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DRAFT UGANDA STANDARD

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Textiles — Cotton yarn — Part 2: Hosiery

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Foreword

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(a) a member of International Organisation for Standardisation (ISO) and

(b) a contact point for the WHO/FAO Codex Alimentarius Commission on Food Standards, and

(c) the National Enquiry Point on TBT Agreement of the World Trade Organisation (WTO).

The work of preparing Uganda Standards is carried out through Technical Committees. A Technical Committee is established to deliberate on standards in a given field or area and consists of key stakeholders including government, academia, consumer groups, private sector and other interested parties.

Draft Uganda Standards adopted by the Technical Committee are widely circulated to stakeholders and the general public for comments. The committee reviews the comments before recommending the draft standards for approval and declaration as Uganda Standards by the National Standards Council.

The committee responsible for this document is Technical Committee UNBS/TC 7, Textiles, Paper and Leather Products, Subcommittee SC 1, Textiles and related products.

WDUS 2260 consists of the following parts, under the general title *Textiles — Cotton yarn*

- — *Part 1: Weaving*
- — *Part 2: Hosiery*

Textiles — Cotton yarn — Part 2: Hosiery

1 Scope

This Draft standard specifies requirements of spun (single and doubled) grey cotton yarn for use in knitting (hosiery).

This standard does not cover yarn produced from blends of cotton with man-made fibres or any other fibre.

2 Normative references

The following referenced documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 2, *Textiles — Designation of the direction of twist in yarns and related products*

US ISO 2060, *Textiles — Yarn from packages — Determination of linear density (mass per unit length) by the skein method* ISO 2061, *Textiles — Determination of twist in yarns — Direct counting method*

ISO 2062, *Textiles — Yarns from packages — Determination of single-end breaking force and elongation at break using constant rate of extension (CRE) tester*

ISO 6741-1, *Textiles — Fibres and yarns — Determination of commercial mass of consignments — Part 1: Mass determination and calculations*

ISO 6939, *Textiles — Yarns from packages —Method of test for breaking strength of yarn by the skein method*

ISO 16549, *Textiles — Unevenness of textile strands — Capacitance method*

ISO 17202, *Textiles — Determination of twist in single spun yarns — Untwist/retwist method*

ASTM D2255, *Standard test method for grading spun yarns for appearance*

ASTM D5647, *Standard guide for measuring hairiness of yarns by the photo-electric apparatus*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
cotton count (Ne)
number of hanks (each measuring 768 m or 840 yd) in 453.6 g (or 1 lb)

3.2
count lea strength product (CSP)
product of the lea breaking load in pounds and cotton count

3.3
grey cotton yarn
yarn as it leaves the spinning frame without any bleaching, dyeing or finishing treatment

Note 1 to entry: The yarn may be waxed or unwaxed

3.4
hairiness index
total length of protruding fibres in the yarn in cm with reference to the sensing length of 1 cm yarn

3.5
lea
continuous length of yarn measuring 109.73 m (120 yd) in the form of a coil having 80 wraps wound on a reel of 1.37 m (1.5 yd) girth

3.6
breaking load
maximum load (or force) applied to a specimen in a tensile test carried to rupture

3.7
single yarn tenacity
tensile stress of a single strand at rupture expressed as force per unit linear density of the unstrained specimen expressed usually as cN/tex (gf/tex).

3.8
tex
number of grams per kilometre of yarn

3.9
ring spun yarn
yarn spun on a system employing flat top cards and roller drafting assemblies with or without aprons on drawing, roving and ring frames

3.10
doubled yarn
yarn in which two or more single yarns are twisted together in one or two operations.

4 Requirements

4.1 General

4.1.1 Yarn Count

4.1.1.1 The average resultant count of yarn shall be as agreed between the purchaser and manufacturer.

4.1.1.2 A tolerance of ± 3.0 percent shall be permissible on the count of yarn

4.1.1.3 Yarn count shall be determined in accordance with US ISO 2060.

4.1.2 Yarn twist

4.1.2.1 The twist in yarn shall be as agreed to between the purchaser and manufacturer. However, the twist multiplier of single yarn shall not exceed 3.8 in case of combed yarn and 4.0 in case of carded yarn.

