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Electric dishwashers for household use - Methods for measuring the performance

Lave-vaisselle électriques à usage domestique - Méthodes de mesure de l'aptitude à la fonction

CONTENTS

FOREWORD.....	8
INTRODUCTION.....	10
1 Scope.....	11
2 Normative references	11
3 Terms, definitions and symbols	11
3.1 Terms and definitions.....	11
3.2 Symbols.....	16
3.2.1 Symbols related to the application of egg (6.4.5.3)	16
3.2.2 Symbols related to the calculation of the drying index (7.2.3)	16
3.2.3 Symbols related to the calculation of the cleaning index (7.3.2).....	16
3.2.4 Symbols related to the measurements (Clause 8 and Annex U).....	17
3.2.5 Symbols related to the microwave calibration (Annex F).....	17
4 List of measurements	17
5 General conditions for measurements.....	18
5.1 General.....	18
5.1.1 General information	18
5.1.2 Free-standing dishwasher (3.1.2)	19
5.1.3 Built-in dishwasher (3.1.3) and integrated dishwashers (3.1.4)	19
5.1.4 Multi-compartment dishwashers (3.1.1)	19
5.2 Sequence of test procedures and conditioning of the test machine (3.1.5)	19
5.3 Electricity supply for machines.....	20
5.3.1 Electricity supply for test machine (3.1.5)	20
5.3.2 Electricity supply for the reference machine (3.1.6).....	20
5.4 Test programme (3.1.14)	20
5.5 Ambient conditions	20
5.6 Water.....	21
5.6.1 General	21
5.6.2 Water temperature.....	21
5.6.3 Water hardness	21
5.6.4 Water pressure.....	22
5.6.5 Additional water quality parameters	22
5.7 Detergent (3.1.23).....	22
5.8 Rinse aid (3.1.24)	23
5.9 Salt.....	23
5.10 Intermittently recurring functions (3.1.40).....	23
5.10.1 Provision of information	23
5.10.2 Impact of intermittently recurring functions (3.1.40) on reproducibility and the validity of test results	24
5.10.3 Treatment of intermittently recurring functions (3.1.40)	24
6 Combined cleaning and drying performance tests.....	24
6.1 General and purpose	24
6.2 Load	25
6.2.1 Composition of the test load	25
6.2.2 Requirements for pre-conditioning of new tableware (3.1.9).....	25
6.2.3 Requirements for conditioning of tableware (3.1.9).....	25
6.2.4 Requirements for re-conditioning tableware (3.1.9).....	25

6.3	Soiling agents and preparation equipment	25
6.4	Preparation and application of soiling agents	26
6.4.1	General	26
6.4.2	Milk	27
6.4.3	Tea.....	28
6.4.4	Minced meat.....	30
6.4.5	Egg.....	31
6.4.6	Oat flakes.....	32
6.4.7	Spinach	32
6.4.8	Margarine	34
6.5	Drying of the soiled tableware (3.1.9) items	34
6.5.1	General	34
6.5.2	Oven drying method	34
6.5.3	Air drying method	36
6.6	Loading and operating	36
6.6.1	Loading	36
6.6.2	Operating	36
7	Combined cleaning and drying performance assessment.....	37
7.1	General requirements	37
7.2	Determination of the drying performance.....	37
7.2.1	General requirements to enable subsequent cleaning assessment	37
7.2.2	Drying assessment procedure.....	38
7.2.3	Calculation of the drying index.....	41
7.3	Determination of the cleaning performance	42
7.3.1	General	42
7.3.2	Calculation of the cleaning index	45
7.3.3	Dishwasher (3.1.1) filter systems	46
7.3.4	Assessing $ln W_C$	47
7.4	Results	47
7.4.1	Expressing drying results.....	47
7.4.2	Expressing cleaning results	47
8	Energy consumption, water consumption, programme time (3.1.17).....	48
8.1	General and purpose	48
8.2	Method of measurement	48
8.3	Method of evaluation.....	48
8.3.1	General	48
8.3.2	Energy consumption	49
8.3.3	Hot water energy	49
8.3.4	Water consumption.....	50
8.3.5	Time	50
9	Airborne acoustical noise.....	50
Annex A (normative)	Place settings (3.1.10) and serving pieces (3.1.11)	51
A.1	General information	51
A.2	Test load specifications	51
Annex B (informative)	Tableware (3.1.9) specifications	56
Annex C (normative)	Illustration of soil application quantities	63
C.1	Soil application	63
C.1.1	Soil application example for type A tableware (3.1.9) items	63

