मुख्यालय राष्ट्रीय सुरक्षा गारद
(संभरण शाखा : ऑर्डनेंस अनुभाग)

बुलेट रेसिस्टेंट जैकेट- लेवल-6 (Bullet Resistant Jacket-Level-6) के गुणात्मक आवश्यकता (क्यू0आर0) और परीक्षण निर्देशों (टी0डी0) के मसौदे को विक्रेताओं की टिप्पणियों/सुझावों को आमंत्रित करने के लिए गृह मंत्रालय की वेबसाइट पर डालना

1. कृपया गृह मंत्रालय, पीएम डिविजन के पत्र सं. IV-24011/12/2011-Prov.I दिनांक 05 अक्तूबर 2016, पत्र सं. IV-24011/12/2011-Prov.I दिनांक 13 जून, 2012 और पत्र सं. 11012/02/2009-Fin-I/Prov-I-17 दिनांक 02 जनवरी, 2018 का संदर्भ लें।

2. बुलेट रेसिस्टेंट जैकेट- लेवल-6 (Bullet Resistant Jacket- Level-6) के गुणात्मक आवश्यकता (क्यू0आर0) और परीक्षण निर्देशों (टी0डी0) में संशोधन के लिए तकनीकी विशेषज्ञों के उप समूह की बैठक मुख्यालय राष्ट्रीय सुरक्षा गारद में दिनांक 22 दिसम्बर 2025 को 1500 बजे आयोजित हुई।

3. बैठक के दौरान उप समूह ने कहा कि विक्रेताओं की टिप्पणियों/सुझावों को आमंत्रित करने के लिए बुलेट रेसिस्टेंट जैकेट- लेवल-6 (Bullet Resistant Jacket- Level-6) के गुणात्मक आवश्यकता (क्यू0आर0) और परीक्षण निर्देशों (टी0डी0) क़े मसौदे को 15 दिनों के लिए राष्ट्रीय सुरक्षा गारद के साथ-साथ गृह मंत्रालय की वेबसाइट पर डाला जाए।

4. पी0एम0 डिवीजन के उपर्युक्त संदर्भित पत्रों के अनुसार बुलेट रेसिस्टेंट जैकेट- लेवल-6 (Bullet Resistant Jacket- Level-6) के गुणात्मक आवश्यकता (क्यू०आर०) और परीक्षण निर्देशों (टी०डी०) का मसौदा संलग्न परिशिष्ट के अनुसार विक्रेताओं की टिप्पणियों/सुझावों को आमंत्रित करने के लिए गृह मंत्रालय की वेबसाइट पर डालने हेतु प्रिटेंड कॉपी तथा सॉफ्ट कॉपी में भेजा जा रहा है।

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संख्या: पी/604/25/389/BRJ-6/ संभरण (ऑर्डनेंस)/ एनएसजी/240 दिनांक : 13 जनवरी 2026

बुलेट रेसिस्टेंट जैकेट- लेवल-6 (Bullet Resistant Jacket-Level-6) गुणात्मक आवश्यकता (क्यूआर)/परीक्षण निर्देशों (टीडी) के मसौदे पर विक्रेताओं की टिप्पणियों का आमंत्रण

1. आपको सूचित किया जाता है कि बुलेट रेसिस्टेंट जैकेट- लेवल-6 के गुणात्मक आवश्यकता (क्यू०आर०) और परीक्षण निर्देशों (टी०डी०) के मसौदे पर फर्मों/विक्रेताओं की टिप्पणियां आमंत्रित है। सभी फर्मों से निवेदन है कि नीचे दिए गए प्रारूप में वे अपनी टिप्पणियां भरकर **OEM Certificate** सहित ई-मेल पता **scord@nsg.gov.in** या **gcproc@nsg.gov.in** पर भेजें।

