INVITATION OF EXPRESSION OF INTEREST (EoI) FOR NDRF CLOTHING ITEM

NDRF is the lead federal force responsible for responding to all types of natural and man-made disasters NDRF acknowledge the importance of having reliable equipment to enhance the efficiency and effectiveness of rescue operations.

2. NDRF now intends to procure the Coat combat for NDRF personnel. Accordingly, NDRF has prepared a draft specification for the Coat combat. The draft specifications are appended as Appx- A.

3. In this context, NDRF invites Expressions of Interest (EoI) from eligible manufacturers, suppliers and vendors to submit their comments and suggestions. In case these specifications do not match with the available store/item in the market, the same may be highlighted and the specification of the cloth available in the market may kindly be provided with the same design/use. The purpose of the EoI document is to provide necessary information to NDRF so that genuine and generalized specifications can be framed and finalized for further procurement, and no gap exists in the specifications of the items available in the market and the specificness floated in the bid by NDRF.

4. This EOI is not an offer by NDRF for procurement or a tender document but it is an invitation to receive responses from eligible manufacturers, suppliers, and vendors in the industry regarding the draft specification framed by NDRF.

5. Eligibility Criteria: The minimum eligibility criteria for an entity to participate in the EoI is as follows: -

i. The entity must be a manufacturer or vendor/supplier/dealer registered in India under relevant applicable Acts and Laws.
ii. The entity must have some experience in the supply of such cloth/store.
iii. NDRF may call manufacturers, suppliers and vendors to conduct the demonstration/field trial of such cloth/store if needed before finalizing the specification.

6. Documents to be submitted: The following documents are required to be submitted as part of the response to this EoI.

i. Documents supporting Eligibility Criteria as mentioned above.
ii. List of cloth/store catalogue with detailed technical specifications.

7. Eligible manufacturers, suppliers and vendors who have the competence and experience to carry out such work/supply are requested to submit the EoI along with supporting documents within 21 days.

(Gyaneshwar Singh)
Commandant (Prov/Proc) HQ NDRF

No. 1-17018/PROV/1012/HQ DG NDRF/2024-25/1424 Dated 29/08/2024

Appendix-A

Product Specification

NDRF Coat Combat/2in1 Jacket (Stand Collor)

NDRF · INDIA
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b) **Material List**

SR. N0.	COMPONENT	MATERIAL	COLOR
Outer Jacket			
1	Outer Fabric	Polyester TPU Lamination	Navy Blue
2	Inner Lining Fabric	Polyester - Taffeta	Navy Bue
3	Front Closing Zipper	#5 coil zipper with slider	Navy
4	Waterproof Pocket Zipper	#3 coil zipper with slider	Black
5	Normal Pocket Zipper	#3 coil zipper with slider	Navy Blue
6	Velcro (Hook and Loop)	20mm	Navy
7	Eyelet	Plastic	Navy
8	Stopper	Plastic	Navy
9	Elastic Cord	3mm	Navy
10	Tape	15mm Polyester	Black
11	Reflective Logo and Reflective Tape print on sleeves	Reflective Ink	Sliver
12	Sewing Thread	Spun Polyester	
13	Heat Seal tape for seam sealing	Transparent PU Tape	Clear Transparent
Inner Jacket			
1	Outer Inner Fabric – Main	Polyester Cire with WR finish	Navy Blue
2	Outer Inner Fabric – Sleeve (outer & inner)	Polyester Cire with WR finish	Orange
3	Inner Lining – (Body)	Polyester - Taffeta	Navy
4	Poly Wadding with Scrim on both side	Poly wadding	White
5	Tape	15mm Polyester	Black
6	Elastic	10mm	White
7	Plastic Snap Buttons	Plastic	Navy Blue
8	Sewing Thread	Spun Polyester	Navy

c) **Product Manufacturing process**

The 2 in 1 Jacket shall be manufactured in desired sizes. Product shall be manufactured as per the process described below: -

❖ **Two in one Jacket with Stand collar**

1. **Inner Jacket:**

The jacket is quilted with soft wadding and contrast color sleeve (sleeve in orange color and body in navy color). The jacket has a mandarin collar, with two Velcro loop, stitched in front chest area for attaching rank badges. The cuffs and bottom hem of jacket are elasticated for better fitting. The centre front part shall have slide fastener for opening and closing.

