BS EN 62317-12:2016

BSI Standards Publication

Ferrite cores — Dimensions

Part 12: Ring cores

bsi.

National foreword

This British Standard is the UK implementation of EN 62317-12:2016. It is identical to IEC 62317-12:2016.

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.

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

The text of document 51/1128/CDV, future edition 1 of IEC 62317-12, prepared by IEC/TC 51 "Magnetic components and ferrite materials" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62317-12:2016.

The following dates are fixed:

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

IEC 60401-2	NOTE	Harmonized as EN 60401-2.
IEC 60424-4	NOTE	Harmonized as EN 60424-4.
IEC 60317-1	NOTE	Harmonized as EN 62317-1.

Annex ZA
(normative)
Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60205	-	Calculation of the effective parameters of magnetic piece parts	EN 60205	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FERRITE CORES – DIMENSIONS –

Part 12: Ring cores

FOREWORD

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International Standard IEC 62317-12 has been prepared IEC technical committee 51: Magnetic components, ferrite and magnetic powder materials.

This first edition cancels and replaces the first edition of IEC TR 61604 published in 1997. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC TR 61604:

a) amendment of Clause 5 concerning the relationship between standard of European, Japanese and U.S.A. sizes;
b) addition of Subclause 5.3 concerning coating.

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

CDV	Report on voting
51/1128/CDV	51/1143/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 of the IEC 62317 series, under the general title *Ferrite cores – Dimensions*, 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.

FERRITE CORES – DIMENSIONS –

Part 12: Ring cores

1 Scope

This part of IEC 62317 specifies the dimensions that are of importance for mechanical interchangeability for a preferred range of ring-cores, also called toroid cores, and the effective parameter values to be used in calculations involving them.

The selection of core sizes for this document is based on the philosophy of including those sizes which are industrial standards, meaning that they are in broad-based use within industry. See IEC 62317-1 for more detail concerning the philosophy of selecting core sizes to be included.

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*

3 Terms and definitions

No terms and definitions are listed in this document.

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 Abbreviated terms

ID inside diameter

OD outside diameter

5 Primary standards

5.1 General

Compliance with the following requirements ensures mechanical interchangeability of complete assemblies and wound coils.

5.2 Dimensions of ring-cores

5.2.1 Designation of dimensions

Table 1 describes the alphabetic character assignments for the dimensions of ferrite ring cores.

Table 1 – Ring core dimension designations

Letter	Dimension description
A	Outside diameter
B	Inside diameter
C	Height

5.2.2 Identification of standard sizes

Table 2 shows the nominal dimensions for the range of standard ring cores. Table 2 also shows, where applicable, the origin and regional name of each standard size, whether from historical European sizes, historical Japanese sizes, or historical USA sizes. The previous IEC Technical Report, 61604, detailed the different ring sizes that were tooled and commonly used in the three distinct geographic regions. IEC TR 61604 laid the groundwork for the present standard, which reflects the more global nature of the industry, compared with the time when ferrite standards were evolving in different parts of the world. Manufacturers tend to have more globally complete offerings of ring sizes than before, leading to a profusion of different sizes.

The number of different ring sizes used in total is quite large, far in excess of the 82 commonly known standard sizes shown here, for a couple of reasons: ring cores are relatively inexpensive to build tooling for, nor does a new ring core require an expensive new coil former to be tooled up, meaning that custom ring cores are often commercially practical. Ferrite rings, lacking a residual air gap, such as E-cores and other shapes have at their mating surfaces, exhibit directly the full magnetic performance possible in the ferrite material, meaning that tooling up precisely optimal new dimensions can give a significant advantage to a designer who is optimizing for best possible performance.

5.2.3 Effective parameter values

The effective parameter values for the standard ring cores are given in Table 3. For global practicality and simplicity, the effective parameters in this document are calculated from the nominal dimensions assuming cores of rectangular cross section, and are useful for reference and comparison of cores. For cores having a cross section with an appreciable average rounding radius, more precise values can be calculated from the method given in IEC 60205, if required.

