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GB/T 20290-2024

Replacing GB/T 20290-2016

**Electric Dishwashers for Household Use - Methods for
Measuring the Performance**
家用电动洗碗机 性能测试方法
(IEC 60436:2020, MOD)

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Foreword

This document was drafted in accordance with the rules provided in GB/T 1.1-2020 *Directives for Standardization - Part 1: Rules for the Structure and Drafting of Standardizing Documents*.

This document serves as a replacement for GB/T 20290-2016 *Electric Dishwashers for Household Use - Methods for Measuring the Performance*. In comparison with GB/T 20290-2016, apart from structural adjustments and editorial modifications, the main technical changes are as follows:

- The definition of dishwasher is modified (see 3.1.1; 3.1 of Version 2016);
- The terms and definitions of free-standing dishwasher, built-in dishwasher, integrated dishwasher, test machine, reference machine, test run, test series, tableware, Chinese standard tableware, regeneration, end of programme mode, end-of-programme mode duration, left-on mode duration, power management system, refrigerated, freeze, automatic of self-cleaning filter, manual filter, all activity ceases, intermittently recurring function are added (see 3.1.2 ~ 3.1.9, 3.1.12, 3.1.22, 3.1.26, 3.1.30 ~ 3.1.38);
- The definitions of cycle, detergent, off mode, delay start mode are modified (see 3.1.16, 3.1.24, 3.1.28 and 3.1.29; 3.5, 3.12, 3.16 and 3.18 of Version 2016);
- “non-automatic dispenser (TRANSLATOR NOTE: “手动分配器” in Chinese)” is modified into “non-automatic dispenser (TRANSLATOR NOTE: “非自动分配器” in Chinese)”, and “left on mode (TRANSLATOR NOTE: “待机模式” in Chinese)” is modified into “left on mode (TRANSLATOR NOTE: “等待模式” in Chinese)” (see 3.1.20 and 3.1.27; 3.9 and 3.17 of Version 2016);
- A list of symbols involved in the test is added (see 3.2);
- A test method for measuring power consumption related content in performance characteristics is added (see Chapter 4 and Appendix K);
- Instructions on parameter tolerances and rounding calculation are added (see 5.1.1);
- The test voltage error ranges of the test machine and reference machine are modified (see 5.3.1.1 and 5.3.2.1; 5.3.1.1 and 5.3.2.1 of Version 2016);
- The laboratory ambient temperature is modified, and the temperature difference between the oven drying method and the air drying method is deleted (see 5.5; 5.5 of Version 2016);
- The limit requirements and configuration requirements for soft water hardness are modified (see 5.6.3; 5.6.3 of Version 2016);
- The detergent type and dosage requirements are modified (see 5.7; 5.7 of Version 2016);

- Type IV rinse aid is deleted (see 5.8 of Version 2016);
- The information description of intermittently recurring function, its impact on test results and its handling mode are added (see 5.10);
- The requirements for the test of Chinese tableware are added (see 6.1);
- The requirements for new tableware pre-treatment, tableware adjustment and maintenance are added (see 6.2.2, 6.2.3 and 6.2.4);
- The general requirements for the preparation and use of soils are modified (see 6.4.1; 6.4 of Version 2016);
- The shelf life of ultra-heat-treated milk is modified (see 6.4.2.1; 6.4.1.1 of Version 2016);
- The content of microwave oven heating time conversion is deleted (see 6.4.1.2 of Version 2016);
- The description of the use of tea leaves, and the pre-drying process by the oven and air drying methods are modified (see 6.4.3.3, 6.4.3.4 and 6.4.3.5; 6.4.2.1, 6.4.2.2 and 6.4.2.3 of Version 2016);
- The water ratio when preparing minced meat, the type of tableware used, dosage and soiling method for minced meat are modified (see 6.4.4.2 and 6.4.4.3; 6.4.3.1 and 6.4.3.2 of Version 2016);
- The type of tableware used, dosage and soiling method for eggs and oats are modified (see 6.4.5.3 and 6.4.6.3; 6.4.4.2 and 6.4.5.2 of Version 2016);
- The preparation and storage methods for freeze-dried spinach are added (see 6.4.7.2);
- The type of tableware used, dosage and soiling method for spinach and butter are modified (see 6.4.7.3 and 6.4.8.3; 6.4.6.2 and 6.4.7.2 of Version 2016);
- The tableware placement requirements for the oven drying method are modified (see 6.5.2; 6.5.1 of Version 2016);
- The loading and operation requirements for tableware are modified (see 6.6.1 and 6.6.2; 6.6.1 and 6.6.2 of Version 2016);
- The evaluation mode and calculation of cleaning performance and drying performance are modified (see Chapter 7; Chapter 6 and Chapter 7 of Version 2016);
- The description of the test methods for power consumption, water consumption and programme time is modified (see 8.2; 8.2 of Version 2016);
- The general requirements for the evaluation methods for power consumption, water consumption and programme time are added (see 8.3.1);

