IEC 60424-4

Edition 2.0 2015-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Withdrawn

Ferrite cores – Guidelines on the limits of surface irregularities – Part 4: Ring-cores

Noyaux ferrites – Lignes directrices relatives aux limites des irrégularités de surface – Partie 4: Noyaux toriques

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FERRITE CORES – GUIDELINES ON THE LIMITS OF SURFACE IRREGULARITIES –

Part 4: Ring-cores

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International Standard IEC 60424-4 has been prepared IEC technical committee 51: Magnetic components and ferrite materials.

This second edition cancels and replaces the first edition published in 2001. This edition constitutes a technical revision.

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

a) addition of crystallites in 3.1.3 and of pores in 3.1.4.

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

FDIS	Report on voting
51/1109/FDIS	51/1124/RVD

Full information on the voting for the approval of this standard 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.

A list of all parts in the IEC 60424 series, published under the general title *Ferrite cores – Guidelines on the limits of surface irregularities*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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

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FERRITE CORES – GUIDELINES ON THE LIMITS OF SURFACE IRREGULARITIES –

Part 4: Ring-cores

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1 Scope

This part of IEC 60424 gives guidance on allowable limits of surface irregularities applicable to ring-cores in accordance with the relevant generic specification defined in IEC 60424-1.

This standard is considered as a sectional specification useful in the negotiations between ferrite core manufacturers and customers about surface irregularities.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Void.

3 Limits of surface irregularities

3.1 Uncoated ring-cores

3.1.1 General

Generally, uncoated ring-cores are smoothed (for example: by tumbling) to remove any significant flash and to add radius to edges that would otherwise be sharp due to tooling angles. Tooling angles exist where the compaction punches meet the interior of the die mold, where a sharp angle in the edge of the piece that is formed is unavoidable. This is also the location inside the ferrite tool set where flashing may occur. The purpose of removing flash and rounding edges is to allow uncoated ring cores to be wound with insulated wire, using typical production winding processes, without damage to the wire.

3.1.2 Chips and ragged edges

Figure 1 shows examples of chips and ragged edges location on ring-cores.

– Ragged edges as defined in IEC 60424-1 are allowed.
– Chips shall not exceed 25 % of the wall thickness either in length or in width, up to a maximum of 2 mm.
– The maximum number of chips shall not exceed 3 on one core edge and a total of 5 on all edges.

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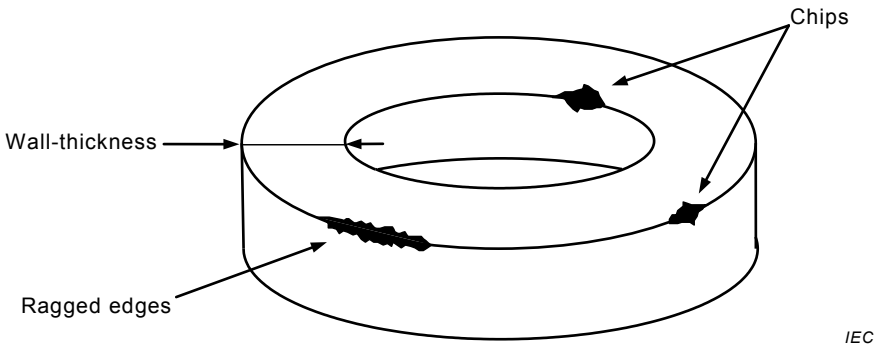

Figure 1 – Chips and ragged edges location on ring-cores

3.1.3 Cracks and pull-out

Figure 2 shows examples of cracks and pull-out location on ring-cores.

Cracks (C1) perpendicular to the magnetic flux path are allowed but shall not exceed 20 % of the wall thickness.

– Cracks (C2) parallel to the magnetic flux are allowed but shall not exceed 12,5 % (1/8) of the relevant core circumference.
– Crazing (C3) which is a grid-like pattern of superficial cracks (e.g. depth less than 0,5 mm) is allowed.
– Pull-out (C4) is allowed but the relevant cumulative area on each affected core surface shall not exceed 25 % of its area.
– Excess dirt or ferrite debris on the surface or in the window of uncoated ring-cores is not acceptable.

NOTE In any case, cores with surface irregularities will meet relevant electrical specifications.

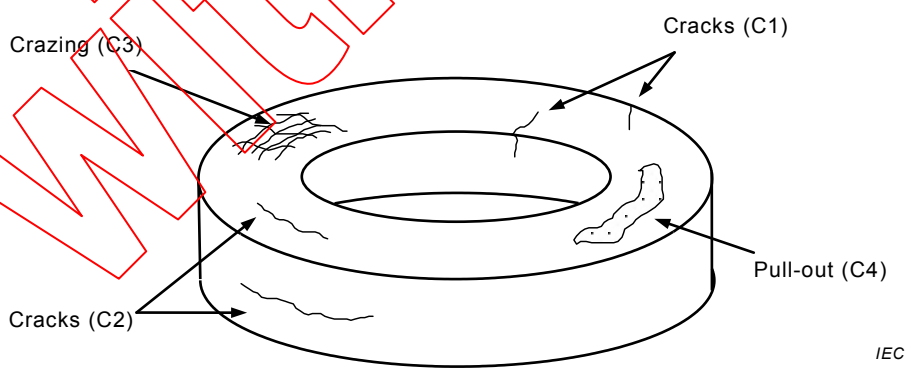

Figure 2 – Cracks and pull-out location on ring-cores

3.1.4 Crystallites

Figure 3 shows examples of crystallites location on ring-cores.

– A single area of the crystallites located on any surface shall be less than 2 % of the respective surface area.
– The cumulative area of the crystallites located on any surface shall be less than 4 % of the respective surface area.

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