INTERNATIONAL STANDARD

ISO 20329

First edition
2020-09

Corrected version
2020-10

Plastics — Determination of abrasive wear by reciprocating linear sliding motion

Plastiques — Détermination de la résistance à l'abrasion par la méthode du panneau d'essai en va-et-vient

Reference number
ISO 20329:2020(E)

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Published in Switzerland

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Principle ... **2**
5 Apparatus ... **3**
5.1 Test apparatus ... 3
5.2 Abrasive material ... 4
5.3 Balance ... 4
6 Test specimens ... **4**
6.1 Test specimens ... 4
6.2 Conditioning ... 4
7 Procedures ... **4**
7.1 Abrasive and load selection ... 4
7.2 Preparation and installation of the wheel ... 4
7.3 Adjustment of loading system ... 4
7.4 Test atmosphere ... 5
7.5 Procedure of the preliminary abrasion ... 5
7.6 Procedure of the main test ... 5
7.7 Test for the remaining specimens ... 5
8 Evaluation of the main test ... **6**
8.1 Wear mass ... 6
8.2 Wear resistance ... 6
8.3 Specific wear rate ... 6
9 Precision ... **6**
10 Test report ... **7**
Annex A (informative) **Precision** ... **8**
Annex B (informative) **Typical test apparatus** ... **11**
Annex C (informative) **Linear relationship between number of reciprocations and wear mass** ... **12**
Bibliography ... **14**

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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 2, *Mechanical behaviour*.

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.

This corrected version of ISO 20329:2020 incorporates the following corrections:

— in the introduction, minor editorial corrections have been applied;

— in Clause 4 and 8.1, editorial corrections have been applied to clarify the procedure;

— in 8.2, a note regarding the number of reciprocations has been added.

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Introduction

The reciprocating test specimen method is an abrasive wear test, based on frictional force generated at the contact surface between test specimen and abrasive material. Frictional force is applied repeatedly over the wear surface, by an abrasive material under load being applied to it in a perpendicular direction and horizontal reciprocating motion of test specimen. In this test method, abrasive wear resistance is usually evaluated by measuring wear mass per unit number of reciprocations or by specific wear rate, which is wear mass per unit load and unit sliding distance. Specific wear rate is one parameter for evaluating wear resistance in the field of tribology.

When conducting abrasive wear tests with abrasive contact, it is important to take into consideration the changes in grinding force of the abrasive material due to clogging. In this test method, an abrasive material is attached to the circumference of a wheel. The wheel itself is rotated by a small angle for each reciprocating motion (the wheel does not rotate during the reciprocating motion). Therefore, after each reciprocating motion, unused section of the abrasive material comes in contact with the test specimen. Also, the test specimen is installed with the surface to be tested facing down, where the abrasive material is placed into contact from underneath the test specimen, and wear particles or debris are not likely to collect in the wear surface. Due to the above factors, the influence of changes in grinding force of abrasive material due to clogging on test results is reduced, and wear mass per unit number of reciprocations is consistent. As a result, specific wear rate irrespective of sliding distance can be obtained.

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Plastics — Determination of abrasive wear by reciprocating linear sliding motion

1 Scope

This document specifies a test method for the determination of abrasive wear resistance of plastics using abrasive material on a reciprocating motion. It also specifies calculation method for specific wear rate.

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 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 80000-1:2009, *Quantities and units — Part 1: General*

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
abrasive wear
progressive loss of material from the abrading surface of a plastics material resulting from the cutting or scratching action of the abrasive contact

3.2
load
W
force applied to the specimen

Note 1 to entry: Expressed in units of N.

3.3
wear resistance
R
resistance to wear, which is expressed as wear mass per reciprocation in this test method

Note 1 to entry: Expressed in the unit of "mg / reciprocation" [see 8.2, Formula (1)].

Note 2 to entry: This mass is actually force measured in a scale.

3.4
specific wear rate
w_s
wear mass per unit sliding distance and unit load

Note 1 to entry: Expressed in the unit of "mg / N•m" [see 8.3, Formula (3)].

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