BS EN 62317-6:2016

BSI Standards Publication

Ferrite cores — Dimensions

Part 6: ETD-cores for use in power supplies

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National foreword

This British Standard is the UK implementation of EN 62317-6:2016. It is identical to IEC 62317-6:2015. It supersedes BS EN 61185:2005 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/51, Transformers, inductors, magnetic components and ferrite materials.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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English Version

Ferrite cores - Dimensions - Part 6: ETD-cores for use in power supplies (IEC 62317-6:2015)

Noyaux ferrites - Dimensions - Partie 6: Noyaux ETD destinés à être utilisés dans des alimentations (IEC 62317-6:2015)

Ferritkerne - Maße - Teil 6: ETD-Kerne für den Einsatz in Stromversorgungsanwendungen (IEC 62317-6:2015)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

The text of document 51/1105/FDIS, future edition 1 of IEC 62317-6, prepared by IEC/TC 51 "Magnetic components and ferrite materials" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62317-6:2016.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2016-10-08
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2019-01-08

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60205:2006	NOTE	Harmonized as EN 60205:2006 (not modified).
IEC 60205:2006/A1:2009	NOTE	Harmonized as EN 60205:2006/A1:2009 (not modified).

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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International Standard IEC 62317-6 has been prepared by IEC technical committee 51: Magnetic components and ferrite materials.

This first edition cancels and replaces the second edition of IEC 61185 published in 2005. This edition constitutes a technical revision.

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

a) Changed dimension A of ETD 54 core.

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

FDIS	Report on voting
51/1105/FDIS	51/1120/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 62317 series, published under the general title *Ferrite cores – Dimensions*, can be found on the IEC website.

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

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

FERRITE CORES – DIMENSIONS –

Part 6: ETD-cores for use in power supplies

1 Scope

This part of IEC 62317 specifies the dimensions that are of importance for mechanical interchangeability for ETD-cores made of ferrite, the essential dimensions of coil formers to be used with them, and the effective parameter values to be used in calculations involving them.

The use of “derived” standards which give more detailed specifications of component parts while still permitting compliance with this standard is discussed in Annex A, which also contains an example of a derived standard for coil formers.

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 Primary standards

3.1 General

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

3.2 Dimensions of ETD-cores

3.2.1 Principal dimensions

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

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 Table 1 is permitted.

