



BSI Standards Publication

Plastics — Methods for marine exposure

National foreword

This British Standard is the UK implementation of [ISO 15314:2018](#). It supersedes [BS ISO 15314:2004](#), which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/21, Testing of plastics.

A list of organizations represented on this committee can be obtained on request to its secretary.

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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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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 61, *Plastics*, Subcommittee SC 6, *Ageing, chemical and environmental resistance*.

This second edition cancels and replaces the first edition (ISO 15314:2004), which has been technically revised.

The main changes compared to the previous edition are as follows.

- The term “sunlight” has been replaced by “solar radiation” or “global solar radiation”.
- [ISO 293](#), [ISO 294-1](#), [ISO 294-2](#), [ISO 294-3](#), [ISO 295](#) and [ISO 3167](#) have been moved to the bibliography.
- In [Clause 2](#), the withdrawn International Standard [ISO 877](#) has been replaced by [ISO 877-1](#), [ISO 877-2](#), and [ISO 877-3](#).

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

Plastics are often used in outdoor applications where they are immersed or partially immersed in water. In some cases, materials made from plastic are designed to float on water. In others, plastic articles that are discarded end up as floating debris. In addition to the effects of global solar radiation and heat, plastic polymers or products exposed in marine environments may be subjected to hydrolysis, water absorption, extraction of stabilizers, erosion by wave action, corrosion by salts and/or attack by seaborne microorganisms. These stresses are not simulated in typical weathering exposures conducted in accordance with [ISO 877-1](#), [ISO 877-2](#) and [ISO 877-3](#). Therefore, it is necessary to define procedures that realistically and consistently stress plastic materials in the same way that they would be in products used or discarded in marine environments. This document describes three procedures for the exposure of plastic materials in the same way as they could be when used in marine environments.

There are four primary reasons why the rate of degradation of plastics exposed at sea can be different from that for the same plastic exposed on land:

- a) exposure in moist conditions is known to accelerate degradation of some polymers — small amounts of absorbed water can act as a plasticizer, increasing accessibility of the matrix to oxygen, or can leach out stabilizing additives;
- b) differences in heat build-up between plastics exposed in water or on the surface compared to plastics exposed on land;
- c) the action of microorganisms that can shield the plastic from UV radiation or can enhance biodegradation processes;
- d) the action of macroorganism settlements that can produce disfigurement of surfaces.

It is essential to establish appropriate exposure procedures in order to properly assess the performance of plastics used in marine environments, and to evaluate how long plastics discarded as litter will persist in marine environments.