

16 (2/20)

TERMS AND CONDITIONS OF CONTRACT FOR THE FABRICATION OF SOCKS WOOLEN BLACK THROUGH TRADE ASSISTANCE

1. **SCOPE:**

Socks Woolen Black to be manufactured in Sizes 28 & Size 30 as per specification No. AIRHQ/DQAS/AK-037. The Scope of Work includes Knitting, Linking, Washing and Pressing of manufactured Socks by the contractor.

2. **MATERIAL:**

Socks shall be knitted by Worsted Yarn 80 Tex/3 and 80Tex Woolen Black. OPF will provide yarn and other material as per the material estimate as mentioned in Annexure A. Contractor will collect the material from OPF, Kanpur by using his own transport.

3. **MANUFACTURE:**

In shape, the socks shall generally be as shown in Fig. 1 of Specification. They shall be well knit and shall be seamless with secure 4 course welt made in two steps of two courses each. The top of the socks shall be knitted in 1x1 rib and the leg and foot portion shall be knitted plain.

The rib top and the leg portion of the socks shall be joined by transferring loop for loop without sewing or seaming. The socks shall be spliced through out the foot and leg up to the portion marked in Fig. 1 (up to the SR line in the figure). The splicing shall be even free from creases and fold, and similar in construction to the fabric of socks.

The socks shall be linked over the toe, and the linking shall be elastic, smooth and free from lumps & knots.

4. **DIMENSIONS:**

The Socks shall conform to the schedule of particulars given in Table – 2 read with Fig. 1 of the specification. Size of socks is defined by a number which is a numerical value of foot length in cms.

5. **WORKMANSHIP AND FINISH:**

The socks shall be well scoured and free from soap, oil, grease or any other impurities used during the manufacture.

They shall be pressed as per their sizes as mentioned in the dimensions.

In addition, the socks shall be free from fabrication defects which would significantly mar the appearance or affect the serviceability of the socks such as Large mend, Ladders, Improper Splicing, Ridges, Strips, Rough or Greasy feel, Holes and Cuts & Prominent stains.

6. **PRE - INSPECTION OF STORE / CONSIGNMENT:**

Contractor must satisfy themselves that the stores are in accordance with the terms of the contract and fully conform to the required specifications by carrying out a thorough pre-inspection of each lot before actually offering the same for inspection to Quality Assurance Examiners/Officers nominated by the Sr. General Manager, OPF Kanpur.



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7. Inspection of Store/ Consignment

Inspection of finished pressed socks will be carried out within Kanpur at firm's premises or any other place arranged by the firm. If the inspection authority finds out that the socks have not been knitted as per specification, the consignment is liable for bulk rejection.

Inspected socks will be brought to OPF by the contractor without any damage by his own conveyance.

8. The payment will be made on JCR basis only after the receipt of Inspection Note by OPF Kanpur from IAF HQMC, Nagpur. 0.5% unavoidable rejection (UAR) has been accommodated in the material estimate and no further material will be issued in case of wastage/rejection by the firm. The firm will have to ensure full tender qty to be made up by the material issued by OPF according to the material estimate and the return of remaining material/wastage if any to OPF Kanpur.

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ANNEXURE-A

MATERIAL ESTIMATE

SIZE WISE SCALE OF SOCKS WOOLEN BLACK

Estimate Qty – 100 PAIRS

Type of Socks	Size	Type	Worsted Yarn 80Tex/3 (in Kg)	Worsted Yarn 80Tex (Splicing) (in Kg)	Detergent for Washing of Socks (in Litres)	Spun Poly. 250D Tex/3 Black Yarn (in KM)
Socks Woolen Black	28	Qty -A	11.0600	2.2000	0.1400	0.0040
		Qty - B (UAR)	0.0553	0.0110	0.0000	0.0000
	30	Qty -A	12.4600	2.5000	0.1400	0.0040
		Qty - B (UAR)	0.0623	0.0125	0.0000	0.0000



6/20

JCM/MM.
Pl. prepare estimate on priority and arrange procurement as early



AIR HQ/DQAS/AK-037

AIR HEADQUARTERS, RK PURAM

सौ. प्रो. एफ. कानू.
सं. 638
दि. 15-2-04

AIR FORCE SPECIFICATION

ON

SOCKS WOOLEN BLACK

STATUTORY WARNING

These specifications are to be strictly complied with. Any act of non-compliance or dilutions of specifications by indenter or inspector will be liable for disciplinary action.

