



Plastics — Methods of exposure to solar radiation —

Part 1:
General guidance

*Plastiques — Méthodes d'exposition au rayonnement solaire —
Partie 1: Lignes directrices générales*

ISO 877-1

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Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Principle	2
5 Apparatus	3
5.1 General requirements.....	3
5.2 Apparatus for measurement of climatic factors.....	3
5.2.1 Apparatus for measurement of radiant exposure.....	3
5.2.2 Other climate-measuring instruments.....	4
6 Test specimens	5
6.1 Form, shape and preparation.....	5
6.2 Number of test specimens.....	5
6.3 Conditioning and storage.....	6
7 Conditions of exposure of the test specimens	6
7.1 Classes of climate.....	6
7.2 Types of exposure used for specimens.....	6
8 Exposure stages	7
8.1 General considerations.....	7
8.2 Duration of exposure.....	7
8.3 Solar radiant exposure.....	7
8.3.1 Importance.....	7
8.3.2 Instrumental measurement of solar radiant exposure.....	7
9 Procedure	8
9.1 Mounting of test specimens.....	8
9.2 Mounting of reference materials.....	8
9.3 Climatic observations.....	9
9.4 Exposure of test specimens.....	9
9.5 Determination of changes in properties, if required.....	9
10 Expression of results	9
10.1 Determination of changes in properties.....	9
10.2 Levels (values) of exposure stages.....	9
10.3 Climatic conditions.....	9
11 Test report	10
Annex A (informative) Classification of climates	12
Bibliography	14

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This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 6, *Ageing, chemical and environmental resistance* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 249, *Plastics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 877-1:2009), which has been technically revised.

The main changes are as follows:

- addition of new term and definition ([3.1](#)) "natural weathering";
- addition of a requirement for the area beneath and in the vicinity of racks in [5.1](#);
- addition of new NOTE 2 in 9.2 referring to ISO/TR 19032;
- addition of information to be included in the test report ([Clause 11](#)).

A list of all parts in the ISO 877 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.

This corrected version of ISO 877-1:2025 incorporates the following corrections:

- in [6.1](#), information on test specimens have been corrected.

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Outdoor-exposure tests of the type specified in the ISO 877 series are needed to evaluate the performance of plastics when exposed to solar radiation. The results of such tests should be regarded only as an indication of the effect of exposure to direct weathering (ISO 877-2:2025, method A) or to indirect weathering using glass-filtered solar radiation (ISO 877-2:2025, method B) or to intensified solar radiation (ISO 877-3) by the methods described. Results from tests conducted in accordance with any of the parts of the ISO 877 series will show some variability when comparing results from repeat exposures conducted at the same location at a different time. This is much more important for materials that show significant change after a year or less of exposure. In general, results from repeat exposures at the same location are necessary to determine the range of performance of a material subjected to exposure to solar radiation as specified in the ISO 877 series. Since the type of climate can have a significant effect on the rate and type of degradation, results from exposures conducted in different types of climate are necessary to fully characterize the outdoor durability of a material. For solar-concentrating exposures conducted in accordance with ISO 877-3, exposure duration is defined in terms of the total solar UV radiant exposure. This reduces the effect of annual and seasonal variations in solar ultraviolet radiation.

Fresnel-reflecting concentrators of the type described in ISO 877-3, are utilized to intensify natural solar radiation, in an attempt to accelerate outdoor-exposure testing of plastics materials.

A system of classifying and characterizing climates in different parts of the world is given in [Annex A](#).

The test method chosen is usually that designed to expose the material to the most severe conditions associated with any particular climate. It should, therefore, be borne in mind that the severity of exposure in actual use is, in most cases, likely to be less than that specified in this document, and allowance should be made accordingly when interpreting the results. For example, vertical exposure at 90° from the horizontal is considerably less severe in its effects on plastics than near-horizontal exposure, particularly in tropical regions, where the sun is most powerful at high zenith angles.

Polar-facing surfaces are much less likely to be degraded than equator-facing surfaces because they are less exposed to solar radiation. However, the fact that they can remain wet for longer periods can be of significance for materials affected by moisture or for materials that are susceptible to microbial growth.