Service Employment:

Bullet Proof Pakas (LWBPP) has been in use as an individual protection gear with Armed Forces. It offers protection around the forehead and sides of the head from fragmentation munitions, low velocity bullets, shrapnel and debris from IEDs and mines laid on the ground. There is a requirement to procure Light Weight Bullet Proof Patkas to facilitate Safety to the most vital portion of a Jawan i.e head.

General Characteristics:-

1. Bullet Proof Patkas should be convenient and comfortable to wear/handle.
2. It should not impede the movement of the wearer in carrying out his functions.
3. It should not have any ill effect on the head of a soldier.
4. The material encasing the steel protection should be breathable.

Physical Characteristics:-

5. Should be in four parts viz (fourth part ie, skull protection is optional)
   a) Steel band to be covered with heatlon.
   b) Suitable disruptive cover with strapping harness, having suitable arrangement for circulation.
   c) High density foam trauma pad, with water resistant cover.
   d) Top plating of Kevlar or other suitable B.R. Material (Ballistic resistance) affording protection from injuries to skull portion. Conical/spherical metallic cover at the top to cater for bullet/splinter/ricochets/air bursts/small arms fire from heights (The protection for skull is optional and user may decide to keep it or otherwise).
6. Suitable Trauma pad to absorb shock.
7. The steel band should cover the entire circumference of the head above the eyes and ears.
8. Should have balance strapping/adjustable system using Velcro or better fastener.

9. The harness of Patka should not be affected by moisture/rain. It should meet the requirement as mentioned in Trial Directive.

**Requirement of Outer Carrier Fabric**

<table>
<thead>
<tr>
<th>SI No</th>
<th>Test Parameter</th>
<th>Requirement</th>
<th>Method of Test, Ref to</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>i)</td>
<td>Mass, g/m²Max</td>
<td>160</td>
<td>IS 7016 (Part-I)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IS 7016 (Part-II)</td>
</tr>
<tr>
<td>ii)</td>
<td>Tensile strength N,Min</td>
<td>1150</td>
<td>IS-7016 (Part3), Method A2, Trouser shaped test piece, single tear method.</td>
</tr>
<tr>
<td></td>
<td>(a) Warp wise</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) Wrap wise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii)</td>
<td>Tear strength ,N,Min:</td>
<td>160</td>
<td>IS 7016 9Part 7</td>
</tr>
<tr>
<td></td>
<td>(a) Warp wise</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) Wrap wise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv)</td>
<td>Flame resistance test:</td>
<td>5</td>
<td>IS 11871, Method A</td>
</tr>
<tr>
<td></td>
<td>(a) Duration of flame (After flame time), s, Max</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) Duration of afterglow, s, Max</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>(v)</td>
<td>Resistance to water penetration at hydrostatic pressure head of 30 cm water column height for 30 minutes</td>
<td>There shall be no water penetration</td>
<td>IS 7016 9Part 7</td>
</tr>
<tr>
<td>vi)</td>
<td>Colour fastness rating to light (Change in colour on blue wool), Min</td>
<td>4</td>
<td>IS 2454</td>
</tr>
</tbody>
</table>

10. firm Hologram should be there with date of manufacture on the steel band.

**Operational Characteristic**:

11. Steel ring should have anti rust & moisture proof coatings.

12. It should provide protection against direct hits/splinters.

13. It should be able to provide following protection levels:

(a) AK 47 (7.62x39 mm, HSC)- From 10 meters (Forehead only)
(b) 9 mm x 19 mm parabellum - From 05 meters (remaining area)

(7.62x39 mm, HSC Ordnance Factory bullet fired through A.K. Series rifles to achieve a muzzle velocity of \(700 \pm 15\) ms and weight of the bullet 8.05 gm) (9 mm x 19 mm Ordnance factory bullet fired through Pistol Carbine to achieve a muzzle velocity of \(430 \pm 15\) m/s and weight of the bullet 7.4 to 8.05 gm).

**Physical Parameters:**

i) Weight with skull protection 1.5 kg ± 10%

ii) Weight without skull protection 1.4 kg ± 10%

**Outer Circumference**

(A) 680 mm ± 10 mm (Small)

(B) 700 mm ± 10 mm (Medium)

(C) 420 mm ± 10 mm (Large)

1. Width of Steel 76.2 mm ± 4 mm
2. Thickness X Length

(A) Front Portion - 4.8 mm ± 02 mm x 225mm ± 5 mm

(B) Rear Portion -

Small - 204 mm ± 0.1 mm x 460 mm ± 5 mm

Medium - 2.4 mm ± 0.1 mm x 480 mm ± mm

Large - 2.4 mm ± 0.1 mm x 500 mm ± 5 mm

Areal density 0.00785 g/cubic mm

**Miscellaneous:**

14. The Patka should also incorporate the following:

(a) Suitable Cup shaped, synthetic/any comfortable material chin strap to be provided for secure fastening instead of Velcro strap.