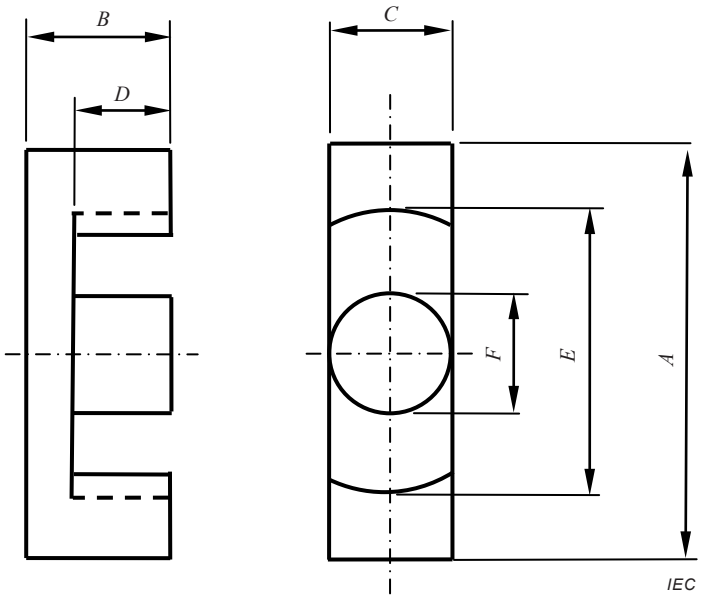


Figure 1 – Dimensions of ETD-cores

Table 1 – Dimensions of ETD-cores

Size	*A* mm		*B* mm		*C* mm		*D* mm		*E* mm		*F* mm	
	Min.	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**
ETD 19	19,1	20,1	13,5	13,8	7,2	7,6	9,2	9,6	14,4	15,4	7,2	7,6
ETD 24	23,8	25,0	14,3	14,6	8,2	8,8	9,9	10,3	18,0	19,2	8,2	8,8
ETD 29	29,0	30,6	15,6	16,0	9,2	9,8	10,7	11,3	22,0	23,4	9,2	9,8
ETD 34	33,4	35,0	17,1	17,5	10,5	11,1	11,8	12,4	25,6	27,0	10,5	11,1
ETD 39	38,2	40,0	19,6	20,0	12,2	12,8	14,2	15,0	29,3	30,9	12,2	12,8
ETD 44	43,0	45,0	22,1	22,5	14,4	15,2	16,1	16,9	32,5	34,1	14,4	15,2
ETD 49	47,6	49,8	24,5	24,9	15,9	16,7	17,7	18,5	36,1	37,9	15,9	16,7
ETD 54	53,2	55,8	27,4	27,8	18,5	19,3	19,8	20,6	40,1	42,3	18,5	19,3
ETD 59	58,4	61,2	30,8	31,2	21,2	22,1	22,0	22,9	43,6	45,8	21,2	22,1

3.2.2 Effective parameter and A_{min} values

The effective parameter values of a pair of cores whose dimensions comply with 3.2.1 shall be as given in Table 2.

A_{min} is specified in IEC 60205:2009, 2.2.

Table 2 – Effective parameter and A_{min} values

Size	C_1 mm^{-1}	C_2 mm^{-3}	L_e mm	A_e mm^2	V_e mm^3	A_{min} mm^2
ETD 19	1,253 9	$28{,}412 \times 10^{-3}$	55,3	44,1	2 440	39,5
ETD 24	1,053 7	$17{,}811 \times 10^{-3}$	62,3	59,2	3 690	55,0
ETD 29	0,927 07	$12{,}139 \times 10^{-3}$	70,8	76,4	5 410	70,9
ETD 34	0,814 49	$8{,}387\,9 \times 10^{-3}$	79,1	97,1	7 680	91,6
ETD 39	0,742 00	$5{,}940\,1 \times 10^{-3}$	92,7	125	11 600	123
ETD 44	0,599 18	$3{,}462\,8 \times 10^{-3}$	104	173	17 900	172
ETD 49	0,542 45	$2{,}569\,2 \times 10^{-3}$	115	211	24 200	209
ETD 54	0,455 01	$1{,}625\,1 \times 10^{-3}$	127	280	35 700	280
ETD 59	0,382 24	$1{,}038\,9 \times 10^{-3}$	141	368	51 700	366

NOTE 1 The manufacturers may indicate in their catalogues more precise values than those given in Table 2.

NOTE 2 The above values have been calculated using the method given in IEC 60205:2009, 3.5.

