Directorate General CRPF

Block No. 1 CGO Complex, Lodhi Road, New Delhi-110003
(Govt. of India/Ministry of Home Affairs)
(Phone/Fax- 011-24360155)
(e-mail: digprov@crpf.gov.in)

EXPRESSION OF INTEREST'

CRPF is in the process of revising the QR (Qualitative Requirements) specifications for the Thermal Pant and Thermal Vest for all CAPF. The draft revised QRs/Specification of these items are attached herewith.

The interested firms/parties dealing in subject matter are invited to submit their views/opinions on the draft revised QRs/ Specification of the item by 20/07/2025.

Contact Person:

(Shahnawaz Khan)
DIG (Provision)
Directorate General CRPF
Lodhi Road, New Delhi
PH/FAX: 011- 24360155
EMAIL: digprov@crpf.gov.in

SPECIFICATION FOR VEST THERMAL

CONTENTS

SPECIFICATION FOR VEST THERMAL
RECORD OF AMENDMENTS

Amendment No. and Date	Amendment pertains to Sl. No./Para No./Column No.	Authority	Amended by Name and Appointment (in block letter)	Signature and Date

1.0 SCOPE

1.1 The specification prescribes the requirement of "Vest Thermal" (Color as per User/Buyer requirements).

1.2 This specification does not specify the general appearance, lusture, feel, type of finish of "Vest Thermal".

2.0 MATERIAL AND MANUFACTURE

2.1 The style and shape with dimensions of the "Vest Thermal" are shown in the Fig. 1.

2.2 The "Vest Thermal" shall be manufactured using polyester filament yarn and elastane filament yarn. For guidance, Yarn to be used in Fabric shall be Hollow Polyester (Min- 50D).

2.3 The "Vest Thermal" shall be tailored out of well and evenly knitted tubular interlock fabric/Brush fabric made from circular knitting machine. The arrangement of needles in dial and cylinder of knitting machine are shown in the Fig. 2. The finish of the "Vest Thermal" shall match the specification of sample.

2.4 The rib (1X1) attached to the sleeves opening of the "Vest Thermal" shall be manufacture using polyester yarn along with 3% elastane filament yarn.

