
**Plastics — Methods of exposure to
solar radiation —**

**Part 3:
Intensified weathering using
concentrated solar radiation**

iTeh STANDARD PREVIEW
Plastiques — Méthodes d'exposition au rayonnement solaire —
(standards.iteh.ai) Partie 3: Exposition intensifiée par rayonnement solaire concentré

[ISO 877-3:2018](https://standards.iteh.ai/catalog/standards/sist/a7824819-0068-4b06-8f22-47b4b3403b2c/iso-877-3-2018)

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Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	1
5 Apparatus	2
6 Test specimens	3
7 Exposure conditions	3
7.1 Orientation of mirrors.....	3
7.2 Exposure site.....	4
7.3 Temperature control.....	4
7.4 Irradiance level.....	5
8 Exposure stages	6
8.1 General.....	6
8.2 Solar radiant exposure.....	6
8.2.1 Guidance for selection of the exposure stage.....	6
8.2.2 Instrumental measurement of solar radiant exposure.....	6
9 Procedure	7
9.1 Mounting of test specimens.....	7
9.2 Mounting of reference materials (if used).....	7
9.3 Climatic observations.....	7
9.4 Exposure of test specimens.....	7
9.4.1 General.....	7
9.4.2 Exposure cycles.....	7
9.4.3 Testing under glass.....	7
10 Expression of results	8
10.1 Determination of changes in properties.....	8
10.2 Climatic conditions and observations.....	8
10.2.1 General.....	8
10.2.2 Temperature.....	8
10.2.3 Relative humidity.....	8
10.2.4 Levels (values) of exposure stages.....	8
10.2.5 Precipitation.....	9
10.2.6 Time of wetness.....	9
10.2.7 Other observations.....	9
11 Test report	9
Bibliography	10

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).

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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. (standards.iteh.ai)

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This second edition cancels and replaces the first edition (ISO 877-3:2009), which has been technically revised.

A list of all the parts in the ISO 877 series can be found on the ISO website.

Introduction

The International Organization for Standardization (ISO) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning temperature control described in [7.3](#)

ISO takes no position concerning the evidence, validity and scope of this patent right.

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Plastics — Methods of exposure to solar radiation —

Part 3: Intensified weathering using concentrated solar radiation

1 Scope

This document specifies a method for exposing plastics to concentrated solar radiation using reflecting concentrators to accelerate the weathering processes. The purpose is to assess property changes produced after specified stages of such exposures. The reflecting concentrators used in these exposures are sometimes referred to as “Fresnel reflectors” because in cross-section the array of mirrors used to concentrate the solar radiation resembles the cross-section of a Fresnel lens.

General guidance concerning the scope of the ISO 877 series is given in ISO 877-1.

NOTE Additional information about solar concentrating exposures, including a partial list of standards in which they are specified, is given in the Bibliography.

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 877-1, *Plastics — Methods of exposure to solar radiation — Part 1: General guidance*

ISO 877-2, *Plastics — Methods of exposure to solar radiation — Part 2: Direct weathering and exposure behind window glass*

ISO 4892-1, *Plastics — Methods of exposure to laboratory light sources — Part 1: General guidance*

ASTM G90, *Standard Practice for Performing Accelerated Outdoor Weathering of Nonmetallic Materials Using Concentrated Natural Sunlight*

ASTM G179, *Standard Specification for Metal Black Panel and White Panel Temperature Devices for Natural Weathering Tests*

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:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

4 Principle

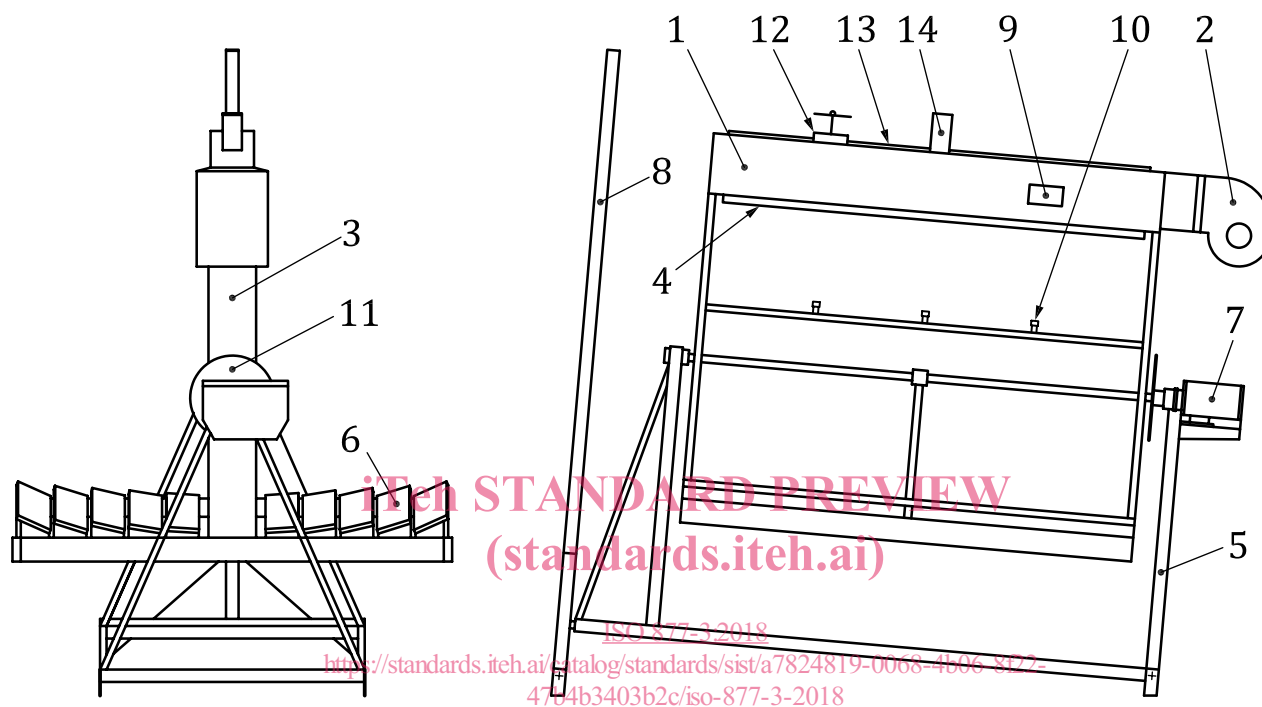
This document describes a method for performing accelerated weathering on plastics using intensified solar radiation. General guidance is given in ISO 877-1.

