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Plastics — Abrasion test method for artificial turfs using combined UV exposure and mechanical wear

Plastiques — Méthode d'essai d'abrasion pour gazons artificiels combinant exposition UV et usure mécanique

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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 61, *Plastics*, Subcommittee SC 6, *Ageing, chemical and environmental resistance*.

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 radiant exposure, combined with simultaneous or sequential mechanical stud wear test, can assess the abrasion resistance of artificial turf used outdoors. The test method developed considers exposure that provides UV radiant exposure and stud wear. This accelerated test method is to be used as a screening or qualifying test for artificial turfs for public sports facilities. The test method may not necessarily correlate to results from exposure to actual use conditions.

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Plastics — Abrasion test method for artificial turfs using combined UV exposure and mechanical wear

1 Scope

This document specifies an abrasion test method for accelerated testing of artificial turfs for use in sports facilities.

Combined exposure to simulated solar UV radiation and mechanical wear in simultaneous or sequential modes is the method used. The details of radiation, temperature, and moisture exposure, as well as to mechanical abrasion using soccer shoe studs on rotating drum assembly, are given in this document.

NOTE It was determined that simultaneous exposure was more effective than sequential exposure.

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 4892-1, *Plastics — Methods of exposure to laboratory light sources — Part 1: General guidance*

ISO 4892-2, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps*

ISO 4892-3, *Plastics — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps*

EN 15306, *Surfaces for outdoor sports areas — Exposure of synthetic turf to simulated wear*

DIN 75220, *Ageing of automobile components in solar simulation units*

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
artificial turf
synthetic fibres made to mimic the natural grass

Note 1 to entry: It is a carpet-like mat consisting of *piles* (3.2), backing sheet, silica sand, rubber chips and shock absorption pad.

Note 2 to entry: See Annex A for the details on the construction of artificial turf.

3.2
pile
directional treads or fibres affixed to the backing layer sheet

3.3
abrasion
process of rubbing away *pile* (3.2) material under contact with stud under load

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3.4
simultaneous exposure
exposure to UV radiation and *abrasion* (3.3) occurring at the same time

3.5
sequential exposure
exposure to UV radiation and *abrasion* (3.3) occurring one after the other

4 Principle

The specimen is exposed to both UV radiation and mechanical wear, either simultaneous or sequential. To create such a test, an apparatus consisting of an abrasion device, test specimen support and an artificial radiation source is used. The artificial turf specimen is placed on the specimen support and is made to come in contact with an abrasion device for cyclic frictional force application at the same time or in sequence with being subjected to predetermined exposure to radiation, heat and humidity conditions.

5 Apparatus

For the simultaneous exposure, the test device shall include a stud-cylinder abrasion device, test specimen support and radiation source; all assembled in an environmental test chamber or room with temperature and humidity control. A water spray nozzle can also be added.

For sequential exposure, a stud-cylinder abrasion device, and a test chamber meeting the irradiance, temperature, humidity and wetting, and other requirements for exposure devices in ISO 4892-1 are required.

A typical test apparatus is given in Annex C.

5.1 Laboratory radiation source, an UVA-340 fluorescent lamp, Xenon arc lamp or metal halide lamp shall be used. If other radiation source is used, the radiation source shall be reported.

5.1.1 Fluorescent UVA-340 lamp, in accordance with ISO 4892-3, type 1A(UVA-340).

5.1.2 Metal halide lamp in accordance with DIN 75220.

5.1.3 Xenon arc lamp, in accordance with ISO 4892-2, method A (Xenon arc with simulated direct solar radiation filters).

5.2 Abrasion device, in accordance with EN 15306.

5.3 Spraying system, in accordance with ISO 4892-1.

6 Test specimens

The test specimen shall be at least 800 mm × 400 mm. The uniform abraded surface shall be at least 500 mm × 300 mm. Other sizes may be used upon agreement between the parties involved.

The dimension is changeable only if the irradiance uniformity is satisfied. Different specimen dimensions may be used provided that the irradiance uniformity on the specimen is assured.

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