



DRAFT TANZANIA STANDARD

Textiles – Cotton socks – Specification

DRAFT FOR STAKEHOLDERS' COMMENTS ONLY

TANZANIA BUREAU OF STANDARDS

0 Foreword

This Draft Tanzania Standard is issued to help manufacturers of knitted nylon socks to come up with products of defined quality. Cotton socks are generally made on circular knitting machines, and this Tanzania Standard covers the requirements of these types of socks only.

In the preparation of this Tanzania Standard, assistance was derived from:

IS 3329: 1973, *Specification for cotton socks*, published by the Bureau of Indian Standards.

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1. SCOPE

This Draft Tanzania Standard specifies performance requirements, sampling, and test methods of seamless cotton socks knitted in plain or rib stitches having rib top. The socks may be bleached or dyed.

2. NORMATIVE REFERENCES

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies:

TZS 23: *Textiles – Test for colour fastness to light: Xenon arc*

TZS 26: *Textiles – Determination of conductivity, pH, water-soluble matter, chloride, and sulphate in aqueous extracts*

TZS 40: *Textiles – Tests for colour fastness to light: Daylight*

TZS 44: *Textiles – Woven or knitted fabrics – Determination of length and width*

TZS 27: *Determination of dimensional change of woven fabrics-Cold water immersion*

TZS 138: *Textiles – Test for colour fastness to rubbing*

TZS 24: *Method for determination of colour fastness of textile materials to washing.*

Test 4: *severe washing*

TZS 280: *Textiles – Tests for colour fastness – colour fastness to perspiration*

TZS 326: *Textiles – Ternary fibre mixtures – Quantitative analysis*

TZS 327: *Textiles – Binary fibre mixtures – Quantitative chemical analysis*

3. TERMS AND DEFINITIONS

For the purpose of this Draft Tanzania Standard the following terms and definitions shall apply:

3.1 socks

knitted covering for the foot usually worn under shoes and extending above the ankle and sometimes to the knee

4. TYPES OF SOCKS

The socks shall be of two types, Type I and Type II:

a) Type I

Top	1 x 1 rib
Leg (below top up to the ankles and instep portion)	7 x 1 rib
Foot single (sole)	Plain

b) Type II

Top	1 x 1 rib leg
Foot	Plain

5. MANUFACTURE

5.1 Yarn

The cotton yarn used for knitting the socks, linking and splicing shall be evenly spun and uniformly twisted. The count of yarn used for knitting socks of Type I shall be 10 tex x 2 (60 s/2) and of Type II shall be 36 tex x 2 (20 s/2).

5.2 Socks

Socks shall generally be of the design as shown in Figure 1.

5.2.1 Socks shall be knitted seamless on circular knitting machines. The heel and toe shall be knitted on either the front half or the back half of the machine.

5.2.2 Linking

The socks shall be securely linked over or under the toe either by hand stitching or by linking machine. In the case of hand linking, the linking yarn shall be a 2-ply cotton yarn of strength not less than that of the yarn used in knitting the socks.

In the case of machine linking the cotton sewing thread of 10 tex x 3 (60 s/3) shall be used in the needle and cotton yarn of the same count and quality as used for knitting in the looper. The shade of the linking yarn and sewing thread shall conform to that of knitting yarn.

The length of free ends of linking yarn and other loose ends, if any shall be not less than 13 mm and not more than 25 mm. The linking shall not give way when the socks are stretched to the full extent of the elasticity of the knitted fabric without breaking. The linking shall be smooth and free from lumps and knots.

5.2.3 Splicing

The socks of Type I shall be spliced either at the heel and the toe portion or at the whole foot (including heel and toe) as required by the buyer. The socks of Type II are normally not spliced. If required by the buyer these socks shall be spliced at the heel and toe portions. The heel may be high spliced if so desired.

The yarn used in the splicing shall be cotton yarn 2 to 3 times finer than the yarn used for knitting. The shade for splicing yarn shall conform to that of knitting yarn except where it is specifically prescribed otherwise by the buyer.

