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Plastics - Evaluation of the action of microorganisms

塑料 微生物作用的评价

(English Translation)

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Reference

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents"

Drafting.

This document is modified to adopt ISO 846:2019 "Evaluation of the microbiological effects of plastics".

The technical differences between this document and ISO 846:2019 and their reasons are as follows.

- Increase the range of standard temperature and relative humidity maintained by the constant temperature and humidity chamber (see 5.1.3) to improve operability;
- Changed the requirements for stainless steel discs and their finishes (see 5.1.12) and stainless steel surfaces (see Appendix B) to adapt to my country Technical conditions and improve operability;
- Changed the provisions on the number of samples in group 0 and group S (see 6.2.1.1) to be consistent with the number of samples in each group in 6.2.2.

The following editorial changes were made to this document.

- Deleted the normative reference document EN10088-1 (see Chapter 2, 5.1.12 and Appendix B of ISO 846:2019), added the national the grade of the inner stainless steel (see 5.1.12, Appendix B);
- Deleted the normative reference document EN13697:2015 and adopted the cleaning method in Appendix B (see Chapter 2, 6.2.2 and 7.1), added notes to indicate the relationship between Appendix B and EN13697:2015 (see Note 6.2.2);
- Added notes to clarify the type of reagents used (see Note 5.1.11);
- Added notes to supplement the applicable stainless steel sheet types (see Note 5.1.12);
- Added the domestic strain number and related notes of the tested bacteria (see Table 1, Table 2, 5.3.1 and Table D.1);
- Added the size and preparation method of the visual assessment specimen to be consistent with Appendix C (see 6.1);
- Combined the contents of test report items f) and g) of ISO 846:2019 [see item f) in Chapter 12];
- Added explanation of the evaluation sample grid and data on fungal growth examples (see Figures C.1 and C.2);
- Replaced ISO 22196 with the informative reference GB/T 31402 (see 4.3).

Introduction

Under certain climatic and environmental conditions, microorganisms can grow and reproduce on the surface of plastics or plastic products. Microorganisms and their

metabolites it can not only damage the plastic itself, but also affect the reliability of building materials and components containing plastic.

The test methods and conditions specified in this document are based on experiments and cover most potential applications.

For specific applications and long-term testing, agreement needs to be reached on a test procedure that reflects performance under real conditions.

The action of microorganisms on plastics is influenced by two processes.

- a) Direct effect. Microorganisms use plastics as nutrients for growth, causing plastics to deteriorate;
- b) Indirect effects. of microbial metabolites on plastics, such as discoloration or further deterioration.

This paper deals with both processes and their combined effects.

Evaluation of the role of microorganisms in plastics **WARNING** - Handling and manipulation of potentially dangerous microorganisms requires high technical skills and should comply with current national laws and regulations.

Only personnel trained in microbiology techniques can conduct these tests and must strictly follow relevant disinfection, sterilization and personal hygiene procedures.

Standardized procedures. Experimenters should refer to IEC 60068-2-10 and ISO 7218 for operation.

1 Scope

This document describes methods for determining the degradation of plastics caused by the action of fungi, bacteria and soil microorganisms.

biodegradability of materials or degradation of natural fiber composites.

The type and extent of degradation can be determined by one or more of the following.

- a) visual inspection;
- b) changes in quality;
- c) Changes in other physical properties.

This document applies to plastics with smooth, easily cleanable surfaces. Porous materials, such as plastic foams, are excluded.

This document uses the same test fungi as IEC 60068-2-10. The "assembled samples" in IEC 60068-2-10 require the use of spore suspensions.

The samples were inoculated and cultured with the suspension to evaluate the fungal