LITZ & WINDING WIRES

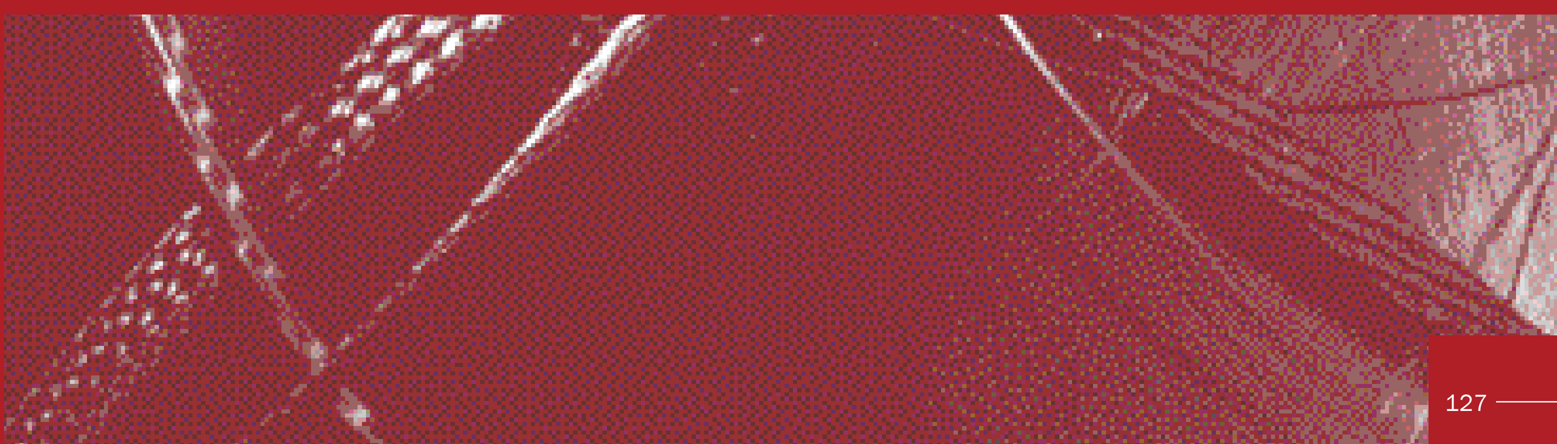
The term "Litz," derived from the German word "Litzendraht" describes a conductor consis insulated strands twisted or braided together. This design equalizes the flux linkages and the individual strands causing the current to spread uniformly throughout the conductor. The resistance ratio (A.C. to D.C.) then tends to approach unity, which is desirable in all high-Q circuit applications.

In 1898, New England Wire became the first company in the United States to manufacture Litz wire on a commercial basis. Since then we have designed and manufactured thousands of constructions for use in high frequency inductors and transformers, inverters, communication equipment, ultrasonic equipment, sonar equipment, television equipment, radio equipment and induction heating equipment. We have also provided cabling, insulating and other services to the superconductor industry since its inception in the early 1960s. And our products are integrated into major accelerator projects, ore separator magnets, NMR magnets, and superconducting magnetic energy storage magnets.

WINDING WIRES

New England Wire Technologies also manufactures specialty winding wires that reduce the size of your designs and save you time and money.

NEWind® Specialty Winding Wire solves the problem of insulating between winding turns by coating the conductors with thin layers of fluoropolymer insulation.



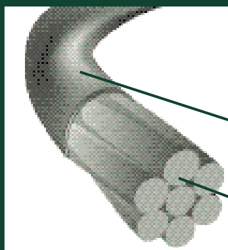
LITZ & WINDING WIRES

New England Wire Technologies is a pioneer and leading designer and manufacturer of Litz wire and specialty winding wire. Litz wire conductors are beneficial for reducing A.C. losses in high frequency windings. New England Wire offers many Litz wire constructions with multiple layers of insulation to meet voltage withstand requirements of UL and IEC.

Our NE-F1 Class F (155° C) Electrical Insulation Systems featuring NEWind® Specialty Winding Wires meets UL 1446 Electrical Insulation System. These high performance products eliminate the need for long term component testing and allow the development of unique solutions to your most complex design challenges, making them ideal for transformer, motor and coil applications.