5.3 Freedom from defects

Socks should be free from manufacturing defects, such as large mends, ladders, dropped stitches, holes, improper splicing, etc. Dyed socks shall be free from dyeing defects, such as streakiness and uneven dyeing and white socks shall be free from defects such as blueing agents. Socks shall be supplied in dry and clean condition and free from filling materials.

6. REQUIREMENTS

6.1 Dimensions and weight

The socks of a particular size shall conform to the requirements of Table 1 or Table 2 as the case may be.

NOTE – Size of socks is denoted by a number which is the numerical value of the foot length in centimeters. For example, a 25-size represents the socks having a foot length of 25 cm.

6.2 Other requirements

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

7. PAIRING

Socks shall be matched and paired according to type, size, shade, and colour combination. A tolerance of 1.2 cm in the leg length and 0.5 cm foot length of socks shall however be permissible while pairing.

8. MARKING

A label or any other suitable method of labeling bearing the following information shall be attached to each pair of socks:

- description of the material, 100% cotton.
- manufacturer's name, or reference (initials or trademark) and if required supplier's name or reference
- size – indicating whether large, medium, small or extra small.

Table 1 – Constructional details and other particulars of cotton socks type I

Size	Foot length: (Distance From D to E through H), cm	Leg length (Distance from A to C through H), cm	Width of leg and foot (Distance from K to L or M to N, cm)	Depth of rib top, cm	Total number of wales (needles)	Number of courses per 5 cm	*Min. weight per 10 pairs, gm	Type of knit
23	23	28	9.0	11.5	136	48	425	Rib-knit
24	24	29	9.0	11.5	136	48	425	
25	25	30	9.0	11.5	144	48	455	
26	26	31	9.5	12.0	144	48	455	
27	27	32	9.5	12.0	144	48	480	
28	28	33	9.5	12.0	144	48	510	
29	29	34	9.5	12.5	152	48	540	
30	30	35	10.0	12.5	152	48	570	
31	31	36	10.0	12.5	152	48	570	
Tolerances	+5 -0	+2 -1	± 0.5	± 0.5	-	± 2		
Method of test	A.3	A.3	A.3	A.3	A.4	A.4	A.5	

*NOTE – A minus tolerance of 3 percent in the weight shall be permissible for individual pairs of socks provided the average minimum weight per 10 pairs is maintained as stipulated for the respective size.

Table 2 – Constructional details and other particulars of cotton socks, type II

Size	Foot length (Distance from D to E through H), cm	Leg length (Distance from A to C through H), cm	Width of leg and foot (Distance from K to L or M to N), cm	Depth of rib top, cm	Total number of wales, (needles)	Number of courses per 5 cm	*Minimum weight per 10 pairs	Type of knit
15	15	15	8.0	9.5	84	35	270	Plain knit
16	16	16	8.0	9.5	84	35	270	
17	17	17	8.0	9.5	84	35	300	
18	18	18	8.0	9.5	84	35	330	
19	19	19	8.0	9.5	84	35	330	
20	20	20	8.0	9.5	84	35	350	
21	21	21	9.0	9.5	96	35	365	
22	22	22	9.0	9.5	96	35	410	
23	23	23	9.0	10.0	96	35	425	
24	24	24	9.5	10.5	108	35	480	
25	25	25	9.5	10.5	108	35	540	
26	26	26	9.5	11.5	108	35	565	
27	27	27	9.5	11.5	108	35	595	
28	28	28	9.5	11.5	108	35	650	
29	29	29	9.5	12.0	108	35	710	
30	30	30	9.5	12.0	108	35	740	
31	31	31	9.5	12.0	108	35	765	
Tolerance	+0.5 -0	+2 -1	± 0.5	± 0.5	-	± 2	-	
Method of test	A.3	A.3	A.3	A.3	A.4	A.4	A.5	

*NOTE – A Minus tolerance of 3 percent in the weight shall be permissible for individual pair of socks provided the average minimum weight per 10 pairs is maintained as specified for the respective size.

