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Studies and comparisons of magnetic measurements on grain-oriented electrical steelsheet determined by the single sheet test method and Epstein test method

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STUDIES AND COMPARISONS OF MAGNETIC MEASUREMENTS ON GRAIN-ORIENTED ELECTRICAL STEELSHEET DETERMINED BY THE SINGLE SHEET TEST METHOD AND EPSTEIN TEST METHOD

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IEC TR 62981, which is a technical report, has been prepared by IEC technical committee 68: Magnetic alloys and steels.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
68/535/DTR	68/543/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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STUDIES AND COMPARISONS OF MAGNETIC MEASUREMENTS ON GRAIN-ORIENTED ELECTRICAL STEELSHEET DETERMINED BY THE SINGLE SHEET TEST METHOD AND EPSTEIN TEST METHOD

1 Scope

This document, which is a Technical Report, provides the results of international exercises and comparisons focusing on achieving the knowledge of the statistical performance of single sheet tester (SST) measurements made on grain-oriented electrical steel. These experiments aim at specifying obligatory reference values, measured by the single sheet test method, for the grading of high permeability (P grades) grain-oriented (g.-o.) materials, independently from the Epstein classification as it is practiced today. Besides this, Epstein test measurements have been made in order to gain more up-to-date statistical performance for comparison with the SST statistical characteristics. A few experiments were carried out aiming at improved knowledge on the systematic error performance of the SST, i.e. they were to determine the correlation between the quality of insulation separating laminations in the SST yokes and the measured loss.

There are various designations for "non-oriented electrical sheet steel" and for "grain-oriented electrical sheet steel" in use, for example in the IEC 60404 classification and specification standards, and there are also abbreviations like CGOS (for conventional grain-oriented steel) often used in industry. In this report, the following designations and abbreviations are used:

– electrical steel as generic term;
– n.-o- electrical steel and g.-o. electrical steel as generic terms for these two types;
– S-type electrical streel or c. g.-o. electrical steel for "conventional grain-oriented electrical steel";
– P-type g.-o. electrical steel or high-permeability g.-o. electrical steel;
– DR g.-o. electrical steel for "domain refined grain-oriented electrical steel";
– where two terms are used, it can depend on the context;
– "electrical steel" can be replaced with "material", depending on the context.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 60050-121, *International Electrotechnical Vocabulary – Part 121: Electromagnetism* (available at http://www.electropedia.org)

IEC 60050-221, *International Electrotechnical Vocabulary – Chapter 221: Magnetic materials and components* (available at http://www.electropedia.org)