LITZ WIRE TYPES & CONSTRUCTION

Round Type 1

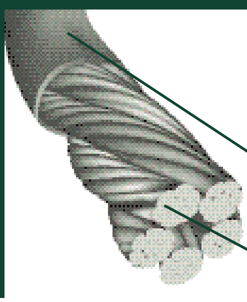


Type 1 Litz construction features a single twisting operation with optional outer insulation.

Outer insulation of textile yarn, tape or extruded compounds.

Single film-insulated wire strand.

Round Type 2

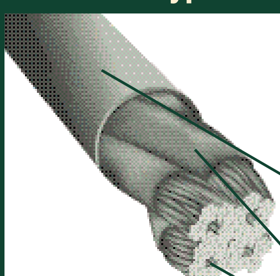


Type 2 Litz construction features bundles of twisted wire twisted together with optional outer insulation.

Outer insulation of textile yarn, tape or extruded compounds.

Bundles of Type 1 Litz wire.

Round Type 3



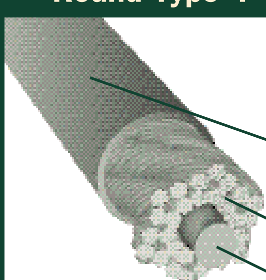
Type 3 Litz construction features insulated bundles of twisted wire twisted together with optional outer insulation.

Outer insulation of textile yarn, tape or extruded compounds.

Individually insulated bundles.

Bundles of Type 2 Litz wire.

Round Type 4



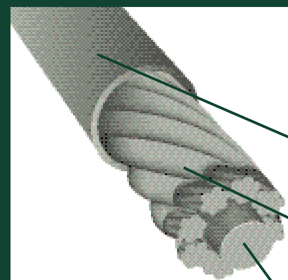
Type 4 Litz construction features bundles of twisted wire twisted together around a central fiber core.

Outer insulation of textile yarn, tape or extruded compounds.

Bundles of Type 2 Litz wire.

Fiber core.

Round Type 5



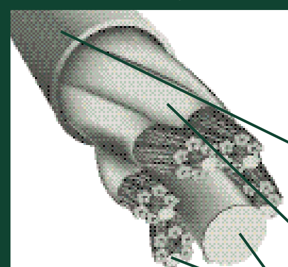
Type 5 Litz construction features insulated bundles of Type 2 Litz wire twisted around a fiber core.

Optional outer insulation of textile yarn, tape or extruded compounds.

Individually insulated bundles of Type 2 Litz wire.

Fiber core.

Round Type 6



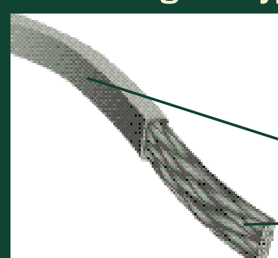
Type 6 Litz construction features insulated bundles of Type 4 Litz wire twisted around a fiber core.

Optional outer insulation of textile yarn, tape or extruded compounds.

Bundles of Type 4 Litz wire insulated with nylon serving.

Fiber cores.

Rectangular Type 7

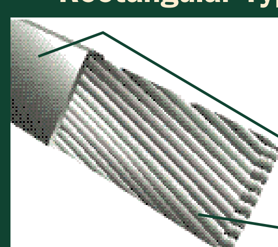


Type 7 Litz construction features insulated wire braided and formed into rectangular profile.

Optional outer insulation of textile yarn, tape or extruded compounds.

Braided film-insulated wire.

Rectangular Type 8



Type 8 Litz construction features insulated strands twisted and compressed into rectangular profile.

Optional outer insulation of textile yarn, tape or extruded compounds.

Compacted film-insulated wires or compacted groups.

www.newenglandwire.com

Tel: 603.838.6624

Litz Wire

For optimum performance, the Litz constructions covered in this section are made with individually insulated strands. Common magnet wire film insulations such as: polyvinylformal, polyurethane, polyurethane/nylon; solderable polyester, solderable polyester/nylon, polyester/polyamide-imide, and polyimide are normally used. The outer insulation and the insulation on the component conductors, in some styles, may be servings or braids of nylon, cotton, Nomex[1], fiberglass or ceramic. Polyester, heat sealed polyester, polyimide and PTFE tape wraps along with extrusions of most thermoplastics are also available as outer insulation if the applications dictate special requirements for voltage breakdown or environmental protection.