5.2.4 Dimensional limits for standard sizes

The standard tolerance limits for uncoated ring cores are given in Table 4. Manufacturers may choose to offer looser standard limits for ferrite materials that exhibit greater process variability, or tighter limits for applications that justify higher processing and yield costs to achieve narrower dimensional range.

The limits take account of shrinkage variation and warping during firing. The specification for out-of-round condition of the inner or outer circumference is that the inside diameter (ID) and outside diameter (OD) must stay within the indicated limits, measured at any point. Similarly, the specification for non-flat condition of the sides of a ring is that the height minimum and maximum must be achieved at all points.

Table 2 – Standard ring cores *(1 of 3)*

Nominal uncoated dimensions			Size reference
A mm	***B*** mm	***C*** mm	
2,5	1,3	1,3	
2,5	1,5	0,8	
2,5	1,5	1,0	Europe R2,5
3,1	1,3	1,3	
3,1	1,8	2,0	
3,5	1,8	1,3	
3,9	1,8	1,8	
3,9	2,2	1,3	USA T3,9
4,0	2,0	2,0	
4,0	2,2	1,6	Europe R4
4,83	2,29	1,27	USA T4,8
5,84	3,05	1,52	USA T5,8
6,0	3,0	2,0	
6,0	4,0	2,0	
6,3	3,8	2,5	Europe R6,3
7,62	3,18	4,78	USA T7,6
8,0	4,0	2,0	
8,2	3,7	4,0	
9,0	6,0	3,0	
9,53	4,75	3,18	USA T9,5
10,0	5,0	4,0	
10,0	5,0	5,0	Japan FOR 10
10,0	6,0	4,0	Europe R10
12,0	6,0	4,0	Japan FOR12
12,7	7,1	5,1	
12,7	7,92	6,35	USA T12,7
13,2	7,4	4,0	
13,6	7,0	3,5	
14,0	8,0	7,0	
14,0	9,0	5,0	
15,88	8,89	4,7	USA T15,9
16,0	9,0	5,0	
16,0	9,6	6,3	Europe R16
16,0	12,0	8,0	
18,0	10,0	10,0	Japan FOR 18
18,5	9,8	10,3	Japan FOR 19
20,0	10,0	7,0	Europe R20

Table 2 *(2 of 3)*

Nominal uncoated dimensions				
A mm	***B*** mm	***C*** mm		**Size reference**
20,0	12,0	10,0		Japan FOR 20
22,0	14,0	10,0		Japan FOR 22
22,1	13,72	6,35		USA T22,1
25,0	15,0	10,0		Europe R25
25,0	15,0	12,0		Japan FOR 25
25,4	15,49	9,53		USA T25,4
26,9	14,2	12,2		
28,0	16,0	13,0		Japan FOR 28
29,0	19,0	7,49		USA T29,0
30,8	19,1	12,7		
31,0	19,0	13,0		Japan FOR 31
32,0	19,0	13,0		
36,0	23,0	10,0		USA T36.0
36,0	23,0	15,0		Europe R36
38,0	19,0	13,0		Japan FOR 38
38,0	22,0	13,0		
38,1	19,0	6,35		USA T38,1
40,0	24,0	16,0		Europe R40
40,0	24,0	20,0		
41,8	26,2	18,0		
44,5	30,0	13,0		Japan FOR 45
47,0	27,0	15,0		Japan FOR 47
49,1	31,8	15,9		
49,1	33,8	15,9		
50,0	30,0	20,0		Europe R50
51,0	32,0	19,0		
55,0	32,0	19,0		
58,0	41,0	18,0		
61,0	35,6	12,7		
63,0	38,0	25,0		Europe R63
68,0	48,0	13,0		
72,0	48,0	20,0		
73,7	38,9	12,7		USA T73,7
80,0	40,0	15,0		
80,0	50,0	20,0		
85,7	55,5	12,7		
96,0	70,0	20,0		

