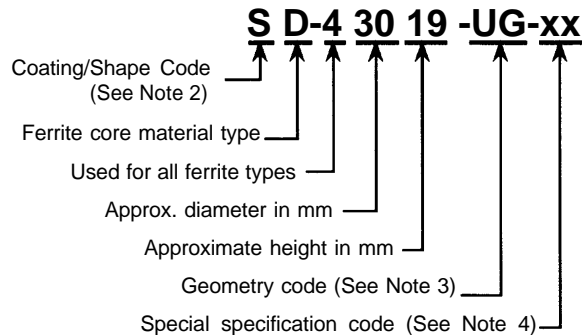


Part Number Identification – How to Order

UNGAPPED CORES and TOROIDS

1. Typical Part Number



2. Coating/Shape Code

For some cores a designation letter precedes the material code.

Code	Meaning	Example
C	Planar E-core with clip recesses	<u>C</u> R-45810-EC
D	DS core with solid centerpost	<u>D</u> F-42311-UG
F	Planar E-core option: no clip recesses (non-standard)	<u>F</u> R-45810-EC
H	DS core with a center hole	<u>H</u> P-41408-UG
N	RM core with solid centerpost	<u>N</u> P-41510-UG
P	EP core	<u>P</u> J-41313-UG
R	RM core with a center hole	<u>R</u> G-41510-UG
S	RS core	<u>S</u> D-41408-UG
X	Black coating (contact factory)	<u>X</u> W-41003-TC
Y	Parylene toroid coating	<u>Y</u> A-40603-TC
Z	Gray toroid coating	<u>Z</u> J-42915-TC
0	No meaning (e.g. 0P-41808-EC is the same as P-41808-EC)	

3. Geometry Code

For standard ungapped cores a two letter code indicates the geometry.

Code	Geometry	Example	Unit of Measure
EC	All E-Cores, including ETD, EC, ER, EER, EEM, EFD, planar, and lamination size	0P-44317- <u>EC</u>	Piece
IC	I-Core	0J-42516- <u>IC</u>	Piece
TC	Toroid	ZJ-42915- <u>TC</u>	Piece
UC	U-Core	0J-41106- <u>UC</u>	Piece
UG	POT, RS, DS, RM, PQ, EP	DF-42311- <u>UG</u>	Pair

4. Special specification code

A variety of features over and above the standard specifications are available. For details, see the section on page 1.5, "Special Specification Codes."

5. Unit of measure

POT, RS, DS, RM, PQ, and EP cores are ordered in sets. One set is a pair of two pieces. One set usually is ordered for each transformer, inductor, or device to be built.

E-, U-, and I-Cores are ordered in individual pieces. Two pieces usually are ordered for each transformer, inductor, or device to be built.

Toroids are ordered in individual pieces.

Hardware:

Accessory hardware is offered for nearly all of the cores shown in this catalog. Available items are shown together with the appropriate cores.

Magnetics is a UL-recognized molder in the QMMY2 fabricated parts program. Many bobbins shown in this catalog are covered. Contact the factory for details on specific parts.

The part number and material are shown with the drawing for each bobbin. Every bobbin is provided in the material defined by the part number, whether the bobbin is covered in the UL QMMY2 program or not.

Packing Unit:

A packing unit is the quantity in a standard full package for a particular part. Special consideration, such as expedited deliveries, is given when ordering stocked standard sized packing units. Contact the factory for details.

Ordering:

When ordering, please use MAGNETICS part numbers, or specify material, size, and A_L value. MAGNETICS customer service representatives and applications engineers are available to help you.

Standard Gapped Core Tolerances

For more information about gapped cores and using them, please see pages 4.13-4.19.
For tolerance requirements other than those shown below, please contact the factory.

Either the A_L or the depth of grind (not both) is controlled during production of gapped cores. Part numbering for gapped cores is explained on page 1.5. Codes **A**, **X** and **F** define A_L values. Codes **G** and **M** define depths of grind.

In most applications, defining the gap with the A_L results in inductors with the least variation. Electrical measurement is inherently more precise, and compensation is made for variability in material permeability and core geometry.

For deep gaps, however, better consistency often results when the depth of grind is specified. In such cases, variation in the finished inductor is dominated by the variation in the windings, especially if the number of turns is low.

“Ungapped to gap combination” means an asymmetrical gap; the entire gap is taken from one piece, and the other piece is ungapped. “Gap to gap combination” means the gap is symmetrical; half of the total gap is ground into each piece.

