INTERNATIONAL STANDARD

IEC 60133

Fourth edition
2000-12

Dimensions of pot-cores made of magnetic oxides and associated parts

Dimensions des circuits magnétiques en pots en oxydes magnétiques et pièces associées

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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DIMENSIONS OF POT-CORES MADE OF MAGNETIC OXIDES AND ASSOCIATED PARTS

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60133 has been prepared by technical committee 51: Magnetic components and ferrite materials.

This edition cancels and replaces the third edition published in 1985, of which it constitutes a technical revision.

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

FDIS	Report on voting
51/570/FDIS	51/580/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 2004. 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.

DIMENSIONS OF POT-CORES MADE OF MAGNETIC OXIDES AND ASSOCIATED PARTS

1 Scope

This standard specifies the dimensions that are of importance for mechanical interchangeability for a preferred range of pot-cores made of magnetic oxides, and the dimensional limits for coil formers to be used with them. The general considerations upon which the design of this range of cores is based are given in annex A.

2 Normative reference

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard 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 document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

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

3 Primary standards

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

3.1 Dimensions of pot-cores

3.1.1 Principal dimensions

The principal dimensions of pot-cores shall be as given in table 1.

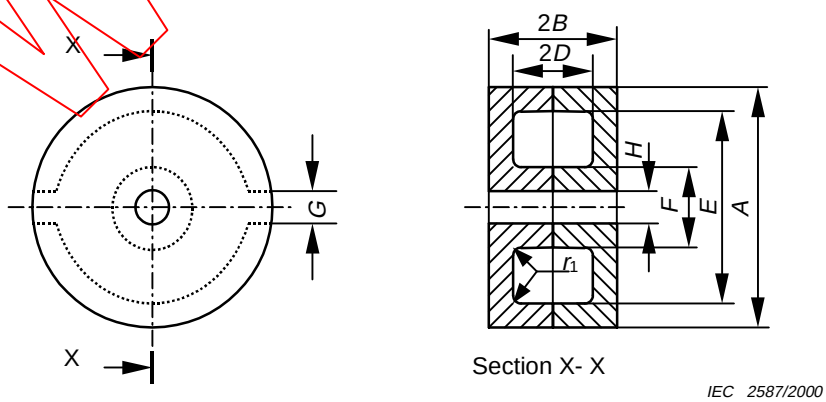

Figure 1 – Principal dimensions of pot-cores without slots

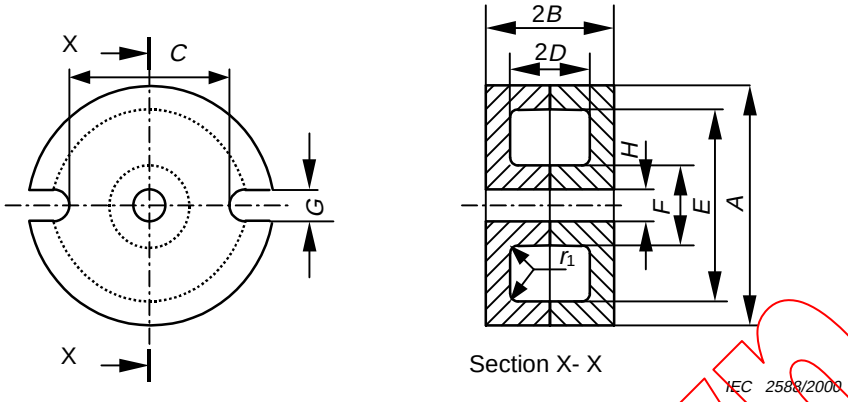

Figure 2 – Principal dimensions of pot-cores with slots

Table 1 – Principal dimensions of pot-cores

Dimensions in millimetres

Size	A		E		F		H		2B		2D		r_1 [1)]	Figures
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Max.	
P3,3/2,6	3,18	3,30	2,50	2,60	1,30	1,40	–	–	2,50	2,60	1,70	1,90	0,20	1
P4,6/3,1	4,40	4,60	3,50	3,65	1,90	2,00	–	–	3,00	3,10	2,10	2,30	0,20	1
P5,8/3,3	5,65	5,80	4,50	4,60	2,40	2,50	0,95	1,05	3,20	3,30	2,20	2,40	0,20	1
P7,4/4,0	7,15	7,35	5,80	5,95	2,90	3,00	1,05	1,15	4,10	4,20	2,80	3,00	0,20	1
P9/5	9	9,3	7,5	7,75	3,7	3,9	2	2,2	5,1	5,4	3,6	3,9	0,25	2
P11/7	10,9	11,3	9	9,4	4,5	4,7	2	2,2	6,3	6,6	4,4	4,7	0,25	2
P14/8	13,8	14,3	11,6	12	5,8	6	3	3,2	8,2	8,5	5,6	6	0,25	2
P18/11	17,6	18,4	14,9	15,4	7,3	7,6	3	3,2	10,4	10,7	7,2	7,6	0,25	2
P22/13	21,2	22	17,9	18,5	9,1	9,4	4,4	4,7	13,2	13,6	9,2	9,6	0,35	2
P26/16	25	26	21,2	22	11,1	11,5	5,4	5,7	15,9	16,3	11	11,4	0,35	2
P30/19	29,5	30,5	25	25,8	13,1	13,5	5,4	5,7	18,6	19	13	13,4	0,35	2
P36/22	35	36,2	29,9	30,9	15,6	16,2	5,4	5,7	21,4	22	14,6	15	0,35	2

NOTE 1 P3,3/2,6 and P4,6/3,1 cores are without the centre hole shown in figure 1.

NOTE 2 P9/5 and P11/7 cores are without the centre hole shown in figure 2.

