
**Textile fibres — Determination of
linear density — Gravimetric method
and vibroscope method**

*Fibres textiles — Détermination de la masse linéique — Méthode
gravimétrique et méthode au vibroscope*



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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 yarns*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 248, *Textiles and textile products*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO1973:1995), which has been technically revised.

The main changes compared to the previous edition are as follows:

- ISO 6989 has been added as a normative reference in [Clause 2](#) and [8.2.1](#);
- a note specifying the tension application has been added in [3.2](#);
- a correction factor (for measurements on stiff fibres) has been permitted in [4.3](#), [8.2.1](#) and [10.3](#);
- testing equipment without a scale but with a display, respectively connection to a computer system in [4.3](#) for linear density reading is permitted;
- reference to [5.2.2](#) “Forceps” (instead of 5.1.6) has been corrected;
- automatic application of a loading force instead of the use of forceps in [5.2.2](#) and [8.2.3](#) is permitted;
- [Formulae \(A.1\) to \(A.8\)](#) have been corrected;
- grammar and linguistic consistency of definitions in [4.3](#), [8.1.3](#), [8.2.2](#), [9.2.1](#), [A.1](#) and [A.2](#) have been reviewed.

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.

Introduction

The linear density of individual fibres is one of the most important physical characteristics in terms of processability and predictability of the next-step intermediate product, such as spun-yarns and nonwovens. Other than testing methods, such as air-permeability on test specimen consisting of mass of fibres (Micronaire), this document describes two measurement methods to determine the mass per unit length (= linear density) using either a bundle of 50 fibres, or on individual fibres. While the first method determines an average value, only, in relatively short time, the second method measures the individual fibre fineness and therefore the statistical distribution of the laboratory sample, too.

Textile fibres — Determination of linear density — Gravimetric method and vibroscope method

1 Scope

This document specifies a gravimetric method and a vibroscope method for the determination of the linear density of textile fibres applicable respectively to:

- a) bundles of fibres;
- b) individual fibres.

Useful data can be obtained on man-made fibres and, with less precision, on natural fibres.

This document only applies to fibres which can be kept straight and, in the case of bundles, parallel, during test preparation. It is properly applicable when the fibres are readily freed of crimp. The methods in this document are not applicable to tapered fibres.

The vibroscope method is not always applicable to hollow and flat (ribbon-like) fibres.

2 Normative references

The following 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 139, *Textiles — Standard atmospheres for conditioning and testing*

ISO 1130, *Textile fibres — Some methods of sampling for testing*

ISO 6989, *Textile fibres — Determination of length and length distribution of staple fibres (by measurement of single fibres)*

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 <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 tension

force tending to cause the extension of a body

3.2 tensioning force

force effective on a fibre specimen during the vibroscope test

Note 1 to entry: In textile testing, the tensioning force applied is based on the linear density or cross-sectional area.