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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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CONTENTS

FOREWORD 4
1 Scope 6
2 Normative references 6
3 Terms and definitions 6
4 Background 7
4.1 Historical background and former concepts of the SST-Epstein relationship 7
4.2 Establishing reference values for grain-oriented electrical steels determined by independent SSTs – A new approach to the purpose 8
5 Preliminary comparisons and experiments 9
5.1 General 9
5.2 Comparison of the relative difference $\delta P_{SE} = (P_{SST} - P_{eps})/P_{Eps}$ measured by steel manufacturers on their own products using own set-ups 10
5.3 Preliminary comparisons and experiments made by four Chinese laboratories using six SSTs with stacked yokes 11
5.4 Necessity of comparing independent SST results 13
6 International comparison of SST measurements on grain-oriented electrical steel and accompanying Epstein measurements 15
6.1 General conditions, samples, participants 15
6.2 Circulation of the samples and measurement procedure 16
6.3 Results and analysis of the measured quantities 17
6.4 Conclusions of the international comparison 30
7 Summary and conclusions 31
Bibliography 32

Figure 1 – Epstein frame and single sheet tester, schematic view, windings partly omitted 7
Figure 2 – Relative difference δP_{SE} = 100 ($P_{SST} - P_{EP}$) / P_{EP} versus peak magnetic polarization J measured by six contributors on samples of their own products 10
Figure 3 – Contact pattern for the measurement of lamination resistance in the air gap of SST yokes 11
Figure 4 – Ratio of the power loss P_{SST} to that of the SST with the best yokes, P_{SSTopt}, versus lamination conductivity factor C_Y of the yokes 12
Figure 5 – Ratio of the power loss at 100 Hz to that at 40 Hz, P_{100}/P_{40}, at 1,7 T, versus lamination conductivity factor C_Y of the yokes 13
Figure 6 – Relative difference δP_{SE} = 100($P_{SST} - P_{EP}$) / P_{EP} versus magnetic polarization 14
Figure 7 – Relative difference δP_{SE} = 100($P_{SST} - P_{EP}$) / P_{EP} at 1,7 T determined by three standard laboratories, IEN, NPL and PTB, on S- and P-type g.-o. sample pairs 14
Figure 8 – Dispersion of manufacturer's grain-oriented material production in form of Epstein samples (PTB 1999) 15
Figure 9 – Example of scattering of the laboratories' best estimates around the reference value (CGO sample No. 2, unweighted average, dash-dotted line) 18
Figure 10 – Example of scattering of the laboratories' best estimates around the reference value (HGO sample No. 4, unweighted average, dash-dotted line) 19
Figure 11 – Example of scattering of the laboratories' best estimates around the reference value (HGO sample No. 5, unweighted average, dash-dotted line) 19
Figure 12 – Samples No. 1 to No. 5: ratio of SST to Epstein power loss reference values $\delta P_{SE}(J_p)$ = (<P_{SST}> – <P_{Epst}>) / <P_{Epst}> at 50 Hz versus peak polarization 20

Figure 13 – Overall dispersion (all labs, J_p values, and samples) of the laboratories' best estimates P_i of the power loss at 50 Hz around their reference values 23

Figure 14 – Overall dispersion (all labs, J_p values, and samples) of the laboratories' best estimates S_i of the apparent power at 50 Hz around their reference values, with and without outliers 24

Figure 15 – Dispersion around the reference value of the laboratories' best values of the power loss P measured at 50 Hz by the Epstein and the SST methods at 1,7 T 25

Figure 16 – Dispersion around the reference value of the laboratories' best values of the apparent power S measured at 50 Hz by the Epstein and the SST methods at 1,7 T 26

Figure 17 – Overall dispersion (European metrological laboratories only, all J_p values and samples) of the laboratories' best estimates P_i of the power loss at 50 Hz around their reference values, with and without outliers 27

Figure 18 – Dispersion of the laboratories' best estimates of SST (a) and Epstein (b) power loss at 50 Hz 28

Figure 19 – Dispersion of the laboratories' best estimates of SST (a) and Epstein (b) power loss at 50 Hz 29

Figure 20 – Dispersion of the laboratories' best estimates, represented by the standard deviation σ of SST (red) and Epstein (blue) power loss (a) and apparent power (b) at 50 Hz, versus the peak value of the polarization, J_P, summarizing Figures 18 and 19 30

Table 1 – Participating laboratories 16

Table 2 – Circulated grain-oriented electrical steel test samples 17

Table 3 – Reference values at 50 Hz for the power loss P and the apparent power S 21

Table 4 – Standard deviations associated with the reference values at 50 Hz for the power loss P and the apparent power S (Table 3) 22

Table 5 – Reference values at 50 Hz of the polarization at H = 800 A/m J_{800} and standard deviation of the distribution of the laboratories' best estimates 22

Table 6 – Relative standard deviations of 50 Hz power loss P and apparent power S distributions around their reference values 27

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

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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,
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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)