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

GB/T 17948.6-2018

Replacing GB/T 17948.6-2007

**Rotating electrical machines -- Functional evaluation of insulation
systems -- Test procedures for form-wound windings -- Evaluation of
thermomechanical endurance of insulation systems**

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Foreword

GB/T 17948 "Rotor motor insulation structure functional assessment" is divided into the following parts.

--- Thermal evaluation and classification of test procedures for loose windings (GB/T 17948.1);

--- Change of test procedure for loose winding and classification of insulation component replacement (GB/T 17948.2);

--- Forming winding test procedure Thermal evaluation and classification of rotating electrical insulation structure (GB/T 17948.3);

---Formed winding test procedures voltage durability assessment (GB/T 17948.4);

---Formed Winding Test Procedures Multi-factor evaluation of thermal and electrical comprehensive stress durability (GB/T 17948.5);

---Formed Winding Test Procedures Thermal Mechanical Durability Assessment of Insulation Structures (GB/T 17948.6);

--- General (GB/T 17948.7).

This part is the sixth part of GB/T 17948.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 17948.6-2007 "Rotating electrical machine insulation structure functional evaluation forming winding test specification insulation structure

Thermomechanical Durability Assessment, the main technical changes compared with GB/T 17948.6-2007 are as follows.

- Modified the "number of samples" (see 4.2, 4.2 of the.2007 edition);
- Modified the "temperature upper limit allowed range" (see 5.1,.2007 version 5.1);
- Added "identification test" (see Chapter 8).

This part uses the translation method equivalent to IEC 60034-18-34.2012 "Rotating electrical machines Part 18-34. Functional evaluation of insulation structures

Determination of the thermomechanical durability of insulation structures for fixed winding test procedures.

The documents of our country that have a consistent correspondence with the international documents referenced in this part are as follows.

---GB/T 755-2008 Rotating electrical machine rating and performance (IEC 60034-1.2004, IDT);

---GB/T 17948.7-2016 General rules for the functional evaluation of insulating structures for rotating electrical machines (IEC 60034-18-1.2010, IDT);

---GB/T 22715-2016 Rotating AC motor stator forming coil withstand voltage level (IEC 60034-15.2009, IDT).

This section has made the following editorial changes.

--- In line with the existing standard series, the name of this part was changed to "Rolling motor insulation structure functional evaluation forming winding test

Procedure for thermal mechanical durability assessment of insulation structures.

This part was proposed by China Electrical Equipment Industry Association.

This part is under the jurisdiction of the National Rotating Electric Machine Standardization Technical Committee (SAC/TC26).

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Introduction

General rules for the evaluation and grading of the insulation structure of rotating electrical machines are given in IEC 60034-18-1.

This part of GB/T 17948 gives an assessment of the insulation structure of the shaped winding under thermal cycling. This durability is for slender (especially

Indirect cooling) and motors with considerable load changes during normal operation are particularly important.

Due to the difference in thermal expansion between the conductor and the insulation, the main aging factor expected in this test procedure is mechanical stress, defined as thermomechanical

force. In this test, the temperature gradient of the coil/bar conductor to the outer surface is similar to the temperature gradient of the actual motor, and the thermal cycle is repeated.

Causes aging of the insulation structure.

In this test, heat aging was negligible. For thermal aging functional tests, see IEC 60034-18-31.

Functional Evaluation of Insulation Structure of Rotating Electric Machine

Forming winding test procedure

Thermomechanical durability evaluation of insulation structures

1 Scope

This part of GB/T 17948 specifies the test procedures for the evaluation of thermomechanical durability of molded winding insulation structures.

In the assessment, the performance of the insulation structure to be evaluated is compared with the reference insulation structure confirmed by operational experience.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 1410-2006 Test method for volume resistivity and surface resistivity of solid insulating materials (IEC 60093. 1980, IDT)

GB/T 17948.4-2016 Rotating electrical machines - Insulating structures - Functional assessment

(IEC 60034-18-32.2010, IDT)

GB/T 20833.1-2016 Rotating electrical machines - Part 1

TS60034-27.2006, IDT)

IEC 60028. 1925 International Standard of Resistance for Copper (International Standard of Resistance for Copper)

IEC 60034-1.2010 Rotating electrical machines - Part 1. Quantitative and performance (Rotating electrical machines - Part 1

Rating and performance)

Rotating electrical machines - Part 15. Resistance to surge voltages

electrical machines - Part

15. Impulse voltage withstand level of form-wound stator coils for rotating

AC machines)

IEC 60034-18-1 Rotating electrical machines - Part 18-1. General rules for functional assessment of insulation structures (Rotating electrical machines -

Part 18-1. Functional evaluation of insulation systems - General guidelines)

IEC /T R60894.1987 Guide to the test procedure for the winding windings and bars loss tangent values (Guide for test

Procedure for the measurement of loss tangent of coils and bars for machine windings)

3.1 Relationship with IEC 60034-18-1

Unless otherwise recommended in this section, the principles of IEC 60034-18-1 should be followed.

3.2 Thermomechanical aging process

Due to the influence of the thermomechanical cycle, the following mechanical aging occurs in the winding insulation structure.

- a) delamination between insulations;
- b) delamination of insulation and conductors;
- c) wear of the outer surface of the insulation;