गुणात्मक आवश्यकता (क्यू०आर०)	परीक्षण निर्देश (टी०डी०)	फर्म द्वारा टिप्पणियां

2. आपसे अनुरोध है कि वेबसाइट पर प्रदर्शित होने की तारीख से 15 दिनों के भीतर अपनी टिप्पणियां भेजें । उप समूह कमेटी की बैठक में उपर्युक्त उपकरण/हथियार के गुणात्मक आवश्यकताओं/परीक्षण निर्देशों को अंतिम रूप देने पर विचार किया जा रहा है।

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दिनांक : 13 जनवरी 2026

DRAFT QRs AND TDS OF BULLET RESISTANT JACKET-LEVEL-6: 22 DEC 2025

Sl.No	Parameters	Specification/QRs	Trial Directives (TDs)
1.	General	Bullet Resistant Jacket level-6 consists of mainly three parts (a) Outer Tactical Vest (OTV) (b) Soft Armour Pannels (SAPs) (c) Hard Armour Pannels (HAPs)	The BRJs should meet the requirement of BIS 17051:2018 in sizes and configuration mentioned in this document. The Broad technical requirements of BRJs for small, medium and large sizes.
2.	Ballistic Protection	The basic Bullet Resistant Jacket should meet BIS 17051:2018 and should defeat following ammunition: (a) 7.62 x 54 mm R API rounds fired from sniper (Level 6 of 17051) (b) 7.62 x 51 mm (Level 3 of BIS 17051) (c) 7.62 x 39 mm Mild Steel Core (MSC) rounds (Level 2 of 17051) (d) 9 x 19 mm rounds (Level 1 of 17051)	As per Trial Directive compliance to BIS 17051:2018 (**Attached as annexure-A)**
3.	Construction	The Bullet Resistant Jacket level-6 should provide 360 degree all round upper torso body protection. The system should be flexible and allow complete freedom of movement without compromising the ability to acquire and neutralize threats from any firing position. The BR Jacket should provide the protection to vital part of body (chest, back, throat and abdomen) and modular in design. The jacket should have waist adjustment cord to tighten-loosen the jacket. The jacket should have MOLLE webbing around the front and sides. The BR Jacket should be equipped with self suspending Ballistic system to keep ballistic panels in place, prevent sagging and/or bunching that can expose vulnerable areas.	To be physically checked by Board of Officers.

<table>
<tr><th>Sl.No</th><th>Parameters</th><th>Specification/QRs</th><th>Trial Directives (TDs)</th></tr>
<tr><td>4.</td><td>Mobility</td><td>The jacket shall be designed to offer comfort and ease of movement to the wearer during combat or tactical operations.

(a) The size of each BR Jacket shall be designated by chest or bust girth as control dimensions, in cm. The currently applicable chest girth ranges for different size designations shall be as given below. If required by the user, any other size of BR Jackets may also be supplied.

<table>
<tr><th>S No</th><th>Size Designations</th><th>Symbol</th><th>Chest Girth Cm</th></tr>
<tr><td>(i)</td><td>Extra Small</td><td>XS</td><td>72-80</td></tr>
<tr><td>(ii)</td><td>Small</td><td>S</td><td>Above 80-88</td></tr>
<tr><td>(iii)</td><td>Medium</td><td>M</td><td>Above 88-96</td></tr>
<tr><td>(iv)</td><td>Large</td><td>L</td><td>Above 96-104</td></tr>
<tr><td>(v)</td><td>Extra Large</td><td>XL</td><td>Above 104-112</td></tr>
</table>
(b) It should not hinder basic movements such as crouching, aiming, running, crawling, climbing or any other movement as per operational requirement.