Litz Design

Typically, the design engineer requiring the use of Litz knows the operating frequency and RMS current required for the application. Since the primary benefit of a Litz conductor is the reduction of A.C. losses, the first consideration in any Litz design is the operating frequency. The operating frequency not only influences the actual Litz construction, but is also used to determine the individual wire gauge.

Ratios of alternating-current resistance to direct-current resistance for an isolated solid round wire (H) in terms of a value (X) are shown in Table 1.

Table 1

X	0	0.5	0.6	0.7	0.8	0.9	1.0
H	1.0000	1.0003	1.0007	1.0012	1.0021	1.0034	1.005

The value of X for copper wire is determined by Formula 1.

FORMULA 1

$$X = 0.271\, D_M \sqrt{F_{MHZ}}$$

Where: D_M = Wire diameter in mils
F_{MHZ} = Frequency in Megahertz

From Table 1 and other empirical data the following table of recommended wire gauges vs. frequency for most Litz constructions has been prepared.

Table 2

FREQUENCY	RECM'D WIRE GAUGE	NOM. DIA. OVER COPPER	DC RES. OHMS/M' (MAX)	SINGLE STRAND R_{ac}/R_{dc} "H"
60 HZ to 1 KHZ	28 AWG	.0126	66.37	1.0000
1 KHZ to 10 KHZ	30 AWG	.0100	105.82	1.0000
10 KHZ to 20 KHZ	33 AWG	.0071	211.70	1.0000
20 KHZ to 50 KHZ	36 AWG	.0050	431.90	1.0000
50 KHZ to 100 KHZ	38 AWG	.0040	681.90	1.0000
100 KHZ to 200 KHZ	40 AWG	.0031	1152.3	1.0000
200 KHZ to 350 KHZ	42 AWG	.0025	1801.0	1.0000
350KHZ to 850 KHZ	44 AWG	.0020	2873.0	1.0003
850 KHZ to 1.4 MHZ	46 AWG	.0016	4544.0	1.0003
1.4MHZ to 2.8 MHZ	48 AWG	.0012	7285.0	1.0003

After the individual wire gauge has been determined and assuming that the Litz construction has been designed such that each strand tends to occupy all possible positions in the cable to approximately the same extent, the ratio of A.C. to D.C. resistance of an isolated Litz conductor can be determined from the following formula.

FORMULA 2[2]

$$\frac{\text{Resistance to Alternating Current}}{\text{Resistance to Direct Current}} = H + K\left(\frac{N\,D_I}{D_O}\right)^2 G$$

[1] DuPont Registered Trademark
[2] See Radio Engineers Handbook - Terman, pp. 30-83.

Where: H = Resistance ratio of individual strands when isolated (taken from Table 1 or 2)

G = Eddy-current basis factor = $\left(\frac{D_I\sqrt{F}}{10.44}\right)^4$

F = Operating frequency in HZ

N = Number of strands in the cable

D_I = Diameter of the individual strands over the copper in inches

D_O = Diameter of the finished cable over the strands in inches

K = Constant depending on N, given in the following table

N	3	9	27	Infinity
K	1.55	1.84	1.92	2

The D.C. resistance of a Litz conductor is related to the following parameters:

1. AWG of the individual strands.
2. Number of strands in the cable.
3. Factors relating to the increased length of the individual strands per unit length of cable (take-up). For normal Litz constructions a 1.5% increase in D.C. resistance for every bunching operation and a 2.5% increase in D.C. resistance for every cabling operation are approximately correct.

The formula derived from these parameters for the D.C. resistance of any Litz construction is:

FORMULA 3

$$R_{DC} = \frac{R_S(1.02)^{N_B}\ (1.03)^{N_C}}{N_S}$$

Where: R_{DC} = Resistance in Ohms/1000 ft.

