

Amidon IRON POWDER TOROIDAL CORES

Iron Powder Material	Basic Iron Powder	Material Permeability μ_0	Temperature Stability (ppm/°C)	Resonant Circuit Frequency Range (MHz)	Color Code
0	Phenolic	1	0	100.0 - 300.0	Tan
1	Carbonyl C	20	280	0.5 - 5.0	Blue
2	Carbonyl E	10	95	2.0 - 30.0	Red
3	Carbonyl HP	35	370	0.05 - 0.5	Grey
6	Carbonyl SF	8	35	10.0 - 50.0	Yellow
7	Carbonyl TH	9	30	5.0 - 35.0	White
10	Carbonyl W	6	150	30.0 - 100.0	Black
12	Synthetic Oxide	4	170*	50.0 - 200.0	Green/White
15	Carbonyl GS6	25	190	0.10 - 2.0	Red/White
17	Carbonyl Special	4	50	50.00 - 200.0	Blue/Yellow
26	Special	75	882	LF filters, chokes	Yellow/White

Material #17 has been developed as a temperature stable alternative to the #12.
Frequency ranges shown are for best 'Q'/ Useful over broader frequency ranges with lower 'Q'.

- MATERIAL #0 ($\mu=1$): Most commonly used for frequencies above 100 MHz. Available in toroidal form only. Note: Due to the nature of this material the inductance resulting from the use of a given AL value may not be as accurate as we would like. Inductance vs. number of turns will vary greatly depending upon the winding technique.
- MATERIAL #1 ($\mu=20$): A Carbonyl 'C' material, very similar to material #3 except that it has higher volume resistivity and better stability. Available in toroidal form and shielded coil form.
- MATERIAL #2 ($\mu=10$): A Carbonyl 'E' iron powder material having high volume resistivity. Offers high 'Q' for the 2 MHz to 20 MHz frequency range. Available in toroidal form and shielded coil form.
- MATERIAL #3 ($\mu=35$): A Carbonyl 'HP' material having excellent stability and good 'Q' for the lower frequencies from 50 KHz to 500 KHz. Available in toroidal form and shielded coil form.
- MATERIAL #6 ($\mu=8$): A Carbonyl 'SF' material. Offers very good 'Q' and temperature stability for the 20 to 50 MHz frequency range. Available in both toroidal and shielded coil form.
- MATERIAL #7 ($\mu=9$): A Carbonyl 'TH' material. Very similar to the #2 and #6 materials but offers better temperature stability than either. Available in both toroidal and shielded coil form.
- MATERIAL #10 ($\mu=6$): A powdered iron 'W' material. Offers good 'Q' and high stability for frequencies from 40 MHz to 100 MHz. Available in toroidal form and shielded coil form.
- MATERIAL #12 ($\mu=4$): A Synthetic oxide material which provides good 'Q' and moderate stability for frequencies from 50 MHz to 200 MHz. If high 'Q' is of prime importance this material is a good choice. If stability is of a prime importance, consider the #17 material. The #12 material is available in all sizes up to T-94, in toroidal form. Not available in shielded coil form.

- MATERIAL #15 ($\mu=25$): A carbonyl 'GS6' material. Has excellent stability and good 'Q'. A good choice for commercial broadcast frequencies where good 'Q' and stability are essential. Available in toroidal form only.
- MATERIAL #17 ($\mu=4$): This is a new carbonyl material which is very similar to the #12 material except tatar it has better temperature stability. However, as compared to the #12 material, there is a slight 'Q' loss of about 10% from 50 MHz to 100 MHz. Above 100 MHz, the 'Q' will gradually deteriorate to approximately 20% lower. It is available in both toroidal form and the shielded coil form.
- MATERIAL #26 ($\mu=75$): A Hydrogen Reduced material. Has highest permeability of all of the iron powder materials. Used for EMI filters and DC chokes. The #26 is very similar to the older #41 material but can provide an extended frequency range. See AC Line Filter and CD Choke sections for size, permeability and frequency range information.

