### INTERNATIONAL STANDARD

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# 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



Reference number ISO 4582:2007(E)

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#### Foreword

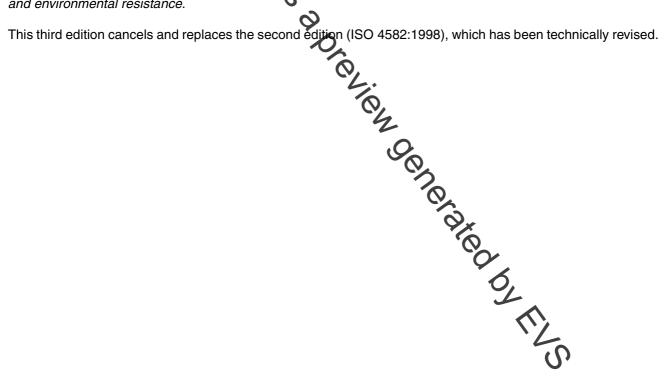
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ISO 4582 was prepared by Technical Committee ISO/TC 61, Plastics, Subcommittee SC 6, Ageing, chemical and onvironmental resistance and environmental resistance.



#### 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 objected 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.



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## 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 upder conditions described in specific exposure standards.

#### 2 Normative references

The following referenced documents 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 AD3: 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: Noninstrumented impact testing

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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 — Nonresonance method

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

ISO 8256, Plastics — Determination of tensile-impact strength

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

ISO 14782, Plastics — Determination o 🕿 for transparent materials

CIE Publication No. 15, Colorimetry

#### Terms and definitions 3

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

#### 3.1

#### control

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

#### 3.2

#### file specimen

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

#### 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