C.1.2	Soil application example for type B tableware (3.1.9) items	63
C.1.3	Soil application on the serving pieces (3.1.11)	64
C.1.4	Soil application quantities for different rated dishwasher capacities (3.1.12).....	64
Annex D (informative)	Pictures of the soiled items	66
Annex E (normative)	Test additives.....	70
E.1	General.....	70
E.2	Detergent (3.1.23).....	70
E.3	Rinse aid (3.1.24)	72
E.4	Salt.....	73
Annex F (normative)	Microwave oven	74
F.1	Specification of the microwave oven	74
F.2	Calibration of the microwave oven	74
Annex G (normative)	Through-circulation thermal cabinet	76
G.1	Specification of the thermal cabinet	76
G.2	Calibration of the thermal cabinet	76
Annex H (informative)	Alternate cleaning and drying assessment tables	78
H.1	General.....	78
H.2	Alternate drying performance table	78
H.3	Alternate cleaning performance table	80
Annex I (normative)	Description of the reference machine (3.1.6) type 2.....	83
I.1	General.....	83
I.2	Installation and use of the reference machine (3.1.6).....	83
I.3	Specification of the reference machine (3.1.6)	84
I.3.1	General specifications	84
I.3.2	Specifications of performance values.....	84
I.4	Specification check of the reference machine (3.1.6)	84
I.4.1	General	84
I.4.2	Checking spray arm rotation	85
I.4.3	Checking the water hardness.....	85
I.4.4	Checking the energy consumption and water consumption	85
I.4.5	Checking the programme time (3.1.17)	85
I.4.6	Checking the water temperature in the sump	85
I.4.7	Checking the cleaning and drying performance.....	85
I.4.8	Checking the water level in the sump.....	86
I.5	Reference machine (3.1.6) loading plan	86
Annex J (informative)	Shade chart	88
J.1	General.....	88
J.2	Classification of shade numbers	88
Annex K (normative)	Measurement of energy consumption in low power modes of dishwashers (3.1.1)	89
K.1	General.....	89
K.2	Determination of left-on mode (3.1.26) power	91
K.3	Determination of left on mode duration (3.1.33)	91
K.4	Determination of off mode (3.1.27) power	91
K.5	Determination of standby mode (3.1.29) power	92
K.6	Determination of standby mode in condition of networked standby (3.1.30).....	92
K.7	Determination of delay start mode (3.1.31) power	93

K.8	Measurement procedure for low power modes	94
Annex L (informative)	Suppliers of test materials	97
Annex M (informative)	Test report contents	98
M.1	General.....	98
M.2	Machine description	98
M.3	Laboratory details	98
M.4	Test conditions	98
M.5	Test results and measurements	98
M.5.1	Setup.....	98
M.5.2	Results	99
Annex N (normative)	Test enclosure for built-in dishwasher (3.1.3) and integrated dishwashers (3.1.4)	100
Annex O (informative)	Internal evaluation guidelines	102
Annex P (informative)	Test procedure for sensing programmes (3.1.14)	103
P.1	General.....	103
P.2	General conditions	103
P.3	Loading.....	104
P.4	Soiling	104
P.5	Measured data	104
Annex Q (informative)	Additional rinse performance evaluation.....	105
Q.1	General.....	105
Q.2	General conditions	105
Q.3	Loading.....	105
Q.4	Evaluation.....	105
Q.5	Measured data	106
Annex R (informative)	Dishwasher (3.1.1) filtration evaluation	107
R.1	General.....	107
R.2	General conditions	107
R.3	Test procedure.....	107
R.3.1	General	107
R.3.2	Coffee grounds	107
R.3.3	Spinach	109
R.4	Evaluation.....	109
Annex S (informative)	Flow chart – evaluation of filter systems	113
Annex T (normative)	Instrumentation and accuracy.....	114
Annex U (informative)	Inlet water temperature influence on energy consumption	115
U.1	General.....	115
U.2	Cold water energy correction	115
U.3	Correlating energy consumption tests with different cold water inlet temperatures	116
U.3.1	General	116
U.3.2	Estimating regional energy consumption from standard cold water temperature	117
U.3.3	Estimating standard energy consumption from regional cold water temperature	117
Annex V (informative)	Testing intermittently recurring functions (3.1.40)	119
V.1	General.....	119
V.2	Test series (3.1.8) design	119