R_S = Maximum D.C. resistance of the individual strands (taken from Table 2)

N_B = Number of bunching operations

N_C = Number of cabling operations

N_S = Number of individual strands

Following is an example of the calculations required to evaluate a Type 2 Litz construction consisting of 450 strands of 40 AWG single-film polyurethane-coated wire operating at 100 KHZ. This construction, designed with two bunching operations and one cabling operation, would be written 5x3/30/40 (NEW uses “x” to indicate a cabling operation and “/” to indicate a bunching operation.)

1. Calculate the D.C. resistance of the Litz construction using formula 3.

$$R_{DC} = \frac{1152.3x(1.015)^2 x(1.025)^1}{450} = 2.70 \text{ ohms}/1000'$$

2. Calculate the A.C. to D.C. resistance ratio using formula 2.

$$\frac{R_{AC}}{R_{DC}} = 1.0000 + 2\left(\frac{450 \times 0.0031}{0.094}\right)^2 (7.8x10^{-6}) = 1.0344$$

3. The A.C. resistance is, therefore, 1.0344 x 2.70 or 2.79 ohms/1000 ft.

The value of Litz can easily be seen if the above example is compared with a solid round wire with equivalent cross sectional area, 65.8 mils in diameter. Using the same operating parameters, the D.C. resistance is 2.395 ohms/1000 ft. However, the A.C./D.C. resistance ratio increases to approximately 21.4 making the A.C. resistance 51.3 ohms/1000 ft.

The following tables list examples of Litz constructions which can be manufactured by New England Wire Technologies. These are categorized by operating frequency and by equivalent AWG size. Round, braided and rectangular Litz conductors are shown separately to provide the greatest possible selection for any design application.

Round Litz

Litz constructions Types 1 through 6 are all designed to be round and vary from a simple bunch of conductors (Type 1) to complex designs utilizing multiple cores and several manufacturing operations (Type 6).

The smaller constructions of Litz Types 1 and 2 are typically used in High Q circuitry, such as toroidal coils and transformers. The larger Type 2 and 3 Litz designs have greater current carrying capacities necessary for high frequency power supply, inverter and grounding applications. Type 4, 5 and 6 Litz constructions all utilize at least one inert core and are used primarily in tuning circuitry for high power radio transmitters.

Equivalent AWG	Circular Mil Area	Number of Wires	AWG of Wire	Film Coating[1]	Construction Type	Outer Insulation[2]	Nominal OD	Nominal LBS./1000 FT.	Direct Current Resistance OHM/1000 FT^	Construction
RECOMMENDED OPERATING FREQUENCY - 60 HZ TO 1 KHZ										
24	476	3	28	S	1	-	.027	1.49	22.570	3/28
22	794	5	28	S	1	-	.035	2.49	13.540	5/28
20	1112	7	28	S	1	-	.042	3.49	9.670	7/28
18	1588	10	28	S	1	-	.050	4.99	6.770	10/28
16	2700	17	28	S	1	SN	.065	8.68	3.980	17/28
14	4129	26	28	S	1	SN	.080	13.23	2.600	26/28
12	6670	42	28	S	1	SN	.102	21.28	1.610	42/28
10	10480	66	28	S	2	SN	.140	34.02	1.060	3X22/28
8	16674	105	28	S	2	SN	.177	54.01	.660	3X35/28
6	26202	165	28	S	2	SN	.222	86.59	.420	5X33/28
4	42240	266	28	S	2	DN	.285	141.87	.260	7X38/28
2	66696	420	28	S	2	DN	.431	227.39	.170	5X3X28/28
1/0	105602	665	28	S	2	SNB	.537	366.00	.110	7X5X19/28
2/0	133392	840	28	S	5	SNB	.657	480.00	.084	6(5X28/28)
3/0	171504	1080	28	S	5	SNB	.787	634.00	.065	9(5X24/28)
4/0	217238	1368	28	S	5	SNB	.941	828.00	.051	12(3X38/28)
RECOMMENDED OPERATING FREQUENCY - 1 HZ TO 10 KHZ										
26	300	3	30	S	1	-	.022	.95	35.980	3/30
24	500	5	30	S	1	-	.028	1.58	21.590	5/30
22	700	7	30	S	1	-	.033	2.21	15.420	7/30
20	1100	11	30	S	1	-	.045	3.47	9.810	11/30
18	1700	17	30	S	1	SN	.055	5.52	6.350	17/30
16	2600	26	30	S	1	SN	.064	8.38	4.150	26/30
14	4200	42	30	S	1	SN	.082	13.48	2.570	42/30
12	6500	65	30	S	2	SN	.112	21.21	1.710	5X13/30
10	11000	110	30	S	2	SN	.145	35.75	1.010	5X22/30
8	16800	168	30	H	2	-	.191	55.03	.660	7X24/30
7	25900	259	30	H	2	-	.237	84.83	.430	7X37/30
6	26600	266	30	H	2	-	.240	87.13	.420	7X38/30
4	41300	413	30	H	2	-	.300	138.27	.270	7X59/30
3	52500	525	30	H	2	-	.338	171.96	.210	7X75/30
2	66500	665	30	H	2	-	.380	217.81	.170	7X95/30
2	80500	805	30	H	2	DN	.421	272.95	.140	7X115/30
1/0	125000	1250	30	S	2	SNB	.631	435.00	.090	5X5X50/30
2/0	135000	1350	30	S	5	SNB	.667	486.00	.083	6(5X45/30)
3/0	195000	1950	30	S	5	SNB	.794	697.00	.057	6(5X5X13/30)
4/0	252000	2520	30	S	5	SNB	.981	916.00	.045	6(5X3X28/30)

