www.lscable.com

LS Cable
Leading Solution

LS Magnet Wire

Higher Performance with Greater Reliability

Leading Solution

LG Cable, LG Industrial Systems and LG-Nikko Copper,
Gaon Cable, E1 and Kukdong City Gas are starting with
a new name, Leading Solution, LS.

New Dream, New Start

To become a leader in the competitive global market, LG has been divided into three groups, electronics and chemicals for LG, energy and distribution for GS, Industrial electric · electronics and material for LS based on their business specialties.

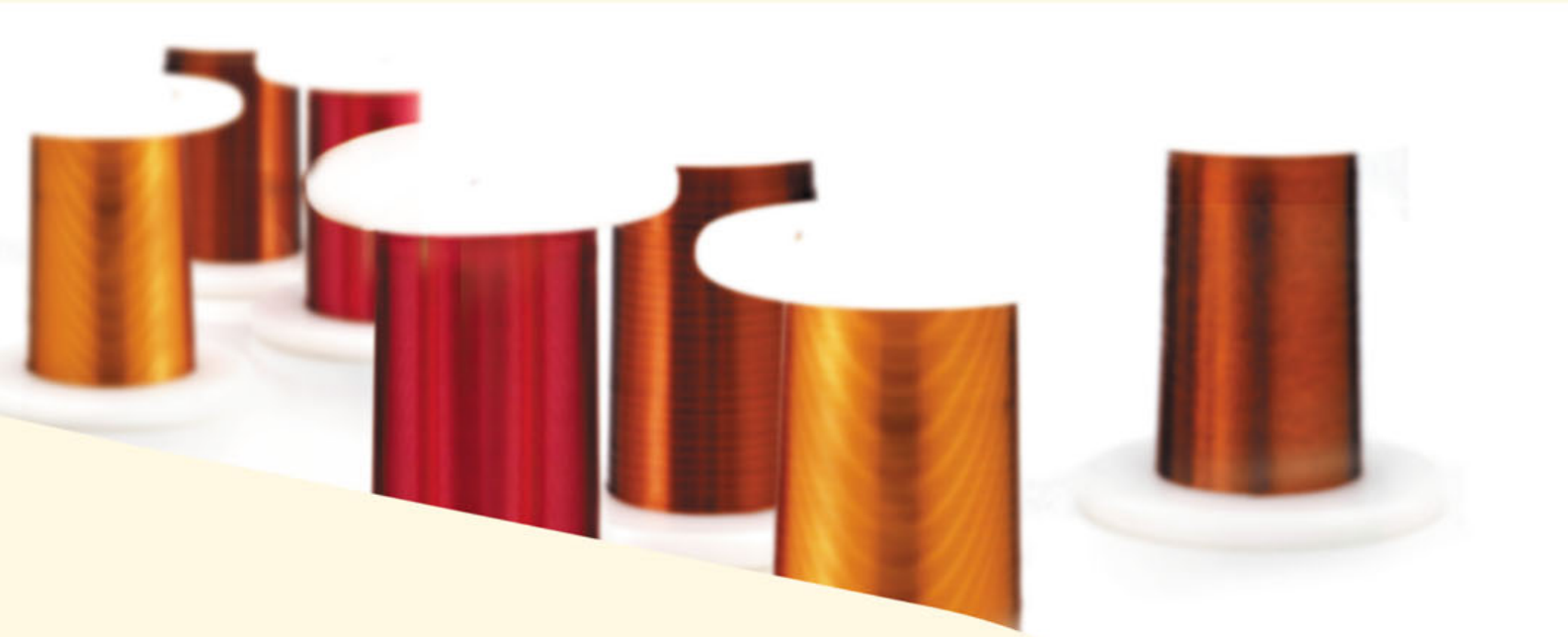
LS' main companies, such as LS cable, LS industrial systems,LS-Nikko copper, Gaon cable, E1 and Kukdong City gas, are ranked as No.1 in their respective industry. However, LS won't just sit back, satisfied with being the best in Korea. We will pave the way for becoming the world's best in Industrial electric · electronics and material industry with the new CI, LS.