Depth of Grind Tolerance Ranges

Inches		For Shapes: POT, RS, DS, RM, PQ, and EP Cores	Millimeters	
Gap	Tolerance		Gap	Tolerance
0.001" – 0.038"	± 0.0005"	Ungapped to gap combination	0.1 mm – 0.9 mm	± 0.03 mm
0.039" – 0.076"	± 0.001"	Ungapped to gap combination <small>(Except if the gap is more than 10% of the minimum bobbin depth for the set*. Then gap-to-gap combination.)</small>	1.0 mm – 1.9 mm	± 0.04 mm
0.077" – 0.114"	± 0.002"	Gap to gap combination <small>(Except if the gap is less than 10% of the minimum bobbin depth for the set*. Then ungapped-to-gap combination.)</small>	2.0 mm – 2.9 mm	± 0.07 mm
0.115" – 0.152"	± 0.002"	Gap to gap combination	3.0 mm – 3.8 mm	± 0.07 mm
0.153" – 0.228"	± 0.004"	Gap to gap combination	3.9 mm – 5.0 mm	± 0.12 mm

* The bobbin depth for the set is the 20 dimension, or 2 times the D dimension.

Inches		For E-Cores: Lamination Size, EFD, EEM, EC, ETD, ER, EER, Planar E, and other E-cores <i>E-cores are sold as pieces, not sets. To make an ungapped/gapped set, use one piece of each. For example, use 0R-41808-G050 with 0R-41808-EC for an asymmetrical gap of 0.050"±0.01". For the same gap, but symmetric, use two pieces of 0R-41808-G025.</i>	Millimeters	
Gap	Tolerance		Gap	Tolerance
0.001" – 0.038"	± 0.0005"		0.1 mm – 0.9 mm	± 0.03 mm
0.039" – 0.076"	± 0.001"		1.0 mm – 1.9 mm	± 0.04 mm
0.077" – 0.152"	± 0.002"		2.0 mm – 3.8 mm	± 0.07 mm
0.153" – 0.228"	± 0.004"		3.9 mm – 5.0 mm	± 0.12 mm

Gapping for A_L

1. Unit of Measure

When specifying and ordering E-Cores gapped to an A_L , it is important to note which cores are produced in gap-to-gap combination, because two gapped pieces are assembled to achieve the A_L . Alternatively, for E-Cores provided ungapped-to-gap, an ungapped piece must be used with the gapped part to achieve the A_L . POT, RS, DS, RM, PQ, and EP cores are sold as sets whether the combination is G/G or UG/G.

2. Significant Figures

A_L testing and limits are calculated to three significant digits, based on the nominal value. For example, $A_L=99 \pm 3\%$ is interpreted as 96.0 Minimum, 99.0 Nominal, and 102.0 Maximum.

3. Correlation

Magnetics tests gapped A_L values with full bobbins, usually 100 turns, or 250 turns for deep gaps. The drive level is low (5 Gauss) and the frequency is set low enough to avoid resonance effects. Measured inductance in an application may vary significantly from the theoretical value due to low turns, low bobbin fill, leakage effects, resonance effects, or elevated drive levels.

It is important for the user to verify the correlation between the test of the core and the specific test being applied to the inductor or transformer. Planar E Cores, planar RM, and planar PQ cores are especially susceptible to correlation discrepancies.

Standard Gapped Core Tolerances (Continued)

Chart shows type of combination and the guaranteed tolerance for corresponding A_L ranges.
For special tolerances, or for $A_L=2000$ or higher, contact the factory.

PC (Pot) Cores (Section 6)

	Gap to gap ± 3%	Ungapped to gap combination			
		± 3%	± 5%	± 7%	± 10%
40704	25-55	56-75	≤ 110	≤ 135	≤ 225
40905	25-79	80-105	≤ 160	≤ 250	≤ 320
41107	25-104	105-170	≤ 315	≤ 370	≤ 450
41408	71-129	130-191	≤ 307	≤ 417	≤ 574
41811	96-174	175-326	≤ 523	≤ 712	≤ 988
42213	113-204	205-482	≤ 779	≤ 1060	≤ 1459
42616	139-249	250-695	≤ 1125	≤ 1543	≤ 1999
43019	170-304	305-1015	≤ 1642	≤ 1999	
43622	222-399	400-1494	≤ 1999		
44229	169-389	390-1965	≤ 1999		
44529	172-549	550-1999			

PQ Cores (page 10.1)