Table 2 *(3 of 3)*

Nominal uncoated dimensions				Size reference
A mm	*B* mm	*C* mm		
102,0	65,0	15,0		
104,0	80,0	20,0		
107,0	65,0	18,0		
127,0	89,0	20,0		
140,0	106,0	25,0		
152,0	104,0	19,0		
202,0	153,0	25,0		
305,0	207,0	30,0		

Table 3 – Effective parameters of ring cores *(1 of 3)*

A mm	*B* mm	*C* mm		C_1 mm^{-1}	C_2 mm^{-3}	A_e mm^2	l_e mm	V_e mm^3
2,5	1,3	1,3		7,3911	9,8183	0,753	5,56	4,19
2,5	1,5	0,8		15,375	39,281	0,391	6,02	2,36
2,5	1,5	1,0		12,300	25,140	0,489	6,02	2,94
3,1	1,3	1,3		5,5616	5,0603	1,10	6,11	6,72
3,1	1,8	2,0		5,7791	4,5560	1,27	7,33	9,30
3,5	1,8	1,3		7,2683	6,8236	1,07	7,74	8,25
3,9	1,8	1,8		4,5146	2,5101	1,80	8,12	14,6
3,9	2,2	1,3		8,7610	8,3338	1,05	9,21	9,68
4,0	2,0	2,0		4,5324	2,3584	1,92	8,71	16,7
4,0	2,2	1,6		6,5687	4,6991	1,40	9,18	12,8
4,83	2,29	1,27		6,6293	4,3045	1,54	10,2	15,7
5,84	3,05	1,52		6,3635	3,1081	2,05	13,0	26,7
6,0	3,0	2,0		4,5324	1,5723	2,88	13,1	37,7
6,0	4,0	2,0		7,7481	3,9274	1,97	15,3	30,2
6,3	3,8	2,5		4,9714	1,6250	3,06	15,2	46,5
7,62	3,18	4,78		1,5042	0,15100	9,96	15,0	149
8,0	4,0	2,0		4,5324	1,1792	3,84	17,4	67,0
8,2	3,7	4,0		1,9739	0,23114	8,54	16,9	144
9,0	6,0	3,0		5,1654	1,1637	4,44	22,9	102
9,53	4,75	3,18		2,8376	0,38869	7,30	20,7	151
10,0	5,0	4,0		2,2662	0,23584	9,61	21,8	209
10,0	5,0	5,0		1,8129	0,15094	12,0	21,8	262
10,0	6,0	4,0		3,0750	0,39281	7,83	24,1	188

Table 3 *(2 of 3)*

A mm	B mm	C mm		C_1 mm^{-1}	C_2 mm^{-3}	A_e mm^2	l_e mm	V_e mm^3
12,0	6,0	4,0		2,2662	0,19653	11,5	26,1	301
12,7	7,1	5,1		2,1186	0,15259	13,9	29,4	408
12,7	7,92	6,35		2,0954	0,14065	14,9	31,2	465
13,2	7,4	4,0		2,7142	0,24059	11,3	30,6	345
13,6	7,0	3,5		2,7030	0,24275	11,1	30,1	335
14,0	8,0	7,0		1,6040	0,078393	20,5	32,8	671
14,0	9,0	5,0		2,8441	0,23126	12,3	35,0	430
15,88	8,89	4,7		2,3044	0,14426	16,0	36,8	588
16,0	9,0	5,0		2,1841	0,12829	17,0	37,2	633
16,0	9,6	6,3		1,9524	0,098969	19,7	38,5	760
16,0	12,0	8,0		2,7301	0,17181	15,9	43,4	689
18,0	10,0	10,0		1,0690	0,027502	38,9	41,5	1610
18,5	9,8	10,3		0,96007	0,022158	43,3	41,6	1800
20,0	10,0	7,0		1,2950	0,038504	33,6	43,6	1460
20,0	12,0	10		1,2300	0,031425	39,1	48,1	1880
22,0	14,0	10,0		1,3901	0,035349	39,3	54,7	2150
22,1	13,72	6,35		2,0756	0,079499	26,1	54,2	1410
25,0	15,0	10,0		1,2300	0,025140	48,9	60,2	2940
25,0	15,0	12,0		1,0250	0,017458	58,7	60,2	3530
25,4	15,49	9,53		1,3331	0,028812	46,3	61,7	2850
26,9	14,2	12,2		0,80612	0,010764	74,9	60,4	4520
28,0	16,0	13,0		0,86367	0,011365	76,0	65,6	4990
29,0	19,0	7,49		1,9838	0,053767	36,9	73,2	2700
30,8	19,1	12,7		1,0354	0,014203	72,9	75,5	5500
31,0	19,0	13,0		0,98728	0,012912	76,5	75,5	5770
32,0	19,0	13,0		0,92715	0,011223	82,6	76,6	6330
36,0	23,0	10,0		1,4024	0,021939	63,9	89,6	5730
36,0	23,0	15,0		0,93495	0,0097507	95,9	89,6	8600
38,0	19,0	13,0		0,69729	0,0058757	119	82,7	9820
38,0	22,0	13,0		0,88432	0,0087169	101	89,7	9100
38,1	19,0	6,35		1.4221	0,024412	58,3	8,8	4830
40,0	24,0	16,0		0,76875	0,0061376	125	96,.3	12100
40,0	24,0	20,0		0,615 00	0,0039281	157	96,3	15100
41,8	26,2	18,0		0,74725	0,0054198	138	103	14200
44,5	30,0	13,0		1,2258	0,013175	93,0	114	10600
47,0	27,0	15,0		0,75568	0,0051682	146	110	16200
49,1	31,8	15,9		0,90970	0,0067190	135	123	16700

