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NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 19.040
K 20

GB/T 12665-2008

Replacing GB/T 12665-1990

**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实验要求

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Issued on: June 13, 2008

Implemented on: March 01, 2009

**Issued by: General Administration of Quality Supervision, Inspection
and Quarantine of the People's Republic of China;**

**Standardization Administration of the People's Republic of
China.**

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Foreword

This Standard replaces GB/T 12665-1990 *Requirements of damp-heat testing of electrical machine for service in general environmental condition*.

Compared with GB/T 12665-1990, the main changes of this Standard are as follows:

- Update the reference standards;
- Add the severity condition 55°C to damp-heat test in 3.2;
- Update figure 1;
- Add the article “3.4 Measurement of leakage current”;
- Change the “alternate damp-heat test” to be “damp-heat test” in 4.1.

This Standard was proposed by China Electrical Equipment Industrial Association (CEEIA).

This Standard shall be under the jurisdiction of Subcommittee 1 of Low-power Electric Machine of National Technical Committee 26 on Electric Rotating Machinery of Standardization Administration of China.

Drafting organizations of this Standard: China National Electric Apparatus Research Institute (CEI), and Hengdian Group Lianyi Electrical Machine Co., Ltd.

Main drafting staffs of this Standard: Yan Jinglian, Liao Guoqing, and Shen Tujun.

This Standard replaces the following historical edition:

- GB/T 12665-1990.

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

1 Scope

This Standard specifies the damp heat test method, technical requirements and inspection rules of the rotating electrical machine for service in general environmental condition.

This Standard is applicable to all kinds of rotating electrical machines (except mini-type control machine, hereinafter referred to as electrical machine). According to provisions of GB 755, the relative humidity of service environment is: the average maximum relative humidity in the wettest month is 90%; and the average lowest temperature in that month is not higher than 25°C; it shall meet the requirements of this Standard.

2 Normative References

The articles contained in the following documents have become part of this Standard when they are quoted herein. For the dated documents so quoted, all the modifications (excluding corrections) or revisions made thereafter shall not be applicable to this Standard. For the undated documents so quoted, the latest editions shall be applicable to this Standard.

GB 755-2000 Rotating electrical machines - Rating and performance (idt IEC 60034-1:1996)

GB/T 2423.3-2006 Environmental testing for electric and electronic products - Part 2: Testing method test Cab: Damp heat Steady state (idt IEC 60068-2-78:2001)

GB/T 2423.4-1993 Basic environmental testing procedures for electric and electronic products—Test Db: Damp heat, cyclic (eqv IEC 60068-2-78:1985)

3 Test method

3.1 Preparation before the test

3.1.1 Test equipment and instruments

Damp heat test chamber shall meet the requirements in Chapter 3 of GB/T 2423.4-1993.

The voltage class of megameter for measuring insulation resistance shall meet the provisions in Table 1.

3.4 Leakage current measurement

After damp heat test, the leakage current of the electrical machine shall comply with the provisions of the relevant product standards.

3.5 Withstand-voltage test

After measuring insulation resistance and leakage current of test samples, the insulation withstand-voltage test shall be immediately carried out, which shall be generally in the test chamber; when conditions do not permit, the high-voltage electrical machines or components and parts can be removed from the test chamber for testing, however, it must be completed within 6 h. If there is doubt on the insulation breakdown, it allows re-testing immediately without changing the test status, and the test voltage shall be still based on the provisions of Chapter 4.

3.6 Operating performance inspection

The inspection on the operating performance of electrical machine shall be completed within 48h after being removed from the test chamber; the operating performance inspection shall be carried out in energizing and operation; and the performance requirements of electrical machine shall be specified by the various professional product standards.

4 Technical requirements

4.1 Insulation performance

The complete electrical machine or components and parts (only for large electrical machines) shall meet the following conditions after damp heat test specified in Article 3.2:

4.1.1 The insulation requirements of complete electrical machine after damp heat test

The complete electrical machine shall meet the following requirements after damp heat test:

- a) The insulation resistance of the electrical machine windings against shell and the windings shall not be less than the following values.

The electrical machine with the rated voltage of 220 V and above shall be determined according to formula (1):

$$R = \frac{U}{1000 + \frac{P}{100}} \dots\dots\dots (1)$$

Where:

R — the insulation resistance of the electrical machine windings, in megaohms

The middle-large electrical machine can be installed with anti-damp heater; the heater power shall be able to make the temperature inside the shell 5 °C higher than room temperature, and ensure that the heating temperature cannot cause its nearby insulation more than the allowable temperature of this insulation.

The damp heat test can not be carried out on the electrical machine installed with heater.

4.4 Others

When the constant damp heat test is carried out on the relevant professional products according to 3.2, it shall be according to the specified corresponding test cycles and the technical requirements after damp heat test, but shall not be less than the requirements specified in this Standard.

The damp heat test cannot be carried out on the large steam turbine generator and hydraulic generator and whether to install heater shall be consulted and determined by the user with the manufacturer.

5 Inspection rules

5.1 Overview

Damp heat test shall be carried out under the following conditions:

When the damp heat resistance performance affecting product is changed by the product design finalizing or design, process and materials are used.

Whether to carry out regular sampling test on products and its deadline shall be specified by various professional product standards.

5.2 Sampling method

The damp heat test of the electrical machine allows to sample the representative products for testing in a random sampling method in the same series of products with same-structure, same-process and same-material; if passing the test, it shall be accepted that the products with same-structure, same-process and same-materials (including the derived series and the similar products with the same center height range) are qualified.

5.3 Number of test samples

For the electrical machine under damp heat test, the number of components and parts shall be according to the following provisions:

For the electrical machine with the center height of 315 mm and below, 2 sets shall be tested for each time.

For the medium and large electrical machine with the center height of above 315 mm, 1 set shall be tested for each time.

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