(c) It shall be compatible with standard equipment including helmets, communication gear and weapons harnesses.</td><td>The mobility trial will contain the following:-
(i) Walk forward (300-400m)
(ii) Sprint forward (100m)
(iii) Prone position → crawl forward 20m and backward 20m.
(iv) Move to different firing positions like kneel position, Lying position, Standing position, transition from standing → kneeling → lying → standing
(v) React to fire and change positions (agility test)
(vi) Observe comfort while lying on uneven ground with HAP in groin & throat.
(vii) Return to start position

The Jacket should not get torn during above mobility trials.</td></tr>
</table>

No	Parameters	Specification/QRs	Trial Directives (TDs)
5.	Quick Release System	Ensure Doffing of the BRJ by single pull action within five seconds. Should be operable by third person to enable assistance as necessary. BRJ must remain in one piece to enable reassembling for donning the jacket within 30 seconds. It should be integral to the Outer Tactical Vest (OTV).	To assess the rapid donning/doffing performance of QR system across all sizes. **Procedure:** (a) Jacket to be donned & doffed by Industry Representative(unaided) (b) Each participant repeats the process thrice. **Time Limits:** **Donning:** ≤ 30 seconds **Doffing:** ≤ 5 seconds **Compliance (To be concurred/endorsed by user):** •Must work in night conditions / no light by trained user. •Must work with both hands smoothly. •Must be operable by another person in case the user is not mobile.
6.	Wearer Comfort: Provision for Weight Distribution should be provided	The Weight distribution mechanism shall be based on external, flexible spine and hip belt that shall allow the user to change the ratio of weight load from hips to shoulders while on the move and without removing the BR Jacket.	To be Physically checked by Board of Officers (BOO).
7.	Flexible Harness Attachment System (FHAH)	The BRJ should have Flexible Harness Attachment System (FHAH) that facilitates attachment of various pouches. Multipurpose side wings to secure the vest around the waist to provide adjustment and allow quick break away, Offers load attaching point's for the sides of the vest and to hold the side plate pouches which should be adjustable both vertically and horizontally.	To be Physically checked by Board of Officers (BOO).
8.	Field Upgradable Addons	The BRJ should have the provision to attach / detach protection armour at the throat and groin area and these should not hinder normal movement.	To be Physically checked by Board of Officers (BOO).

Sl.No	Parameters	Specification/QRs	Trial Directives (TDs)
9.	Outer Carrier Fabric/Material	(a) Type : Minimum 250 GSM (b) Material : Nylon (c) Colour fastness to light: 4 or better (ISO 105-B02 or later) (d) Colour fastness to washing, change in shade, staining of cloth : 4 or better (ISO 105-C10 or later) (e) Water repellent: 80 min(IS0 3, std ISO 4920) (f) Tear Strength: 245 N in warp and 245 N in weft as per IS 7016:2023 Method A1 or later. (g) Breaking/Tensile Strength : 2200 N(Warp) and 1600 N (Weft) (h) Flame Resistance : <5 seconds after glow (IS 11871:1986, RA 2018 or later) (j) Creep Resistance (Anti Sagging): <3% (Test methodology as per **ANNEXURE - F).**	The fabric sample for testing during tender and PDI will be provided by the firm along with test certificate from any govt/ NABL accredited lab.
10.	Areal Density, Weight and Threat Level	The technical specification of developed BRJ are as follows (for small, Medium and Large sizes) (a) Hard Armour Panels (HAPs): A. Front Hard Armour Panel for protection against 7.62x54R API (Level 6 of BIS 17051 - 2018) **[ANNEXURE - B]** (b) Other HAPs (Excluding Front HAP): Level 2 & Level 3 protection as per BIS 17051: 2018 **[ANNEXURE - C]** (User may specify higher level of protection as per attached annexure, if required.) (c) Soft Armour Panels (SAPs): For Level 1 protection of BIS 170512018 **[ANNEXURE - D] (Optional)**	To be Physically checked by Board of Officers (BOO). Areal density of HAP to be measured using 3D scanning in presence of BOO.