V.3	Method of evaluation.....	120
V.3.1	General	120
V.3.2	Energy consumption	121
V.3.3	Hot water energy	121
V.3.4	Water consumption	121
V.3.5	Time	121
V.4	Ballast soil	121
V.4.1	Dose.....	121
V.4.2	Preparation.....	122
V.4.3	Storage	122
V.4.4	Application.....	122
Annex W (normative)	Description of the reference machine (3.1.6) type 3.....	126
W.1	General.....	126
W.2	Installation and use of the reference machine (3.1.6).....	126
W.3	Specification of the reference machine (3.1.6)	126
W.3.1	General specifications	126
W.3.2	Specifications of performance values.....	127
W.4	Specification check of the reference machine (3.1.6)	127
W.4.1	General	127
W.4.2	Checking spray arm rotation	128
W.4.3	Checking the water hardness.....	128
W.4.4	Checking the energy consumption and water consumption	128
W.4.5	Checking the temperature during the programme (3.1.14)	128
W.4.6	Checking the programme time (3.1.17)	129
W.4.7	Checking the cleaning and drying performance.....	129
W.4.8	Checking the water level in the sump.....	129
W.5	Reference machine (3.1.6) loading plan.....	130
Annex X (informative)	Multi-compartment dishwashers (3.1.1)	131
X.1	General.....	131
X.1.1	Multi-compartment dishwasher (3.1.1)	131
X.1.2	Multi-compartment mode	131
X.1.3	Combined rated dishwasher capacity (3.1.12).....	131
X.2	Measurement and evaluation of the compartments of a multi-compartment dishwasher (3.1.1)	131
X.3	Rated capacity and detergent (3.1.23) dosage for compartments operated in multi-compartment mode.....	131
X.4	Combined cleaning and drying performance tests for dishwasher (3.1.1) in multi-compartment mode.....	132
X.4.1	Preparation.....	132
X.4.2	Loading and operating	132
X.5	Combined cleaning and drying performance assessment for dishwasher (3.1.1) in multi-compartment mode.....	132
X.5.1	General	132
X.5.2	Assessment of drying performance	132
X.5.3	Assessment of cleaning performance	133
X.6	Energy consumption, water consumption, programme time (3.1.17) in multi-compartment mode	133
X.6.1	General	133
X.6.2	Energy consumption	133
X.6.3	Water consumption.....	133

X.6.4	Programme time (3.1.17)	133
Annex Y (informative)	Implementation of test class	134
Y.1	Overview	134
Y.1.1	General	134
Y.1.2	Test series (3.1.8)	134
Y.1.3	Test class	134
Y.2	Purpose of test series (3.1.8) – Test class	134
Y.3	Operating	135
Y.4	Performance assessment	135
Y.4.1	Cleaning and drying performance assessment	135
Y.4.2	Drying assessment procedure	135
Y.4.3	Calculation of the drying index according to 7.2.3	136
Y.4.4	Determination of the cleaning performance	136
Bibliography	137
Figure 1	– Position of the glasses on the microwave turntable	28
Figure 2	– Thermal cabinet for pre-drying of soiled cups, mugs and saucers	29
Figure 3	– Schematic view of the different beef pieces	30
Figure 4	– The thermal cabinet with soiled load items (30 place settings (3.1.10))	35
Figure D.1	– Figure D.1 Minced meat mixture: Glass bowl, oval platter, oven pan	66
Figure D.2	– Egg yolk: Dinner plate, melamine dessert plate, fork	66
Figure D.3	– Oat flakes: Soup plate, dessert bowl, soup spoon	67
Figure D.4	– Spinach: Dessert plate, small pot	67
Figure D.5	– Milk: Glass	67
Figure D.6	– Tea: Cups, mugs and saucers (pictures were made after oven drying)	68
Figure D.7	– Margarine: Melamine bowl	69
Figure G.1	– Location of the thermocouple on upper, intermediate and lower wire shelves	77
Figure I.1	– Maximum water level in the reference machine (3.1.6) at the end of cycle	86
Figure I.2	– Reference machine (3.1.6) loading plan - cutlery rack	86
Figure I.3	– Reference machine (3.1.6) loading plan - upper and lower baskets	87
Figure K.1	– Required door position in the case of opened and unlatched door (left picture)	90
Figure N.1	– Test enclosure for built-in dishwashers (3.1.3) and integrated dishwashers (3.1.4)	101
Figure Q.1	– Example for an assessment light box	106
Figure Q.2	– Photo catalogue to assess spots on glasses	106
Figure R.1	– Suitable sieves for grounded coffee	108
Figure R.2	– Soiled melamine bowl with margarine and coffee grounds	109
Figure S.1	– Flow chart – evaluation of filter systems	113
Figure V.1	– Flow chart showing the general test design for assessing intermittently recurring functions (3.1.40)	123
Figure W.1	– Possible position for temperature sensor.	129
Figure W.2	– Maximum water level in the reference machine (3.1.6) at the end of cycle	130
Figure W.3	– Reference machine (3.1.6) loading plan	130

