

Essex[®] Magnet Wire / Winding Wire

Fine Wire & Ultra Fine Wire Copper Products

Sizes 30 AWG – 54.5 AWG

0,254mm – 0,0149mm



Essex® Fine Wire Copper Products

Thermal Class	NEMA Designation	IEC Designation	Product Name		Insulation
			North America / Far East	Europe / Far East	
105°C	MW 15	IEC 60317-1	Formvar	–	Polyvinyl Acetal
155°C	MW 136	–	Soderbond® N / 155	–	Polyurethane / Nylon / Butvar
155°C	MW 131	IEC 60317-35	–	Magnebond® UV-155	Polyurethane / Polyvinylbutyral
155°C	MW 131	IEC 60317-35	–	Magnebond® UL-155	Polyurethane / Aliphatic Polyamide
155°C	MW 79	IEC 60317-20	Soderex® / 155	Magnesol® U-155	Polyurethane
155°C	MW 80	IEC 60317-21	Soderon® / 155	Magnesol® UN-155	Polyurethane / Polyamide
180°C	–	IEC 60317-37	–	Magnebond® CL-180	THEIC Polyesterimide / Aliphatic Polyamide
180°C	–	IEC 60317-35	–	Magnebond® UL-180	Polyurethane / Aliphatic Polyamide
180°C	MW 30, MW 72	IEC 60317-8	–	Magnetemp® C-180	THEIC Polyesterimide
180°C	MW 77	IEC 60317-23	Solidex®	Magnesol® E-180	Solderable Polyester(imide)
180°C	MW 78	–	Solidon®	Magnesol® EN-180	Solderable Polyester(imide) / Polyamide
180°C	MW 82	IEC 60317-51	Soderex® / 180	Magnesol® U-180	Polyurethane
180°C	MW 83	IEC 60317-55	Soderon® / 180	Magnesol® UN-180	Polyurethane / Polyamide
180°C	Reference MW1000 for dimension data only *	–	Polybondex®	–	Modified Polyester / (with or without Polyamideimide) / Bondcoat
200°C	MW 35, MW 73	IEC 60317-13	GP/MR-200®	Magnetemp® CA-200	THEIC Polyester or Polyester(imide) / Polyamideimide
200°C	MW 74	IEC 60317-42	Thermalex 200®	–	THEIC Polyester
200°C	–	IEC 60317-38	–	Magnebond® CAB-200	THEIC Polyesterimide / Polyamide-imide / Aromatic Polyamide
220°C	MW 81	IEC 60317-26	AI	Magnetemp® A-220	Polyamideimide
240°C	MW 16	IEC 60317-46	Allex®	Magnetemp® Y-240	Polyimide

Note:

1. Special builds, additional sizes and colors available upon request. For additional details or specific requests, please contact Essex Magnet Wire Marketing at finewire@spsx.com or by one of the phone numbers listed on the back of this brochure.
2. Products listed are UL recognized with the exception of Formvar.

* MW 102 for Polybondex® Bond E and Bond S products.