Your good partner LG Cable is making a fresh start as LS Cable

LS Cable is No. 1 cable maker in Korea and its business fields are telecommunication, electric power, components & materials and machinery.Also, LS Cable is creating new businesses particularly in component and materials industry. LS Cable makes its best to accomplish the vision, 'Your No.1 Creative Partner' and be one of the world leaders with high technology and best level of service.

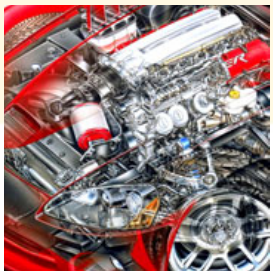
LS Magnet Wire

Higher Performance with Greater Reliability



At the heart of the energy conversion system between electrical, electromagnetic, mechanical and other forms of energy, which system corresponds to the nerves and blood vessels of the electrical equipment and their properties, our products show high performance with great reliability. Our ceaseless effort to research, design, develop, and manufacture the products has been keeping our position as a leading company in customer satisfaction level in the industry.

The quality control meets the most delicate requirements of international standards and the high level of quality is recognized both by domestic and international customers. Our commitment to develop and deliver solutions to address our customers' needs and challenges keep our technology on the cutting edge and our know-how in the field more valuable, which our clients highly appreciate.

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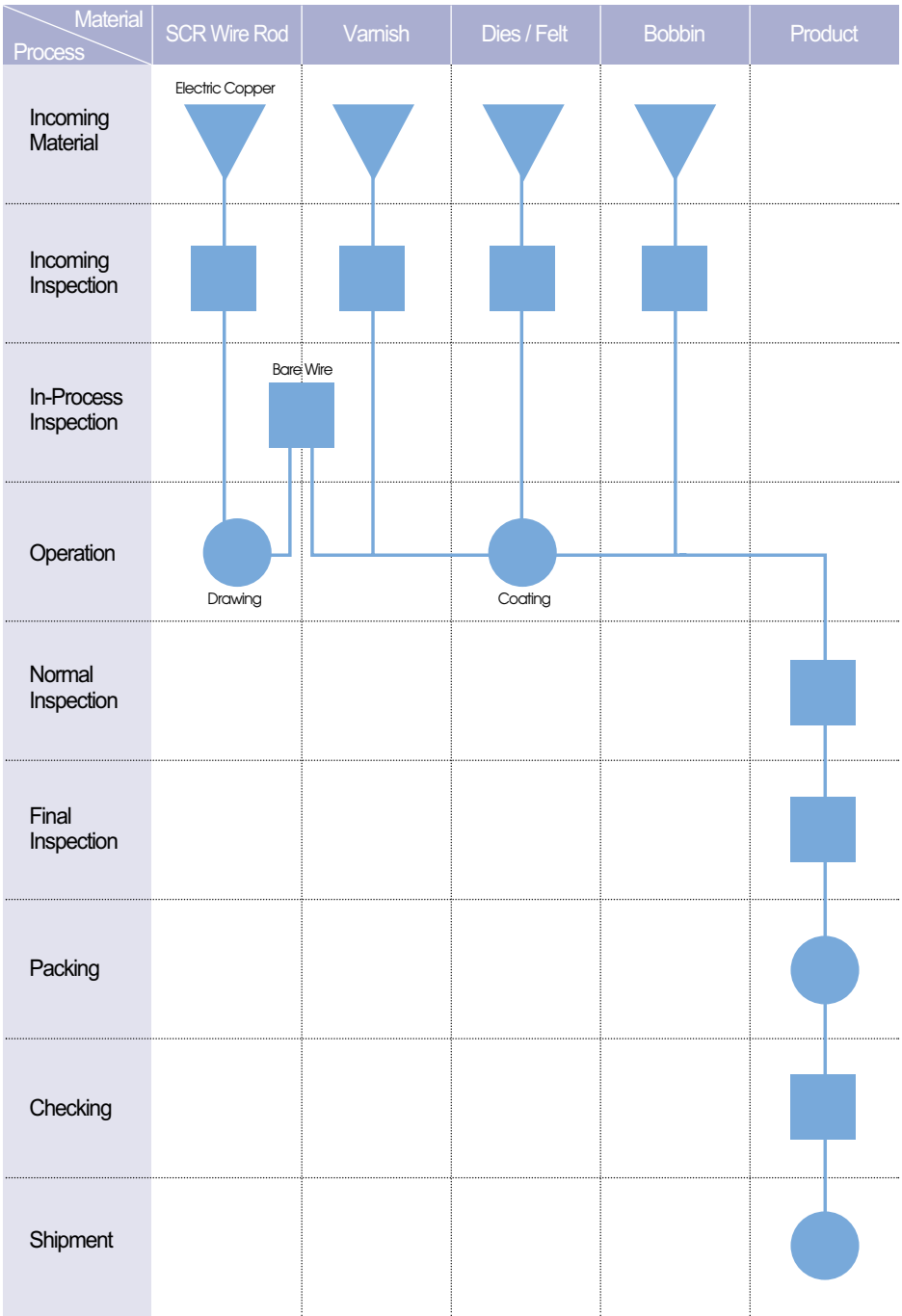
1. Production Process of Magnet Wires



