Specification for staple spun yarns

Part 5. Polyester Yarns

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First Edition 2022

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State Department for Industrialization Directorate of Agro-Industries
Spin Knit Ltd
Kenya Association of Manufacturers (KAM)
Kenya Agricultural & Livestock Research Organization (KALRO)
Agriculture and Food Authority- Fibre Crops Directorate (AFA-FCD)
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Foreword

This Kenya Standard has been prepared by the Technical Committee on Yarns and Fibers under guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

Yarn quality affects not only the efficiency of fabric production but also the fabric quality. Yarn quality specification will therefore be of utmost importance and interest to the spinner, weaver, knitter and yarn merchant. Yarns are produced in a wide range of counts (linear densities) or varying fibre blend compositions and proportions for various end-users. This Kenya Standard takes into consideration all the variations and specifies only the minimum requirements for essential quality characteristics of yarns.

During the development of this standard reference was made to the following:

KS 1113-1:1993 Specification for Spun Yarns - Part 1: Cotton Yarns.
KS 1113-3:1993 Specifications for Spun Yarns- Part 3: Polyester/Cellulose Blended Yarns

Acknowledgment is hereby made for assistance received from this source.

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1 SCOPE

This Part of this Kenya Standard specifies the requirements for 100 per cent polyester spun yarns.

2 NORMATIVE REFERENCES

The following referenced documents 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.

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

KS EAS 257, *Methods for estimation of moisture, total size for finish, ash, fatty matter and determination of water-soluble matter in textiles.*

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

KS ISO 2060, *Textiles — Yarn from packages — Determination of linear density (mass per unit length) by the skein method.*

KS ISO 2061, *Textiles — Determination of twist in yarns — Direct counting method.*

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

KS ISO 1139, *Textiles — Designation of yarns.*

KS ISO 1144, *Textiles — Universal system for designating linear density (Tex System).*

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3 DEFINITIONS

For the purpose of this Part XXX of this Kenya Standard, the following definitions together with those given in KS ISO 1139 and KS ISO 1144 shall apply:

3.1 linear density — The mass per unit length of a yarn. It is expressed in tex, or multiples or submultiples thereof.

3.2 tex — Number of grams per kilometer of yarn.

3.3 breaking force — The maximum force applied to a specimen in a tensile test carried to rupture. It is expressed in Newtons, centiNewtons or milliNewtons.

3.4 tenacity — The ratio of the tension to the linear density of an unstrained specimen. It is expressed in Newtons per tex or centiNewtons per tex.

3.5 breaking tenacity — The tenacity corresponding to the breaking force.

NOTE: The breaking tenacity is calculated from the breaking force and the linear density of the unstrained specimen, or, for specimens of known linear density, obtained directly from tensile testing machines, which can be suitably adjusted to indicate tenacity instead of breaking force.

3.6 twist — The number of turns about the axis of a length of specimen equal to the nominal gauge length before untwisting. Twist shall preferably be expressed in turns per metre (t.p.m.) but may also be expressed in turns per centimetre (t.p.cm.).

3.7 elongation per cent — The increase in length of a specimen expressed as a percentage of the original length; extension per cent.

NOTE: In a tensile test, the elongation per cent, or extension per cent, is calculated on the basis of the nominal gauge length of a pre-tensioned specimen.

3.8 elongation at the breaking force — The elongation produced by the breaking force, i.e. the maximum force.

3.9 yarn packages — A length or lengths of yarn in a form suitable for use, handling, storing or shipping. Packages may be unsupported, such as balls, skeins or cakes or supported, such as bobbins, cops, cones, pirns, spools, tubes, or beams.

3.10 moisture regain — The mass of moisture present in a textile material expressed as a percentage of the oven-dry mass.

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4. REQUIREMENTS

4.1 Linear Density — The nominal linear density of the yarn shall be as declared, subject to a tolerance of ± 3 per cent. This shall be determined in accordance with KS ISO 2060.

