



BSI Standards Publication

Permanence and durability of commercial prints

Part 21: In-window display — Light and ozone stability

National foreword

This Published Document is the UK implementation of ISO/TS 21139-21:2019.

The UK participation in its preparation was entrusted to Technical Committee CPW/42, Photography.

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 0 580 98532 4

ICS 37.040.20

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 July 2019.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

**Permanence and durability of
commercial prints —**

**Part 21:
In-window display — Light and
ozone stability**

Permanence et durabilité des impressions commerciales —

*Partie 21: Fenêtre de visualisation — Stabilité à la lumière
et à l'ozone*





COPYRIGHT PROTECTED DOCUMENT

© ISO 2019. 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

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Use profile	2
4.1 General.....	2
4.2 Environmental light condition.....	2
4.3 Environmental ozone condition.....	2
5 Test method	2
5.1 General.....	2
5.2 Sample preparation.....	3
5.2.1 Outline.....	3
5.2.2 Test target.....	3
5.2.3 Storage conditions between printing and light or ozone exposure test.....	3
5.2.4 Reference samples.....	3
5.2.5 Backing of the specimens.....	3
5.3 Light exposure.....	3
5.3.1 Outline.....	3
5.3.2 Spectral power distribution.....	3
5.3.3 Light intensity.....	4
5.3.4 Temperature and humidity.....	4
5.3.5 Duration of the light exposures.....	4
5.4 Ozone test.....	4
5.4.1 Outline.....	4
5.4.2 Apparatus.....	4
5.4.3 Test procedure.....	4
5.4.4 Test conditions.....	4
6 Measurement	5
6.1 General.....	5
6.2 Measurement conditions.....	5
6.3 Calculation of colour difference.....	5
7 Data analysis	6
7.1 General.....	6
7.2 Image quality parameter for data analysis.....	6
7.3 Environmental conditions.....	6
7.4 Estimation of time to reach certain change.....	7
8 Reporting	7
Annex A (informative) Display window type and lighting design	8
Annex B (informative) Example of test results	10
Bibliography	14

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 on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 42, *Photography*.

A list of all parts in the ISO 21139 series can be found on the ISO website.

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.

Introduction

In commercial application of colour prints, displaying the prints under ambient light or artificial illumination is one of the typical use cases. These prints may fade or otherwise change in appearance due to various environmental stresses, such as light, heat, humidity, pollutant gas, or biological weathering, and the combination of these factors. One of the most critical degradations is light fading caused by bright light which includes some UV components. A typical example of such a case is where prints are displayed in a display window (see [Annex A](#)) and are illuminated with bright light, especially daylight through window glass.

A test method for light stability of prints by simulating daylight through window glass directly falling on a print displayed in a window is described in ISO 18937. The test method described in ISO 18937 has broader application (for example covers a broad range of temperatures) than is required for this document and so requires some modification. A test method for ozone stability is described in ISO 18941.

In addition, ISO 18937 and ISO 18941 focus on test method itself, and do not cover translation of test results into performance in specific use profile which is one of the aims of this document.

Permanence and durability of commercial prints —

Part 21:

In-window display — Light and ozone stability

1 Scope

This document describes the test method for light stability and ozone stability for commercial prints, which are displayed in indoor bright places in or near to windows, especially in display windows with air conditioning.

This document also provides guidelines for data analysis.

This document is applicable to the various product classes of “commercial prints” that, following the terminology of ISO/TR 19300, include commercial production prints (flyers, brochures), transactional and stationary prints, signage, newspapers and periodical prints, book printing as well as packaging printing. These commercial prints often contain combinations of text, pictorial images and/or artwork. Prints for non-commercial use, including prints used and displayed in consumer home environments and prints exhibited or stored in museum context, are outside the scope of this document.

This document is applicable to both analogue and digitally printed matter. Methods and principles apply to both, colour and monochrome prints.

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 12647-7, *Graphic technology — Processes control for the production of halftone colour separations, proof and production prints — Part 7: Proofing processes working directly from digital data*

ISO 13655, *Graphic technology — Spectral measurement and colorimetric computation for graphic arts images*

ISO 18937:¹⁾, *Imaging materials — Photographic reflection prints — Methods for measuring indoor light stability*

ISO 18941:2007, *Imaging materials — Colour reflection prints — Test method for ozone gas fading stability*

ISO/TS 21139-1, *Permanence and durability of commercial prints — Definition of use cases and guiding principles for specifications*

3 Terms and definitions

No terms and definitions are listed in this document.

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/>

1) Under preparation. Stage at the moment of publication ISO/DIS 18937:2019.