Table 1 – Evaluation of the drying performance	39
Table 2 – Evaluation to determine the drying performance	40
Table 3 – Evaluation of the cleaning performance	43
Table 4 – Evaluation to determine the cleaning performance	43
Table 5 – Numerical values of the t-factor for statistical calculations	46
Table A.1 – Specifications of tableware (3.1.9) items	51
Table A.2 – Composition of test loads	53
Table B.1 – Tableware (3.1.9) specifications	57
Table C.1 – Soil application example for type A tableware (3.1.9) items	63
Table C.2 – Soil application example for type B tableware (3.1.9) items	63
Table C.3 – Soil application on the serving pieces (3.1.11)	64
Table C.4 – Soil application quantities for different rated dishwasher capacities (3.1.12)	64
Table E.1 – Ingredients of reference detergent (3.1.23) type E	70
Table E.2 – Ingredients of reference rinse aid (3.1.24) III	72
Table H.1 – Alternate drying performance table	78
Table H.2 – Alternate cleaning performance table	80
Table J.1 – Shade chart	88
Table K.1 – Measurement procedure for low power modes	94
Table P.1 – Test scenarios for testing the sensing programme (3.1.14)	103
Table P.2 – Example for a one week schedule	104
Table R.1 – Evaluation to determine the cleaning performance	110
Table R.2 – Soil application on the serving pieces (3.1.11)	111
Table R.3 – Soil application quantities for different rated dishwasher capacities (3.1.12)	112
Table T.1 – Specification of instruments	114
Table V.1 – Intermittently recurring function (3.1.40) data provided by the manufacturer / supplier	124
Table V.2 – Record of preparatory and trigger cycles (3.1.15) carried out before and / or between test runs (3.1.7)	124

INTERNATIONAL ELECTROTECHNICAL COMMISSION

Electric dishwashers for household use - Methods for measuring the performance

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.
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- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60436 has been prepared by subcommittee 59A: Electric dishwashers, of IEC technical committee 59: Performance of household and similar electrical appliances. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2015, and Amendment 1:2020. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Implementation of a new reference machine, which better reflects modern dishwasher energy and water saving technologies. Its ability to function as a reference machine for the cleaning assessment was assessed in a Round Robin Test.
- b) Implementation of the new reference detergent type E, which better reflects market detergents formulations. It includes upgraded enzymes and a lower content of silicates to reduce the alkalinity which simplifies the world wide transportation by avoiding dangerous goods labelling and therefore improves the usage all over the world.
- c) Implementation of an alignment factor for the cleaning performance assessment as proposed in a scientific study done by an university to align test results of the previous version to the new version of this document with the new reference system described above.
- d) Introduction of replacements and alternatives for the pan and knives as the production of the current ones was stopped.
- e) Improvement of the room temperature control by a temperature measurement inside the dishwasher directly prior to the start of the test programme.
- f) Update of the weight of different load items and the specified ranges to anneal the requirements in the document to the actual weight of the items.
- g) Introduction of an updated method to assess low power modes providing a step-by-step measurement description and including new modes, e.g. network standby which are of increased importance for dishwasher offering additional services via internet connection. Additionally, reactions to different interactions with the appliance can be assessed in a better way and learnings of Round Robin Test are included.
- h) Inclusion of additional method for dishwasher testing which allows the assessment of variations of dishwasher units from one model.
- i) New requirements for the loading and handling instructions for tests institutes.
- j) Implementation of testing methodology for multi-compartment dishwashers.
- k) Improvement of ballast soil preparation process in Annex V.

The text of this International Standard is based on the following documents:

Draft	Report on voting
59A/273/FDIS	59A/276/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn, or
- revised.

