INTERNATIONAL STANDARD

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Rubber, vulcanized or thermoplastic — Antistatic and conductive products — Determination of electrical resistance

Caoutchouc vulcanisé ou thermoplastique — Produits antistatiques et conducteurs — Détermination de la résistance électrique

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Foreword

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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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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html

This document was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 2, *Testing and analysis*.

This fifth edition cancels and replaces the fourth edition (ISO 2878:2011), of which it constitutes a minor revision to update the normative reference in Clause 2.

Introduction

The elimination or reduction of static voltages and charges on rubber products is important in many applications. By providing suitable leakage paths the charge can be dissipated. The antistatic properties of a product are also influenced by its electrostatic charging characteristics. This document deals only with methods involving the use of leakage paths.

The addition of carbon black to a polymer in sufficient quantities causes a conductive network of carbon particles to be formed within the mixture, and materials with a wide range of electrical conductivity can be produced. The conductive network is sensitive to mechanical strain, and the electrical resistance of the material varies according to the degree of strain and the time and temperature history after straining. Antistatic properties can also be conferred on rubber materials by incorporating ionizable materials into the rubber mix.

A method for the measurement of the resistivity of specially prepared test pieces of antistatic and conductive rubber is described in ISO 1853.

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WARNING 1 — Persons using this document should be familiar with normal laboratory practice. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

WARNING 2 — Certain procedures specified in this document might involve the use or generation of substances, or the generation of waste, that could constitute a local environmental hazard. Reference should be made to appropriate documentation on safe handling and disposal after use.

1 Scope

This document specifies a method of test to determine the electrical resistance of antistatic and conductive products manufactured wholly or in part from rubber whose electrical resistance measured between defined points, when new, does not exceed 3×10^8 Ω and whose conductivity is derived from the addition of carbon black and/or other appropriate substances to the bulk of the material.

NOTE Highly conductive mixes cannot be made in this way.

This document specifies the electrode configuration for basic geometries, but it is intended that reference be made to relevant product specifications for requirements for specific products.

It does not apply to:

a) products the relevant surfaces of which are composed of mixtures of insulating and conductive areas;

b) products with a substantial surface area of insulating material, except for footwear (which does not normally have a conductive or antistatic upper).

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 18899:2013, *Rubber — Guide to the calibration of test equipment*

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

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

4 Principle

The resistance between two positions on a product is measured, using a defined system of electrodes, by a system suited to factory inspection or service testing.