1. S = single-film coating thickness
   H = heavy-film coating thickness
2. SN = single nylon serving
   DN = double nylon serving
   SNB = single nylon braid
   PVC = extruded polyvinylchloride

^ Not for specification purposes.

All measurements are in inches unless otherwise stated.

NEW ENGLAND WIRE TECHNOLOGIES
Innovate. Create. Accelerate.

Round Litz, *continued*

Equivalent AWG	Circular Mil Area	Number of Wires	AWG of Wire	Film Coating[1]	Construction Type	Outer Insulation[2]	Nominal OD	Nominal LBS/1000 FT	Direct Current Resistance OHMS/1000 FT^	Construction
RECOMMENDED OPERATING FREQUENCY - 10 KHZ TO 20 KHZ										
26	303	6	33	S	1	SN	.025	1.00	35.990	6/33
24	403	8	33	S	1	-	.025	1.27	26.990	8/33
22	655	13	33	S	1	SN	.035	2.13	16.610	13/33
20	1059	21	33	S	1	SN	.044	3.41	10.280	21/33
18	1613	32	33	S	1	SN	.054	5.24	6.750	32/33
16	2672	53	33	S	1	SN	.066	8.59	4.070	53/33
14	5041	100	33	S	2	SN	.099	16.44	2.220	5X20/33
12	7562	150	33	S	2	SN	.121	24.60	1.480	5X30/33
10	10586	210	33	S	2	SN	.143	34.36	1.060	3X70/33
8	16585	329	33	S	2	DN	.175	55.20	.680	7X47/33
6	26465	525	33	S	2	DN	.237	92.03	.440	5X3X35/33
4	42849	850	33	S	2	DN	.302	147.14	.270	5X5X34/33
2	66541	1320	33	S	5	SNB	.484	244.00	.171	6(5X44/33)
1	90738	1800	33	S	5	SNB	.558	334.00	.127	6(3/5/20/33)
1/0	105861	2100	33	S	5	SNB	.600	383.00	.107	6(5/70/33)
2/0	136107	2700	33	S	5	SNB	.675	496.00	.084	6(5X3/30/33)
3/0	169377	3360	33	S	5	SNB	.850	651.00	.067	12(5X56/33)
4/0	211772	4200	33	S	5	SNB	.987	841.00	.054	14(5X3/20/33)
-	299435	5940	33	S	6	PVC	1.290	1255.00	.038	6(6(5/33/33))
-	512972	10176	33	S	6	PVC	1.800	2283.00	.022	8(6(4X53/33))
-	725904	14400	33	S	6	PVC	2.420	3550.00	.016	15(6(5X32/33))
-	917462	18200	33	S	6	PVC	3.120	5088.00	.012	20(13(70/33))
-	1572792	31200	33	S	6	PVC	3.990	8684.00	.007	20(6(5/52/33))
RECOMMENDED OPERATING FREQUENCY - 20 KHZ TO 50 KHZ										
30	100	4	36	S	1	-	.013	.318	110.100	4/36
28	175	7	36	S	1	-	.017	.557	62.900	7/36
26	250	10	36	S	1	SN	.023	.839	44.050	10/36
24	400	16	36	S	1	SN	.029	1.340	27.530	16/36
22	675	27	36	S	1	SN	.037	2.220	16.320	27/36
20	1025	41	36	S	1	SN	.044	3.350	10.740	41/36
18	1625	65	36	S	2	SN	.059	5.440	6.980	5X13/36
16	2625	105	36	S	2	SN	.074	8.740	4.320	3X35/36
14	4125	165	36	S	2	SN	.092	13.660	2.750	5X33/36
12	6625	265	36	S	2	SN	.116	21.830	1.710	5X53/36
10	10500	420	36	S	2	DN	.158	35.630	1.110	5X3X28/36
8	16500	660	36	S	2	DN	.197	59.010	.710	5X3X44/36
6	26250	1050	36	S	2	DN	.247	92.450	.450	5X5X42/36
4	45000	1800	36	S	2	DN	.322	156.420	.260	5X5X72/36
2	66500	2660	36	S	2	DN	.373	228.670	.180	7X5X76/36
1	84000	3360	36	S	5	SNB	.548	318.000	.140	6(5X4X28/36)
1/0	108000	4320	36	S	5	SNB	.655	420.000	.109	9(5X3X32/36)
2/0	135000	5400	36	S	5	SNB	.728	522.000	.087	9(5X3X40/36)
3/0	171000	6840	36	S	5	SNB	.870	682.000	.069	12(5X3X38/36)
4/0	211500	8460	36	S	5	SNB	.962	840.000	.055	12(5X3X47/36)

