

IEEE Recommended Practice for Thermal Evaluation of Sealed Insulation Systems for AC Electric Machinery Employing Random-Wound Stator Coils

Sponsor

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Abstract: A test procedure for comparing expected life, at rated temperature, of two or more sealed insulation systems is outlined. The procedure is limited to insulation systems for ac electric machines using random-wound stator coils. It is the intent of this procedure to evaluate insulation systems for use with air cooling under severe environmental conditions where the insulation is exposed to conducting contaminants. It does not cover special requirements such as those for machines enclosed in gas atmospheres, subjected to strong chemicals, or to submersion in liquids.

Keywords: aging temperature, condensation chamber, environmental conditions, exposure time, humidity exposure, insulation system, mechanical stress, moisture exposure, motorette, proof testing, random-wound machine insulation, screening tests, sealed insulation, service life expectancy, thermal exposure, voltage exposure, water immersion

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Introduction

(This introduction is not part of IEEE Std 1107-1996, IEEE Recommended Practice for Thermal Evaluation of Sealed Insulation Systems for AC Electric Machinery Employing Random-Wound Stator Coils.)

AC random-wound rotating equipment is increasingly being employed in severe environment applications, formerly dominated by form-wound constructions. IEEE Std 1107-1996 was developed to provide a practice for assessing the capability of such an electrical insulation system for severe environment application. This recommended practice intentionally follows many of the proven teachings of IEEE Std 117-1974, IEEE Standard Test Procedure for Evaluation of Systems of Insulating Materials for Random-Wound AC Electric Machinery.

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1. Overview

1.1 Scope

This recommended practice outlines a test procedure for comparing expected life, at rated temperature, of two or more sealed insulation systems. The procedure is limited to insulation systems for ac electric machines using random-wound stator coils.

It is the intent of this procedure to evaluate insulation systems for use with air cooling under severe environmental conditions where the insulation is exposed to conducting contaminants. It does not cover special requirements such as those for machines enclosed in gas atmospheres, subjected to strong chemicals, or to submersion in liquids.

The procedure includes instructions for the following:

- a) Testing candidate systems in comparison with known systems having a proven record of service experience
- b) Interpretation of the results

1.2 Purpose

The purpose of this procedure is to classify sealed insulation systems of machinery used in severe environmental conditions, within the scope of this recommended practice, with respect to their temperature limits, by test, rather than by chemical composition of the materials of the system. Data from such tests may be used to establish the temperature classification of new insulation systems before they are service proven, by comparison of expected life, at rated temperature, of two or more sealed insulation systems. The procedure is limited to insulation systems for ac electric machines incorporating random-wound stator coils.