MATERIAL 0 -- Permeability 1, Freq Range 100 MHz - 300 MHz, Color - Tan

Core Number	O.D. (inches)	I.D. (inches)	Hgt (inches)	l_e (cm)	A_e (cm) ²	V_e (cm) ³	A_L Value μ h/100 Turns
T-12-0	.125	.062	.050	.74	.010	.007	3.0
T-16-0	.160	.078	.060	.95	.016	.015	3.0
T-20-0	.200	.088	.070	1.15	.025	.029	3.5
T-25-0	.255	.120	.096	1.50	.042	.063	4.5
T-30-0	.307	.151	.128	1.83	.065	.119	6.0
T-37-0	.375	.205	.128	2.32	.070	.162	4.9
T-44-0	.440	.229	.159	2.67	.107	.286	6.5
T-50-0	.500	.303	.190	3.03	.121	.367	6.4
T-68-0	.690	.370	.190	4.24	.196	.831	7.5
T-80-0	.795	.495	.250	5.15	.242	1.246	8.5
T-94-0	.942	.560	.312	6.00	.385	2.310	10.6
T-106-0	1.060	.570	.437	6.50	.690	4.485	19.0
T-130-0	1.300	.780	.437	8.29	.730	6.052	15.0

Note:

Due to the nature of the '0' material, the inductance resulting from the use of the given A_L value may vary greatly depending upon the winding technique. This may cause discrepancy between calculated and measured inductance.

MATERIAL 1 -- Permeability 20, Freq. Range 0.5 MHz to 5 MHz, Color - Blue

Core Number	O.D. (inches)	I.D. (inches)	Hgt (inches)	X (cm)	A_e (cm) ²	V_e (cm) ³	A_L Value μ h/100 Turns
T-12-1	.125	.062	.050	.74	.010	.007	48
T-16-1	.160	.078	.060	.95	.016	.015	44
T-20-1	.200	.088	.070	1.15	.025	.029	52
T-25-1	.255	.120	.096	1.50	.042	.063	70

T-30-1	.307	.151	.128	1.83	.065	.119	85
T-37-1	.375	.205	.128	2.32	.070	.162	80
T-44-1	.440	.229	.159	2.67	.107	.286	105
T-50-1	.500	.303	.190	3.03	.121	.367	100
T-68-1	.69	.370	.190	4.24	.196	.831	115
T-80-1	.795	.495	.250	5.15	.242	1.246	115
T-94-1	.942	.560	.312	6.00	.385	2.310	160
T-106-1	1.060	.570	.437	6.50	.690	4.485	325
T-130-1	1.300	.780	.437	8.29	.730	6.052	200
T-157-1	1.570	.950	.570	10.05	1.140	11.457	320
T-184-1	1.840	.950	.710	11.12	2.040	22.685	500
T-200-1	2.000	1.250	.550	12.97	1.330	17.250	250

Note:

Most cores can be very useful well below the lower frequency limits shown here.

MATERIAL 2 -- Permeability 10, Freq. Range 2 MHz to 30 MHz, Color - Red

Core Number	O.D. (inches)	I.D. (inches)	Hgt (inches)	l_c (cm)	A_e (cm) ²	V_c (cm) ³	A_L Value μ h/100 Turns
T-12-2	.125	.062	.050	.74	.010	.007	20
T-16-2	.160	.078	.060	.95	.016	.015	22
T-20-2	.200	.088	.070	1.15	.025	.029	25
T-25-2	.255	.120	.096	1.50	.042	.063	34
T-30-2	.307	.151	.128	1.83	.065	.119	43
T-37-2	.375	.205	.128	2.32	.070	.162	40
T-44-2	.440	.229	.159	2.67	.107	.286	52
T-50-2	.500	.303	.190	3.03	.121	.367	49
T-68-2	.690	.370	.190	4.24	.196	.831	57
T-80-2	.795	.495	.250	5.15	.242	1.246	55
T-94-2	.942	.560	.312	6.00	.385	2.310	84
T-106-2	1.060	.780	.437	6.50	.690	4.485	135
T-130-2	1.300	.950	.437	8.29	.730	6.052	110
T-157-2	1.570	.950	.570	10.05	1.140	11.457	140
T-184-2	1.840	1.250	.710	11.12	2.040	22.685	240
T-200-2	2.000	1.250	.550	12.97	1.330	17.250	120
T-200A-2	2.000	1.405	1.000	12.97	2.240	29.050	218
T-225-2	2.250	1.485	.550	14.56	1.508	21.956	120
T-225A-2	2.250	1.250	1.000	14.56	2.730	39.749	215
T-300-2	3.058	1.925	.500	19.83	1.810	35.892	114
T-300A-2	3.048	1.925	1.000	19.83	3.580	70.991	228
T-400-2	4.000	2.250	.650	24.93	3.660	91.244	180
T-400A-2	4.000	2.250	1.300	24.93	7.432	185.250	360
T-520-2	5.200	3.080	.800	33.16	5.460	181.000	207

