BS EN 60436:2020+A11:2020
Incorporating corrigenda June 2020 and September 2020

BSI Standards Publication

Electric dishwashers for household use - Methods for measuring the performance

National foreword

This British Standard is the UK implementation of EN 60436:2020+A11:2020, incorporating corrigendum June 2020. It is derived from IEC 60436:2015, incorporating corrigendum September 2020. It supersedes BS EN 60436:2020, which is withdrawn.

The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags 〖C〉 〈C〗.

The UK participation in its preparation was entrusted to Technical Committee CPL/59, Performance of household electrical appliances.

A list of organizations represented on this committee can be obtained on request to its committee manager.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments/corrigenda issued since publication

Date	Text affected
31 July 2020	Implementation of CENELEC corrigendum June 2020: common modification to Table E.1
30 November 2020	Implementation of IEC corrigendum September 2020: replacement of Table E.1
30 November 2020	Implementation of CENELEC amendment A11:2020: addition of Annexes ZZA and ZZB

EUROPEAN STANDARD

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EUROPÄISCHE NORM

EN 60436:2020+A11

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English Version

Electric dishwashers for household use - Methods for measuring the performance (IEC 60436:2015 , modified)

Lave-vaisselle électriques à usage domestique - Méthodes de mesure de l'aptitude à la fonction (IEC 60436:2015 , modifiée)

Elektrische Geschirrspüler für den Hausgebrauch - Messverfahren für Gebrauchseigenschaften (IEC 60436:2015 , modifiziert)

This European Standard was approved by CENELEC on 2019-09-30. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

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European Foreword

This document (EN 60436:2020/A11:2020) has been prepared by CLC/TC 59X "Performance of household and similar electrical appliances".

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2021-10-28
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2023-10-28

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

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annexes ZZA and ZZB, which are an integral part of this document.

European foreword

This document (EN 60436:2020) consists of the text of IEC 60436:2015 prepared by IEC/TC 59, "Electric dishwashers", together with the common modifications prepared by CLC/TC 59X "Performance of household and similar electrical appliances".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-09-27
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2023-03-27

This document supersedes EN 50242:2016 and all of its amendments and corrigenda (if any).

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

EN 60436:2019 includes the following significant technical changes with respect to EN 50242:2016/EN 60436:2016:

— new test load with a bigger variety of materials and shapes, including pots, mugs, plastic items and more bowls;

— new phosphate-free reference detergent reflecting more market relevant composition of ingredients;

— more precise soiling procedure;

— new reference materials;

— new definitions and measurement procedures for low power modes.

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 60436:2015 are prefixed “Z”.

In this document, the common modifications to the International Standards are indicated in red.

Endorsement notice

The text of the International Standard IEC 60436:2015 was approved by CENELEC as a European Standard with agreed common modifications.

Annex ZA

(normative)

Measurement procedure for low power modes

ZA.1 General

Annex ZA sets out determination of **off mode**, **standby mode**, **standby mode in condition of networked standby** and **delay start mode**. The first three are steady state modes that can persist for an indefinite period, while **delay start mode** is a short duration mode associated with active mode (selection and use of a particular **programme**). These are the only four low power modes specified in this European Standard. Other low power modes may exist in some products, but for the current designs of **dishwashers**, these are not considered important in terms of duration and energy consumption.

Where low power modes are determined, they shall be determined in accordance with Annex ZA.

Ensure that the following conditions remain relevant for the duration of the measurement:

- instructions for use regarding installation, **operation** and settings of the **dishwasher** (as applicable) are followed;
- the appliance shall be connected to mains power for the duration of the test;
- no adverse warning indicators (including **rinse aid** and salt indicators, where applicable) are present;
- laboratory supply water is left on at the specified pressure;
- follow manufacturer's instructions regarding the configuration of network connectivity of the **dishwasher** (where applicable) and ensure that the **network** is connected to the product (when required).

NOTE Z1 Some products may require software updates at first time use to ensure secure network operations. It is recommended to allow for those updates to be installed and to make a note of it in the test report. Updates may occur or may be requested after activation of network capability and may impact energy during measurement.

Power measurements for **off mode**, **standby mode**, **standby mode in condition of networked standby** and **delay start mode** shall be made in accordance with the requirements of EN 50643 and EN 50564. However, subclause 5.3. (procedure) and the requirement defining air speed in subclause 4.2 of EN 50564 shall not apply.

The measurement procedure and measurement duration are specified in Annex ZA. The average power is measured in watts and rounded to two decimal places.

Data for the required parameters, power and energy consumption, shall be recorded at regular intervals of 1 s or less throughout the test using a data logger or computer.

Manufacturers or suppliers may have information on the design and **operation** of their **dishwashers** which would allow an accurate determination of these modes through methods other than the methods specified below. For the purposes of declaration, a manufacturer or supplier may use any method which gives an equivalent result to the methods specified below. For verification purposes, the methods specified below take precedence over any other determination.

Dishwashers with a power management system switch automatically to **off mode** or **standby mode** after a certain period of time following appliance interaction. Relevant appliance interactions to be considered for measurement are:

- after the household dishwasher has been switched on, or
- at the end of any programme and associated activities, or
- after any interaction with the household **dishwasher**, or
- if no other mode, including emergency measures, is triggered.