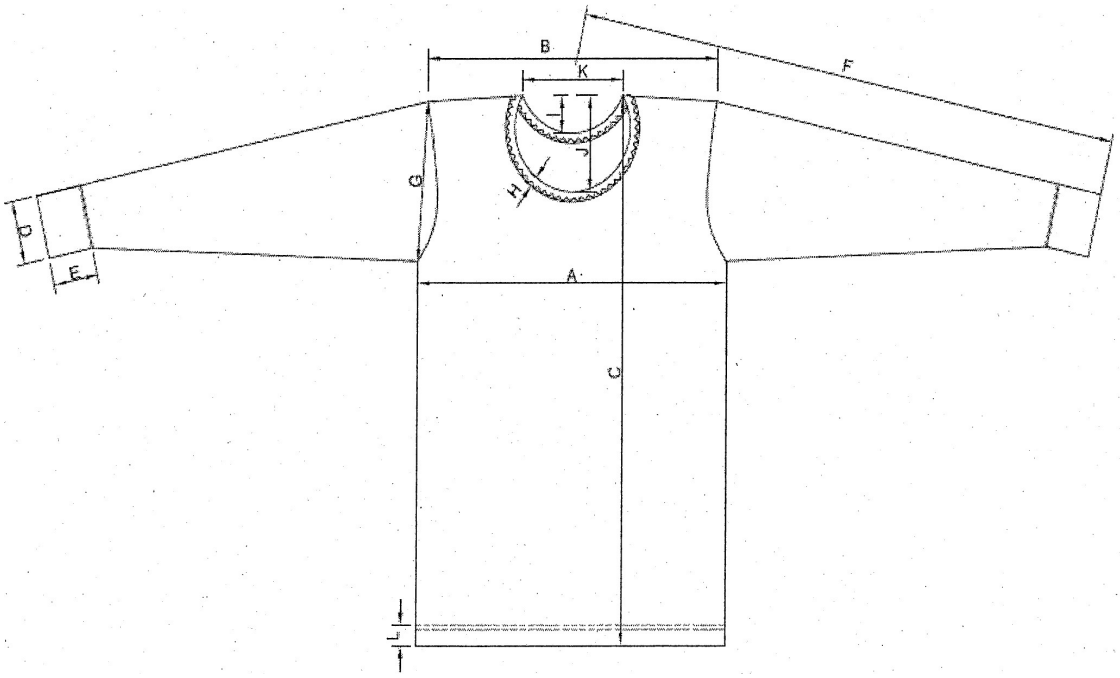

Fig. 1: Vest Thermal

3.0 STITCHING

3.1 The type of stitch and seams (refer ISO 4915:1991 (Latest) Textiles -Stitch types- classification and terminology and ISO 4916:1991(Latest) Textiles — Seam types- classification and terminology) and count of sewing thread (color as per user) for seams and stitches at various portions of "Vest Thermal" shall be as given in Table 1. All the stitches shall be of even tension throughout with all loose ends fastened.

Table-1 Seams and Stitches

Sl. No 1	Portion to be stitched 2	Type of stitch 3	Nos. of stitches per cm, Min. 4	Type of Seam 5	Recommended Thread in the Needle/Looper(s) 6
1	Neck Binding	Cover stitch (605)	4	EFa	i) 80 Tex Polyester sewing thread (two ply)- in needle ii) ii) 80 Tex Polyester (two ply)- in Looper
2	Shoulder Attached	Overlock (514)	4	SSa	
3	Sleeve Attach	Overlock (514)	4	SSa	
4	Underarm	Overlock (514)	4	SSa	
5	Hemming at the bottom	Multithread chainstitch (406)	5	EFa	
6	Rib Making	Overlock (514)	4	SSa	
7	Rib attach	Overlock (514)	4	SSa	
8	Rib topstitch	Multithread chainstitch (406)	5	LSb	

Efa=Edge Finishing (Sub Class-a), SSa= Super imposed Seam (Sub class-a), BSb=Bound Seam (Sub class-b), LSb=Lapped Seam (Sub class-b)

4.0 WORKMANSHIP AND FINISH

The "Vest Thermal" shall be free from workmanship defects i.e. texture, knitting flaws etc. The "Vest Thermal" shall not have missed stitches, hole, cut, oil stains or any other defect which may significantly affect the appearance or serviceability of "Vest Thermal".

5.0 REQUIREMENTS

5.1 Dimensions

The dimensions of "Vest Thermal" when measured by, the method prescribed in Annex- A shall conform to the requirements given in Table 2.

5.2 Other Requirements:

i) The "Vest Thermal" shall conform to the parameters as given in Table 3A.

ii) The rib attached with the sleeve opening of the "Vest Thermal" shall confirm to the parameters given in Table 3B.

iii) Neck Rib- the size of neck rib shall as per Table 2(i.e. 2 cm)

Table 2: Dimension of "Vest Thermal"
(All measurements are in centimeter)

Sizes	Chest **Width** **(A)**	**Shoulder** **(B)**	Length From H.P.S. (C)	**Rib** (Length) (D)	**Rib** (Width) (E)	Sleeve Length From C.B. (F)	Armhole Straight (G)	**Neck** Binding Rib (H)	Back Neck Depth (I)	Neck Drop (J)	Neck **Width** (K)	Bottom Hem Width (L)
80	38.1	35.6	63.5	5.7	8	66.0	17.8	2	3.8	10.2	11.4	2.5
85	40.6	38.1	66.0	5.7	8	69.9	19.1	2	4.4	11.4	13.3	2.5
90	43.2	40.6	68.6	5.7	8	73.7	20.3	2	4.4	11.4	13.3	2.5
95	45.7	43.2	71.1	6.4	8	76.2	21.6	2	5.1	12.7	14.6	2.5
100	48.3	45.7	73.7	6.4	8	78.7	22.9	2	5.1	12.7	14.6	2.5
105	50.8	48.3	76.2	6.4	8	81.3	24.1	2	5.1	12.7	14.6	2.5
Tolerance	+- 1. 5	+-1.5	+-1.5	+-0.5	+-0.5	+-1.5	+-0.5	+-0.1	+-0.5	+-0.5	+-0.5	+-0.1