There shall be two zippered pockets on the front side, all runners will have external pullers for easy access. Lining inside the pocket shall be of body fabric. Lining seams shall be inverted so that they do not touch the wearer. The front zipper pocket has flap to cover the zipper.

The sleeves will have elasticated cuff for better fitting. Two Velcro loops are stitched on wearer's left sleeve for rank badges placements. Fabric loop are provided at sleeve cuff and inside neck area for hooking outer jacket.

❖ **Reflective Strip (Print)**

(Reflective Strip Certification: IS 15809)

❖ **Print Placement- Outer Jacket**

h) **Dimension/Size Chart:**

❖ **Outer Jacket**

Measurement in cms							
S No	Measuring points	TOL+/-	S	M	L	XL	XXL
1	Front and back body lengths From HPS	+2.0/-1.0	70	72	74	76	78.00
2	Chest width 2cm below armhole	+2.0/-1.0	107	113	119	125	131.00
3	Bottom Hem opening relaxed	+2.0/-1.0	102	108	114	120	126.00
4	Across shoulder	+1/-1	46.00	48.00	50.00	52	54.00
5	Across front 16 cm below from HPS	+1/-1	42.00	44.00	46.00	48.00	50.00
6	Across back 16 cm below from HPS	+1/-1	44.00	46.00	48.00	50.00	52.00
7	Armhole straight	+1/-1	26.50	28	29.50	31.00	32.50
8	Bicep 2cm below from AH	+1/-1	44.00	46.00	48.00	50.00	52.00
9	Sleeve length from shoulder seam	+1/-1	65.00	66.00	67.00	68.00	69.00
10	Sleeve opening - relaxed	+0.5/-0.5	27	28	29	30	31.00
11	Bottom side Pocket placement at top from CF	+0.5/-0.5	8.50	9.00	9.50	10.00	10.50
12	Bottom side Pocket placement at Bottom from C	+0.5/-0.5	23.50	24.00	24.50	25.00	25.50
13	CF Zipper length	+1/-1	69.50	71.00	72.50	74.00	75.50
14	Collar Circumference at top edge of collar	+1.0/-1.0	46.00	48.00	50.00	52.00	54.00
15	Hood height at centre front-from top of hood to	+1/-1	34.00	34.00	35.00	35.00	36.00
16	Hood width at 15cm from top edge of hood	+1/-1	23.50	24.00	24.50	25.00	25.50

10	Hydrostatic Pressure Test After Contamination of Fuel of oil or chemicals	ISO 811:2018 & EN 343: 2003+A1:2007	Chemical: 4000 mmH_2o Oil: 4000 mmH_2o	minimum
11	Hydrostatic Pressure Test After Sharp Bend Test	ISO 811:2018 & EN 1876-1 (Temp: -20^0C, Time 6 hours)	5000 mmH_2o	minimum
12	Spray Rating	ISO 4920: 2012	90 (ISO 4) Slight Random sticking or wetting of specimen face	minimum
13	Spray Rating after 5 washes	ISO 4920: 2012	70 (ISO 2) Partial wetting of specimen face beyond spray point	minimum
14	Abrasion Resistance	ISO 12947-2:2016 Load: 12kpa Wool Abrader, 5000 Cycles	No thread break observed up to 5000 cycles	Minimum 5000 cycles
15	Resistance to De-Lamination	EN ISO 7854, Method A: 1995 10,000 cycles	No cracking, delamination or tearing observed after 10,000 cycles	
16	Colour Fastness to Light	ISO 105 B02:2014	Blue Wool Rating 4	Minimum 4
17	Colour Fastness to perspiration	ISO 105 E04:2013	Acid and Alkaline Grey Scale Rating Change in color and Staining Multi fiber: 4	Minimum
18	Colour Fastness to Washing	ISO 105 C10:2010 Method A1 Temp:40°C	Grey Scale Rating Change in color and Staining Multi fiber: 4	Minimum
19	Colour Fastness to Rubbing	ISO 105 X12:2016	Grey scale rating Dry: 4 Wet:4	Minimum
20	pH of aqueous extract	ISO :3071: 2020	6.5 to 7.5	
21	Antistatic Properties	EN 1149-1:2006	Less than 10^{11}	
22	Colour Spectrum Values	AATCC 173: 2015 D65/10 Degree	L= 19.55 a = 1.69 b = (-)10.90 c=11.03 h=278.83	