The test report shall contain the description of the used appliance interaction.

	Types of machines: step	Machine without delay start and without network standby	Machine with delay start	Machine with network standby	Machine with delay start and network standby	Measured parameter
standby mode and off mode	0	machine is in off mode or standby mode	machine is in off mode or standby mode	machine is in off mode or standby mode	machine is in off mode or standby mode	
	1	wait 15 minutes[a]	wait 15 minutes[a]	wait 15 minutes[a]	wait 15 minutes[a]	
	2	measure power consumption	measure power consumption	measure power consumption	measure power consumption	standby mode: P_{sm} or off mode: P_o
	3	switch on appliance	switch on appliance	switch on appliance	switch on appliance	
	optional	programme (any) run	programme (any) run	programme (any) run	programme (any) run	
	4	Appliance Interaction	Appliance Interaction	Appliance Interaction	Appliance Interaction	
	5	-	-	Deactivate network connection if not already deactivated	Deactivate network connection if not already deactivated	
	6	wait 15 minutes[a]	wait 15 minutes[a]	wait 15 minutes[a]	wait 15 minutes[a]	
	7	measure power consumption	measure power consumption	measure power consumption	measure power consumption	standby mode: P_{sm} or off mode: P_o
	8	-	-	activate network standby	activate network standby	
	9	-	-	wait 15 minutes[a]	wait 15 minutes[a]	
	10	-	-	measure power consumption	measure power consumption	network standby: P_{ns}
	11	turn off appliance if it is not already off	turn off appliance if it is not already off	turn off appliance if it is not already off	turn off appliance if it is not already off	
delay start	12		switch on appliance		switch on appliance	
	13		-		activate network connection if not already activated	
	14		activate delay start		activate delay start	
	15		wait 15 minutes		wait 15 minutes	
	16		measure power consumption		measure power consumption	delay start: P_{ds}
Opening or closing the door by the operator may reactivate the dishwasher to perform auxiliary functions such as display information or interior light. Should an interaction occur, 5 minutes waiting time is needed for the dishwasher to revert to off mode or standby mode or network standby.						

Figure ZA.1 – Measurement procedure for low power modes

ZA.2 Determination of off mode

According to Figure ZA.1 the dishwasher should switch automatically to **off mode or standby mode** or both.

Where **off mode** power is determined, it shall be determined in accordance with Figure ZA.1.

In all cases, **off mode** shall be determined over a period of not less than 10 min. The power consumption of the **off mode** is the average of the measured data.

NOTE Z1 If the dishwasher provides **off mode** it should be described by the manufacturer.

ZA.3 Determination of standby mode

According to Figure ZA.1 the dishwasher should switch automatically to **off mode or standby mode** or both.

Where **standby mode** power is determined, it shall be determined in accordance with Figure ZA.1.

In all cases, **standby mode** shall be determined over a period of not less than 10 min. The power consumption of the **standby mode** is the average of the measured data.

NOTE Z1 If the dishwasher provides **standby mode** it should be described by the manufacturer.

ZA.4 Determination of standby mode in condition of networked standby

For dishwashers with network connectivity follow manufacturer's instructions regarding the configuration of the dishwasher and ensure that network (e.g. LAN or WLAN) is connected to the product and activated.

Where **standby mode in condition of networked standby** power is determined, it shall be determined in accordance with Figure ZA.1.

In all cases, **standby mode in condition of networked standby** shall be determined over a period of not less than 10 min. The power consumption of the **standby mode in condition of networked standby** is the average of the measured data.

NOTE Z1 Ensure that there is no update running during measurement.

The test report shall contain the description of the network connection used.

ZA.5 Determination of delay start mode power

This mode is only applicable to **dishwashers** providing a delay start function.

Where **delay start mode** power is determined, it shall be determined in accordance with Figure ZA.1.

For determination of this mode, any programme can be selected and any user programmed delay is selected by the operator.

Latch the door and keep it latched for the duration of the test. Select any **programme** to be measured and **programme** the delay start setting. Power measurements in **delay start mode** shall commence 15 min after the moment the **delay start mode** is activated and shall continue for at least 10 min.

The **programme** name, the delay start setting selected, and the duration of the measurement shall be stated with the measured power value. Where the display changes during the timer countdown, there can be some small variations in power consumption during this mode.

The power consumption of the **delay start mode** is the average of the measured data.

NOTE Z1 For a **dishwasher**, the term latched means that the door is closed, and the door interlock is engaged so that the product could operate if required.

Annex ZB
(normative)
Normative references to international publications with their corresponding European publications

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.

NOTE Z1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE Z2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
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	EN 60704-2-3	—
IEC 60705	—	Household microwave ovens – Methods for measuring performance	EN 60705	—
IEC 60734	—	Household electrical appliances – Performance – Water for testing	EN 60734	—
IEC 607	—	Surface active agents and detergents – Methods of sample division	—	—
ISO 80000-1	2009	Quantities and Units – Part 1: General	EN ISO 80000-1	2013