DIRECTORATE OF QUALITY ASSURANCE SERVICES (AERO)
AIR HEADQUARTERS, RAMA KRISHNA PURAM
WEST BLOCK-VI
NEW DELHI-110 066
DATE OF ISSUE : Nov 2004

received vide DQAS letter no. Air HQ/94853/CQ 10A/

7/20

AIR HQ/DQAS/AK-037

RECORD OF AMENDMENTS

Amendment No. Date	Amendment pertains to : SI No./ Para No. Column No.	Authority	Amended by Name and Appointment (IN BLOCK LETTERS)	Signature and Date
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AIR HQ/DQAS/AK-037CONTENTS

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0. FOREWORD

0.1 This specification has been issued by Dte of QAS (Aero), Air HQ (RKP), New Delhi 110066.

0.2 The specification has been prepared on the basis of Spec No.IS:2187-1982.

0.3 This specification would be used to guide manufacture, quality assurance and procurement of the item.

0.4 Copies of the specification can be obtained on payment from:-

The Director,
Dte of Quality Assurance Services (Aero),
Air Headquarters,
West Block-VI
Rama Krishna Puram
New Delhi-110066

0.5 This specification holds good only for the supply order for which it is issued.

SCOPE

This standard does not specify the design, type of finish, general appearance, luster feel of the socks.

TERMINOLOGY

For the purpose of this standard, the definitions given in IS:3596-1967 shall apply.

MATERIALS

Yarn. The yarn used in the manufacture of the socks shall be spun on worsted form from wool only or blends of wool, nylon and viscose rayon in proportion as agreed to between the buyer and the seller. In the case of mixture shades the yarn shall be spun from dyed wool tops and nylon tops and undyed viscose rayon tops and for solid shades the dyed wool tops shall be blended with dyed nylon and viscose rayon tops.

g. Double combing is likely to impart better finish and thorough blending of fibres.

The particulars of yarn commonly used for knitting, linking and splicing shall be as given in Table I.

MANUFACTURE

In shape, the socks shall generally be as shown in Fig.1. They shall be well knit, shall be seamless with secure 4 course welt made either in one step or in two steps of 2 courses each. The top of the socks shall be knitted in 1 x 1 rib and the leg and foot portions shall be knitted plain.

The particulars of circular machines for knitting different sizes of the socks are as follows :-

Size No.	Diameter of Machine, cm	Total No of Needles in the Machine	DS Cat No.
23	9.5	72	8440-000-467
24	10.0	76	
25	10.0	80	8440-000-468
26	10.0	80	
27	10.0	80	8400-000-469 8440-000-469
28	11.5	84	8400-000-470 8440-000-470
29	11.5	84	8400-000-471 8440-000-471
30	11.5	84	8400-000-472 8440-000-472
31	11.5	84	8400-000-473 8440-000-473

4.3 The rib top and leg portions of the socks shall be joined by transferring loop for loop without sewing or seaming. The socks shall be spliced throughout the foot and the leg up to the portion marked in Fig.1 (upto the line SR in the figure). The splicing shall be even, free from creases and folds, and similar in construction to the fabric of the socks. The socks shall be linked over the toe, and the linking shall be elastic, smooth and free from lumps and knots. The free ends of the linking yarn and other loose ends, if any, shall be between 13 mm and 25 mm in length and shall not pull out when the socks are stretched to the limit.

TABLE-2 DIMENSIONS AND MASS OF WOOL SOCKS
(Clause 4.1.1, 5.1 and Fig.1)

Size	Foot Length	Length of Sock	Depth of Rib Top Portion	Width of Foot at Centre	Length of Splicing	Mass per 10 pairs, min (see note)
1	2	3	4	5	6	7
	A cm	B cm	C cm	D cm	E cm	g
23	23.0	280	10.0	9.5	13.0	850
24	24.0	29.0	10.0	10.0	13.0	920
25	25.0	30.0	10.0	10.0	13.0	1000
26	26.0	31.0	11.0	10.0	13.0	1060
27	27.0	32.0	11.0	10.0	14.0	1130
28	28.0	33.0	11.0	11.5	14.0	1200
29	29.0	33.0	12.0	11.5	14.0	1270
30	30.0	34.0	12.0	11.5	14.0	1340
31	31.0	34.0	12.0	11.5	14.0	1410
Tolerance	±0.5	±2.5 -1	±1	±0.5	±0.5	--
Method of Test	A-2	A-2	A-2	A-2	A-2	A-3

Note. A tolerance of -5 percent on the mass of the individual pair of the socks shall be permissible provided the average mass per ten pairs is maintained.

5. REQUIREMENTS

5.1 Dimensions and Mass. The socks shall conform to the requirements of Table 2 read with Fig.1.

Note. The size of the socks is denoted by a number which is the numerical value of the foot length in centimeters.