Table 3 *(3 of 3)*

A mm	B mm	C mm		C_1 mm^{-1}	C_2 mm^{-3}	A_e mm^2	l_e mm	V_e mm^3
49,1	33,8	15,9		1,0583	0,0088022	120	127	15300
50,0	30,0	20,0		0,615 00	0,0031425	196	120	23600
51,0	32,0	19,0		0,70951	0,0040025	177	126	22300
55,0	32,0	19,0		0,61059	0,0028634	213	130	27800
58,0	41,0	18,0		1,0063	0,0066435	151	152	23100
61,0	35,6	12,7		0,91869	0,0058349	157	145	22800
63,0	38,0	25,0		0,497 14	0,0016250	306	152	46500
68,0	48,0	13,0		1,3876	0,010782	129	179	23000
72,0	48,0	20,0		0,774 81	0,0032729	237	183	43400
73,7	38,9	12,7		0,774 23	0,0036245	214	165	35300
80,0	40,0	15,0		0,604 31	0,0020963	288	174	50200
80,0	50,0	20,0		0,668 42	0,0022694	295	197	58000
85,7	55,5	12,7		1,1387	0,0060319	189	215	40600
96,0	70,0	20,0		0,994 64	0,0038574	258	256	66100
102,0	65,0	15,0		0,929 63	0,0034071	273	254	69200
104,0	80,0	20,0		1,1974	0,0050179	239	286	68200
107,0	65,0	18,0		0,700 31	0,0018914	370	259	96000
127,0	89,0	20,0		0,883 58	0,0023498	376	332	125000
140,0	106,0	25,0		0,903 39	0,0021394	422	381	161000
152,0	104,0	19,0		0,871 42	0,0019340	451	393	177000
202,0	153,0	25,0		0,904 61	0,0014864	609	551	335000
305,0	207,0	30,0		0,540 36	0,00037222	1450	784	1140000