Characteristics	Applications
Excellent flexibility, adhesion, and abrasion scrape resistance. Good thermal shock resistance.	Oil-filled transformers, motors, solenoids.
Excellent bond strength at room temperature.	Helical and toroidal coils, solenoid coils, voice coils.
Very low bonding temperature (low energy), solvo-bonding can be used, excellent performance for ultra-fine applications.	Watch coils, sensors for medical, optics, acoustic measurement equipment, hearing aids.
Bonding at low temperature and good solderability.	Small motors, electromagnetic coils.
Polyurethane insulation allows soldering without prior removal of the film from the wire. Excellent resistance to moisture and most common solvents. Excellent solderability and elevated thermal properties.	Appliance motors, relays, timers and clock coils, encapsulated coils, bobbin wound coils, small motors, automotive coils, toroidal coils.
Same characteristics as Soderex with the advantages of a nylon topcoat. The nylon topcoat helps provide improvement in the windability and tolerates more severe winding operations.	Appliance motors, relays, timers and clock coils, encapsulated coils, bobbin wound coils, small motors, toroidal coils, transformers, components for automotive.
High thermal properties, good chemical resistance, low bonding temperature.	Small motors, RFID coils.
Bonding at low temperature and good solderability.	Deflection yokes for monitors, small motors, electromagnetic coils.
High thermal properties, good chemical resistance.	Small motors, ignition coils, transformers.
Soderability is coupled with a need for high thermal resistance.	Automotive controls, relays, ABS coils, ignition coils, solenoids, appliance controls, coils, small motors, small transformers.
Good solderability at high temperatures. Enhanced by addition of a polyamide overcoat. Excellent resistance to thermal stress.	Applications submitted to high thermal stresses: automotive components, ignition coils, small motors, solenoids, appliance controls, small transformers.
Designed for applications requiring both high thermal resistance and low soldering temperatures.	Relays, automotive coils, specialty power transformers, appliance controls, automotive controls, solenoids, motors.
Designed for applications requiring both high thermal resistance and low soldering temperatures. The nylon topcoat helps provide improvement in the windability and tolerates more severe winding operations.	Bobbin wound and paper section coils, molded and encapsulated coils, small motors, armatures and fields, toroidal coils, linear motors, relays, transformers, watch coils, components for automotive, ignition coils.
Different constructions of bondable wire having a GP/MR-200® or Thermalex 200® base insulation with a thermoplastic bondcoat. Bondcoat allows the use of resistance, induction, or radiant heating to flow the bond.	Armatures, bobbinless coils, brake, clutch and ignition coils, motors, relays, sensors, solenoids, stators, transformers.
Standard of excellence for motor repair with high moisture resistance and ease of insertion. Film insulation has physical toughness, excellent dielectric properties, and superior chemical resistance to common solvents and refrigerants.	Applications submitted to high stresses (thermal, chemical and/or mechanical). Fractional and integral horsepower motors, hermetic motors, DC motors, automotive alternators and generators, power tool motors, dry type transformers (Class 105 through 200).
Thermally stable, modified polyester film and has excellent physical, chemical and electrical properties for small coils operating at high temperatures.	Small appliance and power tool motors, continuous operation coils, encapsulated coils, sub-fractional instrument and servo-motors, DC motors, fractional and integral horsepower motors.
High bonding strength and high resoftening temperature.	Stators and rotors, dry transformers.
Provides unsurpassed scrape and abrasion resistance. The combination of high moisture and chemical resistance makes it suited for the most demanding of applications. Excellent resistance to thermal and chemical stresses.	Applications submitted to high thermal stress or to radiations especially, adapted to nuclear needs. Fractional and integral horsepower motors, high temperature continuous duty coils and relays, hermetic and sealed units, heavy duty hand tool motors, encapsulated coils.
Exceptional resistance to chemical solvents and burn-out, outstanding thermoplastic flow and ability to withstand excessive overloads in extreme conditions. Excellent resistance to thermal and chemical stresses.	Aerospace, nuclear, medical, fractional and integral horsepower motors, high temperature continuous duty coils and relays, hermetic and sealed units, heavy duty hand tool motors, encapsulated coils. Used when particularly high thermal resistance is required: special relays, transformers, generators, motors.

All Fine Wire Products are exclusively subject to Essex's product warranties set forth in Essex's Standard Terms and Conditions of Sale Pertaining to Magnet/Winding Wire Products and Services which can be located on Essex's website at www.superioressex.com.

The information provided in this chart is provided for convenience only and is intended to identify products available within the corresponding thermal classes and NEMA and IEC designations. No representations or comparisons as to the quality, attributes, reliability or performance of the listed products are intended or expressed.