Example. 30 size socks are the socks having foot length of 30 cm.

The socks shall also conform to the requirements given in Table 3.

TABLE-3 REQUIREMENTS OF WOOL SOCKS
(Clause 5.2)

Sl. No.	Characteristic	Requirement	Method of Test
1)	Course/dm	44±2	A-4
2)	Grade of wool tops	Not less than 64 s	IS:5911-1977 A-5
3)	Dimensional change (due to relaxation), percent, max		
	Leg portion	3.0	
	Foot length	2.5	
4)	pH value of aqueous extract	5 to 7.5	IS:1390-1961 (Mild Method)
5)	Scouring loss, percent, max	4	A-6
6)	Colour fastness to		
	Light	4 or better	IS:686-1957
	Washing Test 2	4 or better	IS:3361-1965
	Change in colour	4 or better	
	Staining of adjacent fabric	4 or better	
	Perspiration	4 or better	
	Change in colour	4 or better	
	Staining of adjacent fabric	4 or better	IS:971-1956
	Rubbing	4 or better	IS:766-1956

note. In case of dispute colour fastness to light shall be determined by IS:686-1957.

7) Fibre composition of the knitting, linking and splicing yarn used in the manufacture of socks of various blends shall be as under :-

70:15:15 Blend of wool, nylon and viscose rayon

Wool, percent 67-73

Nylon percent 13-18

Viscose rayon, percent 13-17

note. Wool content upto 65 percent and viscose rayon content upto 18 percent in an individual sample may be permitted if the average is within specified limits.

5.3.1 In case of wool nylon socks, the blend composition, that is, amount of wool and nylon shall be determined according to IS:2006-1978. while in case of wool nylon rayon socks the percentage of wool fibres shall be determined according to IS:2006-1978 and the percentage of nylon fibres in the residue according to IS:2005-1962. The percentage of viscose rayon fibres shall be calculated by the following formula :-

$$Z = 100 - (X + Y)$$

where X, Y and Z are percentages of wool, nylon and rayon fibres respectively.

Note. The fibres present in the yarn should first be identified according to the method prescribed in IS:667-1955. The sample to be analysed should be free from added and non fibrous materials.

5.4 The socks shall be free from objectionable flaws. The objectionable flaws shall be those which strike immediately the eyes and shall be deemed to include:-

- (a) Noticeable broken thread in the body.
- (b) Large mends.
- (c) Ladders.
- (d) Dropped stitched.
- (e) Noticeable oil or other strains.
- (f) Holes, cuts or tears extending beyond 6 mm square in area.
- (g) Uneven dyeing.
- (h) Streakiness.
- (j) Any other defect which may significantly mar the appearance or serviceability of socks.

5.5 **Sealed Sample.** If in order to illustrate or specify the indeterminate characteristics, such as general appearance, finish, shade and feel of socks a sample has been agreed upon and sealed, the supply shall be in conformity with the sealed sample in such respects.

5.5.1 The custody of the sealed sample shall be a matter of prior agreement between the buyer and the seller.

6. PAIRING

6.1 The socks shall be matched and paired according to their shade and size. A tolerance of ± 15 mm on the length of the socks shall however be permissible while pairing.

AIR HQ/DQAS/AK-037MARKING

- 1 Each pair of the socks shall be marked with indelible ink with the following:-
 - (a) Name of the material, for example, wool socks.
 - (b) Blend composition in the descending order.
 - (c) Size.
 - (d) Manufacturer's name, initials or trademark.
 - (e) Any other information as required by the buyer.

PRESERVATION

The socks shall be preserved with a heavy dose of naphthalene at a minimum quantity of 5 kg per cubic meter of the bale or case.

PACKING

Each pair will be placed in an appropriate self sealing poly bag and further sealed with the Inspectors label to be provided by the vendor. 25 pairs of socks are to be placed on a telescopic mill board/folding board carton size wise to form a unit pack. 8 such unit packs are to be packed in a seven ply grade one fibre board corrugated slotted box to form a case pack. Cases are to be sealed with 40-50 mm self adhesive tape and further wrapped in waterproof hessian/HDPE sheet and securely stitched with not less than six stitches per dm and strip bound appropriately. All boxes are to be legibly marked with assignment details in 40 mm size standard stenciled/printed marking. Hand written marking is not permitted.

SAMPLING

- 1 The sample procedure given below shall give desired protection to the buyer and seller provided the lot submitted for inspection is homogenous. To achieve this, the manufacturer shall maintain a system of process control at all stages of manufacture and shall ensure that the socks tendered by him for inspection comply with the requirements of his standard in all respects.

e. For effective process control, the use of statistical quality control techniques is recommended and a helpful guidance may be obtained in this respect from IS:397.