	Gap to gap ± 3%	Ungapped to gap combination			
		± 3%	± 5%	± 7%	± 10%
42016	60-184	185-467	≤ 755	≤ 1027	≤ 1425
42020	50-139	140-467	≤ 754	≤ 1026	≤ 1422
42610	200-396	397-777	≤ 1258	≤ 1728	≤ 1999
42614	103-334	335-645	≤ 1044	≤ 1421	≤ 1972
42620	95-296	297-888	≤ 1436	≤ 1955	≤ 1999
42625	77-234	235-880	≤ 1423	≤ 1936	≤ 1999
43214	127-416	417-548	≤ 885	≤ 1207	≤ 1661
43220	128-409	410-486	≤ 1369	≤ 1878	≤ 1999
43230	84-241	242-808	≤ 1305	≤ 1775	≤ 1999
43535	89-255	256-980	≤ 1575	≤ 1999	
44040	83-230	231-1006	≤ 1625	≤ 1999	

Planar E-Cores * (pages 11.12, 11.13)

	Gap to gap ± 3%	Ungapped to gap combination			
		± 3%	± 5%	± 7%	± 10%
41425	19-37	38-76	≤ 122	≤ 166	≤ 228
41434	17-31	32-77	≤ 123	≤ 167	≤ 230
41805	18-32	33-205	≤ 329	≤ 448	≤ 617
42107	35-66	67-188	≤ 304	≤ 414	≤ 569
42216	78-141	142-405	≤ 656	≤ 892	≤ 1239
43208	118-216	217-643	≤ 1040	≤ 1427	≤ 1964
43618	119-222	223-673	≤ 1088	≤ 1491	≤ 1999
43808	173-315	316-956	≤ 1547	≤ 1999	
44008	106-189	190-507	≤ 821	≤ 1116	≤ 1548
44308	201-367	368-1130	≤ 1828	≤ 1999	
44310	169-305	306-1130	≤ 1828	≤ 1999	
45810	266-481	482-1496	≤ 1999		
46409	413-768	769-1999			
46410	379-701	702-1999			
49938	336-594	595-1999			

* These tolerances also apply to Planar E-I combinations.

RS (Round-Slab) Cores (Section 7)

	Gap to gap ± 3%	Ungapped to gap combination			
		± 3%	± 5%	± 7%	± 10%
41408		25-177	≤ 283	≤ 385	≤ 530
42311	25-39	40-347	≤ 708	≤ 963	≤ 1325
42318	25-39	40-452	≤ 731	≤ 994	≤ 1378
42616	25-39	40-622	≤ 998	≤ 1369	≤ 1884
43019	25-62	63-918	≤ 1485	≤ 1999	
43622	40-62	63-1286	≤ 1999		
44229	40-62	63-1732	≤ 1999		

Lamination Size E-Cores (page 11.1)

	Gap to gap ± 3%	Ungapped to gap combination			
		± 3%	± 5%	± 7%	± 10%
41203	16-27	28-55	≤ 86	≤ 117	≤ 160
41707	22-37	38-89	≤ 140	≤ 190	≤ 259
41808	27-42	43-121	≤ 192	≤ 258	≤ 355
42510	37-61	62-200	≤ 318	≤ 432	≤ 595
43009	55-91	92-222	≤ 353	≤ 475	≤ 653
43515	54-87	88-429	≤ 687	≤ 934	≤ 1284
44317	81-136	137-762	≤ 1222	≤ 1676	≤ 1999
44721	107-180	181-1188	≤ 1920	≤ 1999	
45724	129-218	219-1732	≤ 1999		

Other E-Cores (Section 11)

	Gap to gap ± 3%	Ungapped to gap combination			
		± 3%	± 5%	± 7%	± 10%
41205	28-47	48-107	≤ 170	≤ 229	≤ 316
41208	19-30	31-78	≤ 123	≤ 166	≤ 228
41810	44-74	75-235	≤ 376	≤ 512	≤ 704
42211	26-42	43-148	≤ 236	≤ 320	≤ 440
42515	28-43	44-210	≤ 333	≤ 452	≤ 616
42520	107-190	191-397	≤ 643	≤ 874	≤ 1202
42530	45-72	73-409	≤ 655	≤ 891	≤ 1225
42810	84-146	147-490	≤ 786	≤ 1069	≤ 1483
43007	42-67	68-307	≤ 491	≤ 668	≤ 919
43013	71-121	122-552	≤ 885	≤ 1204	≤ 1669
43520	65-111	112-461	≤ 738	≤ 1003	≤ 1380
43524	41-62	63-439	≤ 698	≤ 949	≤ 1305
44011	59-95	96-642	≤ 1029	≤ 1400	≤ 1940
44016	52-83	84-545	≤ 872	≤ 1185	≤ 1629
44020	78-126	127-916	≤ 1480	≤ 1999	
44022	94-156	157-1187	≤ 1903	≤ 1999	
44924	100-165	166-1276	≤ 1999		
45021	99-167	168-1127	≤ 1807	≤ 1999	
45528	113-186	187-1736	≤ 1999		
45530	129-215	216-1999			
46016	102-129	130-1231	≤ 1989	≤ 1999	
47228	120-199	200-1823	≤ 1999		
48020	99-158	159-1922	≤ 1999		