3.3 Dimensional limits for coil formers

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

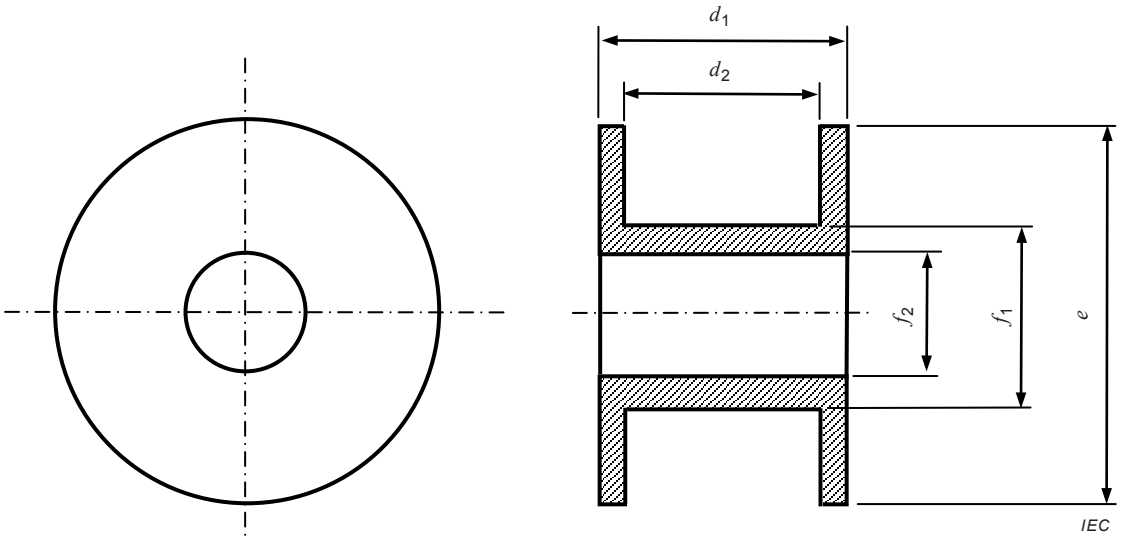


Figure 2 – Essential dimensions of coil formers

Table 3 – Essential dimensions of coil formers

Size	e mm	f_1 mm	f_2 mm	d_1 mm	d^2 mm
	Max.	**Max.**	**Min.**	**Max.**	**Min.**
ETD 19	14,1	9,8	7,8	18,2	15,9
ETD 24	17,6	11,0	9,0	19,6	17,1
ETD 29	21,6	12,0	10,0	21,2	18,7
ETD 34	25,2	13,6	11,3	23,4	20,9
ETD 39	28,8	15,3	13,0	28,2	25,7
ETD 44	32,0	17,7	15,4	32,0	29,5
ETD 49	35,5	19,5	17,0	35,2	32,2
ETD 54	39,5	22,1	19,6	39,3	36,3
ETD 59	43,0	24,9	22,4	43,7	40,7

3.4 Pin locations and base outlines

These shall be as shown in Figure 3, in which the base is viewed in the mounting direction, i.e. from the upper side of the printed wiring board.

NOTE The module, designated as m, as shown in the grid plan, may be 2,50 mm or 2,54 mm.