NOTE 3 Sharp inner corners of pot-cores are preferable but in practice some rounding may occur, provided that radius r_1 is not exceeded[1)].

NOTE 4 The dimensions of the cores may be checked by means of gauges. An example of a possible standard for these gauges is given in annex C.

NOTE 5 In order to facilitate production, it may be necessary to use gauges having dimensions differing from those given in annex C, although no relaxation of the requirements for the dimensions of the cores given in 3.1 is thereby permitted.

Table 2 – Limits for *C* and *G*

Dimensions in millimetres

Size	Cores with two slots			
	C		*G*	
	Min.	Max.	Min.	Max.
P3,3/2,6	–	–	0,8	1,3
P4,6/3,1	–	–	1,1	1,7
P5,8/3,3	–	–	1,4	2,0
P7,4/4,0	–	–	1,6	2,2
P9/5	6,0	7,5	1,6	2,4
P11/7	6,5	8,0	1,8	2,6
P14/8	8,7	10,0	2,3	4,1
P18/11	11,3	14,0	2,7	4,4
P22/13	13,3	16,5	3,0	4,4
P26/16	17,0	20,0	3,0	4,4
P30/19	20,0	23,0	3,5	5,3
P36/22	24,0	27,2	4,0	5,6

NOTE 1 The shape of the slots is not defined, but the width *G* is indicated in the table.

NOTE 2 It is recommended that any tightening of the tolerance on dimension *C* should be towards the minimum value and on dimension *G* towards the maximum value.

3.1.2 Grooves

When grooves are provided corresponding to the slots, their minimum depth shall be as given in table 3.

Table 3 – Minimum groove depth

Dimensions in millimetres

Size	Minimum groove depth
P14/8	0,2
P18/11	0,3
P22/13	0,4
P26/16	0,5
P30/19	0,6
P36/22	0,6

3.1.3 Effective parameter values

The effective parameter values for pot-cores whose dimensions comply with 3.1.1 shall be as given in tables 4 and 5 (for the definitions of these parameters, and their calculation, see IEC 60205).

Table 4 – Effective parameter values pot-cores with a centre hole

Size	C_1 mm^{-1}	C_2 $10^{-3}\ mm^{-3}$	A_e mm^2	l_e mm	V_e mm^3	A_{min} mm^2
P5,8/3,3	1,6326	345,47	4,73	7,72	36,5	3,66
P7,4/4,0	1,3588	186,79	7,27	9,88	71,9	5,79
P9/5	1,2032	118,12	10,2	12,3	125	7,88
P11/7	0,933 53	56,727	16,5	15,4	253	13,2
P14/8	0,757 42	29,521	25,7	19,4	499	19,8
P18/11	0,573 83	12,863	44,6	25,6	1 140	36,0
P22/13	0,480 78	7,4185	64,8	31,2	2 020	50,9
P26/16	0,389 23	4,0605	95,9	37,3	3 580	76,1
P30/19	0,323 43	2,3321	139	44,9	6 220	115
P36/22	0,256 66	1,2492	205	52,7	10 800	172

NOTE The manufacturers may indicate in their catalogues more precise values than those given in the above table.

Table 5 – Effective parameter values pot-cores without a centre hole

Size	C_1 mm^{-1}	C_2 $10^{-3}\ mm^{-3}$	A_e mm^2	l_e mm	V_e mm^3	A_{min} mm^2
P3,3/2,6	3,1367	1768,4	1,77	5,56	9,87	1,43
P4,6/3,1	2,0887	609,06	3,43	7,16	24,6	2,60
P5,8/3,3	1,5406	295,89	5,21	8,02	41,8	3,66
P7,4/4,0	1,2941	163,38	7,92	10,3	81,2	5,79
P9/5	1,0639	84,640	12,6	13,4	168	8,95
P11/7	0,865 00	46,165	18,7	16,2	304	13,2
P14/8	0,680 99	22,061	30,9	21,0	649	23,6
P18/11	0,540 12	10,923	49,4	26,6	1 320	36,0
P22/13	0,438 12	5,7735	75,9	33,2	2 520	58,1
P26/16	0,355 34	3,1831	112	39,7	4 430	87,0
P30/19	0,304 43	1,9888	153	46,6	7 130	117
P36/22	0,246 93	1,1285	219	54,0	11 800	172

3.2 Main dimensions for coil formers

Main dimensions for coil formers shall be in accordance with table 6.

NOTE The dimensions of table 6 which correspond to similar dimensions in table 1 are labelled with the same letter in upper case, for example, 2*d* corresponds to 2*D* in table 1.

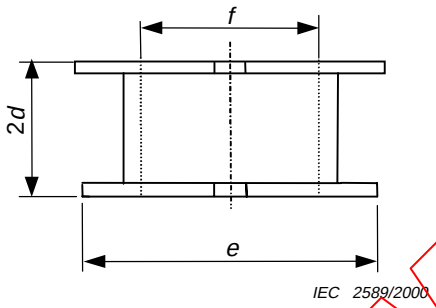

Figure 3 – Main dimensions for coil formers

Table 6 – Main dimensions for coil formers

Dimensions in millimetres

Size	Main dimensions for coil formers		
	e	*f*	2*d*
	Max.	Min.	Max.
P3,3/2,6	2,40	1,50	1,60
P4,6/3,1	3,20	2,10	2,00
P5,8/3,3	4,40	2,60	2,10
P7,4/4,0	5,70	3,10	2,70
P9/5	7,40	4,00	3,50
P11/7	8,90	4,80	4,30
P14/8	11,5	6,10	5,50
P18/11	14,8	7,70	7,10
P22/13	17,8	9,50	9,10
P26/16	21,1	11,6	10,9
P30/19	24,9	13,6	12,9
P36/22	29,8	16,3	14,5