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INTERNATIONAL STANDARD

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Textiles — Cotton yarns — Specifications

Textiles — Fils de coton — Spécifications

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 10290 was prepared by Technical Committee ISO/TC 38, *Textiles*, Sub-Committee SC 22, *Product specifications*.

Annexes A and B of this International Standard are for information only.

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INTERNATIONAL STANDARD ISO 10290:1993(E)

Textiles — Cotton yarns — Specifications

1 Scope

This International Standard specifies criteria, with relevant test methods, to be applied in describing single spun grey cotton yarns, which are widely used in international trade.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2:1973, *Textiles — Designation of the direction of twist in yarns and related products.*

ISO 1144:1973, *Textiles — Universal system for designating linear density (Tex System).*

ISO 2060:1972, *Textiles — Yarn from packages — Determination of linear density (mass per unit length) — Skein method.*

ISO 2061:1972, *Textiles — Determination of twist in yarns — Direct counting method.*

ISO 2062:1993, *Textiles — Yarns from packages — Determination of single-end breaking force and elongation at break.*

ISO 3951:1989, *Sampling procedures and charts for inspection by variables for percent nonconforming.*

ISO 6741-1:1989, *Textiles — Fibres and yarns — Determination of commercial mass of consignments — Part 1: Mass determination and calculations.*

ISO 6939:1988, *Textiles — Yarns from packages — Method of test for breaking strength of yarn by the skein method.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 linear density: Mass per unit length of a yarn.

It is expressed in tex.

3.2 tex: Number of grams per kilometre of yarn.

3.3 breaking load: Maximum load (or force) applied to a specimen in a tensile test carried to rupture.

For yarns, it is preferably expressed in centinewtons.

3.4 elongation at break: Increase in length of a specimen produced by the breaking load.

It is usually expressed as a percentage of the original nominal length.

3.5 tenacity: Ratio of the tension to the linear density of an unstrained specimen.

It is usually expressed in centinewtons per tex.

3.6 breaking tenacity: Ratio of a yarn's breaking load to its linear density.

It is usually expressed in centinewtons per tex.

NOTE 1 For specimens of known linear density, the breaking tenacity can be obtained directly from tensile-testing machines which can be suitable adjusted to indicate tenacity instead of breaking load.

3.7 twist: Number of turns about the axis of a length equal to the nominal gauge length before untwisting.

Twist is expressed preferably in turns per metre, but may also be expressed in turns per centimetre.

3.8 twist factor: A measure of the "twist hardness" of a yarn, calculated by multiplying the number of turns per unit length by the square root of the linear density in a direct system.

It is typically expressed in turns per centimetre × $(tex)^{1/2}$.

3.9 grey cotton yarn: Yarn as it leaves the spinning frame, without any bleaching, dyeing or finishing treatment, and in the case of open-end yarn, waxed or unwaxed.

4 Requirements

The performance requirements and tolerances applied to yarn for use in the textile industry shall be agreed between the purchaser and manufacturer. Examples, for information only, are given in annex A .

4.1 Yarn linear density

The linear density of the yarn shall be determined in accordance with ISO 2060 (see also ISO 1144).

4.2 Evenness

The evenness of the yarn shall be determined, for example in accordance with ASTM D 1425.

4.3 Breaking load/tenacity and elongation at break

The breaking load of single strands and elongation at break shall be determined in accordance with ISO 2062.

4.4 Skein breaking strength

The skein breaking strength of the yarn shall be determined in accordance with ISO 6939.

4.5 Yarn twist

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

4.6 Moisture regain

Moisture regain shall be determined in accordance with ISO 6741-1.

5 Marking

The details of marking shall be subject to agreement between purchaser and manufacturer. Where appropriate, individual units shall be identified.

It is recommended that purchaser and manufacturer select from the following list:

a) name of material;

b) linear density;

c) lot number;

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

e) spinning method used, e.g. ring or rotor;

f) individual package size/mass;

g) mass of consignment, in accordance with ISO 6741-1;

h) whether carded or combed;

i) whether waxed or unwaxed.

6 Sampling and inspection

The sampling procedure for inspection shall be agreed between purchaser and manufacturer. In the absence of any agreed sampling procedure, reference shall be made to ISO 3951.

7 Quality control

It is recommended that manufacturers use ISO 8402 and operate quality control procedures in line with ISO 9000, ISO 9001, ISO 9002, ISO 9003 and ISO 9004 in order to assure that they are able to manufacture yarns consistently to the required standard.

Annex A
(informative)

Examples of cotton yarn specifications

It must be emphasized that the data shown in table A.1 are given ONLY AS EXAMPLES, to illustrate the format which might be used to set out specifications for cotton yarn. They have been selected on the basis of available data to be as realistic as possible, but cannot in any way serve to replace requirements which may be contained in a commercial contract.

Table A.1

Characteristic	Specification		
	Carded ring-spun for weaving	**Combed ring-spun for knitting**	**Carded rotor-spun for weaving**
Nominal count (tex)	37	20	37
Nominal count [Number English (Ne)]	16	30	16
% CV[1] of count[2]	4 max.	4 max.	4 max.
Permitted % deviation from a nominal count	3 max.	3 max.	3 max.
Twist factor (tex)	38	34	42
Direction of twist	S or Z	S or Z	Z
Permitted % deviation of twist	5 max.	5 max.	5 max.
Breaking tenacity[2] (cN/tex)	13 min.	13 min.	9,5 min.
Evenness % CV[1] (determined in accordance with, for example, ASTM D 1425)	17,5 max.	14,5 max.	16 max.
Appearance (determined in accordance with, for example, ASTM D 2255)	Grade D or better	Grade C or better	Grade C or better

1) CV = coefficient of variation.

2) Useful guidelines for these properties may be found in *Uster Statistics 1989*, published by Zellweger Uster A.G., 8610 Uster/ZH, Switzerland.

Annex B
(informative)

[1] ISO 139:1973, *Textiles — Standard atmospheres for conditioning and testing.*

[2] ISO 1139:1973, *Textiles — Designation of yarns.*

[3] ISO 2947:1973, *Textiles — Integrated conversion table for replacing traditional yarn numbers by rounded values in the Tex System.*

[4] ISO/TR 8091:1983, *Textiles — Twist factor related to the Tex System.*

[5] ISO 6741-2:1987, *Textiles — Fibres and yarns — Determination of commercial mass of consignments — Part 2: Methods for obtaining laboratory samples.*

[6] ISO 8402:1986, *Quality — Vocabulary.*

[7] ISO 9000:1987, *Quality management and quality assurance standards — Guidelines for selection and use.*

[8] ISO 9001:1987, *Quality systems — Model for quality assurance in design/development, production, installation and servicing.*

[9] ISO 9002:1987, *Quality systems — Model for quality assurance in production and installation.*

[10] ISO 9003:1987, *Quality systems — Model for quality assurance in final inspection and test.*

[11] ISO 9004:1987, *Quality management and quality system elements — Guidelines.*

[12] ASTM D 1425-89, *Standard test method for unevenness of textile strands using capacitance testing equipment.*

[13] ASTM D 2255-87, *Standard test method for grading cotton yarns for appearance.*

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Descriptors: textiles, cotton, yarns, cotton spun yarns, carded yarns, combed yarns, specifications, performance evaluation, tests, marking, common quality standards.

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