Table 4 – Uncoated ring cores recommended dimensional limits *(1 of 3)*

A	Min.	Max.	*B*	Min.	Max.	*C*	Min.	Max.
mm	mm	mm	mm	mm	mm	mm	mm	mm
2,5	2,35	2,65	1,3	1,15	1,45	1,3	1,15	1,45
2,5	2,35	2,65	1,5	1,35	1,65	0,8	0,65	0,95
2,5	2,35	2,65	1,5	1,35	1,65	1,0	0,85	1,15
3,1	2,95	3,25	1,3	1,15	1,45	1,3	1,15	1,45
3,1	2,95	3,25	1,8	1,65	1,95	2,0	1,85	2,15
3,5	3,35	3,65	1,8	1,65	1,95	1,3	1,15	1,45
3,9	3,75	4,05	1,8	1,65	1,95	1,8	1,65	1,95
3,9	3,79	4,09	2,2	2,09	2,39	1,3	1,12	1,42
4,0	3,80	4,20	2,0	1,85	2,15	2,0	1,85	2,15
4,0	3,80	4,20	2,2	2,05	2,35	1,6	1,45	1,75
4,83	4,63	5,03	2,29	2,14	2,44	1,27	1,12	1,42
5,84	5,64	6,04	3,05	2,90	3,20	1,52	1,37	1,67
6,0	5,80	6,20	3,0	2,85	3,15	2,0	1,85	2,15
6,0	5,80	6,20	4,0	3,85	4,15	2,0	1,85	2,15
6,3	6,10	6,50	3,8	3,65	3,95	2,5	2,35	2,65
7,62	7,42	7,82	3,18	3,03	3,33	4,78	4,48	5,08
8,0	7,80	8,20	4,0	3,85	4,15	2,0	1,85	2,15
8,2	8,00	8,40	3,7	3,55	3,85	4,0	3,75	4,25
9,0	8,70	9,30	6,0	5,80	6,20	3,0	2,80	3,20
9,53	9,23	9,83	4,75	4,55	4,95	3,18	3,03	3,33
10,0	9,70	10,30	5,0	4,80	5,20	4,0	3,85	4,15
10,0	9,70	10,30	5,0	4,80	5,20	5,0	4,85	5,15
10,0	9,70	10,30	6,0	5,80	6,20	4,0	3,85	4,15
12,0	11,60	12,40	6,0	5,75	6,25	4,0	3,85	4,15
12,7	12,30	13,10	7,1	6,85	7,35	5,1	4,90	5,30
12,7	12,30	13,10	7,92	7,67	8,17	6,35	6,15	6,55
13,2	12,80	13,60	7,4	7,15	7,65	4,0	3,85	4,15
13,6	13,20	14,00	7,0	6,75	7,25	3,5	3,35	3,65
14,0	13,50	14,50	8,0	7,70	8,30	7,0	6,80	7,20
14,0	13,50	14,50	9,0	8,70	9,30	5,0	4,80	5,20
15,88	15,38	16,38	8,89	8,59	9,19	4,7	4,50	4,90
16,0	15,50	16,50	9,0	8,70	9,30	5,0	4,80	5,20
16,0	15,50	16,50	9,6	9,30	9,90	6,3	6,10	6,50
16,0	15,50	16,50	12,0	11,70	12,30	8,0	7,70	8,30