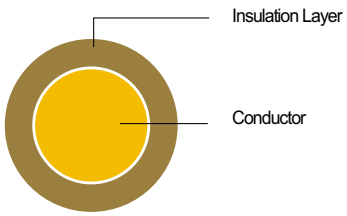
02

TYPE OF ENAMELED WIRES

2. Type of Enameled Wires

Type	Code (Commercial Name)	
Single-Coated Enameled Wires	PEW	Polyester Enameled Wire (UL)
	UEW	Polyurethane Enameled Wire (UL)
	UEW-N	No-Crazing Polyurethane Enameled Wire
	EIW	Polyesterimide Enameled Wire (UL)
	EIW(F)	Polyesterimide Enameled Wire (UL)
	AIW	Polyamideimide Enameled Wire (UL)
	PVF	Polyvinylformal Enameled Wire
	SEW	Solderable Polyesterim
Double-Coated Enameled Wires	SBH-EIW	Polyesterimide Overcoated With Self-bonding Enameled Wire (UL, Bondable by Heating)
	SBL-EIW	Polyesterimide Overcoated With Self-bonding Enameled Wire (Bondable by Alcohol)
	AMSW	Polyesterimide Overcoated With Polyamideimide Self-bonding Enameled Wire (Bondable by Heating, High Resoftening Temperature Type)
	SMUW	Urethane Overcoated With Self-bonding Enameled Wire
	SB-SEW	Solderable Polyesterimide Overcoated With Self-bonding Enameled Wire
	RRW-H	Refrigerant Resistance Enameled Wire (UL)
	SLRW, SLAW	Self-Lubricated Refrigerant Resistance Enameled Wire (UL)
	NY-UEW	Nylon overcoated Polyurethane Enameled Wire (UL)
	NY-EIW(F)	Nylon overcoated Polyesterimide Enameled Wire (UL)
	NY-PEW	Nylon overcoated Polyester Enameled Wire
	GADW	Double-Coated Aluminium Enameled Wire (UL) (Aluminium Conductor, 200℃)
	GADWC	Double-Coated Aluminium Enameled Wire (UL (Aluminium Conductor, 220℃)
	AI-EIW	Polyamideimide Overcoated Polyesterimide Enameled Wire (UL, Thermal Index : 200℃)
	MRW	Polyamideimide Overcoated Polyesterimide Enameled Wire (UL, Thermal Index : 220℃)
	EXLW-C	Polyamideimide Enameled Wire
	EXLW-N	Polyamideimide Overcoated Polyesterimide Enameled Wire
	EXLW-P	Polyamideimide Overcoated Polyesterimide Enameled Wire (UL, Thermal Index : 200℃)
Litz Wires	LZSW	H Class Litz Wire
	SLZSW	Solderable Litz Wire