HPS= Highest point shoulder, C.B.=Centre back

Table 3A: Requirements of "Vest Thermal"

Sl. No.	Parameters	Requirements	Method of Testing
	Type of Knitting	Box fleece with anti-pilling treatment.	**Visual**
1	Composition (excluding of Rib), Percentage	Hollow Polyester 97% +/- 5% Elastane Min 3%	IS 667:1981 and IS 3416 (Part-1): 1988 (Based on dry mass) AATCC 201A:2020 ISO 17751
2	Wales/inch, Minimum	32	B-3, IS:14759-2000
3	Courses/inch, Minimum	48	B-3, IS:14759-2000
4	Weight, g/m2	200 + 5%	IS 1964-2001 RA 2022 (Method A)
5	Dimensional Change, (Machine wash at room temperature percentage, Maximum - Wales direction - Courses direction	 4.0 4.0	Washing after 3 wash & ISO 6330 : 2021
6	pH Value of aqueous extract	6.0 to 8.0	IS:1390(Latest)
7	Colour fastness to Light	4 or better	IS/ISO 105-B02
8	Colour	As per user	Visual
	Additional Parameters		
9	Anti fungal (Penicillium species, Fusarium Species, Aspergillus Niger, Candida Albicans, Trichoderma species)	No fungal growth; Effectiveness to be shown against at least 5 fungal strains (effective upto 20 washes at 40° C)	AATCC 30 (Part III) – 2017 ISO 6330:2021-4N

10	Anti-bacterial (Escherichia coli, Klebsiella pneumoniae, Staphylococcus aureus)	Effectiveness to be shown against at least 2 bacteria (effective upto 20 washes at 40°C)	AATCC 100
11	Breathability / RET factor	4 m^2Pa/W or less	ISO 11092 - 2014
12	Fabric absorbency rate	10 sec (Max)	AATCC-79
13	Wicking (time taken to reach 22mm)	10 sec (Max)	AATCC-197
14	Fabric drying rate	1.0 ml/hr or more	AATCC 201
15	Banned Azo Colorants	None	IS 15570: 2005(Latest)
16	Pilling resistance	4 or better	IS 10971 (Part 1) 2011 RA 2017
17	Colour fastness to Water	4 or better	IS / ISO 105 E01 2010 RA 2017
18	Colour fastness to Rubbing	Dry & Wet: 4 or better	IS/ISO 105-X12: 2001 RA 2016
19	Colour fastness to Laundering at 40C	Change in colour: 4 or better	IS/ISO 105 C 10: 2006 RA 2017 Test A (1)
20	Colour fastness to Perspiration	4 or better	IS/ISO 105 E04: 2008 RA 2019
21	Thermal Resistance in Clo	Minimum - 0.5	ISO11092

Table 3B: Requirements of "Vestt Thermal" – Rib/Cuff

SI. No.	Parameters	Requirements	Method of Testing
1.	Composition, Percentage -Elastane (Polyurethane), Minimum -Hollow Polyester	 5% min 95% Remaining	IS 3421
2.	Wales/inch, Minimum	32-36	B-3, IS:14759-2000
3.	Courses /inch, Minimum (Including elastane yarn)	48	B-3, IS:14759-2000

4.	Colour	Match with the Vest thermal fabric	Visual

6.0 SAMPLING

6.1 The sampling procedure detailed in 6.2 and 6.3 shall give desired protection to the buyer and the seller, provided that the lot submitted for inspection is homogeneous. To achieve this, the manufacturer shall maintain a system of process control at all stages of manufacturing ensuring the "Vest Thermal" tendering by him for inspection to comply with the requirements of this standard in all respects.

6.2 The manufacturer should offer the stores serially numbered and arranged in such a way that the entire lot is accessible to the inspecting officer. The conforming of a lot to the requirement of this specification shall be determined on the basis of the tests carried out on the samples selected from it. The number of samples shall be selected at random in accordance with Table-4.