IEC Dimensional Characteristics

Bare Wire Diameter				Standard Enameled Copper wire						Bondable Enameled Copper Wire					
Nom. Dia.	Tolerance +/-	Section	Mass	Resistance at 20°C			Grade 1		Grade 2		Grade 3		Min Inc. Bonding Layer	Grade 1B	Grade 2B
				Nom.	Max	Insulation Thickness	Max Dia.	Insulation Thickness	Max Dia.	Insulation Thickness	Max Dia.	Max Dia.			
(mm)	(mm)	(mm ²)	(g/m)	(Ohm/m)	(Ohm/m)	(Ohm/m)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	
0,200	+/-0.003	0,03142	0,27930	0,5237	0,5441	0,5657	0,014	0,226	0,027	0,239	0,039	0,252	0,011	0,243	0,256
0,190	+/-0.003	0,02835	0,25210	0,5794	0,6029	0,6278	0,014	0,216	0,027	0,228	0,039	0,240	0,011	0,233	0,245
0,180	+/-0.003	0,02545	0,22620	0,6444	0,6718	0,7007	0,013	0,204	0,025	0,217	0,036	0,229	0,010	0,220	0,233
0,170	+/-0.003	0,02270	0,20180	0,7211	0,7531	0,7871	0,013	0,194	0,025	0,205	0,036	0,217	0,010	0,210	0,221
0,160	+/-0.003	0,02011	0,17870	0,8122	0,8502	0,8906	0,012	0,182	0,023	0,194	0,033	0,205	0,010	0,197	0,209
0,150	+/-0.003	0,01767	0,15710	0,9219	0,9673	1,015	0,012	0,171	0,023	0,182	0,033	0,193	0,010	0,186	0,197
0,140	+/-0.003	0,01539	0,13690	1,055	1,110	1,170	0,011	0,160	0,021	0,171	0,030	0,181	0,010	0,175	0,186
0,132	+/-0.003	0,01368	0,12170	1,184	1,249	1,319	0,011	0,152	0,021	0,162	0,030	0,171	0,010	0,167	0,177
0,125	+/-0.003	0,01227	0,10910	1,317	1,393	1,475	0,010	0,144	0,019	0,154	0,028	0,163	0,009	0,158	0,168
0,118	+/-0.003	0,01094	0,09720	1,474	1,563	1,660	0,010	0,136	0,019	0,145	0,028	0,154	0,009	0,150	0,159
0,112	+/-0.003	0,00985	0,08760	1,632	1,735	1,848	0,009	0,130	0,017	0,139	0,026	0,147	0,008	0,143	0,152
0,106	+/-0.003	0,00882	0,07850	1,816	1,937	2,069	0,009	0,123	0,017	0,132	0,026	0,140	0,008	0,136	0,145
0,100	+/-0.003	0,00785	0,06980	2,034	2,176	2,333	0,008	0,117	0,016	0,125	0,023	0,132	0,007	0,129	0,137
0,095	+/-0.003	0,00709	0,06300	2,247	2,412	2,594	0,008	0,111	0,016	0,119	0,023	0,126	0,007	0,123	0,131
0,090	+/-0.003	0,00636	0,05660	2,495	2,687	2,900	0,008	0,105	0,015	0,113	0,022	0,120	0,007	0,117	0,125
0,085	+/-0.003	0,00567	0,05040	2,787	3,012	3,265	0,008	0,100	0,015	0,107	0,021	0,114	0,007	0,112	0,119
0,080	+/-0.003	0,00503	0,04470	3,133	3,401	3,703	0,007	0,094	0,014	0,101	0,020	0,108	0,007	0,105	0,112
0,075	+/-0.003	0,00442	0,03930	3,547	3,869	4,235	0,007	0,089	0,014	0,095	0,020	0,102	0,007	0,100	0,106
0,071	+/-0.003	0,00396	0,03520	3,941	4,318	4,747	0,007	0,084	0,012	0,091	0,018	0,098	0,006	0,094	0,101
0,067	+/-0.003	0,00353	0,03130	4,484	4,461	5,236	0,007	0,080	0,012	0,088	0,018	0,095	0,006	0,090	0,098
0,063		0,00312	0,02770	5,045	5,484	5,922	0,006	0,076	0,012	0,083	0,017	0,090	0,005	0,085	0,092
0,060		0,00283	0,02510	5,502	6,046	6,590	0,006	0,072	0,012	0,079	0,016	0,085	0,005	0,081	0,088
0,056		0,00246	0,02190	6,316	6,94	7,565	0,005	0,067	0,011	0,074	0,015	0,081	0,005	0,075	0,082
0,053		0,00221	0,01960	7,051	7,748	8,446	0,005	0,064	0,011	0,070	0,015	0,076	0,005	0,072	0,078
0,050		0,00196	0,01750	7,922	8,706	9,489	0,005	0,060	0,010	0,066	0,014	0,072	0,005	0,068	0,074
0,048		0,00181	0,01610	8,530	9,447	10,36	0,005	0,059	0,010	0,065	0,014	0,069	0,005	0,067	0,073
0,045		0,00159	0,01410	9,705	10,75	11,79	0,004	0,055	0,010	0,061	0,013	0,066	0,004	0,062	0,068
0,043		0,00145	0,01290	10,63	11,77	12,91	0,004	0,052	0,009	0,058	0,012	0,063	0,004	0,059	0,065
0,040		0,00126	0,01120	12,28	13,60	14,92	0,004	0,049	0,008	0,054	0,012	0,058	0,004	0,055	0,060
0,038		0,00113	0,01010	13,61	15,07	16,53	0,004	0,046	0,008	0,051	0,011	0,055	0,004	0,052	0,057
0,036		0,00102	0,00900	15,16	16,79	18,42	0,003	0,044	0,008	0,049	0,011	0,053	0,004	0,050	0,055
0,034		0,00091	0,00810	16,94	18,83	20,71	0,003	0,041	0,008	0,046	0,010	0,050	0,003	0,047	0,052
0,032		0,00080	0,00710	19,13	21,25	23,38	0,003	0,039	0,007	0,043	0,010	0,047	0,003	0,044	0,048
0,030		0,00071	0,00634	21,77	24,18	26,60	0,003	0,037	0,007	0,041	0,009	0,044	0,003	0,042	0,046
0,028		0,00062	0,00549	24,99	27,76	30,54	0,003	0,034	0,006	0,038	0,009	0,042	0,003	0,038	0,042
0,027		0,00057	0,00511	26,87	29,86	32,84	0,003	0,033	0,006	0,036	0,009	0,040	0,002	0,037	0,040
0,025		0,00049	0,00438	31,34	34,82	37,31	0,003	0,031	0,005	0,034	0,008	0,037	0,002	0,034	0,037
0,024		0,00045	0,00404	34,01	37,79	41,57	0,002	0,029	0,005	0,032	0,008	0,035	0,002	0,032	0,035
0,023		0,00042	0,00372	37,03	41,14	45,26	0,002	0,028	0,005	0,031	0,007	0,035	0,002	0,031	0,034
0,022		0,00038	0,00339	40,47	44,97	49,47	0,002	0,027	0,005	0,030	0,008	0,033	0,002	0,030	0,033
0,021		0,00035	0,00309	44,42	49,35	54,29	0,002	0,026	0,005	0,028	0,007	0,031	0,001	0,029	0,031
0,020		0,00031	0,00280	48,97	54,41	59,85	0,002	0,024	0,004	0,027	0,007	0,030	0,001	0,026	0,029
0,019		0,00028	0,00253	54,26	60,29	66,32	0,002	0,023	0,004	0,026	0,007	0,028	NA	NA	NA
0,018		0,00025	0,00227	60,46	67,18	73,89	0,002	0,022	0,004	0,024	0,006	0,026	NA	NA	NA
0,016		0,00020	0,00179	76,52	85,02	93,52	0,002	0,020	0,004	0,022	0,005	0,025	NA	NA	NA
0,014		0,00015	0,00137	99,94	111,04	122,15	0,002	0,018	0,004	0,020	0,005	0,023	NA	NA	NA

