

# INTERNATIONAL STANDARD

**Ferrite cores – Guidelines on dimensions and the limits of surface  
irregularities –  
Part 11: EC-cores for use in power supply applications**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FERRITE CORES – GUIDELINES ON DIMENSIONS  
AND THE LIMITS OF SURFACE IRREGULARITIES –****Part 11: EC-cores for use in power supply applications**

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International Standard IEC 63093-11 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 62317-11 published in 2015 and the second edition of IEC 60424-3 published in 2015. This edition constitutes a technical revision.

This document includes the following significant technical changes with respect to IEC 62317-11:2015 and IEC 60424-3:2015:

- a) This document integrates IEC 62317-11:2015 and IEC 60424-3:2015;
- b) Table 3 – Allowable areas of chips for EC-cores, of IEC 60424-3:2015, has been moved to Annex B (informative) of this document.

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

CDV	Report on voting
51/1214/CDV	51/1236/RVC

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- withdrawn,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.

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

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

## Part 11: EC-cores for use in power supply applications

### 1 Scope

This part of IEC 63093 specifies the dimensions that are of importance for mechanical interchangeability for a preferred range of EC-cores made of ferrite and the essential dimensions of coil formers to be used with them, as well the effective parameter values to be used in calculations involving them. It also gives guidelines on allowable limits of surface irregularities applicable to EC-cores.

The specifications contained in this document are useful in negotiations between ferrite core manufacturers and customers about surface irregularities.

### 2 Normative references

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.

IEC 60205, *Calculation of the effective parameters of magnetic piece parts*

IEC 60401-1, *Terms and nomenclature for cores made of magnetically soft ferrites – Part 1: Terms used for physical irregularities*

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

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60401-1 and IEC 60424-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

### 4 Primary dimensions

#### 4.1 General

Compliance with the following requirements ensures mechanical interchangeability of complete assemblies and coil formers.

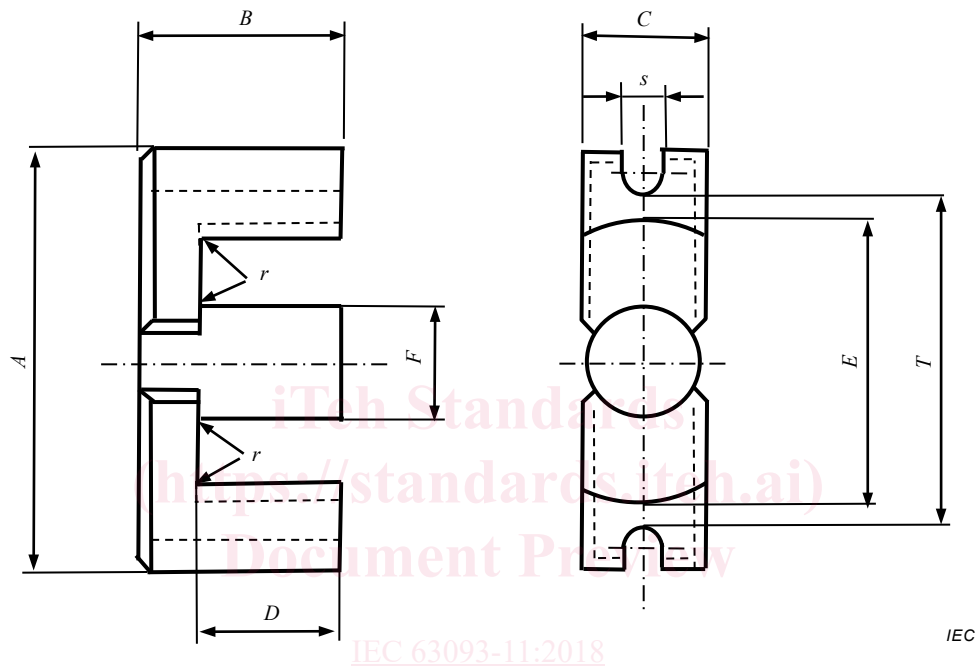
## 4.2 Dimensions of EC-cores

### 4.2.1 Principal dimensions

The principal dimensions of EC-cores shall be those given in Figure 1 and Table 1.

### 4.2.2 Effective parameter and $A_{min}$ values

The effective parameter values of a pair of cores whose dimensions comply with 4.2.1 shall be as given in Table 2. For the definitions of these parameters and their calculations, reference shall be made to IEC 60205.



