IAFS 01061: 2013

## INDIAN AIR FORCE STANDARD

# SPECIFICATION FOR RAIN JACKET (WITH INTEGRATED HOOD & TROUSER)

(GIG NO. -945675, 945676, 945677)

(Supersedes Air HQ/DQAS/AC-061)

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COMMAND ENGINEERING OFFICER (QUALITY ASSURANCE SERVICES) HEAD QUARTERS, MAINTENANCE COMMAND VAYU SENA NAGAR NAGPUR - 440 007 Fax: (0712) 251 2965



# RECORD OF AMENDMENTS [ISSUING AGENCY: C ENG O (QAS), HQ MC, IAF]

AMEND. NO.	AUTH. & DATE	PAGE(S) REPLACED	SIG. & DATE
1	MC/6920/01061/S&S/Q AS Dtd 29 Jan 18	16 & 21 of 26	-Sd/-
2	MC/6920/7/01061/S&S/ QAS(BM) N-4 Dtd 31 Dec 2019	20,21 &23 of 26	-Sd/-
3	MC/7853/315/LGS QAS BM-II dated Dec 2021	10 of 26	
4	MC/7853/315/LGS QAS BM-II dated Dec 2021	15 of 26	
5	MC/7853/315/LGS QAS BM-II dated Dec 2021	19 of 26	
6	MC/7853/315/LGS QAS BM-II dated Dec 2021	24 of 26	
7	MC/7853/315/LGS QAS BM-II dated Dec 2021	24 of 26	
8	MC/7853/315/LGS QAS BM-II dated Dec 2021	24 of 26	
9	MC/7853/315/LGS QAS BM-II dated Dec 2021	24 of 26	
10	MC/7853/315/LGS QAS BM-II dated Dec 2021	24 of 26	



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## 0. FOREWORD

0.1 This standard has been prepared by Command Logistics Management Officer (Quality Assurance Services) [C ENG O (QAS)] on the authority of the Chief of the Air Staff, Indian Air Force (IAF).

0.2 This standard is for use by the IAF.

0.3 Cape Water Proof, as adopted from standard no. JSS 8405-11 (Revision No. 1) of year 1998 was initially in use in the IAF. Following the market trends, standard AIR HQ/DQAS/AC – 061 (Provisional) was formulated in May 2005 for 'Rain Jacket (With Integral Hood & Trouser)'. In order to further improve the quality (in terms of basic material of the fabric), comfort and aesthetics, this standard is revised and issued as 'Rain Jacket (With Integrated Hood & Trouser)' under standard no. 'IAFS 01061: 2013'. This standard is more market friendly and within the in the scope of Indian manufacturers of repute. The prefix 'AIR HQ/DQAS' is replaced with the prefix 'IAFS', as DQAS, Air HQ represents the IAF. The word AC-061 (Clothing General) is replaced with '01061', as part of standardisation of the standard numbers. This IAFS supersedes AIR HQ/DQAS/AC – 061 of May 2005.

0.4 This standard would be used for manufacture, quality assurance and procurement of the item.

0.5 Quality Assurance Authority for the item covered in this standard is C ENG O (QAS), HQ MC, Nagpur for IAF.

0.6 All enquiries regarding this standard, including those relating to any contractual conditions contained therein, shall be addressed to the Quality Assurance Authority at the following address: -

C ENG O (QAS) [FAX No. (0712) 251 2965] HQ MC Vayu Sena Nagar Nagpur – 440007



0.7 Copies of the standard can be obtained on payment from: -

C ENG O (QAS) HQ MC Vayu Sena Nagar Nagpur - 440007

0.8 This standard holds good only for the supply order, for which it is issued.

0.9 The Quality Assurance Authority reserves the right to amend or modify this standard as and when necessary.

0.10 The Quality Assurance Authority is the competent authority to grant concessions, if any, in respect of any clause contained in this standard.