1 S = single-film coating thickness
H = heavy-film coating thickness

2 SN = single nylon serving
DN = double nylon serving
SNB = single nylon braid
PVC = extruded polyvinylchloride

^ Not for specification purposes.

All measurements are in inches unless otherwise stated.

Round Litz, *continued*

Equivalent AWG	Circular Mil Area	Number of Wires	AWG of Wire	Film Coating[1]	Construction Type	Outer Insulation[2]	Nominal OD	Nominal LBS/1000 FT	Direct Current Resistance OHMS/1000 FT^	Construction
RECOMMENDED OPERATING FREQUENCY - 50 KHZ TO 100 KHZ										
30	112	7	38	S	1	SN	.017	.380	99.360	7/38
28	160	10	38	S	1	SN	.019	.542	69.550	10/38
26	256	16	38	S	1	SN	.024	.850	43.470	16/38
24	400	25	38	S	1	SN	.029	1.320	27.820	25/38
22	640	40	38	S	1	SN	.036	2.060	17.390	40/38
20	1056	66	38	S	1	SN	.045	3.380	10.750	3/22/38
18	1600	100	38	S	2	SN	.059	5.250	7.160	5X20/38
16	2592	162	38	S	2	SN	.069	8.270	4.380	3/54/38
14	4160	260	38	S	2	SN	.093	13.470	2.760	5X52/38
12	6720	420	38	S	2	SN	.117	21.690	1.740	5X3/28/38
10	10560	660	38	S	2	DN	.149	33.980	1.110	5X3/44/38
8	16800	1050	38	S	2	DN	.200	58.940	.700	5X5X42/38
6	26400	1650	38	S	2	DN	.249	91.200	.450	5X5X66/38
4	42000	2625	38	S	2	DN	.320	143.450	.290	5X5X3/35/38
2	66240	4140	38	S	5	SNB	.494	247.000	.180	6(5X3/46/38)
1	84000	5250	38	S	5	SNB	.551	311.000	.141	6(5X5X35/38)
1/0	105600	6600	38	S	5	SNB	.613	389.000	.112	6(5X5X44/38)
2/0	136000	8500	38	S	5	SNB	.749	522.000	.087	10(5X5X34/38)
3/0	168000	10500	38	S	5	SNB	.828	642.000	.070	10(5X5X42/38)
4/0	211200	13200	38	S	5	SNB	.966	824.000	.056	12(5X5X44/38)
RECOMMENDED OPERATING FREQUENCY - 100 KHZ TO 200 KHZ										
34	38.4	4	40	S	1	-	.008	.127	293.840	4/40
32	67.3	7	40	S	1	-	.011	.221	167.910	7/40
30	106.0	11	40	S	1	SN	.016	.379	106.850	11/40
28	163.0	17	40	S	1	SN	.020	.580	69.140	17/40
26	260.0	27	40	S	1	SN	.024	.897	43.530	27/40
24	404.0	42	40	S	1	SN	.029	1.397	27.980	42/40
22	634.0	66	40	S	2	SN	.038	2.197	18.340	3X22/40
20	1036.0	108	40	S	2	SN	.045	3.492	11.100	3/36/40
18	1634.0	170	40	S	2	SN	.056	5.537	7.050	5/34/40
16	2595.0	270	40	S	2	SN	.069	8.809	4.530	3/3/30/40
14	4180.0	435	40	S	2	SN	.093	14.264	2.840	5X3/29/40
12	6727.0	700	40	S	2	SN	.126	23.371	1.780	5X5X28/40
10	10571.0	1100	40	S	2	SN	.157	36.608	1.130	5X5X44/40
8	17298.0	1800	40	S	5	DN	.236	66.600	.700	6(5X3/20/40)
6	26812.0	2790	40	S	5	DN	.293	103.000	.451	6(5X3/31/40)
4	42813.0	4455	40	S	5	SNB	.431	176.000	.282	9(5X3/33/40)
2	69192.0	7200	40	S	5	SNB	.572	290.000	.174	12(5X3/40/40)
1/0	105710.0	11000	40	S	5	SNB	.668	428.000	.114	10(5X5X44/40)