Sl.No	Parameters	Specification/QRs	Trial Directives (TDs)
11.	BR Jacket - Construction	It should be in the form of jacket to provide protection as per BIS 17051-2018. It should not restrict overall movement of the wearer. Adjustable at the shoulders, waist and groin with appropriate fasteners and nylon belt of minimum 10cm width should be provided. The industry/firm has to declare the type of materials, number of layers and their areal density in the technical bid of tender and the BRJ supplied later on should conform to same standards/values of weight and areal density. SAP should be encased in coated sealing materials so as to make it water resistant.	To be Physically checked by Board of Officers (BOO).
12.	Fasteners	All the clothing flaps of the jackets should have high quality fasteners, so that it can be worn and taken off easily/quickly. The quality and report of fasteners including shears strength and peel strength should be as per Bureau of Indian Standards specification BIS 17051-2018 or later. Fastners should not be metallic.	(a) To be Physically checked by Board of Officers (BOO). (b) The fasteners will be tested at NABL accredited lab.
13.	Pocket with Flaps	Two pouches for carriage of minimum four SIG-716/AK-203/ INSAS/Rifle magazines in any combination, two pouches for one hand grenade each and one pouch for hand held Radio Set. Must be attachable on the MOLLE layer of OTV without hindrance in weapon usage. Flaps be provided with hook and loop fasteners. (To be **Customized as per user requirements)**	To be Physically checked by Board of Officers (BOO).
14.	Belt /Kamarbandh	An additional belt of nylon with minimum width of 10 cm should be provided around the waist to properly secure the BR jackets with the body of the wearer around waist, so that weight of jacket is distributed on waist/shoulders. Kamar bandh should be of same material as outer carrier with fasteners.	To be Physically checked by Board of Officers (BOO).
15.	Vest Fit	(a) The overall length of the BR jacket shall be such that there is no "ride up" while sitting. (b) The overlapping degree of front and rear panels shall be such as to provide for maximum freedom of movement.	To be Physically checked by Board of Officers (BOO).

Sl. No	Parameters	Specification/QRs	Trial Directives (TDs)
16.	Colour: Black Oras (as per user requirement)	The bidders will submit samples of BR Jackets of Black colour/any other colour as per requirement of user. However, before placement of bulk supply order, exact colour along with modifications required, if any, in outer carrier will be intimated.	To be Physically checked by Board of Officers (BOO).
17.	Labelling	The outer carrier and the soft Armour panels must be labelled giving the following details: (a) Name of the Manufacturer: (b) Name of the Product: (c) Date of Manufacturing: (d) Date of Issue: (e) Threat levels: (f) Size: (g) Serial No: Strike face of jacket should be clearly marked.	To be Physically checked by Board of Officers (BOO).
18.	Soft Armour Panel (SAP)	(a) SAP shall be able to withstand BIS 17051-2018 threat level 1 of BIS 17051 or later. (b) The Areal density (Maximum 4.50 kg/m^2) of the panels shall be such as to provide the rated ballistic and trauma protection. (c) No tears, rips, worn spots, discolorations, loose or torn stitching. (d) The SAP shall be removable from outer carrier to allow for periodic cleaning. (e) The SAP shall be placed in tightly sealed, water repellent and PU coated heavy-duty fabric so as to make it completely water resistant. (As per 8.2 Fluid Exposure of BIS 17051:2018). Note: - Tenderers must declare number of layers and type of material (Areal density of material) used for fabricating Soft Armour Panel and Hard Armour Panel as per original manufacturer of the material clearly indicating source. Raw Material Assurance Certificate (RMAC) must be given from original manufacturer in respect of material for SAPs and HAPs, valid for a period of 12 months from the closing date of tender. The vender has to declare the numbers of layers used for fabricating SAPs and HAPs of tender samples and they have to maintain the same in bulk supplies.	OEM to provide graph paper and template of the SAP for the measurement of Area, weight and Areal Density.

Sl.No	Parameters	Specification/QRs	Trial Directives (TDs)
19.	Hard armour Plate (HAP)	Curvature of the HAPs should be suitable to fit the body contour and cover the sides and rib cage. HAPs shall be shielded with water repellent and coated fabric so as to make it water Resistant.	To be Physically checked by Board of Officers (BOO).
20.	Other Stipulations	(a) Shelf Life: 05 Years (SAPs and HAPs) [shall be assessed as per the procedure given in 8.4 of BIS 17051:2018 or later] (b) Temperature: -30° C to +50° C (operating temperature). (c) Storage : -20° C to +40° C Temperature	To be assessed / checked by Board of Officers (BOO) based on ballistic test, fabric test reports and NABL certificate given by the OEM/ firm for shelf life of BR Jacket.