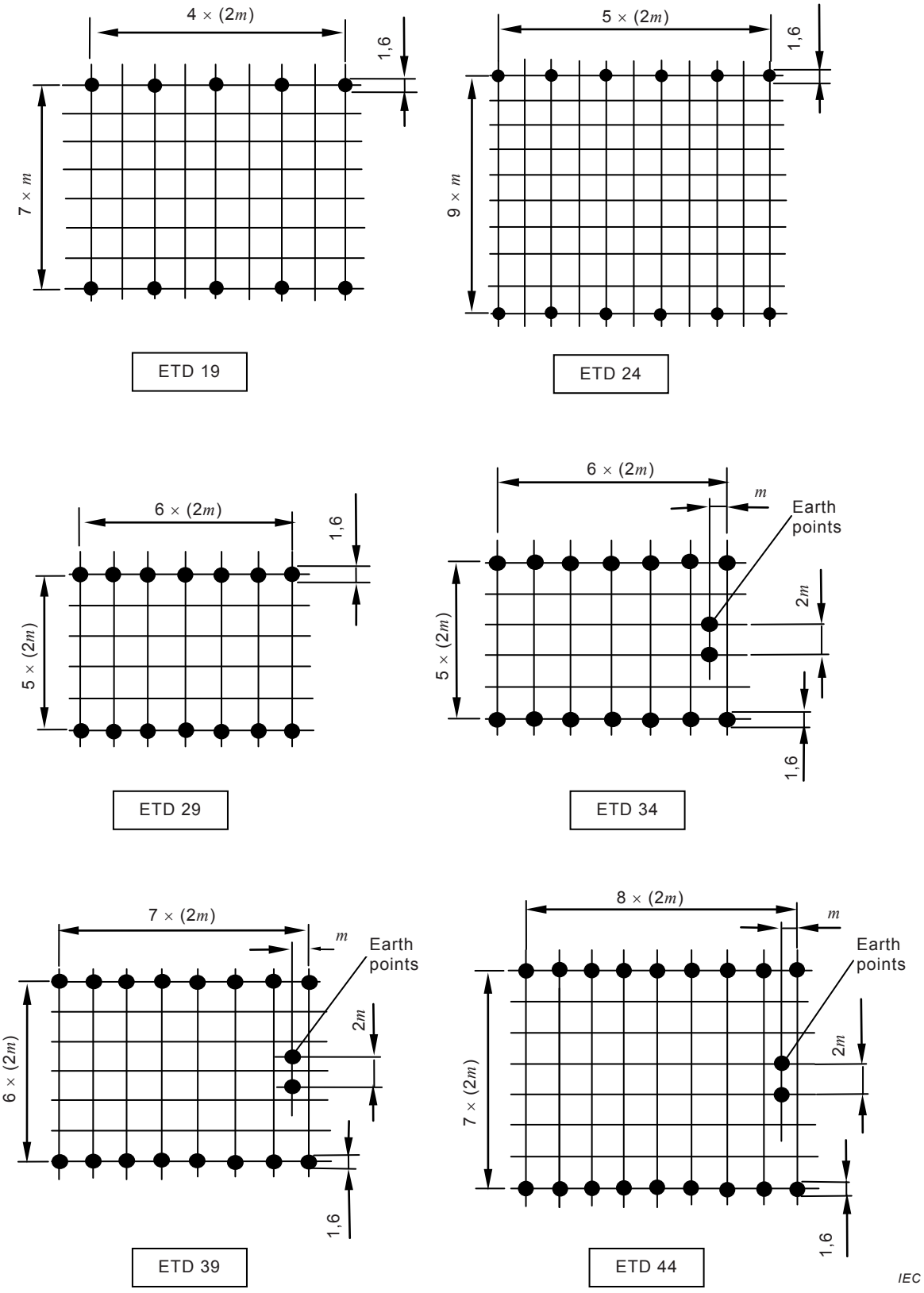


Figure 3 – Pin locations and base outlines viewed from the upper-side of the board (see 3.4) *(1 of 2)*