To ensure the best performance with Essex® fine wire, please be sure to exert special care when handling. We suggest the following guidelines:

DURING INCOMING SHIPMENTS

- ✓ All incoming shipments should be checked for damage during transportation. The inspection should occur while the freight carrier is present at your location. Any damage should be properly noted on the delivery receipt.
- ✓ When using a fork lift or hand cart, be careful not to bump the outside of the packaging as this may damage the magnet wire.

DURING WIRE STORAGE

- ✓ Avoid double stacking the wire pallets.
- ✓ Store packages on their original pallets and keep unused spools safely stored in their original packages until needed. Store the wire package in a dry, non-corrosive location. Keep the wire protected from dust and other contaminants.
- ✓ Spools should be placed back into their original packaging and maintained in a manner to prevent damage with other items, including other spools.

NEMA Dimensional Characteristics

AWG SIZE	Bare Wire Diameter						SINGLE BUILD DIMENSIONS				HEAVY BUILD DIMENSIONS			
							Increase in Diameter Due to Film Coating		Overall Diameter of Film Coated Wire		Increase in Diameter Due to Film Coating		Overall Diameter of Film Coated Wire	
	Minimum		Nominal		Maximum		Minimum		Maximum		Minimum		Maximum	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
30	0.0099	0.251	0.0100	0.254	0.0101	0.257	0.0007	0.018	0.0112	0.285	0.0013	0.033	0.0121	0.307
30 1/2	0.0094	0.239	0.0095	0.241	0.0096	0.244	0.0006	0.015	0.0106	0.270	0.0013	0.033	0.0114	0.291
31	0.0088	0.224	0.0089	0.226	0.0090	0.229	0.0006	0.015	0.0100	0.255	0.0012	0.030	0.0108	0.275
31 1/2	0.0083	0.211	0.0084	0.213	0.0085	0.216	0.0006	0.015	0.0095	0.242	0.0012	0.030	0.0103	0.261
32	0.0079	0.201	0.0080	0.203	0.0081	0.206	0.0006	0.015	0.0090	0.229	0.0011	0.028	0.0097	0.247
32 1/2	0.0074	0.188	0.0075	0.191	0.0076	0.193	0.0005	0.013	0.0086	0.216	0.0011	0.028	0.0093	0.234
33	0.0070	0.178	0.0071	0.180	0.0072	0.183	0.0005	0.013	0.0081	0.205	0.0010	0.025	0.0087	0.222
33 1/2	0.0066	0.168	0.0067	0.170	0.0068	0.173	0.0005	0.013	0.0077	0.194	0.0010	0.025	0.0083	0.210
34	0.0062	0.157	0.0063	0.160	0.0064	0.163	0.0005	0.013	0.0072	0.183	0.0009	0.023	0.0078	0.199
34 1/2	0.0058	0.147	0.0059	0.150	0.0060	0.152	0.0004	0.010	0.0068	0.174	0.0009	0.023	0.0074	0.188
35	0.0055	0.140	0.0056	0.142	0.0057	0.145	0.0004	0.010	0.0065	0.164	0.0009	0.023	0.0070	0.178
35 1/2	0.0052	0.132	0.0053	0.135	0.0054	0.137	0.0004	0.010	0.0061	0.156	0.0008	0.020	0.0067	0.169
36	0.0049	0.124	0.0050	0.127	0.0051	0.130	0.0004	0.010	0.0058	0.147	0.0008	0.020	0.0063	0.160
36 1/2	0.0046	0.117	0.0047	0.119	0.0048	0.122	0.0004	0.010	0.0055	0.139	0.0007	0.018	0.0060	0.152
37	0.0044	0.112	0.0045	0.114	0.0046	0.117	0.0004	0.010	0.0052	0.132	0.0007	0.018	0.0057	0.144
37 1/2	0.0041	0.104	0.0042	0.107	0.0043	0.109	0.0003	0.008	0.0049	0.125	0.0007	0.018	0.0054	0.136
38	0.0039	0.099	0.0040	0.102	0.0041	0.104	0.0003	0.008	0.0047	0.118	0.0007	0.018	0.0051	0.129
38 1/2	0.0036	0.091	0.0037	0.094	0.0038	0.097	0.0003	0.008	0.0044	0.112	0.0006	0.015	0.0048	0.122
39	0.0034	0.086	0.0035	0.089	0.0036	0.091	0.0003	0.008	0.0042	0.106	0.0006	0.015	0.0045	0.116