(b) Additional padding for the scalp portions and proper fitting.

(c) All strap joints should have box stitching.

15. Warranty upto 10 years for steeling and 3 years for Harness and trauma pad.

16. The testing of the B.P. Patka shall be carried out at TBRL, CFSL & GFSU or any other laboratory mandated to carry out such tests by Govt. of India.

17. The firm shall provided 06 samples (02 samples in each size ie, small, medium & Large)
18. The Measurements, and physical and visual inspection shall be carried out by the BOOs comprising of members from all the CAPFs.

19. The ballistic trial shall be carried out on a sample patka at TBRL, CFSL & GFSU or any other laboratory mandated to carry out such tests by Govt. of India.
## APPENDIX-“B”

### DRAFTS TRIAL DIRECTIVES OF BULLET PROOF PATKA

<table>
<thead>
<tr>
<th>Sl No</th>
<th>QRs for Light Weight Bullet Proof Patka</th>
<th>Trial procedure to be adopted by STEC during trial evaluation cum physical demonstration of B.P. Patka</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Service Employment</strong> : Bullet Proof Patkas (LWBPP) has been use as an individual protection gear with Armed Forces, It offers protection around the forehead and sides of the head from fragmentation munitions, low velocity bullets, shrapnel and debris from IEDs and mines laid on the ground. There is a requirement to procure Light Weight Bullet Proof Patkas to facilitate safety to the most vital portion of a Jawan ie, head</td>
<td>Certificate to this effect should be provided by the manufactures from any Govt. agency/lab</td>
</tr>
</tbody>
</table>
| 2.    | **General characteristics** :-  
  a) Bullet Proof Patkas should be convenient and comfortable to wear/handle  
  b) It should not impede the movement of the wearer in carrying out his functions.  
  c) It should not have any ill effect on the head of a soldier.  
  d) The material encasing the steel protection should be breathable. | (a) to (c) Jawans should be made to wear the B.P. pataka for 1 to 2 hours with their weapons, rears & other equipment. Whether the Patka is causing any ill effect or not, shall be ensured by the feedback from the Jawan during the fitment trial & same should be recorded by a doctor/physician. The Patka should not cause inconvenience to him.  
  d) To be checked by the board of officers. |
| 3.    | Physical Characteristics :-  
  Should be in four parts viz : (fourth part ie, skull protection is optional)  
  a) the rubberized steel band/Heatlon. | (a) Firm to produce OEM certificate. |
<p>| | |</p>
<table>
<thead>
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<th></th>
</tr>
</thead>
</table>
| b) | Suitable disruptive cover with strapping harness, having suitable arrangement for air circulation.  
   c) | High Density foam trauma plat, with water resistant cover.  
   d) | Top plating of Kevlar or other suitable B.R. material (Ballistic resistance) affording protection from injuries to skull portion.  
   Conical/spherical metallic cover at the top to cater for bullet/splinter/ricochets/air bursts/small arms fire from heights (The protection for skull is optional and user may decide to keep it or otherwise)  
To be checked by the board of officers. |
| 4. | Suitable Trauma pad to absorb shock  
To be physically checked by the board of officers by making soldiers wear it. |
| 5. | The steel band should cover the entire circumference of the head above the eyes and ears.  
To be physically checked by the board of officers |
| 6. | Should have balance strapping/adjustable system using Velcro or better fastener.  
To be physically checked by the board of officers |
7. The harness of Patka as should be fabricated of fade resistant, disruptive and heavy duty fabric not affected by moisture/rain

<table>
<thead>
<tr>
<th>SI No</th>
<th>Test Parameter</th>
<th>Requirement</th>
<th>Method of Test, Ref to</th>
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<td>IS 7016 (Part-1) IS 7016 (Part-2)</td>
</tr>
<tr>
<td>i)</td>
<td>Tensile strength N,Min: (a) Warp wise (b) Wrap wise</td>
<td>1150 900</td>
<td></td>
</tr>
<tr>
<td>ii)</td>
<td>Tear strength N,Min: (a) Warp wise (b) Wrap wise</td>
<td>160 140</td>
<td>IS-7016 (Part3),Method A2,Trouser shaped test piece, single tear method.</td>
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<td>iii)</td>
<td>Flame resistance test: (a) Duration of flame (After flame time),s, Max (b) Duration of afterglow, s, Max</td>
<td>5 5</td>
<td>IS 11871,Method A</td>
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<td>Resistance to water penetration at hydrostatic pressure head of 30 cm water column height for 30 minutes</td>
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<td>Colour fastness rating to light (Change in colour on blue wool), Min</td>
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<td>IS 2454</td>
</tr>
</tbody>
</table>

Firm to provide sample of harness for trial at any Govt Lab.
8. Firm Hologram should be there with date of manufacture on the steel band.