5 Apparatus

5.1 General requirements

Refer to ISO 877-1 for general requirements.

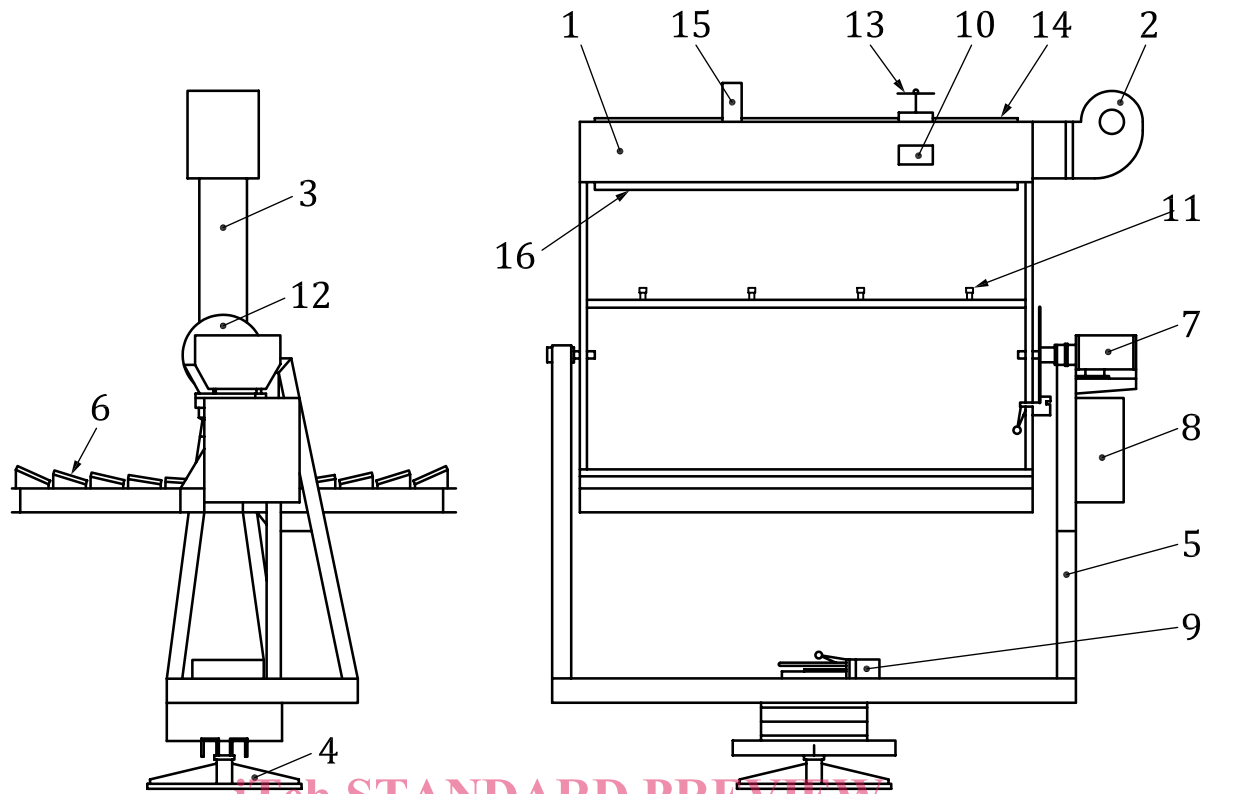
All requirements for the solar concentrating device, operation of the device and measurement of the solar radiation within the specimen exposure area shall be in accordance with ASTM G90. See [Figures 1](#) and [2](#) for schematic diagrams of the two types of test apparatus.



Key

1	air plenum	6	mirror	11	clutch disc for elevation drive
2	air blower	7	gear box	12	solar cells with shadow hat
3	rotor assembly	8	mast for manual elevation adjustment	13	specimen protection door
4	air deflector	9	air flow switch	14	door release mechanism
5	A-frame assembly	10	water spray nozzles		

Figure 1 — Schematic diagram of test apparatus with single-axis tracking and manual elevation adjustment



Key

1	air plenum	7	gear box for elevation drive	13	solar cells with shadow hat
2	air blower	8	control box	14	specimen protection door
3	rotor assembly	9	gear box for azimuth drive	15	door release mechanism
4	turntable assembly	10	air flow switch	16	air deflector
5	A-frame assembly	11	water spray nozzles		
6	mirror	12	clutch disc for elevation drive		

Figure 2 — Schematic diagram of test apparatus with dual-axis tracking

5.2 Apparatus for measurement of climatic factors

Refer to ISO 877-1.

6 Test specimens

Refer to ISO 877-1.

NOTE When irregularly shaped specimens are used, air flow and specimen cooling can be adversely affected. In addition, irradiance will not be uniform on all surfaces of a shaped specimen.

7 Exposure conditions

7.1 Orientation of mirrors

For specific information on the orientation of the mirrors, refer to ASTM G90.