2 · 1. Single-Coated (Monolithic) Enameled wires



PEW

Polyester Enameled Wire

Specification	KSC 3107, JISC 3202
Thermal index	B(130℃), F(155℃)
UL file number	E84441
Product range	0.08 ~ 2.5 mm

Features
- Good electrical characteristics
- High continuous operating temperature
- Possible to be colored

Applications
- Motors (General purpose)
- Motors for home appliance
- Magnet coils

UEW

Polyurethane Enameled Wire

Specification	KSC 3107, JISC 3202
Thermal index	A(105℃), E(120℃), B(130℃), F(155℃)
UL file number	E84441
Product range	0.05 ~ 1.5 mm

Features
- Good solderability
- Superior characteristics at high frequency
- Free to coloring

Applications
- Communication apparatus
- Small motors
- Electric devices
- Relays

UEW-N

No-Crazing
Polyurethane Enameled Wire

Specification	LSC
Thermal index	E(120℃), B(130℃)
UL file number	
Product range	0.08 ~ 0.5 mm

Features
- Excellent crazing resistance

Applications
- F.B.T.

EIW

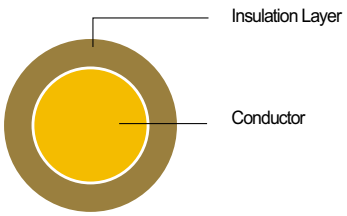
Polyesterimide Enameled Wire

Specification	KSC 3107, JISC 3202, NEMA MW30, JCS 333
Thermal index	H(180℃)
UL file number	E84441
Product range	0.08 ~ 2.5 mm

Features
- Excellent heat resistance
- Excellent heat-shock resistance

Applications
- Motors

2 · 1. Single-Coated (Monolithic) Enameled wires



EIW(F)

Polyesterimide Enameled Wire

Specification	NEMA MW5
Thermal index	F(155℃)
UL file number	E84441
Product range	0.05 ~ 3.2 mm

Features
- Excellent heat resistance
- Excellent heat-shock resistance

Applications
- Motors

AIW

Polyamideimide Enameled Wire

Specification	JCS 334A
Thermal index	C(220℃)
UL file number	E84441
Product range	0.10 ~ 1.5 mm

Features
- Excellent abrasion resistance
- Excellent thermal stability
- Good resistance to overload and cut-through

Applications
- Apparatus for high operating temperature
- Motors for power tools
- Motors used in Freon gas
- Electric Components for automobile

PVF

Polyvinylformal Enameled Wire

Specification	KSC 3107, JISC 3202
Thermal index	A(105℃)
UL file number	
Product range	0.05 ~ 3.2 mm

Features
- Good abrasion resistance
- Excellent hydrolysis resistance
- Excellent solvent resistance

Applications
- General use
- Hermetic purpose
- Oil immersed transformer

SEW

Solderable Polyesterimide Enameled Wire

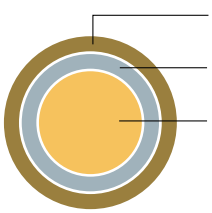
Specification	LSC
Thermal index	F(155℃)
UL file number	
Product range	0.10 ~ 0.35 mm

Features
- Solderable without stripping off

Applications
- Apparatus for high operating temperature

2 · 2. Double-Coated Enameled wires

2·2·1. Self-Bonding Enameled Wires



SBH-EIW

Polyesterimide Overcoated With Self-Bonding Enameled Wire

Specification	LSC
Thermal index	H(180℃)
UL file number	E84441
Product range	0.12 ~ 0.90 mm

