

# INTERNATIONAL STANDARD

**IEC**  
**60424-4**

First edition  
2001-02

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## **Ferrite cores – Guide on the limits of surface irregularities –**

### **Part 4: Ring-cores**

*Noyaux ferrites –  
Guide relatif aux limites des irrégularités de surface –*

*Partie 4:  
Noyaux toriques*



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FERRITE CORES – GUIDE ON THE LIMITS  
OF SURFACE IRREGULARITIES –**

**Part 4: Ring-cores**

FOREWORD

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

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

FDIS	Report on voting
51/579/FDIS	51/586/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 3.

The committee has decided that the contents of this publication will remain unchanged until 2005. At this date, the publication will be

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- withdrawn;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

A bilingual version of this standard may be issued at a later date.

# FERRITE CORES – GUIDE ON THE LIMITS OF SURFACE IRREGULARITIES –

## Part 4: Ring-cores

### 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 negotiation between ferrite core manufacturers and customers about surface irregularities.

### 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60424. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60424 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative documents referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

IEC 60424-1:1999, *Ferrite cores – Guide on the limits of surface irregularities – Part 1: General specification*

### 3 Limits of surface irregularities

#### 3.1 Uncoated ring-cores

Generally, uncoated ring-cores are smoothed (for example: by tumbling) to prevent any flash and therefore wire damage during the winding process.

##### 3.1.1 Chips and ragged edges (see figure 1)

- Ragged edges as defined in IEC 60424-1 are allowed.
- Chips shall not exceed 25 % of the wall thickness neither in length nor in width, up to a maximum of 2 mm.
- The maximum number of chips shall not exceed three on one core edge and not exceed a total of five on all edges.

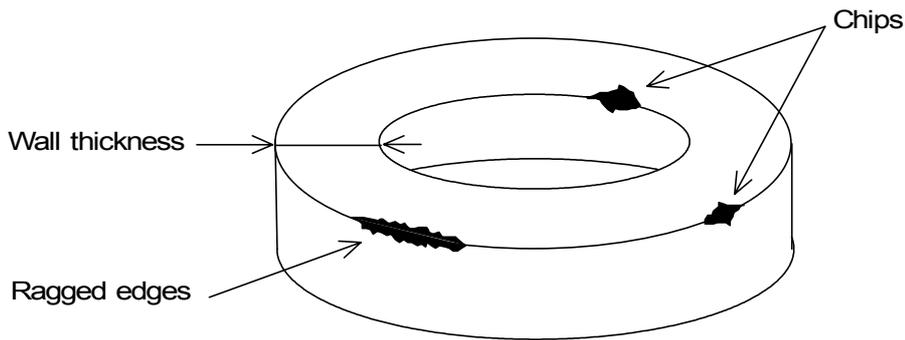


Figure 1 – Chips and ragged edges location on ring-cores

### 3.1.2 Cracks and pull-out (see figure 2)

- 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.
- Crazeing (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.

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



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

### 3.2 Coated ring-cores

Coated ring-cores are generally smoothed (e.g. by tumbling) before the coating process.

- Rough coating is acceptable provided that dimensional specifications are met.
- Partial coating exposing the bare core is unacceptable.

NOTE In any case, the coated ring-cores will have to withstand the relevant breakdown voltage specifications.

3.3 Area and length reference (see table 1)

Table 1 – Area and length reference for visual inspection

Area	A	B	C	D	E	Area	A	B	C	D	E
0,5 mm <sup>2</sup>	•	■	▬	▬	▴	12,5 mm <sup>2</sup>	●	■	▬	▬	▴
1,0 mm <sup>2</sup>	•	■	▬	▬	▴	15,0 mm <sup>2</sup>	●	■	▬	▬	▴
1,5 mm <sup>2</sup>	•	■	▬	▬	▴	17,5 mm <sup>2</sup>	●	■	▬	▬	▴
2,0 mm <sup>2</sup>	•	■	▬	▬	▴	20,0 mm <sup>2</sup>	●	■	▬	▬	▴
2,5 mm <sup>2</sup>	•	■	▬	▬	▴	25,0 mm <sup>2</sup>	●	■	▬	▬	▴
3,0 mm <sup>2</sup>	•	■	▬	▬	▴	30,0 mm <sup>2</sup>	●	■	▬	▬	▴
3,5 mm <sup>2</sup>	•	■	▬	▬	▴	35,0 mm <sup>2</sup>	●	■	▬	▬	▴
4,0 mm <sup>2</sup>	•	■	▬	▬	▴	40,0 mm <sup>2</sup>	●	■	▬	▬	▴
4,5 mm <sup>2</sup>	•	■	▬	▬	▴	45,0 mm <sup>2</sup>	●	■	▬	▬	▴
5,0 mm <sup>2</sup>	•	■	▬	▬	▴	50,0 mm <sup>2</sup>	●	■	▬	▬	▴
6,0 mm <sup>2</sup>	•	■	▬	▬	▴						
7,0 mm <sup>2</sup>	•	■	▬	▬	▴						
8,0 mm <sup>2</sup>	•	■	▬	▬	▴						
9,0 mm <sup>2</sup>	•	■	▬	▬	▴						
10,0 mm <sup>2</sup>	•	■	▬	▬	▴						

Scale 1:1

1 mm —      2 mm —      3 mm —      4 mm —

5 mm —      7,5 mm —      10 mm —

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