PD ISO/TR 19032:2019

BSI Standards Publication

Plastics — Use of polyethylene reference specimens (PERS) for monitoring laboratory and outdoor weathering conditions

Documents
Document Sharing Hub

Full document details: PD ISO/TR 19032:2019

National foreword

This Published Document is the UK implementation of ISO/TR 19032:2019.

The UK participation in its preparation was entrusted to Technical Committee PRI/21, Testing of plastics.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2019
Published by BSI Standards Limited 2019

ISBN 978 0 539 03226 0

ICS 83.080.01

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 October 2019.

Amendments/corrigenda issued since publication

Date	Text affected

Documents
Document Sharing Hub

Full document details: PD ISO/TR 19032:2019

TECHNICAL REPORT

ISO/TR 19032

Second edition
2019-09

Plastics — Use of polyethylene reference specimens (PERS) for monitoring laboratory and outdoor weathering conditions

Plastiques — Utilisation d'éprouvettes de référence en polyéthylène pour l'évaluation des conditions de vieillissement climatique

Reference number
ISO/TR 19032:2019(E)

Documents
Document Sharing Hub

© ISO 2019

Full document details: PD ISO/TR 19032:2019

COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

© ISO 2019 – All rights reserved

Documents
Document Sharing Hub

Full document details: PD ISO/TR 19032:2019

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Background information ... **1**
5 Material ... **1**
5.1 General ... 1
5.2 Preparation of PERS ... 2
6 Procedure ... **2**
6.1 Method for measuring the carbonyl index of PERS ... 2
6.2 Round robin test of laboratory light-source exposure devices with PERS ... 3
6.2.1 General ... 3
6.2.2 Xenon-arc-lamp exposure ... 3
6.2.3 Open-flame carbon-arc-lamp exposure ... 4
6.2.4 Fluorescence lamp exposure ... 4
6.3 Outdoor exposure test of PERS ... 4
6.4 Consistency of laboratory light-source exposure devices ... 5
7 Results and discussion ... **6**
7.1 Result of RRT of laboratory light-source exposure devices with PERS ... 6
7.1.1 Xenon-arc-lamp exposure ... 6
7.1.2 Open-flame carbon-arc-lamp exposure ... 10
7.1.3 Fluorescent lamp exposure ... 10
7.2 Characterizing the conditions of outdoor exposure test site ... 11
7.3 Examples of correlation between outdoor exposure test and laboratory light-source exposure test using PERS ... 12
7.4 Control limit of particular laboratory light-source exposure apparatus ... 13
8 Conclusion ... **14**
8.1 Results of RRT ... 14
8.2 Outdoor exposure of PERS ... 15
8.3 Correlation between outdoor and xenon-arc-lamp exposure for PERS ... 15
8.4 Consistency of laboratory light-source exposure devices ... 15
Bibliography ... **16**

© ISO 2019 – All rights reserved

Documents
Document Sharing Hub
Full document details: PD ISO/TR 19032:2019

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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

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*.

This second edition cancels and replaces the first edition (ISO/TR 19032:2006), which has been technically revised.

The main changes compared to the previous edition are as follows:

— the shipping address of PERS in 3.1 has been cancelled;

— a cautionary sentence has been added in Clause 4.

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.

© ISO 2019 – All rights reserved
Documents
Document Sharing Hub
Full document details: PD ISO/TR 19032:2019

Introduction

The method described in this document demonstrates the use of polyethylene reference specimens (PERS) for monitoring conditions in weathering tests used for plastics. PERS has double bonds in its molecular structure, which are easily oxidized to produce carbonyl groups. The change in carbonyl index of PERS is produced by the combined effects of ultraviolet (UV) and temperature. Therefore, the carbonyl groups proportionally increase, depending on the received UV and temperature. Based on this relationship, the effect of UV radiation and temperature on PERS can be expressed quantitatively. For laboratory-accelerated exposures, PERS is also sensitive to changes in the chamber air temperature. The effect of moisture was not determined in the study.

© ISO 2019 – All rights reserved

Documents
Document Sharing Hub
Full document details: PD ISO/TR 19032:2019

Documents
Document Sharing Hub