INTERNATIONAL STANDARD

ISO 6356

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Textile floor coverings — Assessment of static electrical propensity — Walking test

Revêtements de sol textiles — Évaluation de la propension à l'accumulation des charges électrostatiques — Essai du marcheur

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 6356 was prepared by Technical Committee ISO/TC 219, *Floor coverings*.

This first edition of ISO 6356 cancels and replaces ISO/TR 6356:1982, which has been technically revised.

Annexes A, B, C and E form a normative part of this International Standard. Annex D is for information only.

Introduction

This test is a measurement of the electric potential (voltage) due to the accumulation of static charge on a person walking on the surface of a textile floor covering under controlled conditions. It is important that this measurement be made under carefully controlled conditions to minimize test variability.

Textile floor coverings — Assessment of static electrical propensity — Walking test

1 Scope

This International Standard describes a method of evaluating the electrostatic propensity of all types of textile floor coverings under controlled conditions. Since the potential generated varies with humidity, shoe materials, walk surface and individuals' mannerisms, the values generated by this test will not necessarily duplicate actual field experience, but will provide a relative comparison of the performance of different surfaces.

For classification purposes and in cases of dispute the measurement procedure specified in this International Standard can be used under controlled conditions specified in the relevant classification standard or agreed between disputing parties. There may be occasions where measurements are required under non-controlled conditions, e.g. *in situ* measurements on installed floor coverings. The principle of measurement using the equipment specified in this International Standard can be used to make measurements, either with the standard footwear specified or with specific footwear relevant to the end use.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 48:1994, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*.

ISO 1957:—[1)], *Machine-made textile floor coverings — Sampling and cutting specimens for physical tests.*

ISO 2424:1992, *Textile floor coverings — Vocabulary.*

ISO 9407:1991, *Shoe sizes — Mondopoint system of sizing and marking.*

IEC 60093:1980, *Methods of test for volume resistivity and surface resistivity of solid electrical insulating materials.*

ASTM D394-59[2)], *Standard method of Test for Abrasion Resistance of Rubber Compounds*.

3 Terms and definitions

For the purposes of this International Standard the terms and definitions given in ISO 2424 shall apply.

1) To be published. (Revision of ISO 1957:1986)

2) Withdrawn in 1970.

4 Principle

The difference in electrical potential, in relation to the earth's potential (zero), produced by a person walking:

a) on the textile floor covering under test;

b) with standardized footwear;

c) in a prescribed manner;

d) under controlled atmospheric conditions

is measured and used to evaluate the risk of a person experiencing the discomfort of static electrical shock from in-service use of this textile floor covering.

5 Apparatus

5.1 Earthed metal base plate, measuring at least 2 000 mm × 1 000 mm.

WARNING: The use of either an earthed metal plate on the floor of the test room or an entire metal floor may constitute a hazard where electricity supply lines are present. It is recommended that all electrical supply sources be protected by suitable earth fault circuit breakers.

5.2 Rubber mat, of dimensions 2 200 mm × 1 200 mm, thickness 4,5 mm ± 0,5 mm and vertical resistance $\geqslant 10^{13}\ \Omega/cm^2$, measured in accordance with IEC 60093:1980.

5.3 Sandals, made in accordance with the requirements in annex A and reserved specifically for this test method. Sole material shall be XS-664P Neolite[3)] in accordance with annex B. The resistance between the metal base plate and an operative standing on it wearing the sandals shall be between $10^{10}\ \Omega$ and $10^{11}\ \Omega$ as measured in accordance with annex C.

NOTE For tests with conductive footwear, sandals with BAM rubber[4)] soles may be used.

5.4 Means of cleaning footwear.

5.4.1 P280 sandpaper.

5.4.2 Scoured cotton cloth, free of finish or detergent.

5.4.3 Ethanol, ⩾ 95 % concentration.

5.5 Ionizing source, capable of eliminating electrostatic charge from the surface of the specimen.

NOTE All the manufacturer's safety precautions should be observed.

3) The Neolite material may be obtained from AATCC Technical Center; P.O. Box 12215; Research Triangle Park; NC 27709; USA. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of the product. Equivalent products may be used if they can be shown to lead to the same results.

4) The BAM rubber material is available from BAM, Berlin, Germany. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of the product. Equivalent products may be used if they can be shown to lead to the same results.

5.6 Two standard reference carpets[5]**,** reserved specifically for this test method and meeting the following requirements:

a) one specimen of unprotected carpet, free from finish, giving body voltage of $-9{,}0\ \text{kV} \pm 5{,}0\ \text{kV}$ when tested under conditions of 25 % relative humidity, and $-9{,}5\ \text{kV}$ to $-13{,}7\ \text{kV}$ when tested under conditions of 20 % relative humidity;

b) one specimen of static protected carpet, free from finish, giving body voltage of $-1{,}5 \pm 0{,}4\ \text{kV}$ when tested under conditions of 25 % relative humidity, and $-2{,}7\ \text{kV} \pm 0{,}3\ \text{kV}$ when tested under conditions of 20 % relative humidity.

5.7 Body voltage measuring system, consisting of a d.c. static voltmeter, an autographic recorder and a hand electrode meeting the following requirements:

a) input resistance of voltmeter and hand electrode system: $\geqslant 10^{14}\ \Omega$;

b) input capacitance of hand electrode: $\leqslant 20$ pF;

c) response time of electrode/voltmeter/recorder system such that full scale deflection on the recorder is reached within 0,25 s.

See annex D for an example of a suitable hand electrode system.

5.8 Relative humidity measuring instrument, capable of determining relative humidity to an accuracy of ± 1 % RH.

6 Atmosphere for conditioning and testing

The specimens shall be conditioned and the test conducted in a specified standard atmosphere and the test conditions used shall be stated in the test report. Commonly specified test conditions include:

a) 23 °C ± 1 °C and 25 % RH ± 3 % RH

b) 23 °C ± 1 °C and 20 % RH ± 3 % RH

NOTE Several standard atmospheres are specified by various regional authorities based upon the severity of conditions the floor covering normally experiences in service. Values determined under one set of conditions cannot be compared to those using another set of test conditions.

7 Sampling and selection of specimens

Carry out sampling and selection of specimens in accordance with ISO 1957. From each sample select a specimen measuring 2 000 mm × 1 000 mm.

NOTE Generally, the test is performed on the textile floor covering as received, i.e. with finishes and special treatments as appropriate. If the permanency of such finishes and treatments is being investigated, the specimen may be submitted to a cleaning process or to practical wear conditions before testing.

[5] Available from AATCC, P.O. Box 12215, Research Triangle Park, NC 27709, USA. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of the product. Equivalent products may be used if they can be shown to lead to the same results.