39 1/2	0.0032	0.081	0.0033	0.084	0.0034	0.086	0.0003	0.008	0.0039	0.100	0.0006	0.015	0.0043	0.109
40	0.0030	0.076	0.0031	0.079	0.0032	0.081	0.0003	0.008	0.0037	0.095	0.0005	0.013	0.0041	0.104
40 1/2	0.0029	0.074	0.0030	0.076	0.0031	0.079	0.0003	0.008	0.0035	0.090	0.0005	0.013	0.0039	0.098
41	0.0027	0.069	0.0028	0.071	0.0029	0.074	0.0003	0.008	0.0033	0.085	0.0005	0.013	0.0037	0.093
41 1/2	0.0025	0.064	0.0026	0.066	0.0027	0.069	0.0002	0.005	0.0032	0.080	0.0005	0.013	0.0035	0.088
42	0.0024	0.061	0.0025	0.064	0.0026	0.066	0.0002	0.005	0.0030	0.076	0.0005	0.013	0.0033	0.083
42 1/2	0.0023	0.058	0.0024	0.061	0.0025	0.064	0.0002	0.005	0.0028	0.072	0.0005	0.013	0.0031	0.079
43	0.0021	0.053	0.0022	0.056	0.0023	0.058	0.0002	0.005	0.0027	0.068	0.0004	0.010	0.0029	0.075
43 1/2	0.0020	0.051	0.0021	0.053	0.0022	0.056	0.0002	0.005	0.0025	0.065	0.0004	0.010	0.0028	0.071
44	0.0019	0.048	0.0020	0.051	0.0021	0.053	0.0002	0.005	0.0024	0.061	0.0004	0.010	0.0026	0.067
44 1/2	0.0018	0.046	0.0019	0.048	0.0020	0.051	0.0002	0.005	0.0023	0.058	0.0004	0.010	0.0025	0.064
45*	0.00169	0.043	0.00176	0.0447	0.00183	0.0465	0.00020	0.0051	0.00220	0.0559	0.0004	0.010	0.0024	0.0610
46*	0.00151	0.038	0.00157	0.0399	0.00164	0.0417	0.00020	0.0051	0.00200	0.0508	0.0003	0.0076	0.0021	0.0533
47*	0.00135	0.0343	0.00140	0.0356	0.00146	0.0371	0.00010	0.0025	0.00170	0.0432	0.0003	0.0076	0.0019	0.0483
48*	0.00119	0.0302	0.00124	0.0315	0.00129	0.0328	0.00010	0.0025	0.00150	0.0381	0.00020	0.0051	0.00170	0.0432
49*	0.00107	0.0272	0.00111	0.0282	0.00116	0.0295	0.00010	0.0025	0.00130	0.0330	0.00020	0.0051	0.00150	0.0381
50*	0.00095	0.0241	0.00099	0.0251	0.00103	0.0262	0.00010	0.0025	0.00120	0.0305	0.00020	0.0051	0.00140	0.0356
51*	0.00085	0.0216	0.00088	0.0224	0.00092	0.0234	0.00010	0.0025	0.00110	0.0279	0.00020	0.0051	0.00130	0.0330
52*	0.00075	0.0191	0.00078	0.0198	0.00081	0.0206	0.00010	0.0025	0.00100	0.0254	0.00020	0.0051	0.00115	0.0292
53*	0.00067	0.0170	0.00070	0.0178	0.00073	0.0185	0.00005	0.0013	0.00085	0.0216	0.00010	0.0025	0.00103	0.0262
54*	0.00060	0.0152	0.00062	0.0157	0.00065	0.0165	0.00005	0.0013	0.00075	0.0191	0.00010	0.0025	0.00095	0.0241

Note: Data from NEMA Standards Publication MW 1000, NEMA doesn't cover half sizes finer than 30 AWG.

For metric size information, please consult Magnet Wire Marketing.

*Theoretical nominal bare diameter for sizes finer than 45 AWG.

Essex® Fine Wire Handling Suggestions

DURING WIRING HANDLING

- ✓ Do not stack spools outside of the original Essex packaging.
- ✓ When removing spool from its original packaging, be sure that it can be freely removed without the risk of touching anything, including the packaging itself.
- ✓ To protect the wire enamel, do not remove the spool wrapper until ready to load the spool onto the winding equipment. Use extreme caution when removing the tape from the wrapper and place wrappers back in cartons for reuse.
- ✓ Care should be taken when handling spools near jewelry, metal objects, or chemicals; contact may damage the wire enamel.
- ✓ Avoid placing your fingers too far into the packaging handling slots; contact may damage the wire enamel.
- ✓ Carry the spools by using the provided hand holes or handles.