REQUIREMENT OF OUTER JACKET

B: Inner Fabric of Outer Jacket & Inner Jacket
Physical and Chemical tests

C: Garniture Items testing requirement

Zippers (Outer & Inner Jacket Front Center zipper)				
Sr. No.	Test Parameter	Test Method	Requirement	Acceptance Tolerance
1	Reciprocating movement of Slider under load	Annexure K of IS 14181 Part II	Un-impaired up to 1000 Cycles	Minimum
2	Remeshability of fastener	IS 14181:2002 Part 2, Annex N	Remeshable with slider Movement over Disengages Chain	Minimum
3	Security of interlocking of Textile chain to lateral load or crosswise	IS 14181:2002 Part 2, Annex B	760 Newton	Minimum
4	Security of Attachment of Top Stop	IS 14181:2002 Part 2, Annex D	340 Newton	Minimum
5	Security of Attachment of retainer to longitudinal load	IS 14181:2002 Part 2, Annex F	120 Newton	Minimum
6	Security of Attachment of retainer to Lateral load	IS 14181:2002 Part 2, Annex G	140 Newton	Minimum
7	Security of Attachment of puller to slider	IS 14181:2002 Part 2, Annex H	400 Newton	Minimum

Velcro (Hook and Loop)				
Sr. No.	Test Parameter	Test Method	Requirement	Acceptance Tolerance
1	Material Identification (Hook)	Annexure A of IS 8156:2014	NYLON	
2	Material Identification (Loop)	Annexure A of IS 8156:2014	NYLON	
3	Width of Hook	Annexure B of IS 8156:2014	20mm	
4	Width of Loop	Annexure B of IS 8156:2014	20mm	
5	Peel Strength	Annexure E of IS 8156:2014	Min 200 g/cm	
6	Shear Strength	Annexure E of IS 8156:2014	Min 900 g/cm2	
7	Shear Strength after Endurance	Annexure G of IS 8156:2014	Min 675 g/cm2	
Tape (15mm)				
Sr. No.	Test Parameter	Test Method	Requirement	Acceptance Tolerance
1	Material Identification	AATCC 20/20A:2021	100% Polyester	Minimum
2	Width	ISO 22198: 2006	15mm	Minimum
3	Breaking Strength	ASTM D6775: 2002	750 Newton full width	Minimum