DS (Double Slab) Cores (page 7.8)

	Gap to gap ± 3%	Ungapped to gap combination			
		± 3%	± 5%	± 7%	± 10%
42311	109-195	196-386	≤ 625	≤ 850	≤ 1170
42318	78-135	136-441	≤ 706	≤ 961	≤ 1332
42616	117-205	206-580	≤ 930	≤ 1276	≤ 1756
43019	149-264	265-873	≤ 1412	≤ 1922	≤ 1999
43622	170-300	301-1111	≤ 1797	≤ 1999	
44229	179-315	316-1543	≤ 1999		

EFD, EEM Cores (page 11.14)

	Gap to gap ± 3%	Ungapped to gap combination			
		± 3%	± 5%	± 7%	± 10%
41309	17-28	29-64	≤ 100	≤ 135	≤ 184
41515	19-30	31-81	≤ 127	≤ 172	≤ 236
41709	21-34	35-107	≤ 169	≤ 230	≤ 313
42110	15-25	26-92	≤ 145	≤ 195	≤ 268
42523	41-66	67-296	≤ 475	≤ 646	≤ 888

RM Cores (Section 8)

	Gap to gap ± 3%	Ungapped to gap combination			
		± 3%	± 5%	± 7%	± 10%
41110	25-50	51-55	≤ 75	≤ 170	≤ 250
41510	56-99	100-162	≤ 258	≤ 352	≤ 484
41812	69-120	121-238	≤ 381	≤ 519	≤ 714
41912	69-120	121-238	≤ 381	≤ 519	≤ 714
42316	84-150	151-395	≤ 633	≤ 862	≤ 1195
42819	126-200	201-625	≤ 1002	≤ 1374	≤ 1892
43723	145-250	251-977	≤ 1580	≤ 1999	

EC Cores (page 12.1)

	Gap to gap ± 3%	Ungapped to gap combination			
		± 3%	± 5%	± 7%	± 10%
43517	49-79	80-438	≤ 702	≤ 954	≤ 1312
44119	61-98	99-627	≤ 1004	≤ 1365	≤ 1891
45224	76-123	124-911	≤ 1471	≤ 1999	
47035	83-135	136-1403	≤ 1999		

ETD, EER Cores (page 12.4)

	Gap to gap ± 3%	Ungapped to gap combination			
		± 3%	± 5%	± 7%	± 10%
43434	55-88	89-500	≤ 806	≤ 1095	≤ 1507
43521	54-86	87-566	≤ 913	≤ 1241	≤ 1707
43939	95-156	157-641	≤ 1028	≤ 1398	≤ 1935
44216	71-117	118-876	≤ 1415	≤ 1925	≤ 1999
44444	73-117	118-881	≤ 1423	≤ 1935	≤ 1999
44949	81-130	131-1075	≤ 1736	≤ 1999	
45032	62-99	100-807	≤ 1304	≤ 1773	≤ 1999
45959	51-118	119-1822	≤ 1999		
47054	83-126	127-1681	≤ 1999		

EP Cores (Section 9)

	Gap to gap ± 3%	Ungapped to gap combination			
		± 3%	± 5%	± 7%	± 10%
40707	25-63	64-75	≤ 125		≤ 160
41010	25-55	56-75	≤ 125		≤ 160
41313	25-75	76-110	≤ 175	≤ 275	≤ 315
41717	25-100	101-175	≤ 275	≤ 400	≤ 630
42120	25-180	181-450	≤ 630	≤ 850	≤ 1250

Ranges indicated are the tolerances for standard gapped cores.
For ± 5%, ± 7%, and ± 10%, the maximum A_L for each tolerance is shown. Standard cores are manufactured to the smallest allowed tolerance.

