FERRITE MATERIALS

MATERIAL 33 (μ = 850) A manganese-zinc material having low volume resistivity. Used for low frequency antennas in the 1 KHz to 1 MHz frequency range. Available in rod form only.

MATERIAL 43 (μ = 800) High volume resistivity. For medium frequency inductors and wideband transformers up to 50 MHz. Optimum frequency attenuation from 40 MHz to 400 MHz. Available in toroidal cores, shield beads, multi-aperture cores and special shapes for RFI suppression.

MATERIAL 61 (μ = 125) Offers moderate temperature stability and high 'Q' for frequencies 0.2 MHz to 15 MHz. Useful for wideband transformers to 200 MHz and frequency attenuation above 200 MHz. Available in toroids, rods, bobbins and multi-aperture cores.

MATERIAL 63 (μ = 40) For high 'Q' inductors in the 15 MHz to 25 MHz frequency range. Available in toroidal form only.

MATERIAL 64 (μ = 250) Primarily a bead material having high volume resistivity. Excellent temperature stability and very good shielding properties above 400 MHz.

MATERIAL 67 (μ = 40) Similar to the 63 material. Has greater saturation flux density and very good temperature stability. For high 'Q' inductors, (10 MHz to 80 Mhz). Wideband transformers to 200 MHz. Toroids only.

MATERIAL 68 (μ = 20) High volume resistivity and excellent temperature stability. For high Q' resonant circuits 80 MHz to 180 MHz. For high frequency inductors. Toroids only.

MATERIAL 73 (μ = 2500) Primarily a ferrite bead material. Has good attenuation properties from 1 MHz through 50 MHz. Available in beads and some broadband multi-aperture cores.

MATERIAL 77 (μ = 2000) Has high saturation flux density at high temperature. Low core loss in the 1 KHz to 1 MHz range. For low level power conversion and wideband transformers. Extensively used for frequency attenuation from 0.5 MHz to 50 MHz. Available in toroids, pot cores, E-cores, beads, broadband balun cores and sleeves. An upgrade of the former 72 material. The 72 material is still available in some sizes, but the 77 material should be used in all new design.

MATERIAL 'F' (μ = 3000) High saturation flux density at high temperature. For power conversion transformers. Good frequency attenuation 0.5 MHz to 50 MHz. Toroids only.

MATERIAL 'J'/75 (μ = 5000) Low volume resistivity and low core loss from 1 KHz to 1 MHz. Used for pulse transformers and low level wideband transformers. Excellent frequency attenuation from 0.5 MHz to 20 MHz. Available in toroidal form and ferrite beads as standard off the shelf in stock. Also available in pot cores, RM cores, E & U cores as custom ordered parts with lead time for delivery.

MATERIAL K (μ = 290). Used primarily in transmission line transformers from 1.0 MHz to 50 MHz range. Available from stock in a few sizes in toroidal form only.

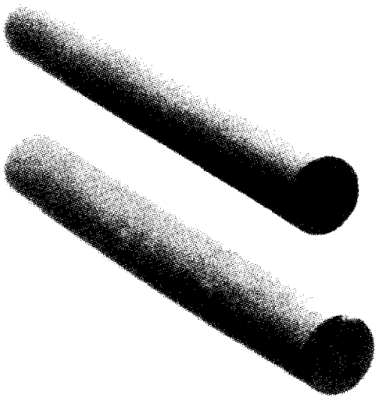
MATERIAL W (μ = 10,000). High permeability material used for frequency attenuation from 10C KHz to 1 MHz in EMI/RFI filters. Also used in broadband transformers. Available in toroidal form from stock. As custom ordered parts for pot cores, EP cores, RM cores.

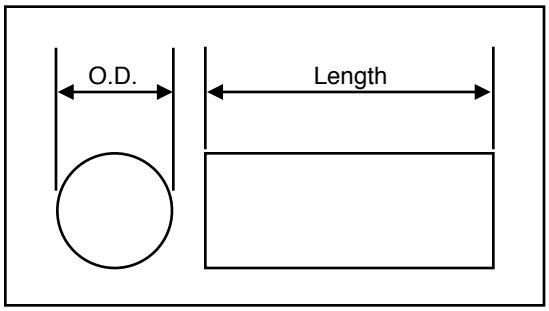
MATERIAL H (μ = 15,000). High permeability material used for frequency attenuation under 200 KHz. Also used in broadband transformers. Available in toroidal form only.

FERRITE RODS, BARS, PLATES, AND TUBES

Ferrite rods, bars, plates and tubes are primarily used in radio antennas and chokes. they are available in materials from permeability of 20 to 10,000.

However, only rods with #61 (μ_i = 125), and #33 (μ_i = 600) materials are standard stocking items. All other materials are custom manufactured, but readily available with lead time for delivery.