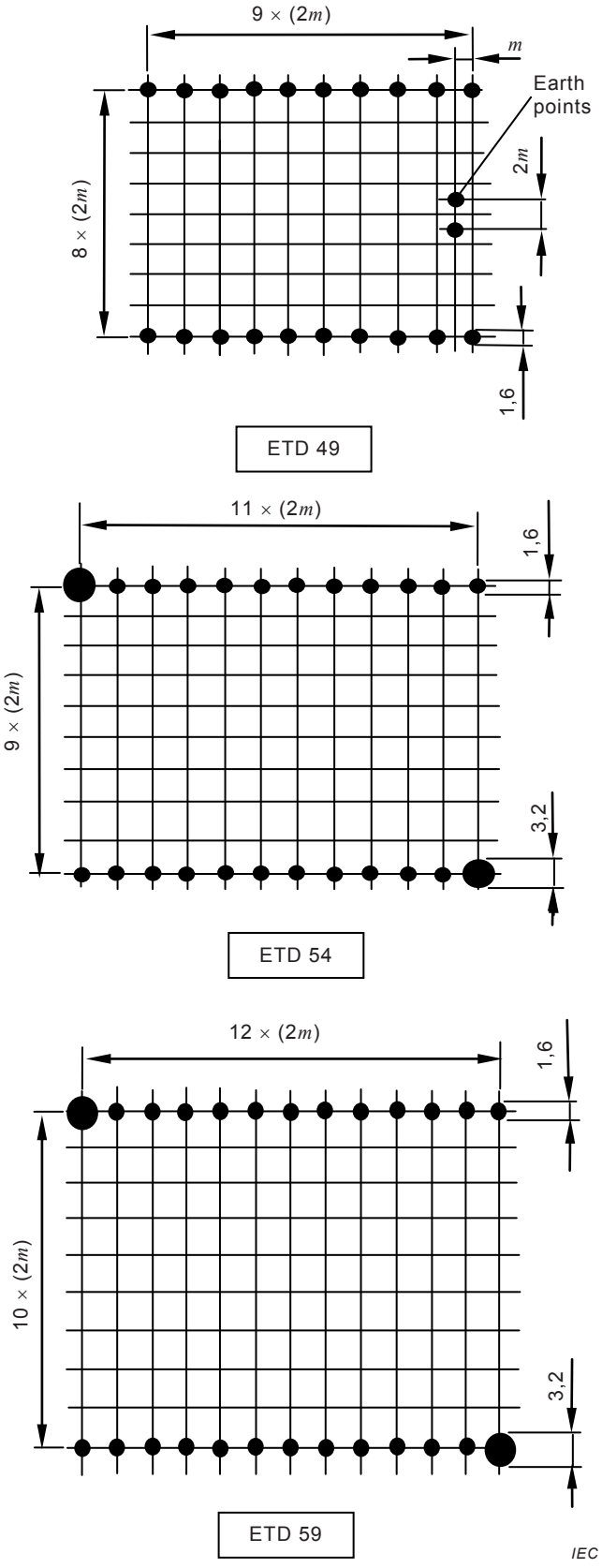


Figure 3 *(2 of 2)*

3.5 Pin diameter

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

4 Marking

Where a coil former is fitted with termination pins conforming to a 2,50 mm module, it shall be clearly and indelibly marked with the letter m, in such a position that it can readily be seen in the completed component.

5 Mounting

According to their sizes and respective weights, it is recommended that two of the largest cores (ETD 54 and ETD 59) be fixed on the printed board by means of screws located at two opposite sides of their coil formers.

Concerning smaller sizes such as ETD 19 and ETD 24, no mounting assemblies are defined. It is recommended that the two cores be fixed by glue or adhesive tape.

Annex A
(normative)

Derived standards

Clauses 1 to 4 of this primary standard establish the values for the principal dimensions of core assemblies and wound coil formers and enable full interchangeability for components complying with this primary standard to be achieved.

Parties interested in making or using ETD-cores may find it desirable to lay down local standards for everyday use, which show the dimensions and tolerances in greater detail than Clause 3 and which correspond to the state of the art in that area. These specifications are known as “derived standards”. When doing so, care should be taken not to exclude any other type of ETD-core meeting this primary standard that would also satisfy the performance specification valid for a specific case.

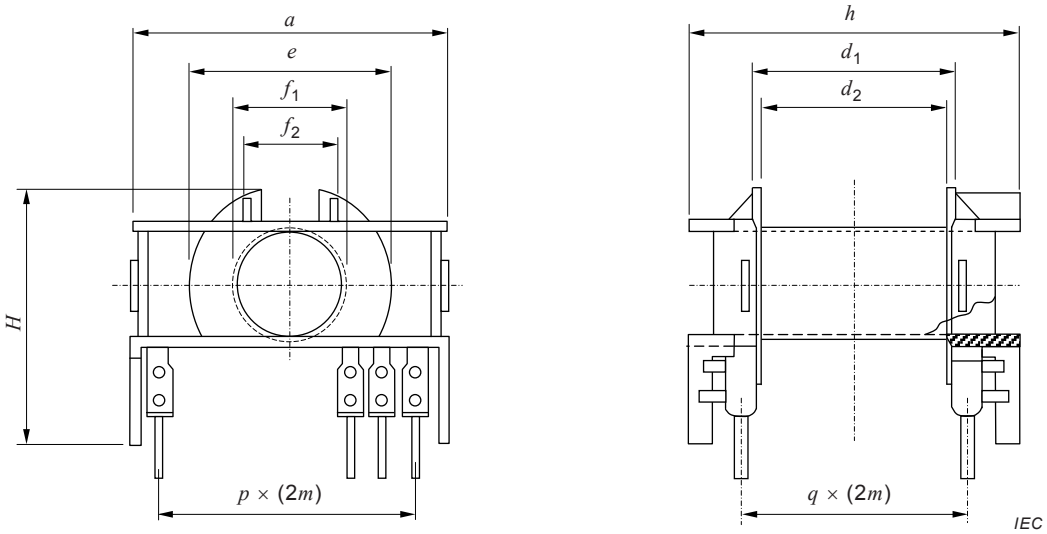
It should be noted that even if a component complies with a derived standard and with the requirements of Clause 3 of this primary standard, therefore permitting core assemblies and coil formers to be freely interchanged, its constituent parts may not necessarily be interchangeable.