DURING MANUFACTURING PROCESS

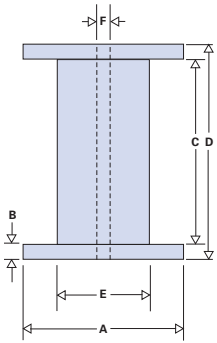
- ✓ Check top flanges for any damage; use very fine grit sand paper to remove minor nicks on the flanges.
- ✓ If the spool is to be returned to its original packaging for later usage, please secure the loose end by tying it to the flange.
- ✓ Keep the spool as straight as possible when inserting into a payoff shroud.
- ✓ Maintain proper tension control during wire payoff.

DURING WIRE RETURNS

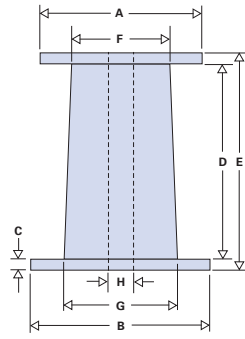
- ✓ If the magnet wire must be returned, please contact your Essex representative.

Essex® Fine Wire Packaging Reference Guide

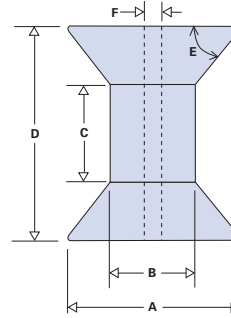
Straight Flange / Barrel – 1



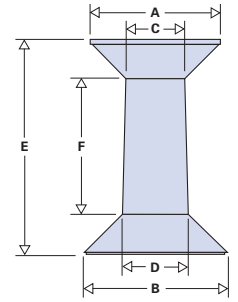
Straight Flange / Tapered Barrel – 2



Taper Flange / Straight Barrel – 3



Tapered Flange / Tapered Barrel – 4



Package	Pkg Code	Package Design	Size - Copper (AWG)	Size - Aluminum	Dimensions (inches)								Nom. Pounds Per Spool-Copper	Number of Spools/Reels Per Carton	Number of Containers per Pallet
					A	B	C	D	E	F	G	H			
DIN 125/45	07	3	35-47	27-30	4.921	2.795	2.559	4.921	45°	0.630	-	-	4.5	8	15
6" x 3 1/2" Spool Box	06	1	28-47	27-30	6.000	0.408	3.500	4.32	3.500	0.630	-	-	8.5	6	30
6" x 3 1/2" Spool Bulk Pack	76	1	28-47	27-30	6.000	0.408	3.500	4.32	3.500	0.630	-	-	8.5	6	42
6" x 6" Spool Box	05	1	28-47	27-30	6.000	0.516	5.968	7	3.750	0.630	-	-	12.0	4	20
6" x 6" Spool Bulk Pack	75	1	28-47	27-30	6.000	0.516	5.968	7	3.750	0.630	-	-	12.0	6	30
DIN 160/45 Spool	10	3	40-47	27-30	6.299	3.543	3.346	6.299	45°	0.630	-	-	13.5	4	30
DIN 200/45 Spool	11	3	29-44	27-30	7.874	4.409	4.173	7.874	45°	0.630	-	-	23.0	2	18
8 1/2" x 9 1/4" Taper Spool	08	2	28-39	27-30	8.500	9.250	0.521	9.000	10.0625	5.500	6.500	1.531	40.0	1	16
8 1/2" Pail	48	2	28-47	*	8.500	9.250	0.521	9.000	10.0625	5.500	6.500	1.531	40.0	1	42
DIN 200 Pail	41	-	-	-	7.874	4.409	9.173	7.874	45°	0.630	-	-	23.0	1	28
DIN 250/45*	40	3	*	*	9.843	5.512	5.236	9.843	45°	0.630	-	-	50.0	1	28
Taper Flange TF 80 (Pail)	13	4	28-37	27-30	10.000	10.875	6.000	6.800	12.634	8.230	45°	1.531	75.0	1	12
Taper Flange TF 80 (Box)	81	4	28-37	27-30	10.000	10.875	6.000	6.800	12.634	8.230	45°	1.531	75.0	1	12
Reel-Pak 250*	25	2	*	*	15.000	16.000	1.218	12.000	14.375	7.960	9.000	1.531	260.0	1	5

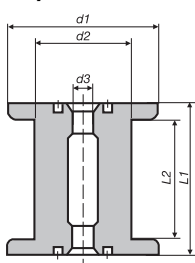
Essex has the capabilities to match spool weights to fit your application requirements.

Note: Aluminum nominal pounds per spool information available upon special request.

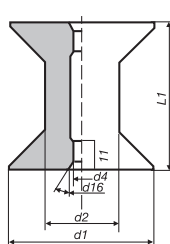
*Available upon special request, please consult Magnet Wire Marketing for more information.

