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Calculation of the effective parameters of magnetic piece parts

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Calculation of the effective parameters of magnetic piece parts

FOREWORD

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This commented version (CMV) of the official standard IEC 60205:2026 edition 5.0 allows the user to identify the changes made to the previous IEC 60205:2016 edition 4.0. Furthermore, comments from IEC TC 51 experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

IEC 60205 has been prepared by IEC technical committee 51: Magnetic components, ferrite and magnetic powder materials. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) addition, in 5.2, of the drawing and the formulae of pair of URS-cores of rectangular-circular section;

b) using, in 5.9, 5.10, 5.11 and 5.13, the conventional calculation formula that includes "B_1-D" is limited for the x-x cores (x is EL, ER, PQ or E) and addition new formulae for x-PLT cores that replaces "B_1-D" with "(B_1-D+B_2)/2";

c) addition, in 5.9, 5.10, 5.11 and 5.13, of formulae of l_1 and l_3 for x-PLT cores (x is EL, ER, PQ or E) which is different from the l_1 and l_3 of x-x cores;

d) addition of formula A_{min} in each subclause from 5.2.1 to 5.14.

The text of this standard is based on the following documents:

Draft	Report on voting
51/1592/FDIS	51/1607/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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

– reconfirmed,

– withdrawn, or

– revised.

~~INTRODUCTION~~

~~The purpose of this revision is to provide formulae by which everybody can reach the same effective parameter values. Firstly, it is necessary to have a sufficient number of significant figures when figures are rounded off in the process of calculation. Additionally, some of the calculation formulae have been changed to get closer to the actual shape.~~

~~In this revision, the basic idea of calculation has not been changed. Recently, analysis of the magnetic field in the core has been considerably improved, so that, based on these ideas, development of new approaches and formulae can be expected.~~

~~Furthermore, the new "EC-cores" have been added.~~

~~The parameters in the existing IEC standards will be revised with the outcome from the formulae of this document.~~

1 Scope

This document specifies uniform rules for the calculation of the effective parameters of closed circuits of ferromagnetic material.

2 Normative references

There are no normative references in this document.

~~Bibliography~~

~~IEC 62317-13, *Ferrite cores – Dimensions – Part 13: PQ-cores for use in power supply applications*~~

List of comments

1 By providing a more detailed description of the calculation method, we ensure that users do not obtain differing calculated values.

2 Addition of the URS shape described in IEC 63093-15, which had not been previously documented.

3 To make it easier for users, A_{min} is listed for each shape.

4 The EL-EL core and the EL-PLT core are described separately. As a result, even if the thickness of the rear part of the EL core and the PLT core differs, the core constant can be calculated correctly. The method of description is changed to align with the IEC 63093 series.

5 The ER-ER core and the ER-PLT core are described separately. As a result, even if the thickness of the rear part of the ER core and the PLT core differs, the core constant can be calculated correctly. The method of description is changed to align with the IEC 63093 series.

6 The PQ-PQ core and the PQ-PLT core are described separately. As a result, even if the thickness of the rear part of the PQ core and the PLT core differs, the core constant can be calculated correctly. The method of description is changed to align with the IEC 63093 series.

7 The E-E core and the E-PLT core are described separately. As a result, even if the thickness of the rear part of the E core and the PLT core differs, the core constant can be calculated correctly. The method of description is changed to align with the IEC 63093 series.