Standard Stocking Rods

Part number	Material	Permeability	Diameter (in.)	Length (in.)	A_L value mh/1000 t	Ampere turns
R61-025-400	61	125	0.25	4.0	26	110
R61-037-300	61	125	0.37	3.0	32	185
R61-050-400	61	125	0.50	4.0	43	575
R61-050-750	61	125	0.50	7.5	49	260
R33-037-400	33	600	0.37	4.0	62	290
R33-050-200	33	600	0.50	2.0	51	465
R33-050-400	33	600	0.50	4.0	59	300
R33-050-750	33	600	0.50	7.5	70	200

Other Dimensions and materials are available. Please call for your other requirements.

FERRITE RODS are available as standard stocking item in various sizes in the #33 and #61 materials. Ferrite rods of other materials are available with lead time. The most common use of a ferrite rods is for antennas and choke applications.

ANTENNAS: Ferrite Rods are widely used as loop antenna such as broadcast-band receivers, direction-finder receivers, etc. The #61 material rods are widely used for commercial AM (550 KHz to 1600 KHz) radio antenna and by radio amateurs (2 MHz to 30 MHz). The #33 material rods are more suitable for very low frequency range (100 KHz to 1 MHz). The table on next page lists the recommended frequency range for a few different materials.

To calculate the inductance or number of turns, please use the formula below:

$$N = 1000\sqrt{\frac{desired\ \ 'L'\ (mh)}{A_L}}$$

N = number of turns

$$L(mh) = \frac{A_L \times N^2}{1{,}000{,}000}$$

L = inductance (mh)

$$A_L\ (mh) = \frac{1{,}000{,}000 \times\ 'L'(mh)}{N^2}$$

AL = inductance index (mh/1000 turns)

FERRITE TOROIDAL CORES

Physical Dimensions - Ferrite Toroids

Core Size	OD (inches)	ID (inches)	Hgt (inches)	Mean length (cm)	Cross Sect (cm2)	Volume (cm3)
FT-23	.230	.120	.060	1.34	.021	.029
FT-37	.375	.187	.125	2.15	.076	.163
FT-50	.500	.281	.188	3.02	.133	.401
FT-50 -A	.500	.312	.250	3.68	.152	.559
FT-50 -B	.500	.312	.500	3.18	.303	.963
FT-82	.825	.520	.250	5.26	.246	1.294
FT-87	.870	.540	.250	5.41	.261	1.414
FT-87 -A	.870	.540	.500	5.42	.315	1.710
FT-114	1.142	.750	.295	7.42	.375	2.783
FT-114-A	1.142	.750	.545	7.42	.690	5.120
FT-140	1.400	.900	.500	9.02	.806	7.270
FT-140A	1.400	.900	.590	9.00	.810	7.300
FT-150	1.500	.750	.250	8.30	.591	4.905
FT-150-A	1.500	.750	.500	8.30	1.110	9.213
FT-193	1.932	1.250	.625	12.31	1.360	16.742
FT-193-A	1.932	1.250	.750	12.31	1.620	19.942
FT-240	2.400	1.400	.500	14.40	1.570	22.608

A_L Values (mH/1000 turns) - Ferrite Toroids

For complete part number add mix number to core size below

Material > core size	43 μ=800	61 μ=125	63 μ=40	67 μ=40	68 μ=20	75 μ=5000	77 μ=2000	F μ=3000	J μ=5000
FT-23 ( )	188	24.8	7.9	7.8	4.0	990	396	NA	NA
FT-37 ( )	420	55.3	17.7	17.7	8.8	2210	884	NA	NA
FT-50 ( )	440	68.0	22.0	22.0	11.0	2750	1100	NA	NA
FT-50A- ( )	480	75.0	24.0	24.0	12.0	2990	1200	NA	NA
FT-50B- ( )	1140	150.0	48.0	48.0	12.0	NA	2400	NA	NA
FT-82 ( )	557	73.3	22.4	22.4	11.7	3020	1170	NA	NA
FT-87 ( )	NA	NA	NA	NA	NA	NA	NA	180	3020
FT-87A- ( )	NA	NA	NA	NA	NA	NA	NA	3700	6040
FT-114 ( )	603	79.3	25.4	25.4	12.7	3170	1270	1902	3170
FT-114A ( )	NA	146.0	NA	NA	NA	NA	2340	NA	NA
FT-140- ( )	952	140.0	45.0	45.0	NA	6736	2250	NA	6736
FT-150- ( )	NA	NA	NA	NA	NA	NA	NA	2640	* 4400
FT-150A ( )	NA	NA	NA	NA	NA	NA	NA	5020	8370
FT-193- ( )	NA	NA	NA	NA	NA	NA	NA	* 3640	* 6065
FT-193A ( )	NA	NA	NA	NA	NA	NA	NA	4460	7435
FT-240 ( )	1240	173.0	53.0	53.0	NA	6845	3130	NA	6845