- 2 Lot. In any consignment, all pairs of socks of the same composition, colour and weight shall constitute a lot.

2.1 The conformity of a lot to the requirements of this standard shall be determined on the basis of the tests carried out on the samples selected from it.

10.3 Unless otherwise agreed to between the buyer and the seller, the number of pairs of socks, depending upon the size of the lot, shall be selected at random in accordance with Col.2 of Table 4.

TABLE-4 NUMBER OF PAIRS OF SOCKS TO BE SELECTED FROM A LOT AND PERMISSIBLE NUMBER OF NON-CONFORMING PAIRS

No of Pairs in the Lot	Non-Destructive Testing		Destructive Testing	
	Number of Pairs to be selected	Permissible Number of Non-Conforming Pairs	Number of Pairs to be Selected	Permissible Number of Non-Conforming Socks
1	2	3	4	5
Upto 50	10	1	2	0
51-100	20	2	2	0
101-200	30	3	2	0
201-300	40	3	3	0
301-500	50	4	5	0
501-800	70	6	7	1
801-1300	110	8	10	1
1301-3200	150	10	15	1
3201 and above	220	14	30	3

10.4 The sample size and the criteria for conformity for various characteristics shall be as follows :-

Characteristics	Sample Size	Criteria for Conformity
Dimensions, courses per decimeter and freedom from defects	All the pairs selected according to Col.2 of Table 4	Non-conforming pairs not to exceed the corresponding number given in Col.3 of Table 4
Mass	All the pairs selected according to Col.2 of Table 3 and made into sets of 10 pairs each	Each observed value to satisfy the specified requirement
Specification for wool ops, dimensional change (due to relaxation), pII value, scouring loss, colour fastness to various agencies except light colour fastness to light	One sock from each pair selected according to Col.4 of Table 4	Non-conforming pairs not to exceed the corresponding number given in Col.5 of Table 4
Colour fastness to light	One sock upto 500 pairs and two above that	Each observed value to satisfy the specified requirement

METHOD OF TEST
(Tables 2 and 3)

CONDITIONING OF TEST SPECIMENS AND ATMOSPHERIC
CONDITIONS FOR TESTING

The test specimen shall preferably be conditioned for testing and tested in the standard atmosphere as given in IS:6359-1971.

DIMENSIONS

Procedure. Take each sock from the test sample. Lay it flat on a horizontal surface. Remove all creases and wrinkles without distorting the specimen. Measure length to the nearest 5 mm, the dimensions given in Table 2.

MASS

Procedure. Take a set of 10 pairs of socks from the test sample. Condition them to moisture equilibrium for 24 hrs and weight them to an accuracy of 10g. Also determine mass of individual pair of socks.

COURSES PER DECIMETER

Procedure. Take one of the socks from the test sample and lay it flat on a table. Remove all creases and wrinkles without distorting it. Count with the help of a pick glass magnifying glass the total number of wales and courses per decimeter of the fabric at different places and determine the average.

DIMENSIONAL CHANGE DUE TO RELAXATION

Apparatus

Watertight Tray of a suitable size, at least 10 cm deep.

Graduated Steel Rule.

5.2 Marking of Test Specimens. As illustrated in Fig.1, mark on each test specimen by means of indelible ink or fast dyed cotton sewing thread, three points X, Y and Z, such that :-

- (a) All the three points are on the same wale.
- (b) Point X is on the top portion.
- (c) Point Y is on the heel gore line.
- (d) Point Z is on the toe portion of the sock.

Note. The colour of the indelible ink or sewing thread shall be in contrast with that of the sock so that it is easy to measure the distances.

5.3 Procedure

5.3.1 Take one of the socks from the test sample. Place the specimen on a glass plate. Remove carefully all wrinkles and creases without distorting the specimen. Place another glass plate on the specimen. Measure correct to the nearest millimeter, the distance between X and Y and between Y and Z.

5.3.2 Lay the test specimen in flat position in a water tray and soak it under a head of 25 mm of water at room temperature for 2 hrs. At the end of this period, without removing the specimen, drain the water from the tray and dry the specimen on a flat surface. Condition the specimen again in the standard atmosphere for 24 hrs.

Note Wetting agent may be added to the water in the tray while soaking the specimen.

5.3.3 Measure again, correct to the nearest millimeter, the distance between X and Y and between Y and Z.

5.4 Calculation. Calculate, correct to one place of decimal, the percentage dimensional change between the points X and Y and between Y and Z by the formula given below :-

$$\text{Dimensional change, percent} = \frac{100(a-b)}{a}$$

where,

a = distance between the two points X and Y, or Y and Z before soaking.

b = distance between the same points after soaking.