To be checked by Board of Officers.

9. **Operational Characteristics:**
   i) Steel ring should have anti rust & moisture proof coatings.
   ii) It should provide protection against direct hits/splinters.
   iii) It should be able to provide following protection levels:
      a) AK-47 (7.62x39 mm/HSC-From 10 meters (Forehead only)
      b) 9mm x19 mm parabellum- From 5 mtrs (remaining area)

   \[(7.62x39 \text{ mm}, \text{HSC Ordnance Factory bullet fired through A.K. Series rifles to achieve a muzzle velocity of } 700 \pm 15 \text{ ms and weight of the bullet } 8.05 \text{ gm}) \]
   \[(9 \text{ mmx19 mm Ordnance factory bullet fired through Pistol Carbine to achieve a muzzle velocity of } 430 \pm 15 \text{ m/s and weight of the bullet } 7.4 \text{ to } 8.05 \text{ gm}.\]

   i) Certificate to be provided by the firm from any Govt agency/lab should able to meet salt fog test-2Cycles) (1 Cycle = 24 hours ).Salt spray (Fog) &24 hours drying ) test as per MIL- STD-810 gm method-509.5
   ii) to iii)
   To be checked at TBRL,CFSL & GFSU as per instructions issued by MHA vide letter No. IV-24011/43/2010-Prov-I dated 03/11/2010.
   The distance was decided on the basis of threat perception of such ammunition in field conditions.

10 **Physical Parameters :-**
   i) Weight with skull protection 1.5 ±10%
   ii) Weight without skull protection 1.4 Kg ±10%
   Outer Circumference
   a) 680 mm±10 mm (Small)
   b) 700 mm± 10mm (Medium)
   c) 720 mm ± 10mm (Large)
   Width of steel 76.2 mm ± 4 mm
   Thickness X Length/Weight
   a) Front portion – 4.8 mm ± 02mmx225 mm ± mm.
   b) Rear Portion :
   Small 2.4mm

To be measured by the board of officers
<table>
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<tr>
<th></th>
<th><strong>Miscellaneous</strong>&lt;br&gt;The Patka should also incorporate the following:&lt;br&gt;a) suitable Cup shaped, synthetic/any comfortable material chin strap to be provided for secure fastening instead of Velcro strap.&lt;br&gt;b) Additional padding for the scalp portions and proper fitting.&lt;br&gt;c) All strap joints should have box stitching.</th>
<th>To be physically checked by the board of officers</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>warranty upto 10 years for steeling and 3 years for Harness and trauma pad.</td>
<td>An undertaking from the OEM should be provided.</td>
</tr>
<tr>
<td>12</td>
<td>The testing of the B.P. Patka shall be carried out at TBRL, CFSL &amp; GFSU or any other laboratory mandated to carry out such tests by Govt of India. Further it should be declared to be failed under following conditions.&lt;br&gt;a) Bulge at the back with radial cracks permitting kerosene oil applied at the point of impact to penetrate to the back of the plate.&lt;br&gt;b) Bulge with tear along the circumference seen at the back of the armor plate.&lt;br&gt;c) Development of cracks in the armour plate permitting kerosene</td>
<td>03 (Three single shots of each ammunition will be fixed from a distance of 15m (for 7.62x39mm) and 05 m (for 9.19mm) and inter shot distance should not be less than 20 mm. There should not be any penetration in the panel(s). To be checked by TBRL, CFSL &amp; GFSU as per instructions issued by MHA vide letter No. IV-24011/43/2010-Prov-I dated 03/11/2010.</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
14. The firm shall provide 06 samples (02 samples in each size i.e., small, medium & Large) To be physically checked by the board of officers.

15. The measurements, and physical and visual inspection shall be carried out by the BOOs comprising of members from all the CAPFs Trial procedure to be adopted by STEC during trial evaluation cum physical demonstration of BP. Patka.

16. The ballistic trial shall be carried out on a sample Patka at TBRL, CFSL & GFSU or any other laboratory mandated to carry out such tests by Govt. of India. Will be checked as per QRs Sl No. 9

17. The firm shall provide 06 Nos samples (02 samples in each size i.e., small, medium & large) Samples shall be checked physically in accordance with physical parameters mentioned above sl. No.10 above.

18. The measurements and physical and visual inspection shall be carried out by the BOOs comprising of members from all the CAPFs.

19. The ballistic trial shall be carried out on a sample Patka at TBRL, CFSL & GFSU or any other laboratory mandated to carry out such tests by Govt. of India. The ballistic trial shall be carried out considering operational characteristics mentioned above sl Sl. No. 09