0.11 Copies of Indian Standards are obtainable on payment from: -

Bureau of Indian Standards Manak Bhavan 9, Bahadur Shah Zafar Marg New Delhi - 110 002

(or) their regional / branch offices

0.12 Copies of IND/GS and CIGS/US series of standard are obtainable on payment from: -

The Controller Controllerate of Quality Assurance (General Stores) Post Box No. 127 Kanpur 208 004



#### 1. **SCOPE**

1.1 This IAFS covers the requirements of item '**Rain Jacket (With Integrated Hood & Trouser)**', including the materials used manufacturing and the manufacturing process.

1.2 Here onwards, the word 'item' in this IAFS denotes 'Rain Jacket (With Integrated Hood & Trouser)'.

#### 2. SEALED SAMPLE

2.1 Item shall conform in every respect with the requirements specified in this standard. Sealed sample held in the custody of C ENG O (QAS) [93-AHSP], HQ MC, Vayu Sena Nagar, Nagpur - 440007 shall constitute the standard pattern with regard to appearance, shade / colour, feel, finish and any other characteristics, properties and parameters not noted and defined in this standard.

#### 3. **RELATED STANDARDS**

3.1 List of related standards is tabled in **Appendix 'A'**.

#### 4. MATERIAL

4.1 List of material used for manufacture is tabled in **Appendix 'B'**.

## 5. MANUFACTURE

5.1 Manufacture of the item shall confirm to the process and methods described in **Appendix 'C'**.

#### 6. **REQUIREMENTS**

6.1 **DESIGN PATTERN.** Design pattern shall confirm to the diagrams in **Appendix 'D' & 'D1'**.



6.2 **MATERIAL.** Material used for manufacturing shall confirm to the requirements tabled in **Appendix 'E'**.

6.3 **<u>DIMENSIONS</u>**. Dimensions shall conform to the requirements tabled in **Appendix 'F' & 'F1'**.

## 6.4 PRE INSPECTION & QUALITY ASSURANCE

6.4.1 The manufacturer shall ensure that items manufactured by him comply with all requirements of this standard and shall be homogeneous.

6.4.2 In order to achieve this, the manufacturer shall maintain a system of quality assurance and process control, at relevant stages of manufacture.

6.4.3 Pre-inspection shall be carried out by the inspection staff of manufacturer. <u>Pre-inspection report, along with lab test report shall</u> be submitted to inspection authority along with the inspection 'Offer <u>Challan'</u>.

## 7. MARKING / LABELLING

7.1 Marking / labelling shall confirm to the details tabled in **Appendix 'G'**.

## 8. PACKAGING

8.1 Packaging shall confirm to the details tabled in **Appendix 'H'**.

8.2 Packing of the stores shall be accomplished in the presence of IAF Inspection Team.

#### 9. PACKAGE MARKING

9.1 Before despatch, each box shall legibly be marked by 40 - 50 mm size letter, stencilled with indelible marking ink / printed with the tabled in **Appendix 'J'**.

Price: - Rs: 150/-



## 10. INSPECTION AND QUALITY CONTROL

10.1 **<u>PILOT SAMPLE.</u>** Two pilot samples shall be fabricated from the material cleared by C ENG O (QAS) and submitted for evaluation.

10.2 BULK PRODUCTION CLEARANCE (BPC).BPC will begranted on successful clearance of the pilot samples.Image: Clearance of the pilot samples.

10.3 LOT. The lot offered for inspection shall be homogeneous. In any consignment, all items / pairs (where applicable) of the same composition, colour and size shall constitute a lot. The manufacturer shall offer the lots, serially numbered and arranged, in such a way that the entire lot is accessible to the inspecting officer.

10.4 **<u>SAMPLING</u>** (VISUAL INSPECTION).</u> Sampling plan and acceptance criteria of conformity for visual inspection shall be as tabled in **Appendix** 'K'.

10.5 **<u>SAMPLING</u>** (LAB TEST). Sampling plan and acceptance criteria of conformity for lab test shall be as tabled in **Appendix 'L'**.

## 11. ACCEPTANCE MARK

11.1 Each jacket and trouser shall be stamped with inspecting officer's "QAS Rubber Stamp" on the label, using indelible ink / paint.

