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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 12665-2017

Replacing GB/T 12665-2008

**Requirements of damp-heat testing of electrical machine for
service in general environmental condition**

电机在一般环境条件下使用的湿热试验要求

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Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009. This Standard replaces GB/T 12665-2008 "Requirements of damp-heat testing of electrical machine for service in general environmental condition". Compared with GB/T 12665-2008, the main technical changes in this Standard are as follows: - updated Clause

2 Normative references; - modified "voltage resistance" to "electrical strength" (see 3.3 of this Edition); - modified alternating humidity test method, added Method 2 (see 4.2 of this Edition); - added Figure 2; - deleted moisture-proof humidifier, added NOTE 1 (see 4.3 of Edition 2008); - added test method for leakage current after damp-heat (see 4.4 of this Edition). This Standard was proposed by China Electrical Appliance Industry Association. This Standard shall be under the jurisdiction of National Technical Committee on Rotary Motor of Standardization Administration of China (SAC/TC 26). The drafting organizations of this Standard. China Electric Apparatus Research Institute Co., Ltd., Zhejiang Lianyi Motor Co., Ltd., Hangzhou Weiguang Electronics Co., Ltd., Anhui University, Weikai Detection Technology Co., Ltd., Hangzhou Fusheng Electric Appliance Co., Ltd., Guangdong Welling Motor Manufacturing Co., Ltd., Zhejiang Jiuke Electric Co., Ltd., Xiamen Fran Appliances Technology Co., Ltd., Xi'an Xumai Intelligent Household Appliance Technology Co., Ltd., Wenzhou Anghua New Energy Co., Ltd. Main drafters of this Standard. Zheng Ziyang, Huang Haiyan, Li Guoli, He Ping, Liu Mingtao, Zhang Yunchang, Zhang Bing, Wang Jianchi, Long Xinhua, Chen Feng, Bao Yikai. Versions of standard substituted by this Standard are. - GB/T 12665-1990, GB/T 12665-2008. Requirements of damp-heat testing of electrical machine for service in general

environmental condition

1 Scope

GB/T 12665-2017 is the Chinese national standard on requirements of damp-heat testing of electrical machine for service in general environmental condition, in the field of testing. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 1 November 2017 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 May 2018. Classification: ICS 19.040, CCS K26. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Standard specifies the damp-heat test method, technical requirements and inspection rules of rotary electrical machine in general environmental condition. This Standard applies to all types of rotary electrical machines (except micro- control electrical machine, hereinafter referred to as the electrical machine).

2 Normative references

The following referenced documents are indispensable for the application 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.

GB/T 755, Rotating electrical machines - Rating and performance

GB/T 2423.3-2006, Environmental testing for electric and electronic products - Part

3.1 Insulation resistance

3.1.1 The insulation resistance value between the windings of the whole machine to the casing and the winding shall not be lower than the following values.

3.1.2 When a large-scale motor component is used for the damp-heat test, the insulation resistance converted to the complete machine is determined according to equation (2).

3.4 Running performance The electrical machine shall be able to operate normally. No sticking or other effects on the normal operation of the motor shall occur. The performance shall meet the requirements of relevant product standards.

4.1 Preparation before test

4.1.1 Test equipment and instruments The damp-heat test chamber shall meet the requirements of Clause 4 of GB/T 2423.4-2008.

4.1.2 Test specimen requirements When the large-scale electrical machine tests components, aluminum foil is used for the measuring electrode of the high-voltage stator winding and the DC electrical machine compensation winding. For slotted insulation and impregnated coils, a simulation slot shall be made.

4.1.3 Pre-treatment of test specimen Before the damp-heat test, the test specimen shall be placed in a hot and humid test chamber for preheating. The preheating temperature is 25°C ~ 35°C. From the time when the temperature of the damp-heat test chamber reaches 25°C, the time is not less than 8h.

4.2 Damp-heat test method According to GB/T 2423.4-2008, perform the alternating damp-heat test. High temperature is generally 40°C. According to the severity of the use of occasions, it can choose 55°C. There are two ways to reduce the temperature (see Figure 1 and Figure 2). Choose one of them to test. The conditions for each test cycle are shown in Figure 1 and Figure

2. Carry out 6 cycles in total.

4.3 Measurement of insulation resistance When carrying out the alternating test, the low temperature and high humidity stage of the last week of the damp-heat test shall be maintained at a temperature of 25°C ± 3°C and a relative humidity of 95% ~ 98%.

4.4 Measurement of leakage current After subjected to the damp-heat test, the leakage current of the electrical machine shall be measured by using the circuit device described in Figure 4 of GB/T 12113-2003.

4.6 Running performance check The check of running performance of the electrical machine shall be completed within 48h after the test specimen is removed from the chamber. The check of running performance shall be carried out in the way of power running. The performance requirements of electrical machine are specified by various professional product standards.

5 Inspection rules

5.1 General The damp-heat test shall be carried out when the product design stereotype or design, process and material used changes affect the damp-heat resistance of the product.

5.2 Sampling method of sample The damp-heat test of the electrical machine allows a representative product to be sampled by a random sampling method in a series of products of the same structure, the same process, and the same material.

5.3 Number of test specimen

5.4 Determination of test results After the damp-heat test of the electrical machine, if it can meet the requirements of Clause 4, the test results shall be qualified. For the damp-heat test of small and micro electrical machines, if one test result is not qualified, it is allowed to double the number of products for retest. If there is another failure, it is not allowed to leave the factory. For medium and large electrical machines, when the test results are unqualified, it is allowed to retest after effectively eliminating product defects.

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