REQUIREMENT OF OUTER JACKET

Assembly and/or Garment testing Physical and Chemical tests				
Sr. No.	**Test Parameter**	**Test Method**	**Requirement**	**Acceptance Tolerance**
1	Seam Strength at Shoulder and Side Warp Weft	EN 13935-2:2014	350 Newton 330 Newton	Minimum
2	Side Seam Strength Warp Weft	EN 13935-2:2014	200 Newton 190 Newton	Minimum
3	Water Penetration (Hydrostatic Head Test) at seam (Seam Sealing)	ISO 811:2018 Pressure Rate: 60mbar/min	3000mm H_2O	Minimum
4	Water Penetration (Hydrostatic Head Test) at seam (Seam Sealing) after 5 washes	ISO 811:2018 Pressure Rate: 60mbar/min	1400mm H_2O	Minimum
5	Tape Weldability (Tape Peel strength)	ISO 2411: 2017	17 N/mm	Minimum
6	Appearance after 5Cycle Home Laundry	ISO 6330:3N: 2021, Temp: 30 0C (After 10HL) & AATCC 124-2018	Color Change: 4.5 Self-Staining:5.0 No deterioration of Elastic cord, Zippers observed. The zippers working are satisfactory. Velcro working is satisfactory. No detachment of the snap button	Minimum
7	Water Impact test at Pocket with waterproof zippers	AATCC TM 42: 2017	<0.1gm	Minimum

Poly Wadding Material of Inner Jacket				
Sr. No.	Test Parameter	Test Method	Requirement	Acceptance Tolerance
1	Material Identification	AATCC20/20A:2021	100% Polyester	
2	Mass/m^2	ISO 3801:1977	90gsm +/- 5%	
3	Compression Recovery %	IND/T/4578 (d) Annexure G: 2016	Minimum 90%	

Thermal Resistance of Jacket Using Manikin (Inner Jacket + Outer Jacket)				
Sr. No.	Test Parameter	Test Method	Measuring unit	Result
1	Thermal Resistance of Jacket Using Manikin (Inner Jacket + Outer Jacket)	DIN EN ISO 15831:2004	m2.K/W (Clo) %	2.5 Clo

Effective Thermal Insulation of clothing Icle and ambient temperature conditions for heat balance at different duration exposure (Ref. Table B.1 of EN 342:2004)

Insulation Icle m2.K/W	Wearing Standing Activity 75 W/m2	
	8h	1h
0.4028	7°C	-10°C

INTRODUCTION

j) Product Sketch

k) Material List

l) Product Manufacturing process

m) Logo and Label Details

n) Dimension/Size Chart

o) Material Specification Requirement

e) Material List

SR. NO.	COMPONENT	MATERIAL	COLOR
Outer Jacket			
1	Outer Fabric	Polyester TPU Lamination	Navy Blue
2	Inner Lining Fabric	Polyester - Taffeta	Navy Bue
3	Front Closing Zipper	#5 coil zipper with slider	Navy
4	Waterproof Pocket Zipper	#3 coil zipper with slider	Black
5	Normal Pocket Zipper	#3 coil zipper with slider	Navy Blue
6	Velcro (Hook and Loop)	20mm	Navy
7	Eyelet	Plastic	Navy
8	Stopper	Plastic	Navy
9	Elastic Cord	3mm	Navy
10	Tape	15mm Polyester	Black
11	Reflective Logo and Reflective Tape print on sleeves	Reflective Ink	Sliver
12	Sewing Thread	Spun Polyester	
13	Heat Seal tape for seam sealing	Transparent PU Tape	Clear Transparent
Inner Jacket			
1	Outer Inner Fabric – Main	Polyester Cire with WR finish	Navy Blue
2	Outer Inner Fabric – Sleeve (outer & inner)	Polyester Cire with WR finish	Orange
3	Inner Lining – (Body)	Polyester - Taffeta	Navy
4	Poly Wadding with Scrim on both side	Poly wadding	White
5	Tape	15mm Polyester	Black
6	Elastic	10mm	White
7	Plastic Snap Buttons	Plastic	Navy Blue
8	Sewing Thread	Spun Polyester	Navy

f) Product Manufacturing process

The 2 in 1 Jacket shall be manufactured in desired sizes. Product shall be manufactured as per the process described below: -

❖ **Two in one Jacket with Stand collar**

3. **Inner Jacket:**

The jacket is quilted with soft wadding and contrast color sleeve (sleeve in orange color and body in navy color). The jacket has a Round neck collar, with two Velcro loop, stitched in front chest area for attaching rank badges. The cuffs and bottom hem of jacket are elasticated for better fitting. The centre front part shall have slide fastener for opening and closing.

