
**Textiles — Synthetic filament yarns —
Electrostatic propensity evaluation by
measuring electrical resistance**

*Textiles — Fils de filaments synthétiques — Évaluation de la
propension électrostatique par mesure de la résistance électrique*

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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*.

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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Textiles — Synthetic filament yarns — Electrostatic propensity evaluation by measuring electrical resistance

1 Scope

This document specifies methods for electrostatic propensity evaluation by measuring electrical resistance of synthetic filament yarns.

It is applicable to synthetic filament yarns. Conductive yarns covered in this document are used for anti-static fabric. They are not used for transmission of electric signals, supply of electric power and electromagnetic shield and heating.

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

3 Terms and definitions

For the purposes of this document, the following terms and 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>

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

3.1

electrical resistance per unit length

electrical resistance of a material per unit length

Note 1 to entry: It is expressed in Ω/m .

3.2

volume resistivity

quotient obtained when the potential gradient is divided by the current density

Note 1 to entry: It is expressed in $\Omega\cdot\text{m}$.

[SOURCE: ISO 472:2013/Amd.1:2018, 3.17, modified — Note 1 to entry has been deleted]

4 Principle

Resistivity is a physical quantity used to compare the conducting properties of different materials.

Under specific condition, electrical resistance of synthetic filament yarns in certain length is measured. Electrical resistance per unit length and volume resistivity are calculated.

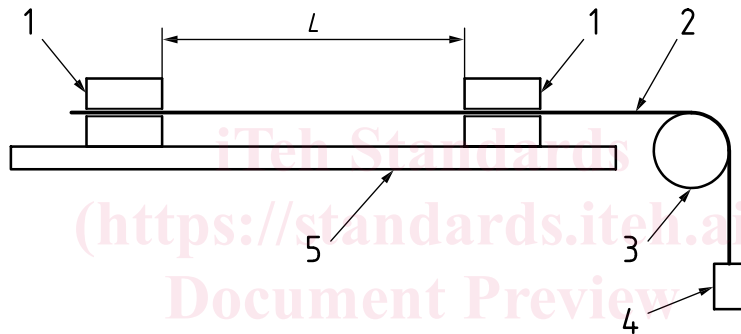
5 Apparatus

5.1 DC high-resistance meter

- a) Resistance range: $1 \times 10^6 \Omega$ to $1 \times 10^{13} \Omega$.
- b) Accuracy: $\pm 5 \%$ for measurements of $1 \times 10^{12} \Omega$ and less, and $\pm 20 \%$ for higher than $1 \times 10^{12} \Omega$.
- c) Open circuit voltage: $(100 \pm 5) \text{ V}$.

5.2 Insulating specimen holder (see Figure 1)

- a) Insulating board, material resistance $\geq 10^{14} \Omega$ and with a pair of copper clamps in a horizontal spacing of $(10 \pm 0,1) \text{ cm}$ on it.
- b) Clamps, with clean and flat jaw faces to hold the test specimen without slippage.
- c) A pulley, on the outside of one clamp.
- d) Jaw faces of the clamps and upper edge of the pulley are at same horizontal plane.



Key

- 1 clamps [5.2, b)]
- 2 specimen
- 3 pulley [5.2, c)]
- 4 tensioning weight (5.3)
- 5 insulating board [5.2, a)]
- L spacing between the two clamps [5.2, a)], expressed in cm.

Figure 1 — Schematic diagram of insulating specimen holder

5.3 Tensioning weight

With clamps, to apply tension force to test specimens.

6 Atmosphere for conditioning and testing

The atmosphere shall be a temperature of $(20 \pm 2) \text{ }^\circ\text{C}$ and a relative humidity of $(40 \pm 4) \%$. If a different temperature or humidity is used, record it in the test report.

NOTE The measurements of temperature and humidity are specified in ISO 139.