Electric Dishwashers for Household Use - Methods for Measuring the Performance

1 Scope

This document specifies the main performance characteristics of electric dishwashers for household and similar use and describes standard methods for testing these characteristics.

This document applies to electric dishwashers for household and similar use, using hot and / or cold water.

This document does not address safety and minimum performance requirements.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB 38383-2019 The Minimum Allowable Values of the Energy, Water Consumption and Grades for Dishwashers

ISO 607 Surface Active Agents and Detergents - Methods of Sample Division

NOTE: GB/T 6372-2006 Surface Active Agents and Detergents - Methods of Sample Division (ISO 607:1977, IDT)

ISO 80000-1:2022 Quantities and Units - Part 1: General

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

NOTE: GB/T 4214.3-2023 Test Method for Noise of Household and Similar Electrical Appliances - Particular Requirements for Dishwashers (IEC 60704-2-3:2017, MOD)

IEC 60705 Household Microwave Ovens - Methods for Measuring Performance

NOTE: GB/T 18800-2017 Household Microwave Oven - Methods for Measuring Performance (IEC 60705:2014, IDT)

IEC 60734 Household Electrical Appliances - Performance - Water for Testing

NOTE: GB/T 23119-2017 Household and Similar Electrical Appliances - Water for Performance

Except for the built-in or integrated types (see 5.1.3), dishwashers shall be tested as the free-standing type. If it can be both free-standing and built-in / integrated, then, the test shall be carried out as free-standing.

5.1.3 Built-in and integrated dishwashers

Dishwashers that can only be installed as built-in or integrated shall be installed in a housing that complies with the requirements of Appendix N. The housing is shown in Figure N.1 and Figure N.2.

5.2 Test Procedures and Conditioning of Test Machine

Before conducting a performance test on a new dishwasher, run the dishwasher for at least 3 cycles using a wash programme suitable for normal or heavily soiled dishes, using a standard detergent (see 5.7) and a standard rinse aid (see 5.8) to remove manufacturing residues; this process can be used with a clean load or no load.

NOTE 1: ignore any cycles or operations performed during product manufacturing.

If noise testing is required, it shall be carried out in accordance with the requirements of Chapter 9 before performance testing. Noise testing shall be completed under test conditions that satisfy the corresponding standards. Between the consecutive steps specified in the following procedures, the test machine shall not be subjected to additional cycles.

Evaluation of cleaning and / or drying performance shall be carried out using soiled load (Chapter 6). Drying and cleaning performance may be consecutively evaluated in a single test or in separate tests. Power consumption, water consumption, programme time (Chapter 8) shall be simultaneously tested with the combined cleaning and drying performance test runs (see Chapter 6 and Chapter 7).

NOTE 2: the evaluation criteria for cleaning performance can be found in Appendix O.

The manufacturer or supplier may have information on the design and operation of the dishwasher that allows the drying performance to be determined equivalently using alternative methods, for example, using unsoiled dishes and independent testing. For the purposes of the declaration and validation of this document, the method using soiled load specified in the preceding paragraph takes precedence over any other determination. The method used shall be documented.

Between two test series, the reference machine and the test machine shall be cleaned for at least two cycles using the test procedures with a standard detergent (see 5.7). Before a new test series is started, ensure that all visible areas of the filter and the appliance, as well as any areas supplied by the manufacturer to the consumer are cleaned. When checking for residual soil inside the dishwasher, special attention shall be paid to deposits in the filter, water cup (see I.3.5), spray arms, door gaps and rack guide rails, etc.

If the supplier mentions the settings for relevant water softener, salt shall be added and the water

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