When requirements lead to the establishment of a national standard, the relevant national standardization body is strongly requested to insert a note in such a national standard stating that:

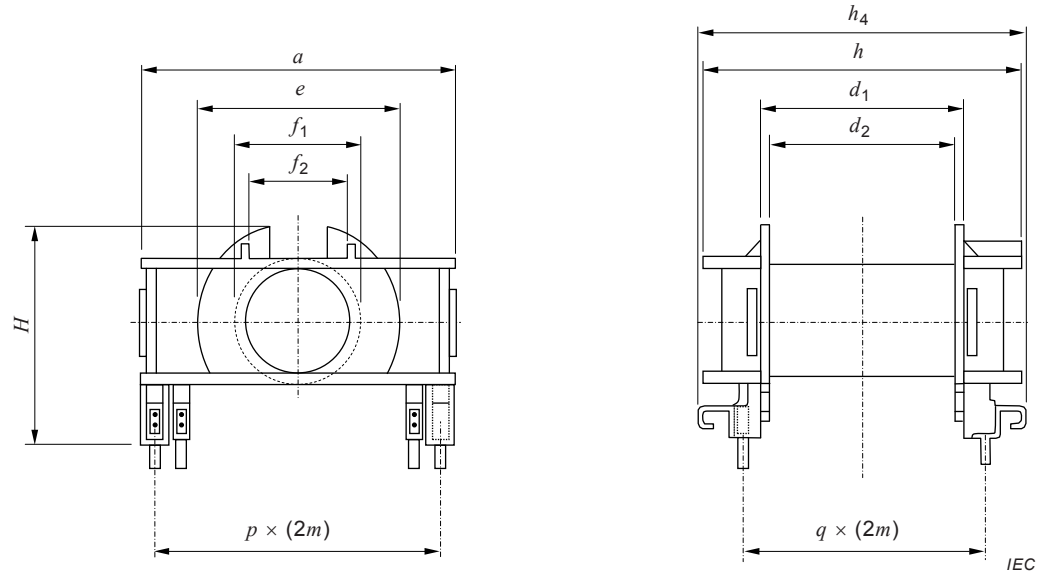
a) it is in accordance with the dimensional requirement of this present primary standard but that more details are given in order to promote its practical use;
b) other solutions are possible within the framework of this primary standard and should not be excluded if the resulting core and formers are functionally interchangeable with those of the national standard.

By way of example, a possible derived standard for coil formers is given in Figure A.1.

An example of a standard for the main dimensions of coil formers for ETD-cores meeting this primary standard is given in Figure A.1 and Table A.1.