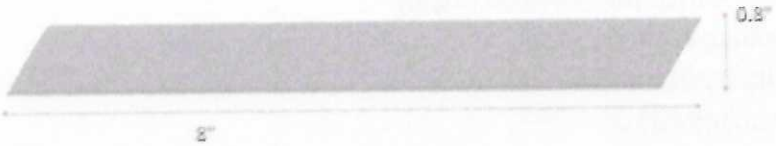
There shall be two zippered pockets on the front side, all runners will have external pullers for easy access. Lining inside the pocket shall be of body fabric. Lining seams shall be inverted so that they do not touch the wearer. The front zipper pocket has flap to cover the zipper.

p) Logo and Label Details

There shall be NDRF Logo at the back side of outer jacket and reflective strip print at the sleeves. Refer below image for dimension and artwork in reflective print.

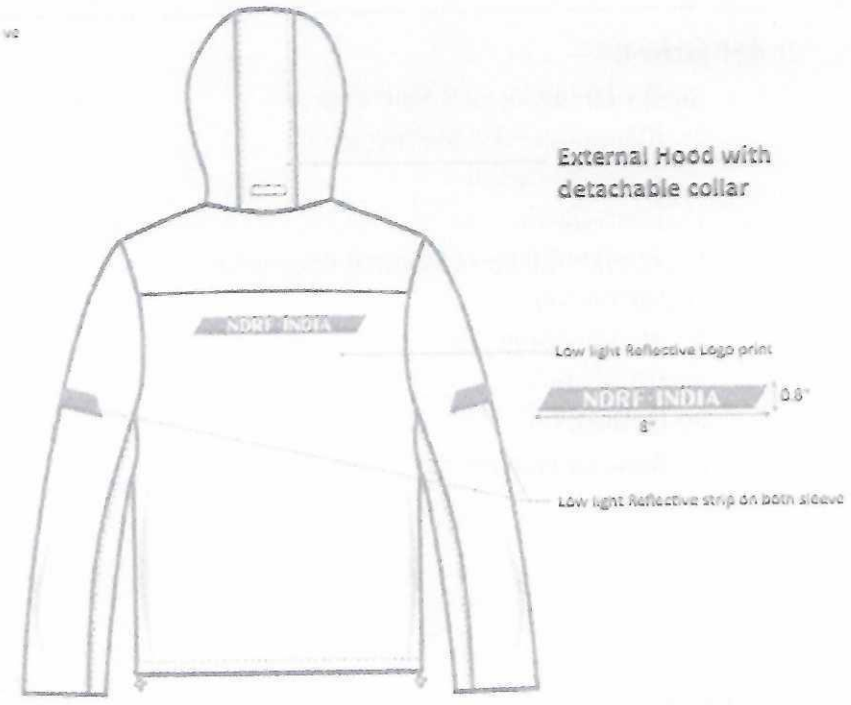
❖ **Logo- NDRF India (Print)**

❖ **Reflective Strip (Print)**



(Reflective Strip Certification: IS 15809)