Table 3 – Requirements of socks

Parameter			Requirement	Test method
Dimensional changes, Shrinkage or elongation, %, <i>max.</i>			±2.5	Annex A 5
pH value			6.0 to 8.5	TZS 26
Colour fastness to	i) Light		4 or better	TZS 23
	ii) Washing		4 or better	TZS 24
	iii) Rubbing	Dry	4 or better	TZS 138
		Wet	3 or better	TZS 138
	iv) Perspiration		4 or better	TZS 280
Dye properties	Non-carcinogenic Non-allergic			TZS 2007-2

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9. PACKING

9.1 Each pair of socks shall be suitably clipped at the heel, toe, and top portion. The clipped pair shall be folded properly at the heel gore line to form two layers. Each folded pair shall be placed in a polyethylene or cellophane bag of suitable size.

9.2 The socks in bags shall be packed in cardboard boxes of suitable sizes. The number of socks in a box shall be as agreed to between the buyer and the seller.

9.3 Each unit cardboard box shall be marked with the following:

- a) Name of the product, i.e. Cotton socks
- b) Size - Large, medium, small or extra small
- c) Manufacturer's name, address, and/or trademark
- d) Number of pairs in a package
- e) Batch number

10. SAMPLING

7.1 Lot

In any consignment, all pairs of socks of the same type, colour, and size shall be grouped to constitute a lot.

7.1.1 The conformity of the lot to the requirements of this Draft Tanzania Standard shall be determined based on tests carried out on the samples selected from the lot.

7.1.2 Unless otherwise agreed upon between the buyer and seller, the number of pieces to be selected at random from a lot shall be in accordance with Table 4.

Table 4 – Sampling size and permissible number of non-conforming pieces

Number of pairs in the lot	Non-destructive testing		Destructive testing	
	Number of pairs to be selected	The permissible number of non-conforming pairs	Number of pairs to be selected	The permissible number of non-conforming pairs
Up to 50	10	1	2	0
51 to 100	20	2	2	0
101 to 200	30	3	2	0
201 to 300	40	3	3	0
301 to 500	50	4	5	0
501 to 800	70	6	7	1
801 to 1300	110	8	10	1
1301 to 3200	150	10	15	2
3201 and above	220	14	30	3

Annex A

Methods of tests

A.1 Conditioning of test specimens and atmospheric conditions for testing

A.1.1 Conditioning

Before the test, the test specimens shall preferably be conditioned to moisture equilibrium in a standard atmosphere at $65 \% \pm 2 \%$ relative humidity and $27 \% \pm 2 ^\circ\text{C}$ temperature.

When the test specimens have been left in such an atmosphere for 24 h in such a way as to expose as far as possible, all portions of the specimens to the atmosphere, they shall be deemed to have reached moisture equilibrium.

A.1.2 Atmospheric conditions for testing

The tests shall preferably be carried out in the standard atmospheric conditions.

A.2 Dimensions

Procedure – Take each sock from the test sample. Lay it flat on a horizontal surface. Remove all the creases and wrinkles without distorting them. Measure to the nearest 5mm, the dimensions given in table 1 or table 2 as the case may be.

A.3 Wales and courses

Procedure – Take each sock from the test sample. Lay it flat on a horizontal surface. Remove all the creases and wrinkles without distorting them. With the help of a pick glass or magnifying glass, count the number of wales including any fraction on the other side of the sock, and finally, add the two values so obtained. Count the number of courses per 5 cm on either the leg or foot portion of the sock.

NOTE – In case it is difficult to count the number of courses due to the design of the sock, the courses may be counted on the inside, turning the sock inside out.

A.4 Weight

A.4.1 Drying oven

Suitable for drying the specimens to constant mass at $105 ^\circ\text{C} \pm 3 ^\circ\text{C}$ temperature and equipped with weighing balance arranged to weigh with an accuracy of 0.5 g while the specimen is suspended within the drying chamber; the holder of the specimen shall be of such type as to ensure free access of dry air to all portions of the specimen.

A.4.2 Procedure

Take 10 pairs of socks from the socks constituting the test sample. Dry them to constant mass in the drying oven and determine the collective mass.

