IEC 62358

Edition 2.0 2012-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Ferrite cores – Standard inductance factor for gapped cores and its tolerance

Noyaux de ferrite – Inductance spécifique normalisée pour noyaux à entrefer et tolérances associées

IEC 62358:2012

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FERRITE CORES – STANDARD INDUCTANCE FACTOR FOR GAPPED CORES AND ITS TOLERANCE

FOREWORD

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International Standard IEC 62358 has been prepared by IEC technical committee 51: Magnetic components and ferrite materials.

This second edition cancels and replaces the first edition published in 2004. This edition constitutes a technical revision.

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

a) addition of A_L value (inductance factor) and its tolerance for PQ-cores;
b) addition of A_L value (inductance factor) and its tolerance for EFD-cores;
c) addition of A_L value (inductance factor) and its tolerance for Low-profile ER-I-cores;
d) addition of A_L value (inductance factor) and its tolerance for Low-profile ER-cores (ER9,5 × 2,5 × 5, ER11 × 2,5 × 6, ER14,5 × 3 × 7 ferrite cores are same as the previous edition);
e) addition of A_L value (inductance factor) and its tolerance for Low-profile PQ-I-cores.

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

FDIS	Report on voting
51/1005/FDIS	51/1008/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.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site 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- withdrawn,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.

INTRODUCTION

The A_L value (inductance factor) and its tolerance have been specified by the users before. When manufacturers wish to have an inventory for short delivery, they have to hold the products before gapping since there is no standard for the A_L value. Because of electronic commerce and the increased demand for rapid delivery of products, it will be more convenient for customers and suppliers to refer to established A_L values and tolerances. This standard has been developed to meet this demand.

As a result of the implementation of this standard, it will be easier for core suppliers and users to develop electronic components using gapped soft ferrite cores. Conventional businesses will benefit, as will new companies working in new fields such as e-commerce.

It is recommended that users specify A_L values by selecting them from this standard. The tolerances in this standard are recommended, but for historical reasons a manufacturer's specification might differ for some components. Users should confirm tolerances from the manufacturer's literature. Manufacturers are encouraged to use the A_L values in this standard when building stocks of gapped cores for short delivery. In cases where users or manufacturers specify a gap length with tolerances the A_L value will only be approximate and without tolerance. Such cases will be outside the scope of this standard.

FERRITE CORES – STANDARD INDUCTANCE FACTOR FOR GAPPED CORES AND ITS TOLERANCE

1 Scope

This International Standard provides standard A_L values (inductance factors) and their tolerances of Pot, RM, ETD, E, EER, EP, PQ and low-profile gapped ferrite cores.

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.

IEC 61185, *Ferrite cores (ETD-cores) intended for use in power supply applications – Dimensions*

IEC 61596, *Magnetic oxide EP-cores and associated parts for use in inductors and transformers – Dimensions*

IEC 62044-2, *Cores made of soft magnetic materials – Measuring methods – Part 2: Magnetic properties at low excitation level*

IEC 62317-2, *Ferrite cores – Dimensions – Part 2: Pot-cores for use in telecommunications, power supply, and filter applications*

IEC 62317-4, *Ferrite cores – Dimensions – Part 4: RM-cores and associated parts*

IEC 62317-7, *Ferrite cores – Dimensions – Part 7: EER-cores*

IEC 62317-8, *Ferrite cores – Dimensions – Part 8: E-cores*

IEC 62317-9, *Ferrite cores – Dimensions – Part 9: Planar cores*

IEC 62317-13, *Ferrite cores – Dimensions – Part 13: PQ-cores for use in power supply applications*

ISO 497, *Guide to the choice of series of preferred numbers and of series containing more rounded values of preferred numbers*

3 Measuring method

The method for measuring the inductance factor shall be in accordance with IEC 62044-2.

4 A_L value and its tolerance

4.1 General

The series of preferred numbers of the A_L value shall be selected from the R10 series of ISO 497.

4.2 Tolerance

The tolerance shall be selected from Table 1, which specifies letter codes for the tolerances.

Table 1 – Tolerance versus letter code

Tolerance %	± 3	± 5	± 7	± 10	± 12	± 15	± 20
Letter code	A	J	E	K	H	L	M

4.3 E-core

The A_L value and its tolerance for E-cores shall be selected from Table 2.

NOTE The E-core is a pair of an E shape core.

4.4 ETD-core and EER-core

The A_L value and its tolerance for ETD-cores and EER-cores shall be selected from Table 3.

4.5 EP-core

The A_L value and its tolerance for EP-cores shall be selected from Table 4.

4.6 RM-core

The A_L value and its tolerance for RM-cores shall be selected from Table 5.

4.7 Pot-core

The A_L value and its tolerance for Pot-cores shall be selected from Table 6.

4.8 PQ-core

The A_L value and its tolerance for PQ-cores shall be selected from Table 7.

4.9 Low-profile core

– The A_L value and its tolerance for EL-cores shall be selected from Tables 8 and 9.

– The A_L value and its tolerance for low-profile ER-cores shall be selected from Tables 10 and 11.

– The A_L value and its tolerance for low-profile E-cores shall be selected from Tables 12 and 13.

– The A_L value and its tolerance for low-profile RM-cores shall be selected from Table 14.

– The A_L value and its tolerance for low-profile PQ-I (plate)-cores shall be selected from Table 15.

