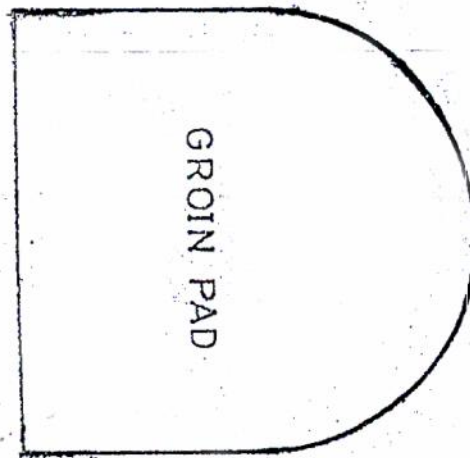
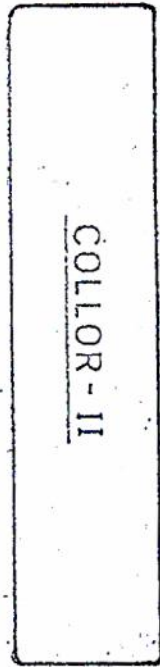
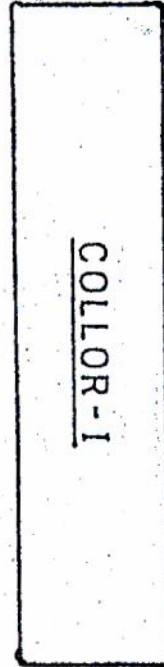
Scale 1:2.77



REAR SAP

For Illustration Purpose Only

Scale 1:3.40



Scale 1:4
For Illustration Purpose Only



L. S. K. 16.11.12
Sub Divisional Police Officer
Police Head Quarter
Daman