MATERIAL 3 -- Permeability 35, Freq. Range 0.05 MHz to 0.5 MHz, Color - Gray

Core Number	O.D. (inches)	I.D. (inches)	Hgt (inches)	l_e (cm)	A_e (cm) ²	V_e (cm) ³	A_L Value μ h/100 Turns
T-12-3	.125	.062	.050	.74	.010	.007	60
T-16-3	.160	.078	.060	.95	.016	.015	61
T-20-3	.200	.088	.070	1.15	.025	.029	76
T-25-3	.255	.120	.096	1.50	.042	.063	100
T-30-3	.307	.151	.128	.183	.065	.119	140
T-37-3	.375	.205	.128	2.32	.070	.162	120
T-44-3	.440	.229	.159	2.67	.107	.286	180
T-50-3	.500	.303	.190	3.03	.121	.367	175
T-68-3	.690	.370	.190	4.24	.196	.831	195
T-80-3	.795	.495	.250	5.15	.242	1.246	180
T-94-3	.942	.560	.312	6.00	.385	2.310	248
T-106-3	1.060	.570	.437	6.50	.690	4.485	450
T-130-3	1.300	.780	.437	8.29	.730	6.052	350
T-157-3	1.570	.950	.570	10.05	1.140	11.457	420
T-184-3	1.840	.950	.710	11.12	2.040	22.685	720
T-200-3	2.000	1.250	.550	12.97	1.330	17.250	425
T-200A-3	2.000	1.250	1.000	12.97	2.240	29.050	460
T-225-3	2.250	1.405	.550	14.56	1.508	21.956	425

MATERIAL 6-- Permeability 8, Freq. Range 10 MHz to 50 MHz, Color - Yellow

Core Number	O.D. (inches)	I.D. (inches)	Hgt (inches)	l_e (cm)	A_e (cm) ²	V_e (cm) ³	A_L Value μ h/100 Turns
T-12-6	.125	.062	.050	.74	.010	.007	17
T-16-6	.160	.078	.060	.95	.016	.015	19
T-20-6	.200	.088	.070	1.15	.025	.029	22
T-25-6	.255	.120	.096	1.50	.042	.063	27
T-30-6	.307	.151	.128	.183	.065	.119	36
T-37-6	.375	.205	.128	2.32	.070	.162	30
T-44-6	.440	.229	.159	2.67	.107	.286	42
T-50-6	.500	.303	.190	3.03	.121	.367	46
T-68-6	.690	.370	.190	4.24	.196	.831	47
T-80-6	.795	.495	.250	5.15	.242	1.246	45
T-94-6	.942	.560	.312	6.00	.385	2.310	70
T-106-6	1.060	.570	.437	6.50	.690	4.485	116
T-130-6	1.300	.780	.437	8.29	.730	6.052	96
T-157-6	1.570	.950	.570	10.05	1.140	11.457	115
T-184-6	1.840	.950	.710	11.12	2.040	22.685	195
T-200-6	2.000	1.250	.550	12.97	1.330	17.250	100
T-200A-6	2.000	1.250	1.000	12.97	2.240	29.050	180
T-225-6	2.250	1.405	.550	14.56	1.508	21.956	100

MATERIAL 7 -- Permeability 9, Freq. Range 3 MHz to 35 MHz, Color - White

Core	O.D.	I.D.	Hgt	l_e	A_e	V_e	A_L Value
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Number	(inches)	(inches)	(inches)	(cm)	(cm)²	(cm)³	μh/100 Turns
T-25-7	.255	.120	.096	1.50	.042	.063	29
T-37-7	.375	.205	.128	2.32	.070	.162	32
T-50-7	.500	.303	.190	3.03	.121	.367	43
T-68-7	.690	.370	.190	4.24	.196	.831	52