11.2 Vendor shall provide inspection sticker [as per the sample held with C ENG O (QAS)], which will be stamped, signed and pasted over the polyethylene bag.

11.3 Clause 11.2 is not applicable for 'Supply Orders' placed under 'Self Certification' by the manufacturer.



#### 12. WARRANTY\*\*\*

12.1 The store supplied against this specification shall be deemed to bear the warranty of the contractor against defective materials would be limited to a total of 15 months including a usages life of 09 months. Total life would start from date of delivery of the said articles at the consignee end and usages life from the date of issue to the end user. Notwithstanding the fact that the purchaser may have inspected and or accepted the said articles, if during the aforesaid period of 15 months of total life including 09 months of usages life, the said articles be discovered not to conform to the description and quality or not giving satisfactory performance or have deteriorated the purchaser shall be entitled to call upon the supplier to rectify the articles or such portion thereof as is found to be defective by the purchaser within such specified period as may be allowed by the purchaser. The decision of the purchaser in that behalf shall be final and binding on the supplier and in such an event, the above mentioned warranty period shall apply to the articles rectified from the date of rectification thereof.

\*\*\* **Amendment no.3** (warranty clause added as a clause no.12, previously not available)

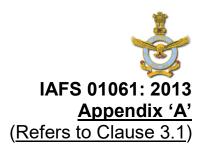
Price: - Rs: 150/-



Appendix 'A' (Refers to Clause 3.1)

## **RELATED STANDARDS**

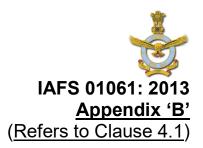
SI. No.	STANDARD No.	SUBJECT
(a)	IS 390: 1975	Method for determining the Water Repellence of Fabrics by Water Spray Test
(b)	IS 667: 1981	Methods for identification of Textiles Fabrics
(c)	IS 1964: 2001	Methods for determination of Mass Per Unit length and Mass Per Unit Area of the Fabrics
(d)	IS 2771 (Part 1): 1990	Corrugated Fibreboard Boxes (Specification) Part 1 (General)
(e)	IS 7016 (Part 1): 1982	Methods of Tests Coated and Treated Fabrics (Determination of Roll Characteristics)
(f)	IS 7016 (Part 2): 1982	Methods of Tests Coated and Treated Fabrics (Determination of Breaking Strength and Extension at Break) First Revision
(g)	IS 7016 (Part 4): 2003	Methods of Tests Coated and Treated Fabrics (Rubber or Plastic Coated Fabrics) Determination of Resistance to Damage by Flexing
(h)	IS 7016 (Part 7): 1986	Methods of Tests Coated and Treated Fabrics (Determination of Resistance to Penetration by Water (First Revision)
(j)	IS 9543: 1980	Specification for Spun Polyester Sewing Threads



## **RELATED STANDARDS**

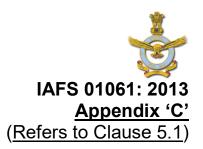
SI. No.	STANDARD No.	SUBJECT
(k)	IS 9686: 1980	Specification for Elastic Tape
(I)	IS 11652: 2000	Specification for Woven Sacks for Packing Cement [High Density Polyethylene (HDPE) / Polyethylene (PP)]
(m)	IS 14181: 1994	Specification for Synthetic (Plastic) Slide Fasteners (Special Purpose)
(n)	ASTM E-96-95 (Method B)	Moisture Vapour Transmission Rate
(o)	CQ (GS) / US / 460	Specification for boxes fibreboard rigid, corrugated triple wall 7 ply

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## **MATERIALS USED FOR MANUFACTURING**

