
**Plastics — Determination of changes in
colour and variations in properties after
exposure to daylight under glass, natural
weathering or laboratory light sources**

*Plastiques — Détermination des changements de coloration et des
variations de propriétés après exposition à la lumière du jour sous verre,
aux agents atmosphériques ou aux sources lumineuses de laboratoire*



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

This document is a preview generated by EVS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2007

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

1	Scope	1
2	Normative references	1
3	Terms and definitions	2
4	Determination of changes in colour or other appearance attributes	3
5	Determination of changes in mechanical or other properties	5
6	Expression of results	7
7	Precision	9
8	Test report	9
	Annex A (normative) Statistical formulae based on ISO 2602 for determination of mean and standard deviation and procedure for determination of time to 50 % loss of property	10
	Annex B (informative) Possible effects of surface cleaning on assessment of exposure	15
	Bibliography	16

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 4582 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 6, *Ageing, chemical and environmental resistance*.

This third edition cancels and replaces the second edition (ISO 4582:1998), which has been technically revised.

Introduction

A number of different exposure techniques can be used to provide information on the effects of environmental stresses such as light, heat and water on plastics (see ISO 877 and ISO 4892). Each exposure test has its own particular application and relevance. When determining changes in a particular property or attribute of a material subjected to different exposures, the same evaluation methods should be used after all exposures to ensure meaningful results.

Results for plastics subjected to exposure tests are strongly dependent on the type of exposure conditions used, the type of plastic being tested and the property being evaluated. A result obtained for one property may not be the same as that for a different property of the same material, even if the same exposure test is used. This standard is not intended to establish a fixed procedure for conducting the exposure test, but is intended to provide a set of specific procedures used to express the results for change in a characteristic property of the material after it has been exposed. It is up to the user to determine which exposure conditions are most relevant to the specific material and the service conditions being used.

Test methods should be selected to determine changes in appearance and properties of the exposed material with its proposed application in mind. The exposure test used should be devised to discriminate among materials based on such changes. This standard suggests typical properties that can be used to determine changes in plastics which have been subjected to exposure tests.

NOTE Because of large differences in the spectral distribution of the light sources used, there can be large differences in results for the same plastics exposed in the various devices described in ISO 4892. Therefore, comparisons between plastics should only be made based on results from exposures in the same type of device and under the same conditions. For optimum comparisons, plastics should be exposed at the same time in the same device.

This document is a preview generated by EVS

Plastics — Determination of changes in colour and variations in properties after exposure to daylight under glass, natural weathering or laboratory light sources

1 Scope

This International Standard describes procedures used to determine changes in colour and other appearance properties, and variations in mechanical or other properties, of plastics that have been exposed to daylight behind glass, to natural weathering or to light from a laboratory source. The procedure used to analyse data depends on whether the test used to characterize the materials being exposed is destructive or non-destructive. The exposures are conducted under conditions described in specific exposure standards.

2 Normative references

The following referenced documents are indispensable for the application 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 75 (all parts), *Plastics — Determination of temperature of deflection under load*

ISO 105-A01, *Textiles — Tests for colour fastness — Part A01: General principles of testing*

ISO 105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*

ISO 105-A03, *Textiles — Tests for colour fastness — Part A03: Grey scale for assessing staining*

ISO 178, *Plastics — Determination of flexural properties*

ISO 179 (both parts), *Plastics — Determination of Charpy impact properties*

ISO 180, *Plastics — Determination of Izod impact strength*

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

ISO 306, *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST)*

ISO 527 (all parts), *Plastics — Determination of tensile properties*

ISO 2602, *Statistical interpretation of test results — Estimation of the mean — Confidence interval*

ISO 2813, *Paints and varnishes — Determination of specular gloss of non-metallic paint films at 20°, 60° and 85°*

ISO 2818, *Plastics — Preparation of test specimens by machining*

ISO 4628-6, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 6: Assessment of degree of chalking by tape method*

ISO 6603-1, *Plastics — Determination of puncture impact behaviour of rigid plastics — Part 1: Non-instrumented impact testing*

ISO 6603-2, *Plastics — Determination of puncture impact behaviour of rigid plastics — Part 2: Instrumented impact testing*

ISO 6721-1, *Plastics — Determination of dynamic mechanical properties — Part 1: General principles*

ISO 6721-3, *Plastics — Determination of dynamic mechanical properties — Part 3: Flexural vibration — Resonance-curve method*

ISO 6721-5, *Plastics — Determination of dynamic mechanical properties — Part 5: Flexural vibration — Non-resonance method*

ISO 7724 (all parts), *Paints and varnishes — Colorimetry*

ISO 8256, *Plastics — Determination of tensile-impact strength*

ISO 13468-1, *Plastics — Determination of the total luminous transmittance of transparent materials — Part 1: Single-beam instrument*

ISO 14782, *Plastics — Determination of haze for transparent materials*

CIE Publication No. 15, *Colorimetry*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

control

material which is of similar composition and construction to the test material, used for comparison and exposed at the same time as the test material

3.2

file specimen

portion of the material to be tested which is stored under conditions in which it is stable, and is used for comparison between the exposed and the original state

3.3

masked area

portion of the exposed specimen which is protected from light exposure by masking

NOTE The masked area is not protected from heat and moisture.

3.4

test specimen

specific portion of the material upon which the testing is to be performed

3.5

replicate specimens

identical pieces of the test material being evaluated which are all exposed, conditioned and tested at the same time