SLOVENSKI STANDARD
oSIST prEN IEC 63093-10:2021

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Feritna jedra - Smernice o merah in mejnih vrednostih površinskih nepravilnosti - 10. del: PM-jedra in pripadajoči deli

Ferrite cores - Guidelines on dimensions and the limits of surface irregularities - Part 10: PM-cores and associated parts

Noyaux ferrites - Lignes directrices relatives aux dimensions et aux limites des irrégularités de surface - Partie 10: Noyaux PM et parties associées

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IEC TC 51 : MAGNETIC COMPONENTS, FERRITE AND MAGNETIC POWDER MATERIALS	
SECRETARIAT: Japan	SECRETARY: Mr Takeshi Abe
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY	
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TITLE:

Ferrite cores - Guidelines on dimensions and the limits of surface irregularities - Part 10: PM-cores and associated parts

PROPOSED STABILITY DATE: 2027

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 10: PM-cores and associated parts

FOREWORD

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IEC 63093-10 has been prepared by IEC technical committee 51: Magnetic components, ferrite and magnetic powder materials. It is an International Standard.

This first edition cancels and replaces the first edition of IEC 61247 published in 1995. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC 61247:

a) The calculations of the effective parameter values have been updated according to the IEC 60205.

b) Add the limits of surface irregularities.

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

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at http://www.iec.ch/standardsdev/publications.

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 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.

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

Part 10: PM-cores and associated parts

1 Scope

This part of IEC 63093 specifies the dimensions that are of importance for mechanical interchangeability for a preferred range of PM-cores made of magnetic oxides, the main dimensions for coil formers to be used with these cores and the locations of their pins on a modular printed wiring grid in relation to the base outlines of cores. It also specifies the effective parameter values to be used in calculations and gives guidelines on allowable limits of surface irregularities applicable to the PM-cores.

The use of derived standards which give a more detailed specification of component parts whilst still permitting compliance with this standard is discussed in Annex A.

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 and reference of dimensions*

IEC 63093-1, *Ferrite cores - Guidelines on dimensions and 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 63093-1 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 wound coil formers.

4.2 Dimensions of PM-cores

4.2.1 Principal dimensions

The principal dimensions of PM-cores shall be as given in Figure 1 and Table 1.

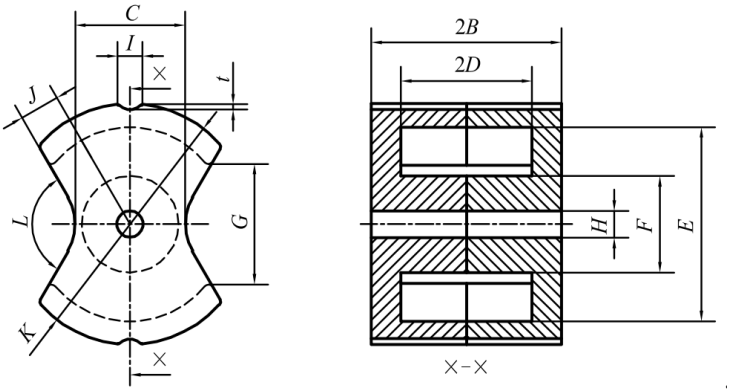

Figure 1 – The main dimensions of PM-cores

Table 1 – The main dimensions of PM-cores

Dimension		Size				
		PM 50/39	PM 62/49	PM 74/59	PM 87/70	PM 114/93
K mm	max.	50,0	62,0	74,0	87,0	114,0
	min.	48,3	60,0	71,5	84,0	109,5
E mm	max.	40,3	50,3	59,3	69,2	91,7
	min.	39,0	48,8	57,5	67,1	88,0
F mm	max.	20,0	25,5	29,5	31,7	43,0
	min.	19,4	24,7	28,5	30,7	41,6
H mm	max.	5,7	5,7	5,7	8,8	5,8
	min.	5,4	5,4	5,4	8,5	5,4
2*B* mm	max.	39,0	49,0	59,0	70,0	93,0
	min.	38,6	48,6	58,4	69,2	92,0
2*D* mm	max.	27,2	34,2	41,5	48,8	64,6
	min.	26,4	33,4	40,7	48,0	63,0
C mm	max.	23,0	28,5	33,0	36,0	45,0
	min	22,0	27,5	32,0	35,0	44,0
L [a] °		120 ± 5	120 ± 5	120 ± 5	90 ± 5	90 ± 5
J mm	max.	7,8	10,5	13,5	8,3	11,5
	min	6,8	9,5	12,5	7,3	10,5
G mm	max.	23,4	29,0	34,0	40,0	52,0
	min	22,4	28,0	33,0	39,0	51,0
t mm	max.	1,6	1,6	2,9	3,9	4,4
	min.	1,2	1,2	2,5	3,5	4,0
I mm	max.	5,0	5,0	5,0	5,5	6,3
	min.	4,0	4,0	4,0	4,5	5,3

NOTE- The dimensions of the cores may be checked by means of gauges. By way of example, a possible standard for these gauges is given in Annex B. In order to facilitate production it may be necessary to use gauges having dimensions differing from those given in Annex B, although no relaxation of the requirements for the dimensions of the cores given in 4.2.1 is thereby permitted.