Table-4: Number of "Vest Thermal" to be selected from a lot and permissible number of non-conforming "Vest Thermal"

Sample Size, Permissible Number of Non-Conforming and Sample drawn for Testing

Lots Size in No's	**Visual Inspection** (As per GIL-1 AQL-4)		**Physical Parameters** (As per SIL-4 AQL-4)		**Chemical Parameters** (As per SIL-2 AQL-4)	
	Sample Size	**Acceptance No (Permissible Number of Non-Conforming)**	**Sample Size**	**Acceptance No.**	**Sample Size**	**Acceptance No.**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Up to 280	13	1	13	1	5	0
281-500	20	2	13	1	5	0
501-1200	32	3	20	2	5	0
1201-3200	50	5	32	3	8	1
3201-10000	80	7	32	3	8	1
10001-35000	125	10	50	5	8	1

Note: Sampling officer will select sampling unit randomly and select ultimate items from each sampling unit as per the above table.

6.3 Lot: For the purpose of conformance inspection and test sampling, a lot is defined as all the completed "Vest Thermal" of the same size and type, with same assemblies, produced in one facility, using the same production processes and materials, and being offered for delivery at one time to buyer against a dispatch note.

6.4 The Buyer reserves the right to carry out inspection of bigger lot sizes, even to the extent of 100% inspection, if considered necessary.

6.5 The sample size and the criterion for conformity for various characteristics shall be as follows:

Characteristics	Sample size	Criteria for conformity
Freedom from defects, manufacture and dimensions	All the "Vest Thermal" shall be inspected according to the column 2 of table 4	Non-conforming "Vest Thermal" not to exceed the corresponding number given in col. 3 of table 4
Nature of fibre, Construction, Dimensional change, Scouring loss, pH value, colour	All the "Vest Thermal" shall be inspected according to the column 4 of table 4	All the "Vest Thermal" to satisfy the relevant requirements.
Colour fastness to light	One each for lot size up to 500 "Vest Thermal" and two if lot size is 501 and above	All the "Vest Thermal" to satisfy the relevant requirements.

7.0 MARKING

A woven cloth label marked with the following information (Colour from the label shall not bleed on to the "Vest Thermal" during storage or use) shall be fastened to each "Vest Therma" at the inside of the neck portion (backside)

a) Name of Force
b) Size in cm
c) Blend composition
d) Year of manufacture
e) Name of manufacturer or trade mark, if any
f) Washing instructions (Bilingual)
g) Any other information required by the buyer.

8.0 PACKAGING & PACKING

8.1 Each "Vest Thermal" shall be placed in polyethylene bag. The vendor shall supply a sticker for each "Vest Thermal" for inspection and signature. 50 such "Vest Thermal" shall be placed in mill Grey board (3 ply corrugated fibre board telescopic Box) to form a unit pack and such four unit shall be packed in 7 ply corrugated fibre board slotted Box and further wrapped into water proof hessian/HDPE sheet (as per buyer requirement) and stitched with not less than 6 stitches/ 6 cm. and strip bound. However, on each box the following shall be indicated:

a) Name of material;
b) "Vest Thermal" style and size in cm;
c) Quantity per box.
d) Any other information as required by the buyer

9. 0 **REFERENCES**

SI. No.	SPEC. /TEST METHOD No.	DESCRIPTION
(a)	IS 667: 1981	Method for identification of textile fibres
(b)	IS 1390: 1983, RA 2004	Methods of testing of pH value of aqueous extract
(c)	IS 2454: 1985, RA 2006	Methods for determining of colour fastness of textile materials to artificial light (xenon lamp)
(d)	IS 6359:1971, RA 2004	Method for Conditioning of Textiles
(e)	IS 14759 : 2000,	Textiles-Fabric, rib-knitted- specification
(f)	IS: 9543: 1980	Spun polyester sewing threads
(g)	IS3421	Fibre analysis: Quantitative

10.0 ANNEX A

A-1 Conditioning of test specimens and atmospheric conditions for testing: The test specimen shall be tested in Standard atmospheric conditions i.e. 65% RH (Relative Humidity), Temp. 65°C ($^{+}_{-}$5).. In case of dispute, the sample shall be conditioned and tested in the standard atmosphere as given in IS 6359.

A-2 Dimensions:

Take each "Vest Thermal" constituting the test specimen. Lay it flat on a table. Removed by hand all crease and wrinkles without distorting the specimen.
Measure nearest to 0.1 cm, the dimensions given in Table-2.