FERRITE MATRIX

MATERIALS										MATERIALS										E, EC, EER,ETD Cores	MATERIALS										MATERIALS									
Pot Cores	A	D	G	P	F	R	K	J	W	Toroids	A	D	G	P	F	R	K	J	W	H		P	F	R	K	J	H	U, I Cores	P	F	R	K	J	W						
40302										40200				1				1	1	1	40904					41106(U)					1									
40506										40301									1	1	41203					41106 (I)					1									
40507										40401	1			1					1	1	41205					42220(U)														
40704		1	1	1						40402		1							1		41208					42512(U)					1									
40905	1		1	1					1	40502				1					1	1	41209					42515(U)		1												
41107	1		1	1	1	1	1	1	1	40503	1								1	1	41707	1				42515 (I)														
41408	1	1		1	1	1	1	1	1	40601	1	1	1	1	1	1	1	1	1	1	41808	1	1	1	1	42516 (I)														
41811	1	1	1	1	1	1	1	1	1	40603	1	1	1	1	1	1	1	1	1	1	41810					42530(U)	1													
42213		1	1	1	1	1	1	1	1	40705		1	1	1	1	1	1	1	1	1	42211					44119 (U)														
42616				1	1	1			1	40907									1	1	42510	1	1	1	1	44121 (U)	1													
43019	1	1		1		1				41003	1		1	1	1	1	1	1	1	1	42515	1	1	1		44125(U)	1													
43622				1	1	1				41005	1	1	1	1	1	1	1	1	1	1	42520					44130(U)	1													
44229				1	1	1			1	41206			1	1	1	1	1	1	1	1	42530					49925 (U)														
44529										41303			1	1	1	1	1	1	1	1	42810	1																		
										41305									1	1	43007	1	1	1		EEM,EFD,ER Cores														
RM Cores	A	D	G	P	F	R	K	J	W	41306	1	1	1	1	1	1	1	1	1	43009						P	F	R	K	J	W									
41110R										41406		1	1	1	1	1	1	1	1	43013					40906	1	1	1	1	1										
41510N				1		1				41407	1		1	1	1	1	1	1	1	43434	1	1			41309															
R									1	41435										43515	1	1	1	1	41515	1	1													
41812N				1		1				41450										43517	1	1			41709															
R				1	1	1				41506			1	1	1	1	1	1	1	43520	1	1			42110															
41912N										41605			1	1	1	1	1	1	1	43521		1			42523	1	1													
R										41809									1	43524					Planar E Cores															
42316N				1		1				42106									1	43939	1	1			41425EC	1	1													
R				1						42109									1	44011	1				41434ECIIC	1	1													
42819N				1		1				42206	1		1	1	1	1	1	1	1	44018					41805ECAC	1	1													
R										42207		1	1	1	1	1	1	1	1	44020	1	1	1		42107EC		1													
43723N				1		1				42212			1	1	1	1	1	1	1	44022	1	1			42216ECAC	1	1													
										42507			1	1	1	1	1	1	1	44119					43208ECAC	1	1													
RS Cores	A	D	G	P	F	R	K	J	W	42508										44218	1	1			43818ECAC	1	1													
s-41408	1	1		1	1	1		1	1	42908			1	1	1	1	1	1	1	44317	1	1		1	43808ECAC	1	1													
S-42311				1	1	1				42915			1	1	1	1	1	1	1	44444	1	1			44008ECAC	1	1	1												
S-42318		1				1			1	43113									1	44721	1	1	1	1	44308ECK	1	1													
S-42616										43205										44924					44310ECAC	1	1													
s-43019				1	1				1	43610									1	44949	1	1			45810ECAC	1	1													
s-43622										43615			1	1	1	1	1	1	1	45021	1	1			46409EC	1	1													
s-44229										43806										45032					46410ECAC	1	1													
										43813		1	1	1	1	1	1	1	1	45224	1	1			49938EC	1	1													
DS Cores	P	F	R	K	J	W				43825		1	1	1	1	1	1	1	45528	1	1																			
D-42311		1								44416		1	1							45530					PQ Cores			P	F	R	K	J								
D-42318		1								44715										45724	1	1			42016	1	1													
D-42616		1								44916			1	1	1	1	1	1		45959	1	1			42020	1	1													
D-43019										44920			1			1				46016					42610															
D-43622										44925			1	1	1	1	1	1		47035	1				42614															
D-44229										44932									1	47054					42620	1	1													
										46113			1	1	1	1	1	1		47228	1	1			42625	1	1													
EP Cores	P	F	R	K	J	W				46326									1	48020	1	1			43214															
40707	1		1		1	1				47313			1	1	1	1	1	1						P	F	R	K	J	W											
41010	1	1	1		1	1				48613									1					43220	1	1														
41313	1	1	1		1	1																		43230	1	1														
41717	1	1	1																					43535	1	1														
42120																								44040	1	1														

1 - Preferred geometries with no minimum order quantities.