

ICS 83.080.01
CCS G 31



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 47922-2026

Plastics - Methods for marine exposure

塑料 海洋暴露试验方法

(English Translation)

Issued on: July 2, 2026

Implemented on: February 1, 2027

Issued by: State Administration for Market Regulation

Table of Contents

- Preface
- Introduction
- 1 Scope
- 2 Normative References
- 3 Terms and Definitions
- 4 Principle
 - 4.1 General Provisions
 - 4.2 Significance
- 5 Experimental Apparatus
 - 5.2 Apparatus for the Floating Exposure Test (Method A)
 - 5.3 Apparatus for Partial Immersion Exposure Test (Method B)
 - 5.4 Apparatus for Full Immersion Exposure Test (Method C)
- 6 Sample
 - 6.1 Sample Shape and Preparation
 - 6.2 Number of Samples
 - 6.3 Storage and Conditioning
- 7 Experimental Procedures
 - 7.1 General Rules
 - 7.2 Floating Exposure Test (Method A)
 - 7.3 Partial Immersion Exposure Test (Method B)
 - 7.4 Full Immersion Exposure Test (Method C)
 - 7.5 Post-exposure specimen evaluation
- 8 Test Report
- References

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document adopts ISO 15314:2018 "Plastics - Marine exposure test method".

This document was proposed by the China Petroleum and Chemical Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Plastics Standardization (SAC/TC15).

Introduction

Plastics are often used outdoors in wet environments, partially or completely submerged. Some plastic materials float on the water's surface.

One part is designed for use; the other part is discarded and eventually becomes floating debris. Plastic materials or products exposed to the marine environment, except...

Influenced by total solar radiation and heat, hydrolysis, water absorption, and stabilizer precipitation may occur, as well as erosion from sea waves, salt corrosion, and/or marine corrosion.

Damage from marine microorganisms. These environmental conditions cannot be simulated by aging tests as specified in ISO 877-1, ISO 877-2 and ISO 877-3.

Therefore, it is necessary to formulate corresponding standards to impose environmental conditions on plastic materials in a practical and consistent manner, so as to ensure that the environment they can withstand is suitable for them.

The conditions are consistent with the environmental conditions experienced by products used or discarded in a marine environment. This document describes simulated plastic materials in a marine environment.

Three testing methods for environmental exposure.

Marine and terrestrial environments differ significantly, and these differences can lead to the same plastic products being exposed to both marine and terrestrial environments.

The different degradation rates are mainly due to the following four factors.

a) Some polymers degrade more rapidly when exposed to moisture. Absorbing small amounts of moisture can act as a plasticizer, accelerating oxidation.

Gas entering the polymer can also lead to the loss of stabilizers.

c) The role of microorganisms may form a shield on the plastic surface to protect it from ultraviolet radiation, and may also promote the biodegradation of plastics.

d) The attachment of large organisms may cause deformation of the plastic surface.

To accurately assess the performance of plastics in the marine environment and estimate the potential duration of plastic waste in the ocean, it is necessary to...

Appropriate exposure testing methods should be established.

Plastics Marine Exposure Test Method

1 Scope

This document describes three test methods for plastics exposed to marine environments. Method A is suitable for exposure where the specimen floats on the water surface.

Test method B is suitable for exposure tests where the sample is partially immersed, while method C is suitable for exposure tests where the sample is completely immersed.

Although these methods...

Designed for marine (saline) environments, but also applicable to outdoor exposure tests in brackish and freshwater environments. Land exposure test methods are described in [link to documentation].

ISO 877-1, ISO 877-2 and ISO 877-3.

Method A is particularly suitable for modified biodegradable materials, which are expected to degrade at significantly higher rates than conventional biodegradable materials in marine floating environments.

Plastic materials.

This document specifies the general technical requirements for the testing equipment and the operating procedures for the tests.

This document provides recommendations for evaluating the performance of plastics after marine exposure. ISO 4582 provides more detailed information on the post-exposure properties of plastics.

Information that can be expressed through varying test methods and results.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

ISO 877-1 Plastics - Methods of exposure to solar radiation - Part 1: General principles

Note. GB/T 3681.1-2021 Plastics - Solar Radiation Exposure Test Methods - Part 1:

General (ISO 877-1:2009, IDT) ISO 877-2 Plastics - Test methods for solar radiation

exposure - Part 2: Direct natural weathering and exposure to weathering behind window glass) Note. GB/T 3681.2-2021 Plastics - Test Methods for Solar Radiation Exposure - Part

2: Direct Natural Climate Aging and Climate Aging Exposed to Window Glass (ISO

877-2:2009, IDT) ISO 877-3 Plastics - Test methods for exposure to solar radiation - Part 3:

Accelerated natural aging due to concentrated solar radiation (Plastics -radiation) Note.
GB/T 39812-2021 Machining preparation of plastic specimens (ISO 2818:2018, IDT) ISO
4582 Measurement of changes in color and properties of plastics after exposure to solar
radiation, natural climate or laboratory radiation sources after glass filtration.

Note: GB/T 15596-2021 Determination of color and performance changes of plastics after exposure
to solar radiation, natural climate or laboratory radiation sources after glass filtration.

(ISO 4582:2017, IDT)