Table 2 – A_L and its tolerance for E-cores (IEC 62317-8) *(1 of 2)*

IEC references Core size	Industrial references	A_L (nH/N^2) tolerance in ± %																		
		A12,5	A16	A20	A25	A31,5	A40	A50	A63	A80	A100	A125	A160	A200	A250	A315	A400	A500	A630	A800
E 5,3/2	FEE5,25 EE5	10	10	15	20															
E6,3/2	FEE6,18	10	10	15	20															
E8/2	FEE 8		5	7	10	10	15	20												
E8,3/4	FEE8,3 EE 8			7	7	10	12	15	20											
E8,8/2	FEE9	7	7	10	15	20														
E10/3	FEE10			5	5	7	10	12	15											
E10,2/5	FEE10,2 EE10x11				5	5	7	10	10	15										
E13/4	FEE12,7A EF12,6				5	5	7	7	10	12	15									
E13/6	EE13						5	5	7	10	12	15								
E16/4,8	FEE16A EE16						5	5	7	10	10	12								
E16/5	FEE16,1 EF16						5	5	7	10	10	12	15							
E19/5	FEE19A EE19						3	5	7	10	10	10	15							
E19,3/4,8	EE-187 EE 19x16						3	5	7	10	10	10	15							
E20/6	FEE20,1 EF20							3	5	7	7	10	10	12						
E25/7	FEE25,1 EF 25								3	3	5	7	7	10	10	12				
E25,4/6	FEE25,4A								3	5	7	7	10	10	12					
E25,4/6,3	EE24x25 EE25x19								3	5	7	7	10	10	12					
E30/11	FEE30A EE30									3	3	3	3	5	7	7	10	10	10	

Table 2 *(2 of 2)*

IEC references Core size	Industrial references	A_L (nH/N^2) tolerance in ± %																		
		A12,5	A16	A20	A25	A31,5	A40	A50	A63	A80	A100	A125	A160	A200	A250	A315	A400	A500	A630	A800
E32/9	FEE32,1 EF32									3	3	3	5	7	7	7	10	12		
E33/13	FEE33A EE33										3	3	3	5	5	7	10	10	10	
E34,6/9	EE375 EE35 x 28B											3	5	7	7	10	10	10		
E35/10	FEE35A EE35											3	5	5	7	7	10	10	15	
E40/11	FEE40A EE40											3	3	5	7	7	10	10	10	
E41/13	EE21 EE41 x 33C											3	3	3	5	5	7	10	10	
E42/15	FEE42A											3	3	3	3	5	7	7	10	
E42/20	FEE42B											3	3	3	3	3	7	7	10	
E47/16	EE625 EE47 x 39											5	5	5	5	7	7	10	12	
E50/15	EE50A EE50											5	5	5	5	7	10	10	15	
E55/21	FEE55,2A											3	5	5	5	5	5	7	10	
E55/25	FEE55,2B											5	5	5	5	5	5	7	7	
E60/16	FEE60A EE60												3	5	5	7	7	10	12	
E65/27	FEE65,2													3	5	5	5	5	5	7
NOTE To guarantee the tolerances in this table, 0,25 AQL (acceptable quality level) is applied.																				

Table 3 – A_L and its tolerance for ETD-cores (IEC 61185) and EER-cores (IEC 62317-7)

IEC references Core size	A_L (nH/N^2) tolerance in ± %											
	A50	A63	A80	A100	A125	A160	A200	A250	A315	A400	A500	A630
ETD19	3	3	5	7	7	10						
ETD24		3	3	5	7	7	10	10				
ETD29			3	3	5	7	7	10	10	12		
ETD34			3	3	5	7	7	10	10	12		
ETD39					3	3	5	5	7	10	10	
ETD44					3	5	5	7	10	10	15	
ETD49						3	5	5	7	10	12	15
ETD54						5	5	5	5	7	10	10
ETD59						5	5	5	5	5	7	10
EER25,5		3	3	7	7	10	10	10				
EER28			3	3	5	5	7	10	10	10		
EER28L			3	3	5	5	7	10	10	10		
EER35				3	3	5	5	7	10	10	10	
EER39					3	3	5	5	7	10	10	
EER40					3	3	3	5	7	7	10	
EER42					3	5	5	7	10	10	15	
EER49						3	5	5	7	10	10	12

NOTE To guarantee the tolerances in this table, 0,25 AQL is applied.

Table 4 – A_L and its tolerance for EP-cores (IEC 61596)

IEC references Core size	A_L (nH/N^2) tolerance in ± %														
	A40	A50	A63	A80	A100	A125	A160	A200	A250	A315	A400	A500	A630	A800	A1 000
EP7	3	3	3	3	5	5	7	10	10						
EP10	3	3	3	3	5	5	7	10	10						
EP13	3	3	3	3	3	3	5	5	7	7	10				
EP17			3	3	3	3	3	3	5	5	7	7	10		
EP20						3	3	3	3	3	3	5	5	7	7
NOTE To guarantee the tolerances in this table, 0,25 AQL is applied.															

Table 5 – A_L and its tolerance for RM-cores (IEC 62317-4)

IEC references Core size	A_L (nH/N^2) tolerance in ± %																			
	A25	A31,5	A40	A50	A63	A80	A100	A125	A160	A200	A250	A315	A400	A500	A630	A800	A1 000	A1 250	A1 600	A2 000
RM4	3	3	3	5	5	5	7	7	10											
RM5			3	3	3	3	3	5	5	5	7									
RM6S			3	3	3	3	3	3	5	5	5									
RM6R			3	3	3	3	3	3	3	5	5									
RM7					3	3	3	3	3	5	5	5	7	10						
RM8							3	3	3	3	3	3	5	5	7	10				
RM10							3	3	3	3	3	3	3	3	5	5	7	10		
RM12							3	3	3	3	3	3	3	5	5	7	10	10		
RM14									3	3	3	3	3	5	5	7	10	10	12	
RM14A									3	3	3	3	3	3	5	5	7	7	10	12
NOTE To guarantee the tolerances in this table, 0,25 AQL is applied.																				