4.1.2.2 The number of turns per unit length shall be determined in accordance with ISO 2061 or ISO 17202. The direction for twist shall be indicated by the capital letter “S” or “Z” as specified in ISO 2.

4.1.2.2 The average twist shall be within ± 10 percent and ± 5 percent of the specified value for single spun yarn and doubled yarn respectively

NOTE Twist multiplier is calculated as follows:

$$Twist\ multiplier = \frac{Turns/inch}{\sqrt{Cotton}\ count, Ne}$$

4.1.3 Moisture regain

Unless otherwise agreed to between the purchaser and manufacturer, the moisture regain shall not exceed 8.5 percent when determined in accordance with ISO 6741-1.

4.1.4 Yarn appearance

When determined in accordance with ASTM D2255, the average black board appearance (5 boards) shall be at least of Grade B. In case of yarn counts coarser than 98 tex (6s), this shall be as agreed to between the purchaser and the manufacturer.

4.1.5 Freedom from defects

The yarn on cones/cheeses shall be free from the following defects:

a) stitches of more than 2.5 cm in length at the base;

b) excessive stitches at the nose;

c) soft cones or cheeses;

d) prominent stains inclusive of chalk and other markings;

e) cut threads;

f) absence of tail end where it is required and the length of the tail-end should not be less than 30 cm;

g) entanglement;

h) presence of hard waste;

i) ribbon formation;

j) drum cuts;

k) count mix up.

4.2 Hosiery single yarn

4.2.1 Hosiery single grey cotton carded or combed yarn shall comply with the requirements given in Table 1 or Table 2 respectively.

4.2.2 When determined in accordance with ISO 6939, the coefficient of variation of lea breaking load shall not exceed 10.0 percent

Table 1 — Performance requirements of carded hosiery single yarn

Parameter	Requirements							Test Method
	≥ 59 tex (≤ 10s)	36.9 tex – 53.7 tex (10s – 16s)	29.5 tex – 34.7 tex (17s – 20s)	20.3 tex – 28.1 tex (21s – 29s)	15.1 tex – 19.7 tex (30s – 39s)	10.9 tex – 14.8 tex (40s – 54s)	10.9 tex (54s) and finer	
Count CV, %, Max.	1.80	2.00	2.00	2.00	2.20	2.20	2.40	US ISO 2060
CSP, Min.	1 700	1 800	1 800	1 900	1 900	2 000	2 100	Annex A
Yarn Tenacity cN/tex, Min.	13.0	13.5	14.0	15.0	15.5	16.0	16.0	ISO 2062
Lea breaking load CV, %, Max.	6.0							ISO 6939
Yarn Tenacity CV, %, Max.	11.0	11.0	11.5	11.5	12.0	12.0	12.5	ISO 2062
Breaking elongation, %, Max.	5.6					5.3	5.0	ISO 2062
Unevenness, %, Max.	11.00	11.50	11.80	12.50	13.00	15.00	15.50	ISO 16549
Hairiness Index, Max.	10.0	9.0	8.5	8.0	7.5	6.5	6.0	ASTM D5647
Imperfections/Km.								ISO 16549
Thin	3	3	8	12	20	50	50	
Thick	85	90	120	180	260	275	350	
Neps	90	100	172	238	420	475	800	
Total	178	193	300	430	700	800	1 200	

NOTE The unevenness percentage (U %) and the imperfections per Km of the yarn on packages shall not exceed the values given in Table 1 when tested at a speed of 400 m/min and at sensitivity of -50%, +50% and +200% for thin places, thick places and neps respectively

Table 2 — Performance requirements of combed hosiery single yarn

Parameter	Requirements								Test Method
	≥ 59 tex (≤ 10s)	36.9 – 53.7 tex (10s – 16s)	29.5 – 34.7 tex (17s – 20s)	20.3 – 28.1 tex (21s – 29s)	15.1 – 19.7 tex (30s – 39s)	10.9 – 14.8 tex (40s – 54s)	7.9 - 10.7 tex (55s – 74s)	7.8 tex (75s) and finer	
Count CV, %, Max.	1.60	1.80	1.80	1.80	1.80	1.80	2.20	2.20	US ISO 2060
CSP, Min.	2 000	2 100	2 100	2 200	2 200	2 300	2 350	2 300	Annex A
Lea breaking load CV, %, Max.	5.5	6.0	6.2	6.4	6.6	6.6	6.8	7.0	ISO 6939
Yarn Tenacity cN/tex, Min.	14.0	14.0	14.5	15.0	15.5	16.0	16.5	16.5	ISO 2062
Yarn Tenacity CV,	9.0	9.0	9.0	9.5	9.5	10.0	10.5	10.5	ISO 2062