(ETD 29, ETD 34, ETD 39, ETD 44 and ETD 49)



(ETD 54 and ETD 59)

Figure A.1 – Main dimensions of coil formers

Table A.1 – Main dimensions of coil formers

Size	a mm	e mm	f_1 mm	f_2 mm	d_1 mm	d_2 mm	h mm	h_4 mm	H mm	p	q
	Max.	**Max.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	**Max.**	**Max.**		
ETD 29	35,3	21,6	11,8	10,0	21,2	19,0	35,2	–	25,0	6	5
ETD 34	39,6	25,2	13,4	11,4	23,4	20,9	42,8		34,9	6	5
ETD 39	44,6	28,9	15,1	13,1	28,2	25,7	47,8		37,6	7	6
ETD 44	49,6	32,0	17,5	15,5	32,0	29,5	52,5		40,4	8	7
ETD 49	54,5	35,7	19,0	17,0	35,2	32,2	57,5	–	42,9	9	8
ETD 54	61,5	39,4	21,6	19,6	39,3	36,3	61,4	64,0	43,0	11	9
ETD 59	66,9	42,9	24,6	22,4	43,7	40,7	66,4	69,0	46,0	12	10

Annex B
(normative)

Example of a standard for gauges to check the dimensions of ETD-cores meeting this primary standard

B.1 General

The gauges shall be in accordance with Table B.1 and its associated Figure B.1.

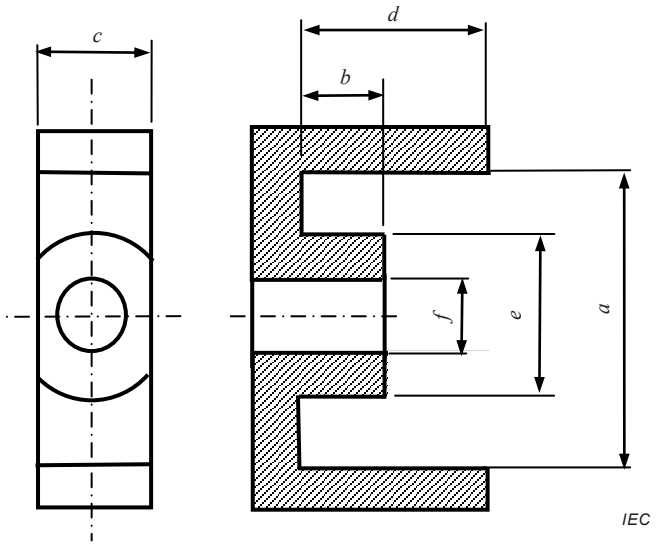


Figure B.1 – Gauge dimensions

Table B.1 – Gauge dimensions

Size	*a* mm		*b* mm		*c* mm	*d* mm	*e* mm		*f* mm	
	Min.	**Max.**	**Min.**	**Max.**	**Min.**	**Min.**	**Min.**	**Max.**	**Min.**	**Max.**
ETD 19	20,105	20,115	9,20	9,21	14,0	14,0	14,385	14,395	7,605	7,615
ETD 24	25,005	25,015	9,90	9,91	15,0	15,0	17,985	17,995	8,805	8,815
ETD 29	30,605	30,615	10,70	10,71	16,0	16,2	21,985	21,995	9,805	9,815
ETD 34	35,005	35,015	11,80	11,81	18,0	18,0	25,585	25,595	11,105	11,115
ETD 39	40,005	40,015	14,20	14,21	20,0	20,2	29,285	29,295	12,805	12,815
ETD 44	45,005	45,015	16,10	16,11	25,0	23,0	32,485	32,495	15,205	15,215
ETD 49	49,805	49,815	17,70	17,71	28,0	25,1	36,085	36,095	16,705	16,715
ETD 54	55,805	55,815	19,80	19,81	28,0	28,0	40,085	40,095	19,305	19,315
ETD 59	61,205	61,215	22,00	22,01	32,0	32,0	43,585	43,595	22,105	22,115

B.2 Procedure and requirements

To check the winding space, the gauge shall be fully inserted into the core without forcing; when fully inserted, the gauge shall meet the mating surface of the outer legs of the core under test.

Bibliography

IEC 60205:2009, *Calculation of the effective parameters of magnetic piece parts*

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