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Round Litz, *continued*

Equivalent AWG	Circular Mil Area	Number of Wires	AWG of Wire	Film Coating[1]	Construction Type	Outer Insulation[2]	Nominal OD	Nominal LBS/1000 FT.	Direct Current Resistance OHMS/1000 FT^	Construction
RECOMMENDED OPERATING FREQUENCY - 200 KHZ TO 350 KHZ										
36	25	4	42	S	1	-	.006	.079	459.260	4/42
34	44	7	42	S	1	SN	.012	.169	262.430	7/42
32	63	10	42	S	1	SN	.013	.228	183.700	10/42
30	100	16	42	S	1	SN	.016	.346	114.810	16/42
28	163	26	42	S	1	SN	.019	.542	70.650	26/42
26	250	40	42	S	1	SN	.023	.829	45.930	40/42
24	413	66	42	S	2	SN	.029	1.370	28.390	3/22/42
22	656	105	42	S	2	SN	.036	2.130	17.850	5/21/42
20	1031	165	42	S	2	SN	.045	3.330	11.360	5/33/42
18	1688	270	42	S	2	SN	.060	5.580	7.150	5X3/18/42
16	2625	420	42	S	2	SN	.074	8.630	4.600	5X3/28/42
14	4125	660	42	S	2	SN	.092	13.490	2.920	5X3/44/42
12	6563	1050	42	S	2	DN	.127	21.820	1.860	5X5X42/42
10	10687	1710	42	S	5	DN	.185	40.300	1.150	6(5X3/19/42)
8	16875	2700	42	S	5	DN	.231	63.000	.729	6(5X3/30/42)
6	26250	4200	42	S	5	DN	.287	97.100	.468	6(5X5/28/42)
4	42188	6750	42	S	5	SNB	.434	169.000	.291	10(5X3/45/42)
2	67500	10800	42	S	5	SNB	.561	272.000	.182	12(5X5/36/42)
RECOMMENDED OPERATING FREQUENCY - 350 KHZ TO 850 KHZ										
38	16	4	44	S	1	-	.005	.050	732.620	4/44
36	28	7	44	S	1	SN	.010	.118	418.640	7/44
34	40	10	44	S	1	SN	.011	.156	293.050	10/44
32	64	16	44	S	1	SN	.013	.230	183.150	16/44
30	100	25	44	S	1	SN	.016	.342	117.220	25/44
28	160	40	44	S	1	SN	.019	.529	73.260	40/44
26	264	66	44	S	2	SN	.024	.874	45.290	3/22/44
24	420	105	44	S	2	SN	.029	1.380	28.470	3/35/44
22	640	160	44	S	2	SN	.035	2.060	18.680	5/32/44
20	1020	255	44	S	2	SN	.044	3.250	11.720	5/51/44
18	1620	405	44	S	2	SN	.058	5.310	7.600	5X3/27/44
16	2600	650	44	S	2	SN	.072	8.470	4.740	5X5/26/44
14	4200	1050	44	S	2	SN	.094	13.870	2.960	5X5X42/44
12	6600	1650	44	S	2	DN	.120	22.010	1.920	5X5X3/22/44
10	10500	2625	44	S	2	DN	.149	34.810	1.210	5X5X3/35/44
8	16800	4200	44	S	5	DN	.226	62.000	.747	6(5X5/28/44)