SCOURING LOSS

Test Specimen. Cut about 10 g of fabric from each test sample. This shall constitute a test specimen.

Procedure

Dry the test specimen to a constant mass in the drying oven at 105 ± 3 Deg C and weigh its mass accurately.

Constant mass shall be deemed to have been reached if the difference between any successive weights at an interval of 20 minutes is less than 0.05 percent.

Extract the test specimen with a mixture of benzene and methyl alcohol, for four hours at the rate of traverse of 5 extractions per hour taking care to place the specimen in a Soxhlet and covered with cotton wool previously extracted with the above said mixture of benzene and methyl alcohol, the solvent shall then be distilled off from the extract. Dry the residue to a constant mass at 105 ± 3 Deg C and determine its mass accurately.

Calculation. Calculate the scouring loss by the formula given below :-

$$\text{Scouring loss, percent} = 100 \frac{a}{b}$$

where,

a = mass of the dry residue.

B = mass of the specimen before extraction.

TABLE-1 PARTICULARS OF KNITTING, LINKING AND SPLICING YARN
(Clause 3.1.1)

Sl. No.	Fibre Composition		Fibre Length mm	Grade of Wool Tops/Fibre Fineness	Approximate Count		Single Thread Breaking Load, min (Notes 1 and 2)	
	Fibre	Percent			Knitting and Linking Yarn	Splicing Yarn	Knitting and Linking Yarn mN(gf)	Splicing Yarn mN(gf)
1.	Wool Crimped Nylon 6	70 15	80 min 80-120	Not less than 64s 0.33 to 0.44 tex (3 or 4 denier)	80 tex x 3 (12.5 Nm/3)	80 tex (12.5 Nm)	13725 (1400)	3135 (320)
2.	Viscose Rayon	15	80-120	0.33 to 0.44 tex (3 or 4 denier)				

Note-1. The breaking load of yarn shall be determined on a test length of 500 mm using a constant rate of traverse type machine at a rate of traverse of 300 ± 15 mm per minute.

Note-2. The breaking load values of yarn removed from the knitted fabric shall not be less than 95 percent of the specified values.

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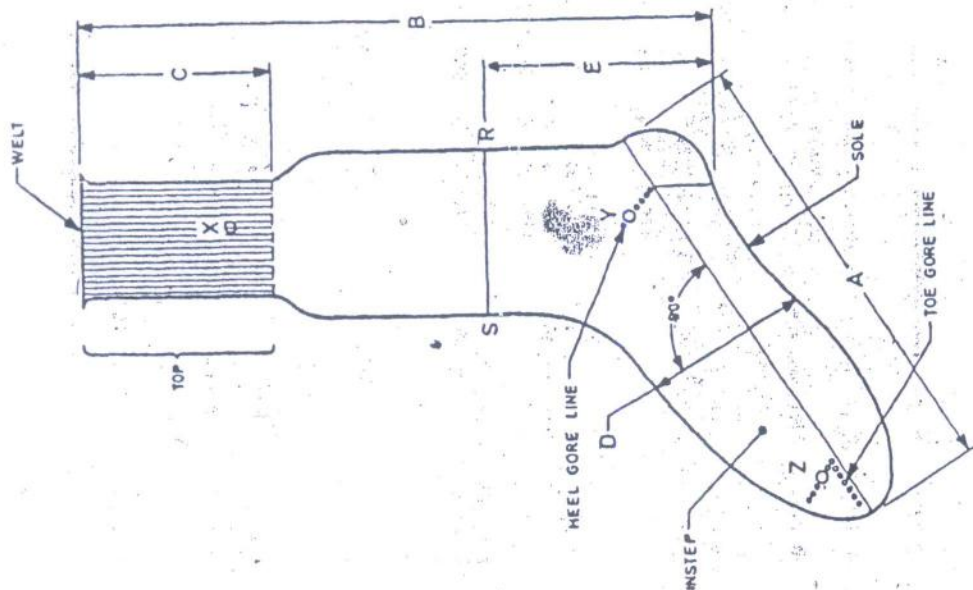


FIG. 1 A TYPICAL SOCK

4.2 The rib top and leg portions of the socks shall be joined by transferring loop for loop without sewing or seaming. The socks shall be spliced throughout the foot and the leg up to the portion marked in Fig. 1 (up to the line SR in the figure). The splicing shall be even, free from creases and folds, and similar in construction to the fabric of the socks. The socks shall be linked over the toe, and the linking shall be elastic, smooth

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