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ANNEXURE- A

Ballistic Test Methodology:

1. Test Standard: BIS 17051:2018
2. Test Condition; Phase-I (Wet) and Phase-II (TMC) (along with post drop X-ray: Mechanical durability)S

HAP: Phase-1 (Wet)

Sl No.	Type	Configuration In-Conjunction With (ICW) (Hard Armour Panel + Soft Armour Panel)	Ammunition	Velocity (m/sec)	Condition	Nos of Shots	Maximum Permissible Back Face Signature (BFS) (mm)
1	Front HAP	ICW	7.62X54 mm R API (Level 6 of 17051)	830 ± 15	Wet	06	≤ 25
2	Back HAP	ICW	7.62X51 mm (Level 3 of 17051)	840 ± 15	Wet	08	≤ 25
			7.62X39 mm(MSC) (Level 2 of 17051)	710 ± 15	Wet	08	≤ 25
3	*Side HAPs	ICW	7.62X51 mm (Level 3 of 17051)	840 ± 15	Wet	03	≤ 25
			7.62X39 mm(MSC) (Level 2 of 17051)	710 ± 15	Wet	03	≤ 25
4	*Groin HAP	ICW	7.62X51 mm (Level 3 of 17051)	840 ± 15	Wet	03	≤ 25
			7.62X39 mm(MSC) (Level 2 of 17051)	710 ± 15	Wet	03	≤ 25
5	#Throat HAP	ICW	7.62X51 mm (Level 3 of 17051)	840 ± 15	Wet	01	≤ 25
			7.62X39 mm(MSC) (Level 2 of 17051)	710 ± 15	Wet	01	≤ 25

HAP: Phase- II (TMC): TMC Exposure of HAPs in controlled environment as per BIS 17051-2018:

Sl No.	Type	Configuration In-Conjunction With (ICW) (Hard Armour Panel + Soft Armour Panel)	Ammunition	Velocity (m/sec)	Condition	Nos of Shots	Maximum Permissible Back Face Signature (BFS) (mm)
1	Front HAP	ICW	7.62X54 mm R API (Level 6 of 17051)	830 ± 15	Wet	06	≤ 25
2	Back HAP	ICW	7.62X51 mm (Level 3 of 17051)	840 ± 15	Wet	08	≤ 25
			7.62X39 mm(MSC) (Level 2 of 17051)	710 ± 15	Wet	08	≤ 25
3	'Side HAPs	ICW	7.62X51 mm (Level 3 of 17051)	840 ± 15	Wet	03	≤ 25
			7.62X39 mm(MSC) (Level 2 of 17051)	710 ± 15	Wet	03	≤ 25
4	'Groin HAP	ICW	7.62X51 mm (Level 3 of 17051)	840 ± 15	Wet	03	≤ 25
			7.62X39 mm(MSC) (Level 2 of 17051)	710 ± 15	Wet	03	≤ 25
5	#Throat HAP	ICW	7.62X51 mm (Level 3 of 17051)	840 ± 15	Wet	01	≤ 25
			7.62X39 mm(MSC) (Level 2 of 17051)	710 ± 15	Wet	01	≤ 25

Note: The back HAP /side HAPs providing protection against level 6/level 5 of BIS 17051-2018 may be opted by user as per their operational requirements (Annexure - E).