MATERIAL 10-- Permeability 6, Freq. Range 30 MHz to 100 MHz, Color - Black

Core Number	O.D. (inches)	I.D. (inches)	Hgt (inches)	<i>l_c</i> (cm)	A_e (cm)²	V_e (cm)³	A_L Value μh/100 Turns
T-12-10	.125	.062	.050	.74	.010	.007	12
T-16-10	.160	.078	.060	.95	.016	.015	13
T-20-10	.200	.088	.070	1.15	.025	.029	16
T-25-10	.255	.120	.096	1.50	.042	.063	19
T-30-10	.307	.151	.128	1.83	.065	.119	25
T-37-10	.375	.205	.128	2.32	.070	.162	25
T-44-10	.440	.229	.159	2.67	.107	.286	33
T-50-10	.500	.303	.190	3.03	.121	.367	31
T-68-10	.690	.370	.190	4.24	.196	.831	32
T-80-10	.795	.495	.250	5.15	.242	1.246	32
T-94-10	.942	.560	.312	6.00	.385	2.310	58

MATERIAL 12-- Permeability 4, Freq. Range 50 MHz to 200 MHz, Color - Green & White

Core Number	O.D. (inches)	I.D. (inches)	Hgt (inches)	<i>l_c</i> (cm)	A_e (cm)²	V_e (cm)³	A_L Value μh/100 Turns
T-12-12	.125	.062	.050	.74	.010	.007	7.5
T-16-12	.160	.078	.060	.95	.016	.015	8.0
T-20-12	.200	.088	.070	1.15	.025	.029	10
T-25-12	.255	.120	.096	1.50	.042	.063	12.0
T-30-12	.307	.151	.128	1.83	.065	.119	16.0
T-37-12	.375	.205	.128	2.32	.070	.162	15.0
T-44-12	.440	.229	.159	2.67	.107	.286	18.5
T-50-12	.500	.303	.190	3.03	.121	.367	18.0
T-68-12	.690	.370	.190	4.24	.196	.831	21.0
T-80-12	.795	.495	.250	5.15	.242	1.246	22.0
T-94-12	.942	.560	.312	6.00	.385	2.310	32.0

MATERIAL 15-- Permeability 25, Freq. Range 0.1 MHz to 2.0 MHz, Color - Red & White

Core Number	O.D. (inches)	I.D. (inches)	Hgt (inches)	<i>l_c</i> (cm)	A_e (cm)²	V_e (cm)³	A_L Value μh/100 Turns
T-12-15	.125	.062	.050	.74	.010	.007	50
T-16-15	.160	.078	.060	.95	.016	.015	55

T-20-15	.200	.088	.070	1.15	.025	.029	65
T-25-15	.255	.120	.096	1.50	.042	.063	85
T-30-15	.307	.151	.128	.183	.065	.119	93
T-37-15	.375	.205	.128	2.32	.070	.162	90
T-44-15	.440	.229	.159	2.67	.107	.286	160
T-50-15	.500	.303	.190	3.03	.121	.367	135
T-68-15	.690	.370	.190	4.24	.196	.831	180
T-80-15	.795	.495	.250	5.15	.242	1.246	170
T-94-15	.942	.560	.312	6.00	.385	2.310	200
T-106-15	1.060	.570	.437	6.50	.690	4.485	345
T-130-15	1.300	.780	.437	8.29	.730	6.052	250
T-157-15	1.570	.950	.570	10.05	1.140	11.457	360

MATERIAL 17-- Permeability 4, Freq. Range 20 MHz to 200 MHz, Color - Blue & Yellow

Core Number	O.D. (inches)	I.D. (inches)	Hgt (inches)	l_e (cm)	A_e (cm)²	V_e (cm)³	A_L Value μh/100 Turns
T-12-17	.125	.062	.050	.74	.010	.007	7.5
T-16-17	.160	.078	.060	.95	.016	.015	8.0
T-20-17	.200	.088	.070	1.15	.025	.029	10.0
T-25-17	.255	.120	.096	1.50	.042	.063	12.0
T-30-17	.307	.151	.128	.183	.065	.119	16.0
T-37-17	.375	.205	.128	2.32	.070	.162	15.0
T-44-17	.440	.229	.159	2.67	.107	.286	18.5
T-50-17	.500	.303	.190	3.03	.121	.367	18.0
T-68-17	.690	.370	.190	4.24	.196	.831	21.0
T-80-17	.795	.495	.250	5.15	.242	1.246	32.0
T-90-17	.942	.560	.312	6.00	.385	2.310	32.0