SI.			CONFIRMING
No.	COMPONENT	MATERIAL	ТО
(a)	Basic Fabric	Nylon 66	Clause 6.2
(b)	Buckle	Plastic	Best quality, light weight, with breaking strength of 5 Kg (Min), in vertical direction.
(c)	Sewing Thread	Spun Polyester (145 D Tex X 3, Variety No. 5)	IS 9543: 1980
(d)	Waist Cord	Polypropylene (or Equivalent)	Diameter 6 mm (Min)
(e)	Slide Fastener (Jacket)	Plastic / Nylon Vizlon	Open end, medium duty (No. 5), single slide and blue grey in colour, conforming to IS 14181: 2002.
(f)	Slide Fastener (Pouch)	Plastic / Nylon Vizlon	Light duty (No. 3) and black in colour, conforming to IS 14181: 2002.
(g)	Press Button	Brass	Nickel / Chromium coated
(h)	Elastic Tape	Best trade quality	Conforming to IS 9686: 1980



#### MANUFACTURING PROCESS

#### INTRODUCTION

(a) Item comprises of a jacket with integrated hood, with built-in zipped pouch on the back and trouser. The fabric surface of the proofed fabric shall be on outer side.

#### JACKET (BODY PORTION)

(b) **Fore Part.** The fore part shall be in two pieces and shall be cut wide enough to have 4 cm fashion on both sides from collar joint to bottom. The front part shall have slide fastener open end with single puller for opening and closing. The slide fastener shall be covered by a flap throughout and shall be provided with 4 press buttons. The flap shall be manufactured from the double layer of fabric with 5.5 cm width. The outer stitching of the flap shall be 5 mm away from the edge of flap. A pocket of 15.5 cm x 13 cm size, with plastic see through front for keeping the identity card, shall be provided on left side 5.5 cm away from the flap seam and 16 cm below the collar gorge. The see-through window shall be of 7 cm size, embossed with IAF insignia. The pocket shall have 6 cm x 13 cm flap made out of double layer of cloth.

(c) Two pockets 18 cm x 22 cm size (one on each side) 5.5 cm away from the flap and 6 cm from the bottom shall be provided. The pockets shall be provided with 7 cm x 18 cm size flaps made of double layer of cloth.

(d) Pockets flaps shall be secured with the pockets using **press buttons**.



(e) **<u>Back Side.</u>** The back shall be in one piece. The fore part and back shall be joined at shoulders and sides by single row of machine stitching. The bottom shall be finished with 1.5 cm hemming with raw edges turned in to form a tunnel for passage of nylon cord.

\*\*\*\*The jacket shall be provided with two tabs of double layer of selfmaterial to provide adjustment for making tight or lose the jacket at waist level. One each at the sides at waist level adjacent to pocket flaps. Each tab shall be stitched with Hook tape 2.5 cm to be fixed to the corresponding loop tape 10 cm stitched on the waist region. The length of tab at waist for all sizes shall be 11.5 cm and width of 5 cm.

(f) <u>Sleeves.</u> The jacket shall have one piece sleeves joined by single row of machine stitching at arm. The bottom of the sleeves shall be hemmed 1 cm by turning in the raw edges. The sleeves shall be joined to the body by single row of machine stitching.

(g) <u>**Collar.**</u> The collar shall be stand and fall type made in two layers of self material. The two layers of the collar shall be stitched in a manner that the upper stitching of the collar shall be finished with double row of stitching 5 mm apart (as per sample). The collar shall be attached to the gorge with two rows of machine stitching i.e. one from inside and the other from outside. The fall of the collar shall be 10.5 cm and shall have 9.5 cm width at the centre.

(h) The collar shall have a built-in pouch, closed and opened with slide fastener for stowage of integral hood. The hood shall be stitched by double row of stitching with pouch.

(j) The hood shall be made of self material. The diameter of the hood shall be 72 cm and length 36 cm. It should be provided with suitable length of cord for tying.

(k) A loop of self material shall be caught between the joining seam in the interior at the centre of the back.

\*\*\*\* Amendment no.4 (Removed  $\rightarrow$ The jacket shall be provided with three belt loops of 5 cm x 10 cm size (two on sides and one at back) at waist level. A belt of 4 cm width made from double layer one piece



cloth in suitable length shall be provided. The belt shall have a light weight unbreakable plastic buckle.)

