

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

**Noyaux ferrites – Lignes directrices relatives aux dimensions et aux limites des
irrégularités de surface –
Partie 4: Noyaux RM**





THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2019 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

67 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC -

webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

67 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.



INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

**Noyaux ferrites – Lignes directrices relatives aux dimensions et aux limites des
irrégularités de surface –
Partie 4: Noyaux RM**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.100.10

ISBN 978-2-8322-6615-1

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

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.