[a] tolerance of degree is ±5°

4.2.2 Effective parameter and A_{min} values

The effective parameter and A_{min} values for PM-cores of which the dimensions comply with 4.2.1 shall be as given in Table 2. The definitions of effective parameters and their calculations shall be as given in IEC 60205.

179 **Table 2 – Effective parameter and A_{min} values**

Size	C_1 mm^{-1}	C_2 $\times 10^{-3}$ mm^{-3}	l_e mm	A_e mm^2	V_e mm^3	A_{min} [a] mm^2
PM 50/39	0,280 49	0,856 46	91,9	327	30 100	281
PM 62/49	0,219 52	0,415 09	116	529	61 000	470
PM 74/59	0,186 88	0,250 48	139	746	104 000	630
PM 87/70	0,186 10	0,217 24	159	857	137 000	700
PM 114/93	0,132 85	0,082 050	215	1 620	348 000	1 380

[a] A_{min} is located at the centre pole only.

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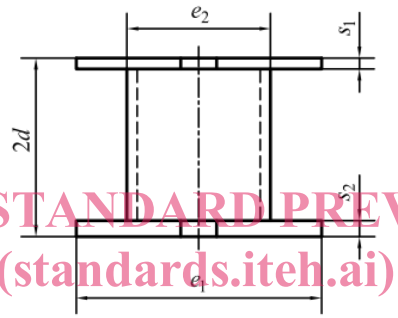
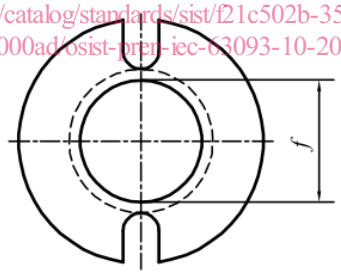
181 **4.3 Main dimensions of coil formers**

182 The main dimensions of coil formers shall be as given in Figure 2 and Table 3.





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184 **Figure 2 – Main dimensions of coil formers**

185 **Table 3 – Main dimensions of coil formers**

Dimension		Size				
		PM 50/39	PM 62/49	PM 74/59	PM 87/70	PM 114/93
e_1 mm	max.	38,6	48,5	57,2	66,4	87,3
	min.	38,2	48,1	56,7	65,8	86,0
e_2 mm	max.	23,4	28,7	32,7	35,2	48,2
	min.	23,0	28,3	32,3	34,7	47,0
f mm	max.	20,4	26,1	30,3	32,7	44,6
	min.	20,2	25,8	29,9	32,1	43,8
$2d$ mm	max.	26,0	33,0	40,0	47,3	62,5
	min.	25,6	32,5	39,3	46,5	61,3
s_1 mm	max.	1,25	1,35	1,35	1,55	2,30
	min.	0,95	1,05	1,05	1,25	2,00
s_2 mm	max.	1,65	1,65	1,75	1,95	2,50
	min.	1,35	1,35	1,45	1,65	2,20

4.4 Pin locations and base outlines

When coil formers are provided with pins intended for use in conjunction with a printed wiring board, they shall be inserted in the thicker flange (s_2), and their location, numbering and relationship to the core base outline shall be as shown in Figure 3, in which the bases are viewed from the pin side, that is from the underside of the printed wiring board. The module, designated m, shown in the grid plan should be 2,50 mm.

NOTE The largest core PM 114/93 is not intended to be mounted on terminal pins because of its weight. In this case pins are usually fitted within the cut out of the core.

4.5 Pin diameter

Coil former terminations (pins) shall be accepted by a gauge having 1,2 mm holes on specified positions.

5 Mounting hardware

No mounting hardware is specified here, however an example is as given in Annex C.

NOTE Components using PM-cores with fully wound coil formers will normally require mechanical support in addition to their printed wiring board mounting. Details are given in Annex C of an assembly consisting of a 3 mm diameter circular section U-bolt with threaded ends which can be used in conjunction with a 0,6 mm thick base plate. Both components are made from non-magnetic materials. The largest core PM 114/93 has a mass approaching 2 kg before winding. It is not possible, therefore, to recommend any simple mounting method and users are expected to design specific mounting hardware according to their application.