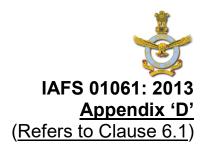
#### TROUSER (BODY PORTION)

(I) The trouser shall be manufactured in four pieces design. The top and under side shall be assembled with plain seam and press open at sides, inside leg and seat. While assembling the trouser, a crotch of suitable size shall be provided. The waist band shall have elastic tape of 3 cm width and finished/caught by three rows of machine stitching. A round polypropylene cord is to be inserted around the waist along with elastic. The free end of the cord to be enclosed in bell caps.

(m) The bottom portion of the legs shall be hemmed 1.5 cm with raw edges turned-in. A press button shall be provided on the hemmed portion of legs in a matter that bottom can be squeeze-folded and secured by the press button. \*The least distance between male and female portion of each pressed button shall be 24 cm.

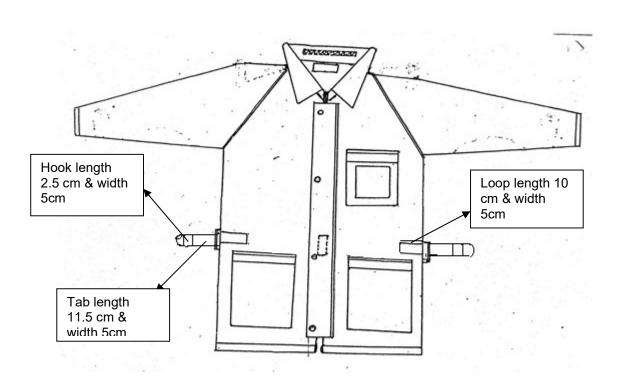
(n) <u>Stitching.</u> The rain suit shall be assembled with lock stitches regulated at 30-35 stitches per decimetre. The stitching shall be press open type and shall be sealed with 2 cm wide tape of basic glued. The stitching of the pockets / flaps on reverse side also shall be sealed in the similar way.