%, Max.									
Breaking elongation, %, Max	5.0					4.8	4.8	4.6	ISO 2062
Unevenness, %, Max	8.20	8.50	8.80	9.60	10.50	12.00	12.50	13.50	ISO 16549
Hairiness Index	6.5	6.0	5.7	5.5	5.0	4.5	4.0	3.5	ASTM D5647
Imperfections/Km									
Thin	0	0	0	0	1	4	12	35	ISO 16549
Thick	4	8	9	14	22	38	72	125	
Neps	6	15	18	26	47	78	146	240	
Total	10	23	27	40	70	120	230	400	
NOTE The unevenness percentage (U %) and the imperfections per Km of the yarn on packages shall not exceed the values given in Table 2 when tested at a speed of 400 m/min and at sensitivity of -50%, +50% and +200% for thin places, thick places and neps respectively									

4.3 Doubled yarn

4.3.1 The single yarn used for producing doubled yarn shall satisfy the requirements specified in 4.1 and 4.2.

4.3.2 The count lea strength product (CSP) of doubled yarn shall not be less than the value calculated by the following relationship:

$$CSP\ of\ doubled\ yarn = 1.10 \times CSP\ of\ corresponding\ single\ fold\ yarn\ given\ in\ either\ Table\ 1\ or\ Table\ 2$$

4.3.3 The coefficient of variation of the lea count shall not exceed 2.0 percent

4.3.4 The coefficient of variation of the lea breaking load shall not exceed 7.0 percent.

5 Labelling

5.1 Each cone or cheese of yarn shall be marked with the following:

a) name of material i.e. 100% ‘Carded Hosiery Cotton’ or ‘Combed Hosiery Cotton’;

b) count of yarn in ‘Ne’ or ‘tex;’

c) lot number;

d) manufacturer’s name, trademark or other means of identification;

e) individual package size/mass;

f) packaging and storage conditions.

5.2 Each case containing cones or cheeses shall be marked with the following:

a) name of material;

b) count of yarn in ‘Ne’ or ‘tex;’

c) lot number;

d) manufacturer's name, trademark or other means of identification;

e) gross mass of bale or case;

f) net mass of bale or case;

g) packaging and storage conditions; and

h) Country of origin

6 Packaging

Cones or cheeses of yarn shall be packaged in suitable packaging materials which shall protect the product from damage during transportation, handling and storage. Cones or cheeses shall be packaged in unit packages and thereafter into bulk cases.

7 Sampling

7.1 In any consignment, the cases containing yarn of the same type and of the same nominal count shall constitute a lot.

7.2 Samples shall be drawn from each lot to determine its conformance with the requirements of the standard.

7.3 Unless otherwise agreed to between the buyer and the seller, the number of cases to be selected from a lot shall be in accordance with Table 7. The bales or cases shall be selected at random.

7.4 In case two or less cases are selected in the sample, at least 10 cones or cheeses shall be drawn at random from each of the selected case. However, in case three or more cases are selected in the sample, at least five cones or cheeses shall be drawn at random from each of the selected case.

Table 7 — Sampling

Lot Size	Sample Size
Up to 3	1
4 – 10	2
11 – 30	3
31 – 50	5
Over 50	8

Annex A

(normative)
Calculation of count strength product (CSP)

CSP is obtained by the following relationship:

$$CSP = Breaking\ load\ of\ a\ lea\ in\ Kg \times 2.2046 \times cotton\ count\ (Ne)$$

Where;

The breaking load is determined in accordance with ISO 6939

Cotton count (Ne) is determined in accordance with US ISO 2060

Bibliography

IS 834:2006, *Textiles — Ring spun grey cotton yarn for hosiery — Specification*

Certification marking

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