Package	Pkg Code	Package Design	Size - Copper (mm)	Size - Aluminum	Dimensions (mm)							Covers (mm)		Ave. Weight (kg) per Spool -Copper	Number of Spools per Pallet
					d1	d2	d3	d4	d5	L1	L2	d	h		
D 80	614	5	< 0,040	*	80	50	16	-	-	80	64	-	-	0,5	288
D 100	613	5	0,040 - 0,1	*	100	63	16	-	-	100	80	-	-	1,1	144
D 125	607	5	0,040 - 0,1	*	125	80	16	-	-	125	100	-	-	3	96
D 160	608	5	0,040 - 0,3	*	160	100	22	-	-	160	128	-	-	7	64
D 200	609	5	0,040 - 0,3	*	200	125	22	-	-	200	160	305	295	10	45
D 250	610	5	0,040 - 0,3	*	250	160	22	-	-	200	160	305	295	20	22
HK 76	615	6	< 0,030	*	64	44,4	16	-	-	86	60	-	-	0,3	450
HK 100	654	6	< 0,030	*	100	56	16	-	-	100	49	-	-	0,8	144
HK 125	645	6	< 0,040	*	125	71	16	-	-	125	65	-	-	3	96
HK 160	652	6	0,040 - 0,150	*	160	90	22	-	-	160	85	-	-	6	64
HK 200	636	6	0,040 - 0,150	*	200	112	22	-	-	200	106	305	295	12	45
HK 250	637	6	0,040 - 0,150	*	250	140	22	-	-	250	133	305	350	20	22
A 250/4	612	7	0,101 - 0,5	*	250	160	100	236	140	400	335	315	500	40	8
A 315/5	611	7	0,151 - 1,0	*	315	200	100	300	180	500	425	400	630	80	5
A 400/6	617	7	0,151 - 3,0	*	400	250	100	375	224	630	530	500	800	160	3

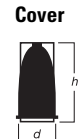
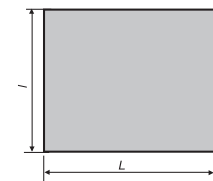
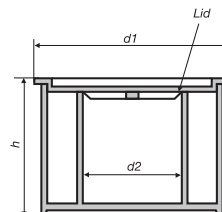
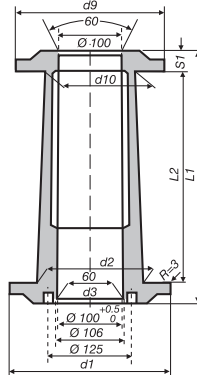
Cylindrical – 5



