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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 21551.5-2024

Antimicrobial and cleaning function of household and similar electrical appliances - Part 5: Particular requirements for electric washing machine

家用和类似用途电器的抗菌、除菌、净化功能 第5部分：洗衣机的特殊要求

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1 Scope

GB/T 21551.5-2024 is Part 5 of the Chinese series on the antimicrobial and cleaning functions of household appliances, and sets the particular requirements for washing machines. Antibacterial and sterilising claims are now on most Chinese washing machines, made variously for the drum surface, the wash cycle and a dedicated high temperature or ozone programme, and they are claims about a result rather than about a component, so they can only be substantiated by measuring how far a deliberately inoculated load is reduced. The standard defines the terms, sets the hygiene, safety and functional requirements and the marking and instructions for use, and describes the test methods, with a normative annex giving the microbial reduction test method, an informative annex giving the variant using a reference appliance as the control, and a normative annex giving the virus reduction test method. It takes effect on 1 January 2027.

This document defines the terms and definitions of household and similar electric washing machines with the antimicrobial, microbial reduction and cleaning functions, specifies the hygiene and safety, and functional requirements, as well as the marking requirements, and describes the corresponding test methods. This document applies to the production, inspection and sales of household and similar washing machines (hereinafter referred to as "washing machines") that are explicitly stated to have one or more functions of antimicrobia, preventing mildew, microbial reduction, dust mite reduction, allergen reduction, virus reduction and deodorization on the appliance or instructions for use. This document does not apply to.

---Production, inspection and sales of ordinary semi-automatic washing machines;

---Inspection of the drying function of washing and drying machines.

1.5 W/m

3.During the test, keep the room door closed. After the test, the entire test room shall be sterilized with ultraviolet light. The sterilization operation time shall be no less than 30 minutes, and after the sterilization operation is completed, air exhaust shall be carried out for 20 minutes. The laboratory exhaust system shall also be equipped with ultraviolet lamps. The wastewater generated during the test process shall be collected and sterilized before discharge. A.2.2 Test loads Use bleached medium plain cloth that complies with the provisions of GB/T 4288-2018, and after desizing pre-treatment, prepare it into test loads of 330 mm 330 mm square towels (the folding edge of the square towel test loads is 7 mm). When the test loads of three 330 mm 330 mm square towels exceed the test load mass, the test loads of 100 mm 100 mm square towels can be used (the folding edge of the square towel test loads is 7 mm). The test load mass shall be explicitly stated in the instructions for use of the appliance or by the manufacturer. If there is no relevant statement, then, 30% of the rated capacity of the appliance to be tested shall be used and recorded in the test report. The test loads shall comply with the bleached medium plain cloth specified in GB/T 4288-2018. After adjustment, by increasing or decreasing the number of test loads, the final test load mass shall be made as close as possible to the required mass 10 g. A.2.3 Test sample blocks Use bleached medium plain cloth that complies with the provisions of GB/T 4288-2018, and after desizing pre-treatment, cut it into test sample blocks of 100 mm 100 mm (without folded edges). Each test sample block shall be used only once, and after use, it shall be sterilized with high pressure steam at 121 C for 30 min. A.2.4 Preparation of test loads and test sample blocks Before the test, all test loads and test sample blocks shall be sterilized at 121 C in a high pressure steam sterilizer for 20 min, dried and cooled to room temperature for later use. A.3 Test Steps A.3.1 Pre-treatment of appliance Before the first test, in accordance with the instructions for use of the appliance, the appliance shall continuously run for 2 cycles of microbial reduction program in the no-load state A.3.2 Preparation of bacteria-contaminated test sample blocks Use a pipette to respectively and evenly drip 1 mL of bacterial solution on each test sample block to prepare bacteria-contaminated test sample blocks. Through visual observation, after the surface of the test sample blocks becomes slightly dry, take a bacteria-contaminated test sample block and put it into a sterile bag. Add 10 mL of 0.85% (mass fraction) sterile physiological saline and thoroughly immerse it for 10 min. Use a homogenizer to elute at a frequency of 8 times/s ~ 10 times/s for 5 min. Dilute the eluent and select 1 mL of the solution with an appropriate degree of dilution to inoculate it into a sterile plate and pour it into the corresponding culture medium. After culturing in accordance with the requirements of A.1.1.2, in accordance with the method of colony counting in GB 4789.2 or GB 4789.15, count the colonies. The viable count shall not be