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Round Litz, *continued*

Equivalent AWG	Circular Mil Area	Number of Wires	AWG of Wire	Film Coating[1]	Construction Type	Outer Insulation[2]	Nominal OD	Nominal LBS/1000 FT	Direct Current Resistance OHMS/1000 FT^	Construction
RECOMMENDED OPERATING FREQUENCY - 850 KHZ TO 1.4 MHZ										
38	17.3	7	46	S	1	-	.005	.054	662.13	7/46
36	24.7	10	46	S	1	SN	.009	.108	463.49	10/46
34	39.5	16	46	S	1	SN	.011	.155	289.68	16/46
32	64.2	26	46	S	1	SN	.013	.232	178.26	26/46
30	101.0	41	46	S	1	SN	.016	.349	113.05	41/46
28	163.0	66	46	S	2	SN	.019	.554	71.63	3/22/46
26	259.0	105	46	S	2	SN	.023	.865	45.02	3/35/46
24	408.0	165	46	S	2	SN	.029	1.350	28.65	5/33/46
22	667.0	270	46	S	2	SN	.038	2.200	18.03	3X3/30/46
20	1038.0	420	46	S	2	SN	.047	3.400	11.59	5X3/28/46
18	1630.0	660	46	S	2	SN	.058	5.380	7.38	5X3/44/46
16	2593.0	1050	46	S	2	SN	.072	8.480	4.64	5X5/42/46
14	4261.0	1725	46	S	2	DN	.094	14.440	2.91	5X5X3/23/46
12	6669.0	2700	46	S	2	DN	.120	22.400	1.86	5X5X3/36/46
10	10745.0	4350	46	S	5	DN	.191	40.500	1.14	6(5X5/29/46)
RECOMMENDED OPERATING FREQUENCY - 1.4 MHZ TO 2.8 MHZ										
42	7.7	5	48	S	1	-	.004	.246	1486.14	5/48
40	10.8	7	48	S	1	SN	.007	.034	1061.53	7/48
38	18.5	12	48	S	1	SN	.009	.090	619.23	12/48
36	27.7	18	48	S	1	SN	.010	.120	412.82	18/48
34	40.0	26	48	S	1	SN	.011	.159	285.80	26/48
32	69.3	45	48	S	1	SN	.014	.252	165.13	45/48
30	102.0	66	48	S	2	SN	.016	.356	114.84	3/22/48
28	162.0	105	48	S	2	SN	.020	.560	71.18	5/21/48
26	277.0	180	48	S	2	SN	.026	.955	42.52	5X36/48
24	462.0	300	48	S	2	SN	.031	1.560	25.77	5/3/20/48
22	647.0	420	48	S	2	SN	.036	2.160	18.41	5/3/28/48
20	1040.0	675	48	S	2	SN	.048	3.470	11.57	5X3/45/48
18	1694.0	1100	48	S	2	SN	060	5.680	7.10	5X5/44/48
16	2657.0	1725	48	S	2	SN	.074	9.350	4.62	5X5/3/23/48
14	4158.0	2700	48	S	2	SN	.093	14.600	2.95	5X5/3/36/48
12	6930.0	4500	48	S	5	DN	.159	26.900	1.77	6(5X5/30/48)

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