Biconical – 6

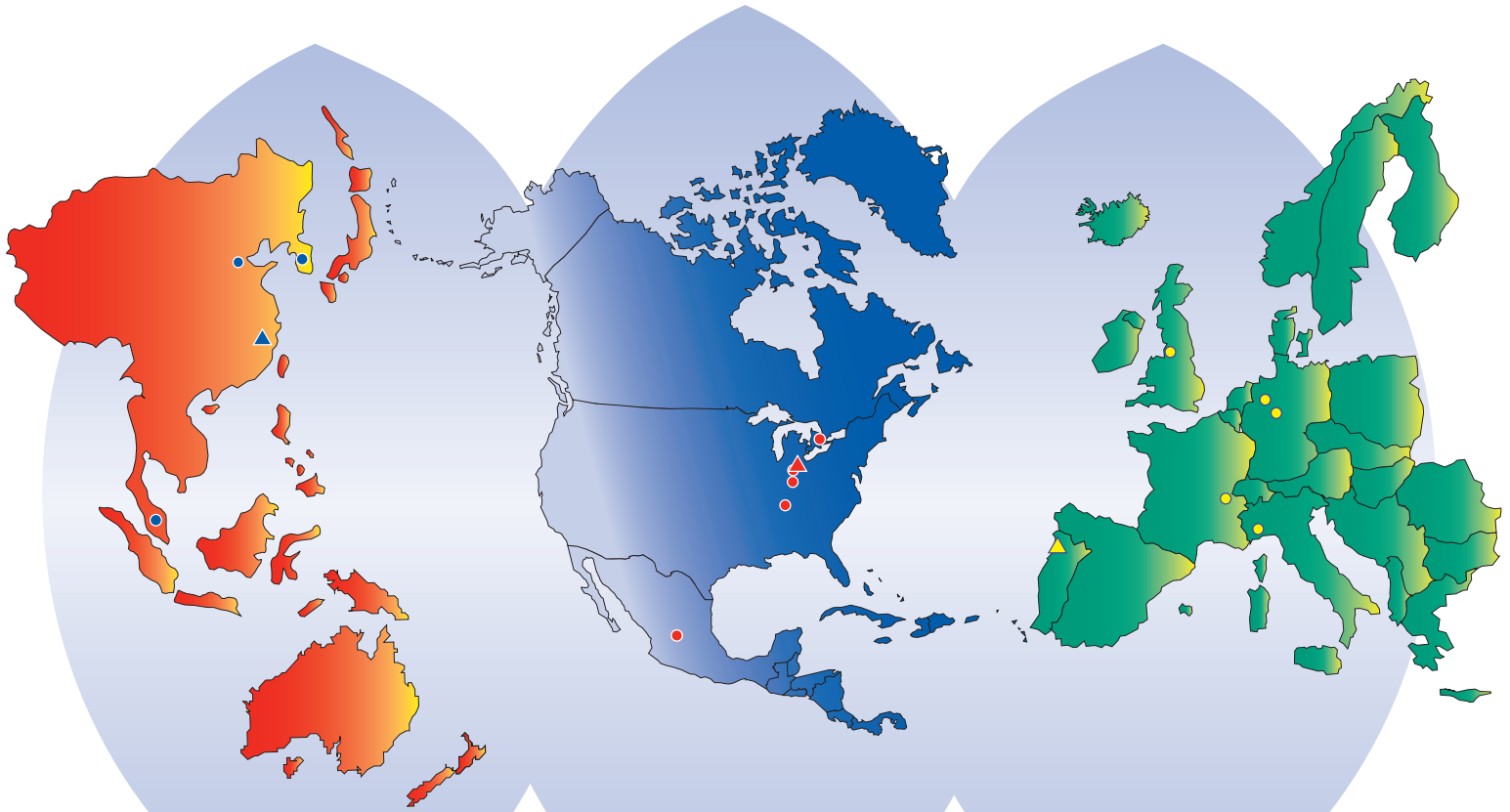


Conical / Taper – 7



Magnet Wire / Winding Wire Manufacturing Facilities

A Global Presence



Asian Pacific

Suzhou, China
Tianjin, China (2)
Gumi, South Korea
Penang, Malaysia

North America

Fort Wayne, Indiana
Franklin, Tennessee
Johnson County, Indiana
Kendallville, Indiana
Simcoe, Canada
Torreón, Mexico

Europe

Arolsen, Germany
Bramsche, Germany
Huyton, England
Mezrieu, France
Quattordio, Italy
Viana Do Castelo, Portugal

▲ Fine Wire and Ultra Fine Wire Manufacturing Locations.

Fine Wire and Ultra Fine Wire Manufacturing Facilities



Suzhou, China



Kendallville, Indiana, USA



Viana Do Castelo, Portugal

Recommended Winding Tensions

NOMINAL DIAMETER (mm)	IEC MINIMUM ELONGATION	Maximum Tension (cN)
0,200	21	268,8
0,190	21	242,0
0,180	20	211,9
0,170	20	190,7
0,160	19	166,8
0,150	19	150,2
0,140	18	131,5
0,132	18	119,0
0,125	17	105,0
0,118	17	95,7
0,112	17	85,3
0,106	17	76,6
0,100	16	66,7
0,095	16	59,4
0,090	15	51,0
0,085	15	45,9
0,080	14	40,2
0,075	14	36,9
0,071	13	33,4
0,067	13	30,1
0,063	12	26,5
0,060	12	23,7
0,056	10	20,6
0,053	10	18,7
0,050	10	16,7
0,048	10	14,8
0,045	9	12,8
0,043	9	11,8
0,040	9	10,8
0,038	9	10,7
0,036	8	10,6
0,034	8	10,4
0,032	8	10,1
0,030	8	9,8
0,028	7	9,2
0,027	7	8,
0,025	7	7,4
0,024	7	6,8
0,023	7	6,3
0,022	6	5,7
0,021	6	5,
0,020	6	4,7
0,019	6	4,2
0,018	5	3,8
0,016	5	3,0
0,014	4	2,3

WHOLE AWG SIZE	NEMA NOM. BARE O.D.	Maximum ^{1,2} Tension
	Inches	Grams
30	0.0100	358
31	0.0089	282
32	0.0080	228
33	0.0071	180
34	0.0063	142
35	0.0056	112
36	0.0500	89
37	0.0045	72
38	0.0040	57
39	0.0035	44
40	0.0031	34
41	0.0028	28
42	0.0025	22
43	0.0022	17
44	0.0020	14
45 ³	0.00176	11
46 ³	0.00157	8.8
47 ³	0.00140	7.0
48 ³	0.00124	5.5
49 ³	0.00111	4.4
50 ³	0.00099	3.5
51 ³	0.00088	2.8
52 ³	0.00078	2.2
53 ³	0.00070	1.7
54 ³	0.00062	1.4

Note: This table is provided as a general guide only; the appropriate winding tensions may vary depending on a number of factors including product application. The type of winder, payoff device, and type of coil may vary the tensions to be used. In general, use the minimum tension that provides a good winding. Some minor variations in the softness of the wire from one lot to another may also dictate minor adjustments in winding tension.

1. Using the yield strength of fully annealed wire as a point of reference, tensions beyond these may cause excessive stretching and high coil resistance.
2. Maximum recommended tensions are based upon 10,000 p.s.i. for copper.
3. Theoretical dimensions for sizes 45 AWG and finer.

Note: Start-up acceleration surge can produce tensions well in excess of production tensions and need to be taken into consideration.

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