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Textiles — Determination of antifungal activity of textile products —

Part 2:
Plate count method

Textiles — Détermination de l'activité antifongique des produits textiles —

Partie 2: Méthode par dénombrement sur plaque de gélose

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13629-2 was prepared by Technical Committee ISO/TC 38, *Textiles.*

ISO 13629 consists of the following parts, under the general title *Textiles — Determination of antifungal activity of textile products*:

— *Part 2: Plate count method*

— *Part 1: Luminescence method*

Introduction

This part of standard adopts the plate count method as a basis of quantitative determination of antifungal activity.

Characteristics of the plate count method are:

— conventional method with easiness to operate in bacteriological laboratories

— no need to special apparatus such as a lumino photometer

— long history and common procedure

Textiles — Determination of antifungal activity of textile products — Part 2: Plate count method

1 Scope

This part of ISO 13629 specifies a test method for quantitative determination of antifungal activity by plate count method.

This standard is applicable to various kinds of textile products such as fibres, yarns, fabrics, clothing, bedclothes, home furnishings and other miscellaneous goods.

2 Normative reference

The following referenced documents are indispensable for the application of this standard.
The latest edition of the referenced document (including any amendments) applies.

ISO 105 F02, *Textiles —Tests for colour fastness—Part F02: Specification for cotton and viscose adjacent fabrics*

ISO 7218, *Microbiology of food and animal feeding stuffs—General requirements and guidance for microbiological examinations*

3 Terms and definitions

For the purposes of this part of standard, the following terms and definitions apply.

3.1
control fabric
fabric used to validate the growth condition of test fungi. Control specimens are sampled form the control fabric

NOTE The control fabric may be the same fabric as the fabric to be tested but without antifungal treatment. If this is not available, a 100% cotton fabric without fluorescent brighteners or other finish, complying with the requirements of ISO 105-F02 is used as control fabric, after 10 cycles of washing for 10 minutes at the temperature of 60 ºC without detergents or any brighteners with mechanical agitation and rinsing twice for 5 minutes in tap water at room temperature.

3.2
antifungal agent
chemical agent to prevent or mitigate the growth of fungi or to reduce the number of fungi

3.3
antifungal treatment
treatment to prevent or mitigate the growth of fungi or to reduce the number of fungi

3.4
spore suspension
liquid with evenly-dispersed fungal spores in sterilized water containing an anionic surfactant

3.5
plate count method
method in which the number of fungi present after incubation is calculated by counting the number of colonies according to a ten-time dilution method. The results are expressed in CFU (Colony Forming Unit)

3.6
Neutraliser
chemical agents used to inactivate, neutralise, or quench the antifungal properties of antifungal agents.

4 Principle

A test specimen and a control specimen are inoculated with spore suspension of reference fungi and incubated at 30 ºC for 48 hours.

In this part of ISO 13629, fungal growth is quantitatively determined by the visual counting of colonies on the agar plate as CFU and the fungal activity is calculated by CFU.

In case of the test specimen absorbs water, the absorption method is recommended and in case of the test specimen does not absorb water, the transfer method is recommended.

5 Safety precaution

The test method specified herein requires use of fungi.

According to the ISO 7218 standard, this test shall be performed only by personnel with training and experience in microbiological techniques.

All regulations, rules and recommendations regarding appropriate safety precautions in the country concerned shall be consulted and followed.

6 Reference fungi

The fungi to be used shall be selected from Annex A, Table A.1.

The equivalent fungi types obtained from other agencies of the World Federation for Culture Collection (WFCC) may be used as agreed upon between interested parties.

The strain number and supply source of the fungi used shall be stated in the test report.

7 Apparatus

Usual laboratory apparatuses and, in particular, the following apparatuses are used. All items have to be sterilized before using.

7.1 Gauze, sterized.

7.2 Petri dish, made of glass or plastic with a diameter of about 60 mm or 90 mm.

7.3 Autoclave, capable of maintaining the temperature of (121 ± 2) ºC (equivalent to 103 kPa).

7.4 Platinum loop, with a loop of 2 mm to 4 mm in diameter (or plastic equivalent).

7.5 L-shaped platinum colony hook (or plastic equivalent)

7.6 Incubator, capable of maintaining a temperature in a range from 25 ºC to 37 ºC with a tolerance of ± 2 ºC.

7.7 Vial, capacity of 30 ml screw-top glass vial with polytetrafluoroethylene or silicone gasket and polypropylene cap. It shall be carefully washed in alkaline or neutral detergent, rinsed and dried.

7.8 Glass funnel

7.9 Pipettes, capacity of 0,2 ml, 1 ml, 5 ml and 10 ml with a tolerance of 0,5 % or less and with a tip made of glass or plastic.

7.10 Pasteur pipette, for microbiological testing (or plastic equivalent).

7.11 Conical flask, capacity of 100 ml to 500 ml.

7.12 Tweezers, made of material which can be sterilized.

7.13 Centrifuge, with centrifugal acceleration of approximate 2 000 *x g*.

7.14 Centrifuge tube, used for centrifuge.

7.15 Hemacytometer, capable of measuring 1 x 10^6 cells/ml to 3 x 10^6 cells/ml.

7.16 Microscope, capable of 200 times magnification.

7.17 Ultrasonic cleaner, compact for experiment tools, with frequency of approximate 30 kHz to 50 kHz.

7.18 pH meter, with glass electrodes for biochemical testing or equivalent pH paper.

7.19 Erlenmeyer flask, capacity of 100 ml.

7.20 Cutting template, made of stainless steel with a diameter of (3,8 ± 0,1) cm.

7.21 Stainless steel cylinder, with a weight of (200 ± 10) g and a diameter of (3,5 ± 0,1) cm.

7.22 Shaker, capable of producing a Vortex shaking action.

7.23 Stomacher, capable of speed, 6 blows/s to 8 blows/s with the corresponding disposable containers.

7.24 Humidity chamber, a tropical chamber or other container capable of maintaining a high humidity atmospheric condition.

7.25 Refrigerator, capable of maintaining a temperature of between 2 °C and 8 °C with a tolerance of ± 2 ºC.