

This is a preview of "ISO 4892-1:2016". [Click here to purchase the full version from the ANSI store.](#)

Third edition  
2016-05-01

---

---

# Plastics — Methods of exposure to laboratory light sources —

## Part 1: General guidance

*Plastiques — Méthodes d'exposition à des sources lumineuses de  
laboratoire —*

*Partie 1: Lignes directrices générales*



Reference number  
ISO 4892-1:2016(E)

© ISO 2016



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, 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  
Ch. de Blandonnet 8 • CP 401  
CH-1214 Vernier, Geneva, Switzerland  
Tel. +41 22 749 01 11  
Fax +41 22 749 09 47  
copyright@iso.org  
www.iso.org

This is a preview of "ISO 4892-1:2016". Click here to purchase the full version from the ANSI store.

## Contents

	Page
<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>2</b>
<b>4 Principle</b> .....	<b>2</b>
4.1 General.....	2
4.2 Significance.....	3
4.3 Use of accelerated tests with laboratory light sources.....	4
<b>5 Requirements for laboratory exposure devices</b> .....	<b>5</b>
5.1 Irradiance.....	5
5.2 Temperature.....	6
5.3 Humidity and wetting.....	8
5.4 Other requirements for the exposure device.....	9
<b>6 Test specimens</b> .....	<b>10</b>
6.1 Form, shape and preparation.....	10
6.2 Number of test specimens.....	11
6.3 Storage and conditioning.....	11
<b>7 Test conditions and procedure</b> .....	<b>11</b>
7.1 Set points for exposure conditions.....	11
7.2 Property measurements on test specimens.....	12
<b>8 Periods of exposure and evaluation of test results</b> .....	<b>13</b>
8.1 General.....	13
8.2 Use of control materials.....	13
8.3 Use of results in specifications.....	13
<b>9 Test report</b> .....	<b>14</b>
<b>Annex A (normative) Procedures for measuring the irradiance uniformity in the specimen exposure area</b> .....	<b>16</b>
<b>Annex B (informative) Factors that decrease the degree of correlation between artificial accelerated weathering or artificial accelerated irradiation exposures and actual-use exposures</b> .....	<b>19</b>
<b>Annex C (informative) Solar spectral irradiance standards</b> .....	<b>22</b>
<b>Bibliography</b> .....	<b>24</b>

## 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](http://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](http://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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 61, *Plastics*, Subcommittee SC 6, *Ageing, chemical and environmental resistance*.

This third edition cancels and replaces the second edition (ISO 4892-1:1999), which has been technically revised.

ISO 4892 consists of the following parts, under the general title *Plastics — Methods of exposure to laboratory light sources*:

- *Part 1: General guidance*
- *Part 2: Xenon-arc lamps*
- *Part 3: Fluorescent UV lamps*
- *Part 4: Open-flame carbon-arc lamps*

This is a preview of "ISO 4892-1:2016". [Click here to purchase the full version from the ANSI store.](#)

## Introduction

Plastics are often used outdoors or in indoor locations where they are exposed to solar radiation or to solar radiation behind glass for long periods. It is therefore very important to determine the effects of solar radiation, heat, moisture and other climatic stresses on the colour and other properties of plastics. Outdoor exposures to solar radiation and to solar radiation filtered by window glass are described in ISO 877 (all parts).<sup>[1]</sup> However, it is often necessary to determine more rapidly the effects of radiation, heat and moisture on the physical, chemical and optical properties of plastics with artificial accelerated weathering or artificial accelerated irradiation exposures that use specific laboratory light sources. Exposures in these laboratory devices are conducted under more controlled conditions than found in natural environments and are intended to accelerate eventual polymer degradation and product failures.

Relating results from accelerated weathering or artificial accelerated irradiation exposures to those obtained in actual-use conditions is difficult because of variability in both types of exposure and because laboratory tests never reproduce exactly all the exposure stresses experienced by plastics exposed in actual-use conditions. No single laboratory exposure test can be specified as a total simulation of actual-use exposures.

The relative durability of materials in actual-use exposures can be very different depending on the location of the exposure because of differences in UV radiation, time of wetness, temperature, pollutants and other factors. Therefore, even if results from specific accelerated weathering or artificial accelerated irradiation exposures are found to be useful for comparing the relative durability of materials exposed in a particular outdoor location or in particular actual-use conditions, it cannot be assumed that they will be useful for determining the relative durability of materials exposed in a different outdoor location or in different actual-use conditions.