lower than 1.0 106 CFU/block. Different bacterial species shall be separately tested. A.3.3 Test group for use of the appliance or by the manufacturer, without adding detergents, disinfectants or other additives. If no relevant statement is made, then, the test is carried out using the "cotton and linen" program or "routine (standard)" program with the microbial reduction function. Within 5 minutes after the microbial reduction program is completed, take out the test load with the nailed bacteria-contaminated test sample blocks from the washing drum (barrel), remove the bacteria-contaminated test sample blocks that have been tested from the load and put them into a sterile bag, add 10 mL of 0.85% (mass fraction) sterile physiological saline for thorough immersion, use a homogenizer to elute at a frequency of 8 times/s ~ 10 times/s for 5 minutes. Dilute the eluent in gradients, select 1 mL of the solution with an appropriate degree of dilution and pour it into the corresponding culture medium. In accordance with the requirements of A.1.1.2, culture it, and then, in accordance with the counting method in GB 4789.2 or GB 4789.15, determine the number of colonies. After the test, the test loads shall be sterilized at 121 C in a high pressure steam sterilizer for 30 min. A.3.4 Positive control group The positive control group is tested using the "cotton and linen" program or "routine (standard)" program. The test load mass is the same as that of the test group. During the test, measure water consumption. The measurement shall start when the program is started (excluding any delay set by the user) and end when the program is completed. After the measurement is completed, in accordance with the test load mass that shall be used in the test, calculate the water consumption per unit test load mass. Specifically speaking, for drum-type washing machines, it shall not be less than 13 L/kg, and for pulsator washing machines, it shall not be less than 30 L/kg. The positive control group shall be prepared, loaded and recovered in accordance with the requirements of A.3.3, and carried out at the same time as the test group. The microbial reduction program is "air washing" or others that only use air or steam, etc., without using flowing liquid to clean and care for clothes. After the bacteria-contaminated test sample blocks are dripped for 15 minutes, the residual viable bacteria on the three bacteria- contaminated test sample blocks are eluted and recovered, and counted in accordance with A.3.3.5, which is the positive control group. The number of colonies recovered in the positive control group shall not be lower than 1.0 103 CFU/block, otherwise, the test is invalid. A.4 Data Calculation In accordance with Formula (A.1), calculate the microbial reduction rate. Where,

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/T 4288-2018 Household and Similar Electrical Washing Machine

GB 4789.2 National Food Safety Standard - Microbiological Examination of Food. Aerobic Plate Count

GB 4789.15 National Food Safety Standard - Food Microbiological Examination. Enumeration of Molds and Yeasts

GB/T 5296.2 Instructions for Use of Products of Consumer Interest - Part

5.3 Test Methods for Antimicrobia, Microbial Reduction and Cleaning

5.3.1 Test methods for materials and components and parts For materials with the antimicrobial and preventing mildew functions used for washing machines, or components and parts containing materials with the above-mentioned functions, the antimicrobial rate and preventing mildew level shall be tested in accordance with the methods specified in GB/T 21551.2.

5.3.2 Test methods for the whole machine

5.3.2.1 Test method for the microbial reduction function When using the washing machine's own program as the control group, in accordance with the method specified in Appendix A, carry out the test. When a drum-type reference washing machine is used as the control group, the test method is shown in Appendix B.

5.3.2.2 Test method for the dust mite reduction function In accordance with the method specified in QB/T 5958-2023, carry out the test.

5.3.2.3 Test method for the allergen reduction function In accordance with the method specified in QB/T 5958-2023, carry out the test.

5.3.2.4 Test method for the virus reduction function In accordance with the method specified in Appendix C, carry out the test.

5.3.2.5 Test method for deodorization In accordance with the method specified in QB/T 5958-2023, carry out the test.

6 Marking and Instructions for Use

6.1 Marking Principles The marking and instructions for use of washing machine products that are explicitly stated to have the antimicrobial, preventing mildew, microbial reduction, dust mite reduction, allergen reduction, virus reduction and deodorization functions shall comply with the requirements of relevant national laws, regulations and mandatory standards.

6.2 Basic Requirements for Marking For washing machine products that are explicitly stated to have the antimicrobial, preventing mildew, microbial reduction, dust mite reduction, allergen reduction, virus reduction and deodorization functions, their instructions for use