* For Sides and Groin HAP; BFS will be measured for only first shot

For throat HAP: No BFS will be measured for Throat HAP

SAP: Phase-1 (Wet)

Sl No.	Type	Configu-ration	Ammunition	Velocity (m/sec)	Condition	Nos of Shots	Maximum Permissible Back Face Signature (BFS)(mm)
1	Front SAP	**SAP**	9X19mm (Level 1 of 17051)	430± 15	Wet	06	≤ 25
2	Back SAP	**SAP**	9X19mm (Level 1 of 17051)	430± 15	Wet	06	≤ 25
3	Groin SAP	**SAP**	9X19mm (Level 1 of 17051)	430+ 15	Wet	03	≤ 25

SAP: Phase- II (TMC): Thermal Conditioning exposure of SAPs in controlled environment as per BIS 17051-2018:

Sl No.	Type	Configu-ration	Ammunition	Velocity (m/sec)	Condition	Nos of Shots	Maximum Permissible Back Face Signature (BFS)(mm)
1	Front SAP	**SAP**	9X19mm (Level 1 of 17051)	430 ± 15	Wet	06	≤ 25
2	Back SAP	**SAP**	9X19mm (Level 1 of 17051)	430 ± 15	Wet	06	≤ 25
3	Groin SAP	**SAP**	9X19mm (Level 1 of 17051)	430 ± 15	Wet	03	≤ 25

1. Numbers of samples for medium size: Four [(Two for ballistic testing (wet and TMC each) and two numbers as standby).
2. In case of any clarification, BIS 17051: 2018 will be referred.
3. Intershot distance: as per BIS 17051: 2018 (intershot distance not to be less than 51 mm)
4. Edge to shot distance : as per BIS 17051: 2018 (edge to shot distance not to be less than 51 mm)
5. Performance criteria: Perforation/ Non- Perforation and Back Face Signature
6. Wet and TMC condition: as per BIS 17051:2018.
7. Mechanical durability test (Drop test with X-ray): as per BIS 17051:2018

ANNEXURE- B

Sl No .	Type	Configuration	Areal Density (Kg/m²) (HAP)	Minimum (cm²		Area	Maximum Weight (kg)			Nos of Shots Level 6: (7.62X54R API)
				S	M	L	S	M	L	
1	Front HAP	In-Conjunction With (ICW)	≤ 40	980	1000	1080	≤ 3.75	≤ 3.95	≤ 4.26	06

ANNEXURE- C

Sl No.	Type	AD (Kg/m²)	Area (cm²)			Weight (kg)			Nos of Shots	
			S	M	L	S	M	L	Level 2	Level 3
1	Back HAP	≤ 13.0	980	100 0	108 0	≤ 1.27	≤ 1.30	≤ 1.40	08	08
2	"Side HAPs (Left& Right)	≤ 13.0	730	750	810	≤ 0.95	≤ 0.98	≤ 1.05	06 (3 each)	06 (3 each)
3	*Groin HAP	≤ 13.0	365	375	405	≤ 0.47	≤ 0.49	≤ 0.53	03	03
4	#Throat HAP	≤ 13.0	265	270	290	≤ 0.34	≤ 0.35	≤ 0.38	01	01
Total			234 0	239 5	258 5	≤ 3.03	≤ 3.12	≤ 3.36		

*for Groin and sides: Back Face Signature (BFS) will be measured only first shot.
No BFS will be measured for Throat HAP

ANNEXURE- D

Sl No.	Type	AD (Kg/m²)	Area (cm²)			Weight (kg)			Nos of Shots: Level 1:
			S	M	L	S	M	L	
1	Front SAP	≤ 4.5	238 0	243 0	267 0	≤ 1.07	≤ 1.09	≤ 1.2	06
2	Back SAP	≤ 4.5	168 0	171 5	188 0	≤ 0.76	≤ 0.77	≤ 0.85	06
3	Groin HAP	≤ 4.5	490	500	550	≤ 0.22	≤ 0.23	≤ 0.25	03
4	Front collar SAP	≤ 4.5	215	220	240	≤ 0.10	≤ 0.10	≤ 0.11	01
5	Back collar SAP	≤ 4.5	275	280	310	≤ 0.12	≤ 0.13	≤ 0.14	01
Total			504 0	514 5	565 0	≤ 2.27	≤ 2.32	≤ 2.55	

Note: Permissible limit of BPS ≤ 25.0mm
1. OTV: Weight of OTC including QRM and MOLLE (without pouches) : ≤1.6Kg.
2. The weight of DWD with belt: <1.0 Kg.