IEC 63093-11:2018  
Figure 1 – Dimensions of EC-cores

IEC



Table 1 – Dimensions of EC-cores

Size	A mm		B mm		C mm		D mm		E mm		F mm		r mm	s mm		T mm	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Max.	Min.	Max.	Min.	Max.
EC 35	33,7	35,3	17,15	17,45	9,2	9,8	11,9	12,6	22,2	23,3	9,2	9,8	0,5	2,5	3,0	27,7	29,3
EC 41	39,6	41,6	19,35	19,65	11,3	11,9	13,5	14,3	26,3	27,8	11,3	11,9	0,7	3,0	3,3	32,6	34,6
EC 52	50,9	53,5	24,05	24,35	13,05	13,75	15,5	16,3	32,1	33,9	13,05	13,75	0,8	3,5	4,0	42,7	45,3
EC 70	68,3	71,7	34,35	34,65	16,0	16,8	22,3	23,2	43,3	45,7	16,0	16,8	1,0	4,5	5,0	57,9	61,3
EC 90	88,2	91,8	44,35	45,65	29,0	31,0	35,0	36,0	68,5	71,5	29,0	31,0	1,0	5,2	5,8	77,2	80,8
EC 120	118,0	122,0	49,85	51,15	29,0	31,0	35,0	36,0	93,3	96,7	29,0	31,0	1,5	5,2	5,8	107,0	111,0

Table 2 – Effective parameter and  $A_{\min}$  values

Size	$C_1$ mm <sup>-1</sup>	$C_2$ mm <sup>-3</sup>	$l_e$ mm	$A_e$ mm <sup>2</sup>	$V_e$ mm <sup>3</sup>	$A_{\min}^a$ mm <sup>2</sup>
EC 35	0,857 84	$9,490 2 \times 10^{-3}$	77,5	90,4	7 010	70,9
EC 41	0,718 10	$5,851 9 \times 10^{-3}$	88,1	123	10 800	106
EC 52	0,572 11	$3,168 9 \times 10^{-3}$	103	181	18 600	141
EC 70	0,508 60	$1,818 5 \times 10^{-3}$	142	280	39 800	211
EC 90	0,342 51	$0,544 66 \times 10^{-3}$	215	629	135 000	570
EC 120	0,324 96	$0,420 96 \times 10^{-3}$	251	772	194 000	707

NOTE Manufacturers can indicate more precise values in their catalogues than those given in Table 2.

<sup>a</sup>  $A_{\min}$  is specified in IEC 60205.

### 4.3 Dimensional limits for coil formers

The essential dimensions of coil formers suitable for use with a pair of EC-cores shall be as given in Table 3. The dimensions specified in Table 3 are illustrated in Figure 2.

Examples of standard coil formers are shown in Annex A.

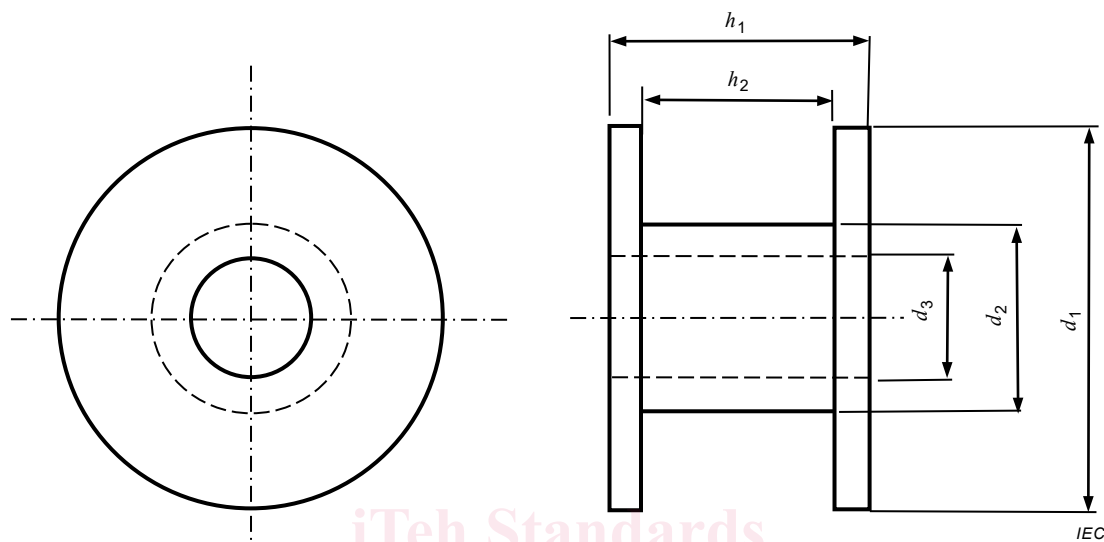


Figure 2 – Main dimensions of coil formers for EC-cores

Table 3 – Dimensional limits for coil formers

Size	$d_1$	$d_2$	$d_3$	$h_1$	$h_2$
	mm	mm	mm	mm	mm
	<b>Max.</b>	<b>Max.</b>	<b>Min.</b>	<b>Max.</b>	<b>Min.</b>
EC 35	21,8	12,3	9,9	23,6	21,4
EC 41	25,8	14,4	12,0	26,8	24,4
EC 52	31,6	16,3	13,85	30,7	28,2
EC 70	42,7	19,6	17,0	44,3	41,3
EC 90	67,7	35,6	31,4	69,6	64,8
EC 120	92,4	35,6	31,4	69,6	64,8

## 5 Limits of surface irregularities

### 5.1 General

Surface irregularities are defined in IEC 60424-1.

### 5.2 Examples of surface irregularities

Figure 3 shows different examples of surface irregularities of an EC-core.