❖ **Print Placement- Outer Jacket**



q) **Dimension/Size Chart:**

❖ **Outer Jacket**

Measurement in cms							
S No	Measuring points	TOL+/-	S	M	L	XL	XXL
1	Front and back body lengths From HPS	+2.0/-1.0	70	72	74	76	78.00
2	Chest width 2cm below armhole	+2.0/-1.0	107	113	119	125	131.00
3	Bottom Hem opening relaxed	+2.0/-1.0	102	108	114	120	126.00
4	Across shoulder	+1/-1	46.00	48.00	50.00	52	54.00
5	Across front 16 cm below from HPS	+1/-1	42.00	44.00	46.00	48.00	50.00
6	Across back 16 cm below from HPS	+1/-1	44.00	46.00	48.00	50.00	52.00
7	Armhole straight	+1/-1	26.50	28	29.50	31.00	32.50
8	Bicep 2cm below from AH	+1/-1	44.00	46.00	48.00	50.00	52.00
9	Sleeve length from shoulder seam	+1.5/-1.5	65.00	66.00	67.00	68.00	69.00
10	Sleeve opening - relaxed	+0.5/-0.5	27	28	29	30	31.00
11	Bottom side Pocket placement at Bottom from C	+0.5/-0.5	23.50	24.00	24.50	25.00	25.50
12	Bottom side pocket placement at bottom from b	+0.5/-0.5	12.00	12.00	12.00	12.00	12.00
13	CF Zipper length	+1/-1	60.50	62.00	63.50	65.00	66.50
14	Collar Circumference at band seam	+1.0/-1.0	42.00	44.00	46.00	48.00	50.00
15	Hood height at centre front-from top of hood to	+1.0/-1.0	36.00	36.50	37.00	37.50	38.00
16	Hood width at 15cm from top edge of hood	+1.0/-1.0	25.50	26.00	26.50	27.00	28.00

11	Hydrostatic Pressure Test After Sharp Bend Test	ISO 811:2018 & EN 1876-1 (Temp: -20°C, Time 6 hours)	5000 mmH_2o	minimum
12	Spray Rating	ISO 4920: 2012	90 (ISO 4) Slight Random sticking or wetting of specimen face	minimum
13	Spray Rating after 5 washes	ISO 4920: 2012	70 (ISO 2) Partial wetting of specimen face beyond spray point	minimum
14	Abrasion Resistance	ISO 12947-2:2016 Load: 12kpa Wool Abrader, 5000 Cycles	No thread break observed up to 5000 cycles	Minimum 5000 cycles
15	Resistance to De-Lamination	EN ISO 7854, Method A: 1995 10,000 cycles	No cracking, delamination or tearing observed after 10,000 cycles	
16	Colour Fastness to Light	ISO 105 B02:2014	Blue Wool Rating 4	Minimum 4
17	Colour Fastness to perspiration	ISO 105 E04:2013	Acid and Alkaline Grey Scale Rating Change in color and Staining Multi fiber: 4	Minimum
18	Colour Fastness to Washing	ISO 105 C10:2010 Method A1 Temp:40°C	Grey Scale Rating Change in color and Staining Multi fiber: 4	Minimum
19	Colour Fastness to Rubbing	ISO 105 X12:2016	Grey scale rating Dry: 4 Wet:4	Minimum
20	pH of aqueous extract	ISO :3071: 2020	6.5 to 7.5	minimum
21	Antistatic Properties	EN 1149-1:2006	Less Than 10^{11}	
22	Colour Spectrum Values	AATCC 173: 2015 D65/10 Degree	L= 19.55 a = 1.69 b = (-)10.90 c=11.03 h=278.83	

REQUIREMENT OF OUTER JACKET

B: Inner Fabric of Outer Jacket & Inner Jacket

Physical and Chemical tests

Sr. No.	Test Parameter	Test Method	Requirement	Acceptance Tolerance
1	Material Identification-Base fabric	AATCC20/20A:2021	100% Polyester	
2	Mass/m2	ISO 3801:1977	60gms +/- 5%	
3	Thread Density Ends/inch Picks/inch	ISO 7211-2: 1984	 105 85	Minimum

3	Security of interlocking of Textile chain to lateral load or crosswise	IS 14181:2002 Part 2, Annex B	760 Newton	Minimum
4	Security of Attachment of Top Stop	IS 14181:2002 Part 2, Annex D	340 Newton	Minimum
5	Security of Attachment of retainer to longitudinal load	IS 14181:2002 Part 2, Annex F	120 Newton	Minimum
6	Security of Attachment of retainer to Lateral load	IS 14181:2002 Part 2, Annex G	140 Newton	Minimum
7	Security of Attachment of puller to slider	IS 14181:2002 Part 2, Annex H	400 Newton	Minimum