NOTE – Constant mass shall be deemed to have been reached if the difference between successive weighing at an interval of 20 min is less than 0.05% of the first two weighings.

A.4.3 Determine the mass as given below:

$$W = \frac{G (1 + R)}{100}$$

Where

W= mass, in g, of 10 pairs of socks

G = oven-dry mass, in g, of socks, as determined in A.5.2 and

R = moisture regain value for cotton.

NOTE – If the correct moisture regains value is not available, it should be taken as 8.5%.

A.5 Dimensional change (due to relaxation)

A.5.1 Apparatus

Watertight tray of suitable size and at least 100 mm deep and graduated steel rule.

A.5.2 Marking of test specimens

As illustrated in figure 1, mark on each test specimen using indelible ink or fast dyed cotton sewing thread, a set of 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, and
- d) point Z is on the toe portion of the sock.

A.5.3 Procedure

A-5.3.1 Take one of the socks constituting the test sample. Place the specimen on the glass plate, carefully remove all wrinkles and creases without distorting the specimen and place the other glass plate on the test specimen. Measure separately correct to the nearest millimeters the distance between X and Y and between Y and Z.

A.5.3.2 Take the test specimen, laying it flat under a head of 25 mm of water containing 0.5% suitable wetting agent at 30°C to 35°C for two hours in the watertight tray. At the end of this period without removing the test specimen, drain the water out of the tray and dry the specimen on the flat surface at room temperature. Condition it again in the standard atmosphere for 24 h. Measure separately, correct to the nearest millimeter, the distance between X and Y and that between Y and Z.

A.5.4 Calculate separately, correct to one place decimal point, the percentage dimensional changes between the points X and Y and that between Y and Z by the formula given below:

$$S = \frac{100 \times (a - b)}{a}$$

where

s = dimensional change, % a = distance between two points X and Y or Y and Z b = distance between the same points after soaking.

A.5.5 Calculate the average dimensional change between the two sets of points, namely, X, Y, and Z.

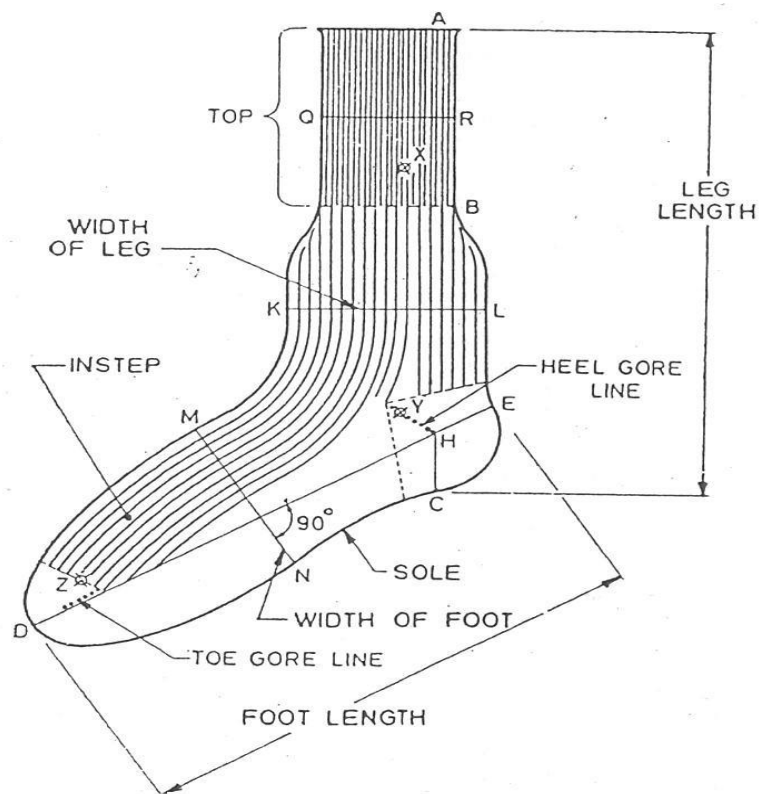


Figure 1 – 'Rib top' cotton sock