

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 846

PLASTICS

RECOMMENDED PRACTICE FOR THE EVALUATION
OF THE RESISTANCE OF PLASTICS TO FUNGI
BY VISUAL EXAMINATION

1st EDITION

October 1968

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Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

BRIEF HISTORY

The ISO Recommendation R 846, *Plastics – Recommended practice for the evaluation of the resistance of plastics to fungi by visual examination*, was drawn up by Technical Committee ISO/TC 61, *Plastics*, the Secretariat of which is held by the United States of America Standards Institute (USASI).

Work on this question by the Technical Committee began in 1957 and led, in 1964, to the adoption of a Draft ISO Recommendation.

In April 1965, this Draft ISO Recommendation (No. 813) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Argentina	Greece	Poland
Australia	Hungary	Portugal
Austria	India	Romania
Belgium	Israel	Switzerland
Brazil	Italy	U.A.R.
Canada	Japan	United Kingdom
Czechoslovakia	Netherlands	U.S.A.
France	New Zealand	U.S.S.R.

One Member Body opposed the approval of the Draft :

Sweden

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in October 1968, to accept it as an ISO RECOMMENDATION.

PLASTICS

RECOMMENDED PRACTICE FOR THE EVALUATION OF THE RESISTANCE OF PLASTICS TO FUNGI BY VISUAL EXAMINATION

INTRODUCTION

Micro-organisms vegetate on plastics containing nutritive substances, necessary for their growth, which are either contained in the plastics as components or are deposited subsequently thereon either in processing or in use.

Thus, on material which is itself fungus-resistant, fungi can vegetate only in the presence of impurities. In this case, the fungus may affect the plastics by its metabolic products influencing indirectly the properties of the plastics.

1. SCOPE

- 1.1 This ISO Recommendation describes the procedure for the evaluation of the resistance of plastics to attack by fungi when inoculated by these organisms.

This procedure provides for visual observation as to whether or not plastics are subject to fungal growth but it does not provide data about changes of chemical and physical properties caused by micro-organisms.

- 1.2 According to the end application of a material, certain requirements, such as water resistance, resistance to washing, resistance to weathering, or heat stability may have necessitated certain treatments. Therefore it should be stated explicitly in what condition the test material is being tested, i.e., its method of pre-treatment should be indicated.

NOTE. — Since the procedure involves handling and working with fungi, it is recommended that personnel trained in microbiology should perform the part of the procedure involving handling of organisms and inoculated specimens.

- 1.3 Two methods of test are described in this ISO Recommendation : *Method A* and *Method B*.

1.3.1 *Method A* determines whether the plastics under test are inert or serve as a nutritive medium for the growth of micro-organisms. The resistance of a material is judged visually according to the degree of fungal growth on its surface.

1.3.2 *Method B* determines the degree of fungal growth on the surface of the material when it is enriched by a nutritive medium. The evaluation is made visually. This method permits the determination of the fungitoxic properties of plastics.

- 1.4 If the conditions of use in service of the material are taken into consideration, Method A may be considered sufficient; if not, the test is then continued according to Method B.

- 1.5 For example, if plastics are used under conditions which exclude surface contamination by organic substances, Method A is sufficient. However, materials used under conditions involving strong surface contamination should be tested according to Method B.

- 1.6 In order to save time, it is recommended that the two test Methods (A and B) should be started simultaneously.

2. METHOD A

2.1 Scope

Method A is intended to determine the ability of plastics themselves to support the growth of fungi, i.e. to serve as a nutritive medium.

For this reason, the test specimens are placed on a mineral-salts agar medium (2.3.1.3) and inoculated with the spore suspension of the fungi in an aqueous mineral-salts solution (2.3.1.4) in order to provide for conditions under which the plastics are a nutritive medium for fungi.

2.2 Test specimens

2.2.1 The size of the test specimens is optional, but not less than three replicate test specimens should be used.

NOTE. — Recommended dimensions of the test specimens are as follows :

30 to 50 mm square pieces, with a maximum thickness of 4 mm.

2.2.2 The specimens are tested under optimum conditions for fungal growth, i.e., at $30 \pm 2^\circ\text{C}$ and at 95 to 100 % relative humidity.

2.2.3 The specimens are tested as delivered, without cleaning.

NOTE. — In order to make sure that secondary contamination with nutrient substances does not interfere with the test, the specimens may be cleaned according to section A.5 of the Annex. When cleaned test specimens are used, this fact should be mentioned in the test report, under section 4.

2.3 Preparation of fungal species for test

2.3.1 *Nutritive media.* The following nutritive media are suitable for the culturing of fungi.

2.3.1.1 *Modified Czapek-Dox agar, containing saccharose.*

NaNO ₃	2	g
KH ₂ PO ₄	0.7	g
K ₂ HPO ₄	0.3	g
KCl	0.5	g
MgSO ₄ · 7 H ₂ O	0.5	g
FeSO ₄ · 7 H ₂ O	0.01	g
Saccharose	30	g
Distilled water	1000	ml
Agar	20	g

2.3.1.2 *Modified Czapek-Dox agar, containing cellulose.* In the nutritive medium mentioned in clause 2.3.1.1 above, saccharose is replaced by cellulose in the form of strips of filter paper.

NOTE. — On modified Czapek-Dox agar containing saccharose the fungal strains No. 1, 2, 3 and 4 can be cultured. Modified Czapek-Dox agar containing cellulose can be used for culturing the strains No. 2, 4 and 5 given below (see clause 2.3.2).

2.3.1.3 *Mineral-salts agar.* This is identical with the composition of modified Czapek-Dox agar (2.3.1.1) but without the saccharose.

2.3.1.4 *Aqueous mineral-salts solution.* This is identical with the composition of modified Czapek-Dox agar (2.3.1.1), but without the saccharose and agar.

NOTE. — For the preparation of nutritive media, see the Annex.