4.2 Coefficient of Variation of Linear Density — The coefficient of variation of the linear density of the yarn shall not exceed 2.5 per cent. The coefficient of variation (C.V.) of the yarns shall be determined from the following formula:

$$\text{C.V.} = \sqrt{\frac{\sigma}{\bar{x}}} \text{X} 100\%$$

where,

$$\sigma = \sqrt{\frac{\sum \left(\bar{x} - x\right)^2}{n}}$$

where,

x = the linear density in tex of any yarn sample;

$\bar{x}$ = the mean linear density in tex of all the yarn samples;

n = the total number of samples; and

σ = the standard deviation in tex.

4.3 Yarn Twist — The turns per metre (or centimetre) of the yarn shall be as declared subject to a tolerance of ± 5 per cent. This shall be determined in accordance with KS ISO 2061.

4.4 Elongation at the Breaking Force — The minimum elongation at the breaking force of the yarn shall be 5 per cent.

4.5 Breaking Tenacity — The minimum breaking tenacity of the yarn shall be as specified in Table 1. The breaking tenacity of the yarn shall be determined in accordance with KS ISO 2062.

4.6 Yarn Unevenness (Irregularity) — The yarn unevenness in terms of coefficient variation (% C.V.) shall be determined in accordance with KS ISO 16549.

4.6.1 *Ring Spun Yarns* — The coefficient of variation (irregularity) of the carded ring spun yarns shall not exceed those specified in Table 2.

4.6.2 *Rotor Spun Yarns* — The coefficient of variations (irregularity) of the carded rotor spun yarns shall not exceed those specified in Table 3.

4.7 Moisture Regain — The moisture regain of the yarn shall not exceed 0.4 per cent. This shall be determined in accordance with KS EAS 257

4.8 Package Mass — The mass of the package shall be as declared subject to a tolerance of ±2 per cent. This shall be determined in accordance with KS ISO 6741-1

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TABLE 1 — REQUIREMENT FOR BREAKING TENACITY

SN	YARN TYPE	MINIMUM BREAKING TENACITY: CN/Tex
1.	Ring spun	24
2.	Rotor spun	22

TABLE 2 — REQUIREMENTS FOR EVENNESS FOR RING SPUN YARNS

SN No.	LINEAR DENSITY, tex	C.V. % Max.
1.	45-25	10.0
2.	24-20	11.0
3.	19-16	11.5
4.	15-13	12.5
5.	12-11	13.0
6.	10-9	13.5
7.	8-7.2	14.0
8.	7-6.4	14.5
9.	6.3-5.9	15.0
10.	Finer than 5.9	15.5

TABLE 3— REQUIREMENTS FOR EVENNESS FOR ROTOR SPUN YARNS

SN No.	LINEAR DENSITY, tex	C.V. % Max.
1.	Courser than 60	12.0
2.	60-35	12.5
3.	34-25	13.0
4.	24-20	13.5
5.	19-16	14.0
6.	15-12	15.0

5 WRAPPING AND PACKING

Yarn package(s) shall be wrapped in suitable wrappers or packed in suitable containers to protect them from damage while being handled or while on transit or in storage.

6. MARKING

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6.1 Unit Packages — Each unit package shall have a label bearing the following information:

a) Manufacturer's name and address or registered trade mark.
b) Linear density in tex.
c) Spinning method used, e.g. ring spun or rotor spun.
d) Name of material, i.e. 100 per cent polyester yarn.
e) Package mass.
f) Yarn twist in t.p.m or t.p.cm
g) Country of origin
h) Lot/batch number

6.2 Bulk Containers — Each bulk container shall have a label bearing the following information:

a) Manufacture's name and address or registered trade mark.
b) Name of material, i.e. 100 per cent polyester yarn.
c) Linear density in tex.
d) Quantity of pieces.
e) Spinning method used, e.g. ring spun or rotor spun.
f) Gross mass of the container.
g) Lot/batch number.
h) Country of origin

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