

PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD

Clothes washing machines for household use – Method for measuring the microbial contamination reduction

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 97.060

ISBN 978-2-8322-2478-6

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms, definitions and symbols.....	9
3.1 Terms and definitions.....	9
3.2 Symbols.....	9
4 Requirements	10
5 Test conditions, materials, equipment and instrumentation	10
5.1 Test conditions	10
5.2 Materials and reagents	10
5.2.1 Microorganisms for test purposes	10
5.2.2 Culture media and solutions	10
5.2.3 Detergent	13
5.3 Equipment	14
5.3.1 General	14
5.3.2 Incubator	14
5.3.3 Autoclave	14
5.3.4 Microorganism carrier	14
5.3.5 Pipettes	14
5.3.6 Electromechanical agitator.....	14
5.3.7 Centrifuge, centrifuge tubes.....	14
5.3.8 Base load	14
5.3.9 Measuring equipment for assessing temperature profile	15
5.3.10 Measuring equipment for water consumption	15
6 Tests	15
6.1 Test method principles.....	15
6.2 Preparation of test washing machine.....	15
6.3 Preparation of test microorganisms and bio monitors	15
6.3.1 Cultures.....	15
6.3.2 Bio monitors	17
6.4 Main test.....	18
6.4.1 General	18
6.4.2 Evidence of test microorganisms	18
6.5 Validation.....	18
6.5.1 Enumeration of microorganisms before exposition N_0 (bio monitor reference).....	18
6.5.2 Negative control (cross contamination)	18
6.5.3 Determination of water quality	19
6.5.4 Determination of water quantity in the main wash	19
7 Evaluation	19
7.1 Log reduction.....	19
7.2 Cross contamination	19
8 Test report.....	19
Annex A (informative) Microorganism reduction in household washing machines with risk class 1 test microorganisms for internal development purpose	21

A.1	Scope	21
A.2	General recommendation	21
A.3	Material and reagents	21
A.3.1	Microorganisms on bio monitors	21
A.3.2	Water for culture media and solutions	21
A.3.3	Culture media and solutions	21
A.3.4	Detergent	23
A.4	Equipment	23
A.4.1	Incubator	23
A.4.2	Autoclave	23
A.4.3	Microorganism carrier	23
A.4.4	Pipettes	23
A.4.5	Electromechanical agitator.....	23
A.4.6	Centrifuge.....	23
A.4.7	Base load	23
A.4.8	Measuring equipment for assessing temperature profile	23
A.4.9	Measuring equipment for water consumption	23
A.5	Tests	23
A.5.1	Test method principles.....	23
A.5.2	Preparation of washing machine	24
A.5.3	Preparation of test organisms and bio monitors	24
A.5.4	Main test	25
A.5.5	Validation	26
A.6	Evaluation.....	26
A.6.1	Plate counts per bio monitor	26
A.6.2	Log reductions.....	27
A.6.3	Cross contamination	27
A.7	Test report	27
Annex B (informative)	Sources of materials and supplies	28
B.1	Disclaimer.....	28
B.2	Microorganism carriers	28
B.3	Electromechanical agitator.....	28
B.4	Ready-to-use bio monitors	28
B.5	Nonionic surfactant and emulsifier	28
Bibliography.....		29
Figure A.1	– Scheme for preparing a dilution series	25
Table 1	– Composition of Tryptone Soy Agar (TSA)	11
Table 2	– Composition of Sabouraud Dextrose Agar with Chloramphenicol.....	11
Table 3	– Composition of Cetrimide Agar	11
Table 4	– Composition of Baird-Parker Agar	12
Table 5	– Composition of Malt Extract Agar (MEA).....	12
Table 6	– Composition of Tryptone Soy Broth (TSB)	12
Table 7	– Composition of diluting agent	13
Table 8	– Composition of recommended neutralisation solution	13
Table 9	– Specifications for temperature logger	15

Table A.1 – Composition of Sabouraud Dextrose Agar 22

Table A.2 – Composition of Columbia CNA Agar 22

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CLOTHES WASHING MACHINES FOR HOUSEHOLD USE –
METHOD FOR MEASURING THE MICROBIAL
CONTAMINATION REDUCTION**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

A PAS is a technical specification not fulfilling the requirements for a standard, but made available to the public.

IEC PAS 62958 has been processed by subcommittee 59D: Performance of household and similar electrical laundry appliances, of IEC technical committee 59:

The text of this PAS is based on the following document:

This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document

Draft PAS	Report on voting
59D/423/PAS	59D/427/RVD

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

This PAS shall remain valid for an initial maximum period of 3 years starting from the publication date. The validity may be extended for a single period up to a maximum of 3 years, at the end of which it shall be published as another type of normative document, or shall be withdrawn.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

SC 59D decided to address the measurement of the microbial contamination reduction in washing machines by developing a globally acceptable Publicly Available Specification to respond to the increase in consumer complaints regarding odour from washing machines and washed laundry caused by presence of microorganisms.

CLOTHES WASHING MACHINES FOR HOUSEHOLD USE – METHOD FOR MEASURING THE MICROBIAL CONTAMINATION REDUCTION

1 Scope

This Publicly Available Specification (PAS) specifies a test method for measuring the reduction of microbial contamination in clothes washing machines and of the possible cross contamination to uncontaminated load.

NOTE A significant differentiation in microorganism contamination reduction capability of washing machines can be expected at wash temperature not higher than 40 °C.

This PAS applies to clothes washing machines for household use, with or without heating devices utilising cold and/or hot water supply. It also covers washing machines which specify the use of no detergent for normal use. This PAS applies also to washing machines for communal use in blocks of flats or in launderettes.

This PAS does not deal with professional washing machines nor with commercial laundry operations associated with food service, hospital linens or other non-residential applications. It also does not address the needs of persons with specific health conditions requiring special sanitization and/or disinfection techniques.

This PAS does not specify safety requirements and does not deal with performance of washing machines measured under IEC 60456 nor with effects on fabrics.

2 Normative references

IEC 60456:2010, *Clothes washing machines for household use – Methods for measuring the performance*

ISO 2267, *Surface active agents – Evaluation of certain effects of laundering – Methods of preparation and use of unsoiled cotton control cloth*

EN 1276, *Chemical disinfectants and antiseptics. Quantitative suspension test for the evaluation of bactericidal activity of chemical disinfectants and antiseptics used in food, industrial, domestic and institutional areas. Test method and requirements (phase 2, step 1)*

EN 1650, *Chemical disinfectants and antiseptics. Quantitative suspension test for the evaluation of fungicidal or yeasticidal activity of chemical disinfectants and antiseptics used in food, industrial, domestic and institutional areas. Test method and requirements (phase 2, step 1)*

EN 12353, *Chemical disinfectants and antiseptics. Preservation of test organisms used for the determination of bactericidal (including Legionella), mycobactericidal, sporicidal, fungicidal and virucidal (including bacteriophages) activity*