Optional- 1 (Front HAP as per BIS 17051:2018

Sl No.	Type	AD (Kg/m²)	Area (cm²)			Weight (kg)			Nos of Shots	
			S	M	L	S	M	L	Level 5 (7.62X39 HSC)	Level 3 (7.62X51 SLR)
1	Front HAP (Level 5 BIS 17051)	≤ 27.0	980	1000	1080	≤ 2.65	≤ 2.70	≤ 2.92	08	08

Optional- 2

Sl No.	Type	AD (Kg/m²)	Area (cm²)			Weight (kg)			Nos of Shots	
			S	M	L	S	M	L	Level 2	Level 3
1	Front HAP (Level 5 BIS 17051)	≤ 27.0	980	1000	1080	≤ 2.65	≤ 2.70	≤ 2.92	08	08
2	Back HAP (Level 5 BIS 17051)	≤ 27.0	980	1000	1080	≤ 2.65	≤ 2.70	≤ 2.92	08	08

Optional- 3

Sl No.	Type	AD (Kg/m²)	Area (cm²)			Weight (kg)			Nos of Shots	
			S	M	L	S	M	L	Level 2 (7.62X39 HSC)	Level 3 (7.62X51 SLR)
1	Front HAP (Level 5 BIS 17051)	≤ 27.0	980	1000	1080	≤ 2.65	≤ 2.70	≤ 2.92	08	08
2	Back HAP (Level 5 BIS 17051)	< 27.0	980	1000	1080	≤ 2.65	≤ 2.70	≤ 2.92	08	08
	*Side HAPs (Left & Right) (Level 5 BIS 17051)	≤ 27.0	730	750	810	≤ 1.97	≤ 2.03	≤ 2.19	06 (3 each)	06 (3 each)

Optional- 4

Sl No.	Type	AD (Kg/m^2)	Area (cm^2)			Weight (kg)			Nos of Shots	
			S	M	L	S	M	L	Level 2 (7.62X39 HSC)	Level 3 (7.62X51 SLR)
1	Front HAP (Level 5 BIS 17051)	≤ 27.0	980	1000	1080	≤ 2.65	≤ 2.70	≤ 2.92	08	08
2	Back HAP (Level 5 BIS 17051)	≤ 27.0	980	1000	1080	≤ 2.65	≤ 2.70	≤ 2.92	08	08
	*Side HAPs (Left & Right) (Level 5 BIS 17051)	≤ 27.0	730	750	810	≤ 1.97	<2.03	≤ 2.19	06 (3 each)	06 (3 each)
	*Throat HAP (Level 5 BIS 17051)	≤ 27.0	265	270	290	< 0.72	< 0.73	≤ 0.78	01	01

Note:

1. For above optional/upgrade, Level 3 ballistic test also be carried out in addition with level-5 on back HAP.

* for Groin and sides: Back Face Signature (BFS) will be measured only first shot.

No BFS will be measured for Throat HAP

ANNEXURE - F

Creep Resistance/ Anti Sagging test

The Creep resistance test (For sagging) shall be carried out on OTV fabric. Take 3 no. of specimen in both direction (Warp & Weft) of 15 cm length & 2.54 cm width. Fix one end of the conditioned test specimen in the fix clamp; add a constant load of 2 kg to the free end of specimen for 12 hours. Measure the % elongation (Creep percent) every hour. The result is reported, in average of 3 reading as per table given below

The test specimen shall be conditioned and the test conducted in the standard atmospheric condition for testing textiles as defined in IS 6359.

Test parameters	Warp		Weft	
	Extended Length (cm)	Creep %	Extended Length (cm)	Creep %
Instantaneous extension in length in cm*				
Extended length in cm (Recorded for every 1 hour till 12 hours)				
After 1 hours				
After 2 hours				
After 3 hours				
After 12 hours				

CALCULATION:

Calculation the percentage creep / percentage elongation of each test specimen as follows:

Where
a = Initial length of the specimen b = Final length of the specimen