

This document is a preview generated by EVS

Ferrite cores - Guidelines on dimensions and the limits of surface irregularities - Part 4: RM-cores

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 63093-4:2019 sisaldb Euroopa standardi EN IEC 63093-4:2019 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 63093-4:2019 consists of the English text of the European standard EN IEC 63093-4:2019.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 26.04.2019.	Date of Availability of the European standard is 26.04.2019.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 29.100.10

Standardite reproduutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN IEC 63093-4

April 2019

ICS 29.100.10

Supersedes EN 60424-2:2016, EN 62317-4:2005

English Version

Ferrite cores - Guidelines on dimensions and the limits of
surface irregularities - Part 4: RM-cores
(IEC 63093-4:2019)

Noyaux ferrites - Lignes directrices relatives aux
dimensions et aux limites des irrégularités de surface -
Partie 4: Noyaux RM
(IEC 63093-4:2019)

Ferritkerne - Richtlinien zu Maßen und Grenzen von
Oberflächenbeschädigungen - Teil 4: RM-Kerne
(IEC 63093-4:2019)

This European Standard was approved by CENELEC on 2019-04-12. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 51/1265/FDIS, future edition 1 of IEC 63093-4, prepared by IEC/TC 51 "Magnetic components, ferrite and magnetic powder materials" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 63093-4:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-01-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-04-12

This document supersedes EN 60424-2:2016, EN 62317-4:2005.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 63093-4:2019 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60424-2:2015	NOTE	Harmonized as EN 60424-2:2016 (not modified)
IEC 62044-2	NOTE	Harmonized as EN 62044-2
IEC 62317-2	NOTE	Harmonized as EN 62317-2

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60205	-	Calculation of the effective parameters of EN 60205 magnetic piece parts		-
IEC 60401-1	-	Terms and nomenclature for cores made of EN 60401-1 magnetically soft ferrites - Part 1: Terms used for physical irregularities		-
IEC 60424-1	-	Ferrite cores - Guidelines on the limits of EN 60424-1 surface irregularities - Part 1: General specification		-

CONTENTS

FOREWORD	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Primary dimensions	7
4.1 General	7
4.2 Dimensions of RM-cores	7
4.2.1 Principal dimensions	7
4.2.2 Effective parameter and A_{\min} values	7
4.3 Main dimensions for coil formers	7
4.3.1 Shape of coil former and pin numbering	7
4.3.2 Dimensions of coil formers for RM-cores for the primary standard	7
4.3.3 RM-cores intended particularly for power applications	7
4.4 Pin locations and base outlines	7
4.5 Spring recess	8
4.6 Stud recess	8
5 Mounting	21
6 Limits of surface irregularities	21
6.1 General	21
6.2 Examples of surface irregularities	21
6.3 Chips and ragged edges	21
6.3.1 General	21
6.3.2 Chip and ragged edges located on the mating surface	21
6.3.3 Chips and ragged edges located on other surfaces	22
6.4 Cracks	24
6.5 Pull-out	26
6.6 Crystallites	27
6.7 Flash	27
6.8 Pores	28
Annex A (informative) RM-core design	29
A.1 General	29
A.2 Pin locations and base outlines	29
A.3 Design considerations and dimensions	29
A.4 Practical considerations	30
Annex B (normative) Guidance for measuring clamping forces relevant to RM-core tests	31
B.1 Test conditions and clamping forces	31
B.2 Clamping procedure	31
Annex C (informative) Examples of allowable areas of chips	33
Bibliography	34
Figure 1 – Dimensions of RM-cores	9
Figure 2 – Dimensions of low-profile RM-cores	10
Figure 3 – Dimensions of spring recess	12
Figure 4 – Dimensions of stud recess	13

Figure 5 – Main dimensions of coil formers for RM-cores	14
Figure 6 – Pin locations and base outlines viewed from the underside of the board	16
Figure 7 – Dimensions of specific features	18
Figure 8 – Pin locations and base outlines viewed from the underside of the board	20
Figure 9 – Examples of surface irregularities	21
Figure 10 – Chips on mating surfaces	22
Figure 11 – Location of cracks – Top view	24
Figure 12 – Location of cracks – Bottom view	24
Figure 13 – Dimension W	26
Figure 14 – Location of pull-out	26
Figure 15 – Pull-out in the clamping recess area	27
Figure 16 – Location of a crystallite	27
Figure 17 – Location of a flash	28
Figure 18 – Location of pore	28
Figure B.1 – Mounting device	31
Table 1 – Dimensions of RM-cores	9
Table 2 – Dimensions of low-profile RM-cores	10
Table 3 – Effective parameter and A_{\min} values for RM-cores	11
Table 4 – Effective parameter and A_{\min} values for low-profile RM-cores	12
Table 5 – Dimensions of spring recess	13
Table 6 – Dimensions of stud recess	13
Table 7 – Dimensional limits for coil formers for RM-cores	14
Table 8 – Dimensional limits for coil formers for low-profile RM-cores	15
Table 9 – Dimensions of specific features	19
Table 10 – Area and length reference of irregularities for visual inspection	23
Table 11 – Limits for cracks	25
Table 12 – W dimensions	25
Table B.1 – Inner diameters and recommended clamping forces	32
Table C.1 – Examples of allowable area of chips	33

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FERRITE CORES – GUIDELINES ON DIMENSIONS AND THE LIMITS OF SURFACE IRREGULARITIES

Part 4: RM-cores

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 63093-4 has been prepared by IEC technical committee 51: Magnetic components, ferrite and magnetic powder materials.

This first edition cancels and replaces the first edition of IEC 62317-4 published in 2005 and the second edition of IEC 60424-2 published in 2015. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC 62317-4:2005 and IEC 60424-2:2015:

- a) IEC 63093-4 integrates the contents of IEC 62317-4:2005 and IEC 60424-2:2015;
- b) IEC 60424-2:2015, Table 2, has been included in Annex C as Table C.1.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
51/1265/FDIS	51/1275/RVD

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

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

A list of all parts in the IEC 63093 series, published under the general title Ferrite cores – Guidelines on dimensions and the limits of surface irregularities, can be found on the IEC website.

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

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