Table 4 *(2 of 3)*

A	Min.	Max.	*B*	Min.	Max.	*C*	Min.	Max.
mm	mm	mm	mm	mm	mm	mm	mm	mm
18,0	17,40	18,60	10,0	9,70	10,30	10,0	9,70	10,30
18,5	17,90	19,10	9,8	9,50	10,10	10,3	10,00	10,60
20,0	19,40	20,60	10,0	9,70	10,30	7,0	6,80	7,20
20,0	19,40	20,60	12,0	11,70	12,30	10,0	9,70	10,30
22,0	21,40	22,60	14,0	13,60	14,40	10,0	9,70	10,30
22,1	21,50	22,70	13,72	13,32	14,12	6,35	6,15	6,55
25,0	24,25	25,75	15,0	14,50	15,50	10,0	9,70	10,30
25,0	24,25	25,75	15,0	14,50	15,50	12,0	11,60	12,40
25,4	24,65	26,15	15,49	14,99	15,99	9,53	9,23	9,83
26,9	26,15	27,65	14,2	13,70	14,70	12,2	11,80	12,60
28,0	27,25	28,75	16,0	15,50	16,50	13,0	12,50	13,50
29,0	28,00	30,00	19,0	18,40	19,60	7,49	7,09	7,89
30,8	29,80	31,80	19.1	18,50	19,70	12,7	12,30	13,10
31,0	30,00	32,00	19,0	18,40	19,60	13,0	12,60	13,40
32,0	31,00	33,00	19,0	18,40	19,60	13,0	12,60	13,40
36,0	34,90	37,10	23,0	22,30	23,70	10,0	9,70	10,30
36,0	34,90	37,10	23,0	22,30	23,70	15,0	14,50	15,50
38,0	36,80	39,20	19,0	18,30	19,70	13,0	12,50	13,50
38,0	36,80	39,20	22,0	21,30	22,70	13,0	12,50	13,50
38,1	36,90	39,30	19,0	18,30	19,70	6,35	6,05	6,65
40,0	38,80	41,20	24,0	23,30	24,70	16,0	15,50	16,50
40,0	38,80	41,20	24,0	23,30	24,70	20,0	19,30	20,70
41,8	40,60	43,00	26,2	25,50	26,90	18,0	17,40	18,60
44,5	43,15	45,85	30,0	29,20	30,80	13,0	12,60	13,40
47,0	45,65	48,35	27,0	26,20	27,80	15,0	14,50	15,50
49,1	47,60	50,60	31,8	30,90	32,70	15,9	15,40	16,40
49,1	47,60	50,60	33,8	32,90	34,70	15,9	15,30	16,50
50,0	48,50	51,50	30,0	29,10	30,90	20,0	19,40	20,60
51,0	49,50	52,50	32,0	31,10	32,90	19,0	18,40	19,60
55,0	53,30	56,70	32,0	31,10	32,90	19,0	18,40	19,60
58,0	56,30	59,70	41,0	40,10	41,90	18,0	17,40	18,60
61,0	59,10	62,90	35,6	34,50	36,70	12,7	12,20	13,20
63,0	61,10	64,90	38,0	36,90	39,10	25,0	24,20	25,80
68,0	66,10	69,90	48,0	46,80	49,20	13,0	12,50	13,50
72,0	70,00	74,00	48,0	46,80	49,20	20,0	19,40	20,60
73,7	71,70	75,70	38,9	37,70	40,10	12,7	12,20	13,20
80,0	77,60	82,40	40,0	38,80	41,20	15,0	14,40	15,60

Table 4 *(3 of 3)*

A	**Min.**	**Max.**
mm	mm	Mm
80,0	77,60	82,40
85,7	83,30	88,10
96,0	93,20	98,80
102,0	99,00	105,00
104,0	101,00	107,00
107,0	104,00	110,00
127,0	123,00	131,00
140,0	136,00	144,00
152,0	147,50	156,50
202,0	196,00	208,00
305,0	296,00	314,00

B	**Min.**	**Max.**
mm	mm	mm
50,0	48,80	51,20
55,5	54,10	56,90
70,0	68,00	72,00
65,0	63,00	67,00
80,0	77,50	82,50
65,0	63,00	67,00
89,0	86,50	91,50
106,0	103,00	109,00
104,0	101,00	107,00
153,0	149,00	157,00
207,0	202,00	212,00

C	**Min.**	**Max.**
mm	mm	mm
20,0	19,20	20,80
12,7	12,10	13,30
20,0	19,20	20,80
15,0	14,40	15,60
20,0	19,20	20,80
18,0	17,20	18,80
20,0	19,20	20,80
25,0	24,20	25,80
19,0	18,20	19,80
25,0	24,00	26,00
30,0	29,00	31,00

5.3 Coating

A variety of materials are used to provide dielectric protection by coating the surfaces of the ring cores to form a barrier. These include epoxies, polyurethanes, nylons, and paraxylylenes.

Manufacturers generally specify limits for maximum OD with coating, minimum ID with coating, and maximum height with coating. The limits take into account bare core variation and coating variation.

Minimum OD, maximum ID, and minimum height are either not specified, or are considered of secondary importance, since coating cannot have a negative thickness. The thickness of the coating is not directly specified or measured. Coating is controlled for adequate thickness by means of voltage breakdown testing and visual inspection.

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