The content of the corrigendum 1 (2026-04) has been included in this copy.

INTRODUCTION

The history of this fifth edition of IEC 60436 is provided as follows:

- Discussion began in fourth quarter of 2021 during one of the web conferences of Maintenance Team 2.
- A first working draft was developed and discussed during the Qingdao China meeting in September 2023.
- It was decided by SC 59A to proceed directly to CDV, skipping CD stage, due to urgency of implementation of the new [detergent \(3.1.23\) E](#). This urgency is caused by production termination of enzymes used for [detergent \(3.1.23\) D](#) composition.
- Implementation of new reference system, the new reference [detergent \(3.1.23\)](#) and the new [reference machine \(3.1.6\)](#), is done based on data coming from Round Robin Test conducted in 2022-2023.

Further readings:

[ISO/IEC Guide 98-3:2008/Suppl 2:2011 \[1\]](#), *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995) – Supplement 2: Extension to any number of output quantities*

[ISO/IEC Guide 98-4:2012 \[2\]](#), *Uncertainty of measurement – Part 4: Role of measurement uncertainty in conformity assessment*

DIN 5035-6:2006 [\[3\]](#), *Beleuchtung mit künstlichem Licht – Teil 6: Messung und Bewertung ("Lighting with artificial light – Part 6: Measurements and evaluation")*

[ISO 3310-1:2016 \[4\]](#), *Test sieves – Technical requirements and testing – Part 1: Test sieves of metal wire cloth*

[EN 12665:2011 \[5\]](#), *Light and lighting – Basic terms and criteria for specifying lighting requirements*

[IEC 60704-3:2019 \[6\]](#), *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 3: Procedure for determining and verifying declared noise emission values*

[ISO/IEC Guide 98-1:2024 \[7\]](#), *Guide to the expression of uncertainty in measurement — Part 1: Introduction*

[ISO/IEC Guide 98-3:2008 \[8\]](#), *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

[ISO/IEC Guide 98-3:2008/Suppl 1:2008 \[9\]](#), *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995) – Supplement 1: Propagation of distributions using a Monte Carlo method*

1 Scope

This document applies to electric **dishwashers (3.1.1)** for household and similar use that are supplied with hot and/or cold water.

The object of this document is to state and define the principal performance characteristics of electric **dishwashers (3.1.1)** for household and similar use and to describe the standard methods of measuring these characteristics.

This document is concerned neither with safety nor with minimum performance requirements.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60704-2-3, *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 2-3: Particular requirements for dishwashers*

IEC 60705, *Household microwave ovens – Methods for measuring performance*

IEC 60734:2012, *Household electrical appliances - Performance - Water for testing*

IEC 62301:2011, *Household electrical appliances - Measurement of standby power*

IEC 63474, *Electrical and electronic household and office equipment - Measurement of networked standby power consumption of edge equipment*

ISO 607, *Surface active agents and detergents – Methods of sample division*

ISO 80000-1:2022, *Quantities and units — Part 1: General*

DIN 51757, *Testing of mineral oils and related materials - Determination of density*

EN 1262, *Surface active agents - Determination of pH value of solutions or dispersions*

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- [1] ISO/IEC Guide 98-3:2008/Suppl 2:2011, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995) — Supplement 2: Extension to any number of output quantities*
 - [2] ISO/IEC Guide 98-4:2012, *Uncertainty of measurement — Part 4: Role of measurement uncertainty in conformity assessment*
 - [3] DIN 5035-6:2006, *Beleuchtung mit künstlichem Licht-Teil 6: Messung und Bewertung ("Lighting with artificial light – Part 6: Measurements and evaluation")*
 - [4] ISO 3310-1:2016, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*
 - [5] EN 12665:2011, *Light and lighting - Basic terms and criteria for specifying lighting requirements*
 - [6] IEC 60704-3:2019, *Household and similar electrical appliances - Test code for the determination of airborne acoustical noise - Part 3: Procedure for determining and verifying declared noise emission values*
 - [7] ISO/IEC Guide 98-1:2024, *Guide to the expression of uncertainty in measurement — Part 1: Introduction*
 - [8] ISO/IEC Guide 98-3:2008, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*
 - [9] ISO/IEC Guide 98-3:2008/Suppl 1:2008, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995) — Supplement 1: Propagation of distributions using a Monte Carlo method*
 - [10] IEC TS 63350, *Household electric appliances - Specification of the properties of a digital system for measuring the performance*
-