International Standard

ISO 1139

Textiles — Designation of yarns

Textiles — Désignation des fils

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 38, *Textiles*, Subcommittee SC 23, *Fibres and yarn.*

This second edition cancels and replaces the first edition (ISO 1139:1973), which has been technically revised.

The main changes are as follows:

— the content structure has been updated to comply with the ISO/IEC Directives, Part 2;

— Clauses 2 and 3 have been updated.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The general introduction of the Tex system for expressing the linear density of yarns requires standardization of the notation for yarn construction. In designating yarns, it has been customary - and it remains desirable - to reflect in a condensed form details of the components of a yarn including values of the linear densities, directions and amounts of twist, number of folds, etc. of these components and/or characteristics of the yarn resulting from this construction, such as its linear density indicated as resultant linear density.

The resultant linear density of folded and/or cabled yarns - in some cases with strong twisted filament yarns - generally differs from the sum of the linear densities of the components. Even when starting from the same component yarns, using the same direction and amount of twist, number of folds, etc., yarns with different resultant linear densities can be produced due to differences in conditions during manufacturing of yarns, such as yarn tensions, types of machine used, moisture content of the yarns, atmospheric conditions, etc.

A yarn notation serves two purposes:

— it is used as a general indication of a yarn; in this case the values for linear densities, amounts of twist, etc. used in the yarn notation will be referred to as nominal values;

— it may be used for reporting the result of an analysis of a yarn; in this case the values derived from an authorised testing procedure for linear densities and amounts of twist used in the yarn notation will be referred to as actual values.

Attention is drawn to the fact that the application of the notation of yarns in the Tex system does not affect existing commercial practices in the trade.

Values of linear density and amount of twist used in commercial transactions are nominal unless explicitly stated as being actual.

Nominal linear densities and amounts of twist are subject to tolerances, the numerical values of which are usually agreed in the various branches of the textile industry or directly between seller and buyer.

In this document, two methods for the notation of yarns are specified, namely:

a) yarn notation starting from the linear density of the single yarn: it may be referred to as single-to-fold notation;

b) yarn notation starting from the linear density of the resultant yarn: it may be referred to as fold-to-single notation.

The symbols used in both systems are identical. The differences are in the order of presentation, the use of the multiplication sign (×) in the single-to-fold notation, and of the solidus (/) in the fold-to-single notation.

Distinction between these two methods does not apply to single spun yarns, monofilaments and multifilaments without twist, nor to multiple wound yarns. The notation of these yarns is given under the heading of the first method (see 4.2 and 4.3).

It is hoped that, ultimately, one method can be used to the exclusion of the other. In fact, ISO 858, dealing with yarns for fishing nets, employs only the single-to-fold method, although giving, in the abbreviations, only those items of information that are appropriate.

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Textiles — Designation of yarns

1 Scope

This document specifies two methods of indicating the composition of yarns, whether single, folded, cabled or multiple wound. The notation comprises linear density indicated in the Tex system, number of filaments in filament yarns, direction and amount of twist, and number of folds.

This document is not applicable to some special kinds of yarns, for example to fancy yarns, textured or bulked yarns or yarns produced by wrapping a textile or non-textile material round a core. It is not applicable to yarns with other features such as constituent fibres, after treatment and type of package.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and symbols

3.1 Terms and definitions

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

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

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

— IEC Electropedia: available at https://www.electropedia.org/

3.1.1
yarn
general term covering all the specific types and structures described in this document

3.1.2
single yarn
simplest continuous strand of textile material

Note 1 to entry: The single yarn is composed of one of the following:

a) a number of discontinuous fibres, held together generally by twist. Such yarns are described as spun yarns,

b) one or more continuous filament(s). Twist may be absent (zero twist yarn) or present. Such yarns are described as filament yarns,

c) only one filament. Such yarns are described as monofilament yarns,

d) two or more filaments. Such yarns are described as multifilament yarns.

Note 2 to entry: For the present this definition does not include polymer tape yarns.

3.1.3
multiple wound yarn
yarns formed from two or more yarns wound together but not twisted together

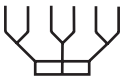
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3.1.4
folded yarn
yarn formed by twisting together two or more single yarns in one folding operation

EXAMPLE twofold yarn, threefold yarn, fourfold yarn

Note 1 to entry: fold or ply: Some sections of the textile industry use fold, folding, folded, and some use ply, plying, plied. In some sections both words are used interchangeably. In this document, fold has been used in the English text, but this should not be taken as implying that national standards, based on this document and written in the English language, should use fold in preference to ply.

3.1.5
cabled yarn
two or more folded yarns (or alternatively folded and single yarns) twisted together in one or more folding operations



Note 1 to entry: In the fishing industry a cabled yarn is generally made of single filaments twisted together, each receiving an additional twist during the twisting operation, which is known as cabling.

3.1.6
yarn notation
condensed technical description of a yarn, comprising some or all of the following:

— *linear density* (3.1.7),

— number of filaments,

— direction of twist at each twisting operation,

— amount of twist at each twisting operation,

— number of components in folding,

— number of components in cabling

3.1.7
linear density
mass per unit length of a yarn, expressed in tex or multiples or sub-multiples thereof

Note 1 to entry: According to ISO 1144, dtex is a submultiple of tex (1 tex = 10 dtex)

3.1.8
resultant linear density
linear density of the final product resulting from twisting, folding or cabling operations

Note 1 to entry: When supplementary chemical or physical treatments have been applied to the final product and their effect has been incorporated in the resultant linear density, this shall be specifically stated.

Note 2 to entry: If considered necessary in national standards, attention should be drawn to the fact that the final product can be influenced by various manufacturing operations to such an extent that the use of the resultant linear density may become preferable as a basis for manufacturing calculations.

3.1.9
twist
number of turns about the axis of a yarn based on its nominal gauge length before untwisting

[SOURCE: ISO 2061:2015, 3.1]

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3.1.9.1
direction of twist
twist direction indicated by the capital letter Z or S

Note 1 to entry: See ISO 2.

3.1.9.2
amount of twist
number of turns per metre of the twisted yarn

Note 1 to entry: Pending the universal application of the metric system, the expression of twist in other units of length is allowed, provided that the units are explicitly stated, for example turns per inch, t/i.

3.1.10
nominal,adj
indicating a value serving as a name

Note 1 to entry: Nominal values serve the purpose of describing characteristics of a yarn in a sufficiently accurate way to be used for calculation in manufacturing. They are subject to the usual commercial tolerances or the agreed between the relevant parties.

Note 2 to entry: The nominal linear density of single yarns in the Tex system shall be chosen for the different types of textiles from the special lists agreed by the various sections of the industry (also given in ISO 1144 and ISO 2947).

Note 3 to entry: Nominal linear density usually refers to the grey yarn; in certain sections of the textile trade, however, the same nominal linear density is used for chemically processed (bleached, dyed, etc.) yarns as for the original unprocessed yarns.

3.1.11
actual,adj
indicating a value which results from an authorized testing procedure

3.2 Symbols

R	symbol for resultant linear density, to be put before its numerical value
f	symbol for filaments, to be put before the number of filaments (for example, figure 1)
t0	symbol for zero twist

4 Yarn notation based on the linear density of the single yarn (single-to-fold notation)

4.1 General

The following characteristics are stated in the order given in 4.2 to 4.5.

In this notation, the resultant linear density may be given as supplementary information. It is separated from the preceding part by a semicolon.

4.2 Single yarn

4.2.1 Spun yarns

a) linear density;

b) direction of twist;

c) amount of twist.

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