Velcro (Hook and Loop)				
Sr. No.	**Test Parameter**	**Test Method**	**Requirement**	**Acceptance Tolerance**
1	Material Identification (Hook)	Annexure A of IS 8156:2014	NYLON	
2	Material Identification (Loop)	Annexure A of IS 8156:2014	NYLON	
3	Width of Hook	Annexure B of IS 8156:2014	20mm	
4	Width of Loop	Annexure B of IS 8156:2014	20mm	
5	Peel Strength	Annexure E of IS 8156:2014	Min 200 g/cm	
6	Shear Strength	Annexure E of IS 8156:2014	Min 900 g/cm2	
7	Shear Strength after Endurance	Annexure G of IS 8156:2014	Min 675 g/cm2	

Tape (15mm)				
Sr. No.	**Test Parameter**	**Test Method**	**Requirement**	**Acceptance Tolerance**
1	Material Identification	AATCC 20/20A:2021	100% Polyester	Minimum
2	Width	ISO 22198: 2006	15mm	Minimum
3	Breaking Strength	ASTM D6775: 2002	750 Newton full width	Minimum

Elastic Cord				
Sr. No.	**Test Parameter**	**Test Method**	**Requirement**	**Acceptance Tolerance**
1	Material Identification	AATCC 20/20A:2021	Polyester and Rubber blend	Minimum
2	Diameter	WRA lab Inhouse Method	3 mm	Minimum

REQUIREMENT OF OUTER JACKET

Assembly and/or Garment testing Physical and Chemical tests				
Sr. No.	Test Parameter	Test Method	Requirement	Acceptance Tolerance
1	Seam Strength at Shoulder and Side Warp Weft	EN 13935-2:2014	350 Newton 330 Newton	Minimum
2	Side Seam Strength Warp Weft	EN 13935-2:2014	200 Newton 190 Newton	Minimum
3	Water Penetration (Hydrostatic Head Test) at seam (Seam Sealing)	ISO 811:2018 Pressure Rate: 60mbar/min	3000mm H_2O	Minimum
4	Water Penetration (Hydrostatic Head Test) at seam (Seam Sealing) after 5 washes	ISO 811:2018 Pressure Rate: 60mbar/min	1400mm H_2O	Minimum
5	Tape Weldability (Tape Peel strength)	ISO 2411: 2017	17 N/mm	Minimum
6	Appearance after 5Cycle Home Laundry	ISO 6330:3N: 2021, Temp: 30 0C (After 10HL) & AATCC 124-2018	Color Change: 4.5 Self-Staining:5.0 No deterioration of Elastic cord, Zippers observed. The zippers working are satisfactory. Velcro working is satisfactory. No detachment of the snap button	Minimum
7	Water Impact test at Pocket with waterproof zippers	AATCC TM 42: 2017	<0.1gm	Minimum

Poly Wadding Material of Inner Jacket				
Sr. No.	Test Parameter	Test Method	Requirement	Acceptance Tolerance
1	Material Identification	AATCC20/20A:2021	100% Polyester	
2	Mass/m^2	ISO 3801:1977	90gsm +/- 5%	
3	Compression Recovery %	IND/T/4578 (d) Annexure G: 2016	90%	

Thermal Resistance of Jacket Using Manikin (Inner Jacket + Outer Jacket)				
Sr. No.	Test Parameter	Test Method	Measuring unit	Result
1	Thermal Resistance of Jacket Using Manikin (Inner Jacket + Outer Jacket)	DIN EN ISO 15831:2004	m2.K/W (Clo) %	2.5 Clo

Effective Thermal Insulation of clothing Icle and ambient temperature conditions for heat balance at different duration exposure (Ref. Table B.1 of EN 342:2004)

Insulation Icle m2.K/W	Wearing Standing Activity 75 W/m2	
	8h	1h
0.4028	7°C	-10°C