INDUCTANCE-TURNS CHART, FERRITE TOROIDS

MATERIAL #43

turns count > core number		A_L*	10	20	30	40	50	60	70	80	90	100
			Inductance in millihenries									
FT-23	-43	158	.018	.075	.169	.300	.470	.677	.921	1.20	1.52	1.88
FT-37	-43	350	.042	.168	.378	.672	1.050	1.510	2.060	2.69	3.40	4.20
FT-50	-43	440	.052	.209	.471	.836	1.300	1.880	2.560	3.35	4.24	5.23
FT-50A	-43	480	.057	.228	.513	.912	1.430	2.050	2.790	3.65	4.62	5.70
FT-50B	-43	965	.110	.456	1.030	1.820	2.850	4.100	5.590	7.30	9.23	11.4
FT-82	-43	470	.056	.224	.503	.894	1.400	2.010	2.740	3.58	4.53	5.59
FT-114	-43	510	.060	.241	.543	.965	1.510	2.170	2.950	3.86	4.88	6.03
FT-140	-43	885	.095	.380	.857	1.520	2.380	3.430	4.660	6.09	7.71	9.52
FT-240	-43	1075	.123	.494	1.110	1.970	3.090	4.440	6.050	7.90	9.96	12.3

MATERIAL #61

turns count > core number		A_L*	10	20	30	40	50	60	70	80	90	100
			Inductance in millihenries									
FT-23	-61	24.8	.002	.010	.022	.040	.063	.089	.122	.159	.201	.248
FT-37	-61	55.3	.006	.022	.050	.088	.138	.199	.271	.354	.448	.553
FT-50	-61	68.8	.007	.028	.062	.110	.172	.248	.337	.440	.557	.688
FT-50A	-61	75.0	.008	.030	.068	.120	.186	.270	.366	.480	.608	.750
FT-50B	-61	150.0	.015	.060	.135	.240	.375	.540	.735	.960	1.220	1.500
FT-82	-61	73.3	.007	.029	.066	.117	.183	.264	.359	.469	.594	.733
FT-114	-61	79.3	.008	.032	.071	.127	.198	.285	.389	.508	.642	.793
FT-114A	-61	146.0	.015	.058	.131	.233	.365	.526	.715	.934	1.180	1.460
FT-140	-61	140.0	.014	.056	.126	.224	.350	.504	.686	.896	1.130	1.400
FT-240	-61	171.0	.017	.068	.154	.274	.428	.616	.838	1.090	1.390	1.710

MATERIAL #67

turns count > core number		A_L*	10	20	30	40	50	60	70	80	90	100
			Inductance in millihenries									
FT-23	-67	7.9	——	.003	.007	.013	.020	.028	.038	.051	.064	.079
FT-37	-67	19.7	.002	.008	.018	.032	.049	.071	.097	.126	.160	.197
FT-50	-67	22.0	.002	.009	.020	.035	.055	.079	.108	.141	.178	.220
FT-50A	-67	24.0	.002	.020	.033	.038	.060	.086	.112	.154	.194	.240
FT-50B	-67	48.0	.005	.019	.043	.077	.120	.173	.235	.307	.389	.480
FT-82	-67	22.4	.002	.009	.020	.036	.056	.081	.110	.143	.181	.224
FT-114	-67	25.4	.003	.010	.023	.041	.064	.091	.124	.163	.206	.254
FT-140	-67	45.0	.005	.018	.041	.072	.118	.162	.220	.288	.365	.450
FT-240	-67	53.0	.005	.021	.048	.084	.133	.199	.260	.339	.430	.530

MATERIAL #68

turns count > core number		A_L*	10	20	30	40	50	60	70	80	90	100
			Inductance in millihenries									
FT-23	-67	7.9	——	.003	.007	.013	.020	.028	.038	.051	.064	.079
FT-23	-68	4.0	——	.002	.004	.006	.010	.014	.020	.026	.032	.040
FT-37	-68	8.8	——	.006	.008	.014	.022	.032	.043	.056	.071	.088
FT-50	-68	11.0	.001	.004	.010	.018	.028	.040	.054	.070	.089	.110
FT-50A	-68	12.0	.001	.005	.011	.019	.030	.043	.059	.077	.097	.117
FT-82	-68	11.7	.001	.005	.011	.019	.029	.042	.057	.075	.095	.117
FT-114	-68	12.7	.001	.005	.011	.020	.032	.046	.062	.081	.123	.127

* A_L value in mh/1000 turns