\* Amendment No. 1



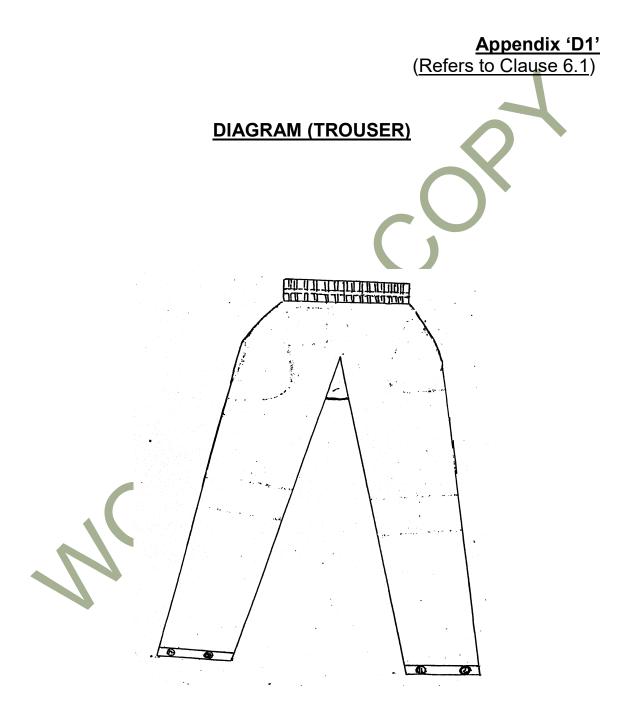
4

## **DIAGRAM (JACKET)**











# Appendix 'E' (Refers to Clause 6.2)

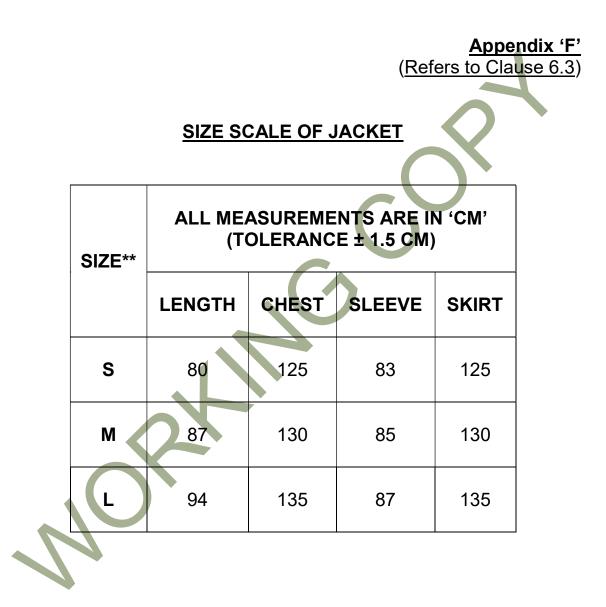
# **REQUIREMENTS FOR FABRIC**

PROPERTY	TEST METHOD	MINIMUM VALUE	
Colour	Visual	Navy Blue	
Composition	IS 667: 1981	Nylon 66	
Mass Per Unit Area	IS 7016 (Part 1): 1982	90 ± 10 gm	
Breaking Strength	IS 7016 (Part 2): 1982	Warp 100 kg Weft 70 kg	
Tearing Strength	Revised Single Rip Method	Warp 4 kg Weft 4 kg	
Water Proof @ 150 cm per hour	IS 7016 (Part 7): 1986 (Low Pressure Method)	No Leakage	
Moisture Vapour Transmission Rate @ 23 Deg C & 50 % RH		1.0 mg / sq cm / hour	
Spray Rating	IS 390: 1975	80 min	
Nature of Water Proofing Layer	Not Applicable	Breathable Membrane	
Mass Per Unit Area of the Membrane	IS 7016 (Part 1): 1982	25 ± 5 gm	
Resistance to De- Lamination	IS 7016 (Part 4): 2003	75000 Flexing Cycles	

\*\*\*\*\*Hook and loop fastener (width 2.5 cm & length 20 cm) shall be put on **Sleeve wrist end**.

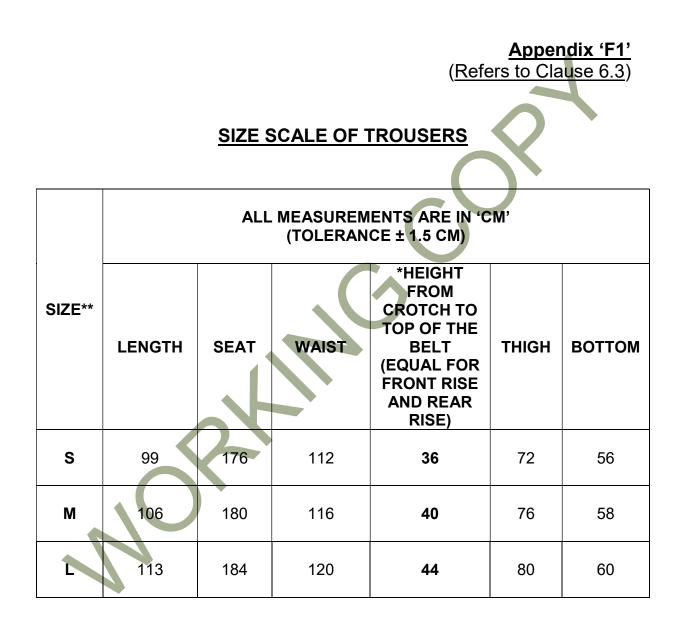


\*\*\*\*\* **Amendment No.5** (Length amended as 20 cm in place of 05 cm and location amended as sleeve wrist end in place of waist pockets)



\*\* Amendment No. 2





\* Amendment No. 1 \*\* Amendment No.2

Price: - Rs: 150/-



	<u>LAB</u>	<u>Appendix 'G'</u> (Refers to Clause 7.1) ELLING		
SI. No.	REQUIREMENTS	DETAILS		
(a)	Labelling Type	Fabric label, stitched on the collar stand from inside, towards right side of the hanging loop		
(b)	Marking	Embroidered / Woven / Printed		
(C)	Label Size	8 x 3 cm		
(d)	Basic Fabric	Taffeta / Silk		
(e)	Fabric Colour	White		
(f)	Washing Instructions	Not Applicable		
	MARKING			

# MARKING

SI. No.	MARKING ON THE LABEL	
(a)	Nomenclature	
(b)	DS Cat No	
(C)	Name / Trade mark of the manufacturer	
(d)	Month and year of manufacture	
(e)	Size	



	Appe (Refers to Clau			Appendix 'H' Clause 8.1)
		PACKAG		2
MODULE	CONTAINS	PACKAGING MATERIAL	REQUIREMENT	CONFIRMING TO STANDARD
Unit Pack**	One (Pair, where applicable)	Nylon 66 as per clause 6.2	As per <b>Appendix 'E'</b>	IS 667:1981
Inner Box	Eight Unit Packs	5 Ply Carton	420X330X375 mm	IS 2771
Outer Box	Two Inner Boxes	7 Ply Carton (duly lined with Polythene Sheet of 0.04 mm Thickness)	700X450X400 mm (Weight of the packed boxes not to exceed 30 Kg)	CQ (GS) / US / 460
Sealing (of open ends)	Each Outer Box	Water Proof Cellophane / Adhesive Tape	Having Width 40 – 50 mm	Nil
Strip Bounding	Each Outer Box	Polypropylene Tape (sealed with lead seal with 'IAF' impression)	20 mm	Nil
Outer	Each	HDPE Bag	As Required	IS 11652:

Price: - Rs: 150/-



#### \*\* Amendment No.2

Outer Box

Wrap

	PACKAGE MARI	Appendix 'J' (Refers to Clause 9.1) KING
SI. No.	MARKING ON TI	HE LABEL
(a)	Nomenclature*****	Rain Jacket with Integrated Hood and Trouser
(b)	NIIN No.******	720149888-Small 720149889-Medium 720149890-Large
(c)	Sec/Ref No. *******	22G/1500A-Small 22G/1501A-Medium 22G/1502A-Large
(d)	Supply order number and date	
(e)	Delivery Lot number ********	10
(f)	Qty packed in the box********	16
(g)	Month and year of packing	
(h) (J)	Gross weight of the box Inspection note number and date	
(k)	Address of consignee	
(I)	Name / Address / Trade mark of the manufacturer	

\*\*\*\*\*\* Amendment No.6 (details filled, previously not available) \*\*\*\*\*\*\* Amendment No.7 (details filled, previously not available) \*\*\*\*\*\*\* Amendment No.8 (details filled, previously not available)



\*\*\*\*\*\*\*\* **Amendment No.9** (delivery lot number in place of lot & serial no of the box)

\*\*\*\*\*\*\*\*\* Amendment No.10 (details filled, previously not available)



#### LOT SIZE, SAMPLING PLAN & ACCEPTANCE CRITERIA (FOR VISUAL INSPECTION)

	NON-DESTRUCTIVE TESTING			
LOT SIZE	SAMPLE SIZE	ACCEPTANCE CRITERIA No.		
	(n)	(a)		
Up to 50	10	0		
51 – 100	20	1		
101 – 200	30	1		
201 – 300	40	2		
301 – 500	50	3		
501 - 800	70	4		
800 - 1300	110	5		
1301 – 3200	150	6		
3201 & Above	220	10		



Appendix 'L' (Refers to Clause 10.4)

#### LOT SIZE, SAMPLING PLAN & ACCEPTANCE CRITERIA (FOR LABORATORY TEST)

	CHEMICAL PROPERTIES		PHYSICAL PROPERTIES		
LOT SIZE	SAMPLE SIZE	ACCEPTANCE CRITERIA No.	SAMPLE SIZE	ACCEPTANCE CRITERIA No.	
	(n)	(a)	(n)	(a)	
Up to 50	2	0	2	0	
51 – 100	2	0	2	0	
101 – 200	2	0	2	0	
201 – 300	3	0	3	0	
301 – 500	5	0	5	0	
501 – 800	7	1	7	1	
800 – 1300	10	1	10	1	
1301 – 3200	15	1	15	1	
3201 & Above	30	3	30	3	