Features
- Bondable by heating without impregnating
- Excellent thermal stability

Applications
- Deflection yoke coils
- Magnet coils (Clutch coil, Vacuum Cleaner Motor, etc)

SBL-EIW

Polyesterimide Overcoated With Self-Bonding Enameled Wire

Specification	LSC
Thermal index	H(180℃)
UL file number	E84441
Product range	0.12 ~ 0.90 mm

Features
- Bondable by alcohol without impregnating
- Excellent thermal stability

Applications
- Magnet coils (Clutch coil, Vacuum Cleaner Motor, etc)

AMSW

Polyesterimide Overcoated With Polyamideimide Self-Bonding Enameled Wire

Specification	LSC
Thermal index	N(200℃)
UL file number	E84441
Product range	0.50 ~ 1.50 mm

Features
- Bondable by heating without impregnating
- High resofting temperature type : 190 - 200℃
- Excellent thermal stability

Applications
- Motors for automobile

SMUW

Urethane Overcoated With Self-Bonding Enameled Wire

Specification	LSC
Thermal index	F(155℃)
UL file number	
Product range	0.12 ~ 0.35 mm

Features
- Bondable by heating without impregnating
- Solderable without stripping off

Applications
- Deflection yoke coils
- Magnet coils

SB-SEW

Solderable Polyesterimide Overcoated With Self-Bonding Enameled Wire

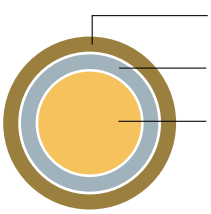
Specification	LSC
Thermal index	F(155℃)
UL file number	
Product range	0.12 ~ 0.35 mm

Features
- Bondable by heating without impregnating
- Solderable without stripping off

Applications
- Deflection yoke coils
- Magnet coils

2 · 2. Double-Coated Enameled wires

2·2·2. Refrigerant Resistance Enameled Wires



RRW-H

Refrigerant Resistance Enameled Wire

Specification	LSC, NEMA MW73-C
Thermal index	N(200℃)
UL file number	E84441
Product range	0.29 ~ 1.5 mm

Features

- Excellent refrigerant resistance

Applications

- Compressors for refrigerators & air-conditioners

SLRW, SLAW

Self-Lubricated Refrigerant Resistance Enameled Wire

Specification	LSC, NEMA MW73-C
Thermal index	N(200℃)
UL file number	E84441
Product range	0.29 ~ 1.5 mm

Features

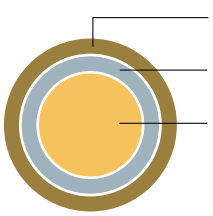
- Good resistance to R-134a refrigerant
- No need lubricant

Applications

- Compressors for refrigerators & air-conditioner

2 · 2. Double-Coated Enameled wires

2·2·3. Nylon Over-Coated Enameled Wires



NY-UEW

Nylon overcoated Polyurethane Enameled Wire

Specification	NEMA MW 28
Thermal index	B(130℃)
UL file number	E84441
Product range	0.3 ~ 1.5 mm

Features
- Suitable for high speed winding

Applications
- Communication apparatus
- Small motors
- Electric devices
- Relays

NY-EIW(F)

Nylon overcoated Polyester-imide Enameled Wire

Specification	NEMA MW 24
Thermal index	F(155℃)
UL file number	E84441
Product range	0.3 ~ 1.5 mm

Features
- Suitable for high speed winding

Applications
- Motors

NY-PEW

Nylon overcoated Polyester Enameled Wire

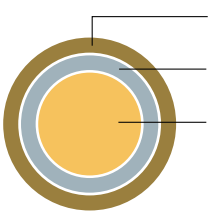
Specification	LSC, F(NEMA 24C), H(NEMA 76C)
Thermal index	F(155℃), H(180℃)
UL file number	E84441
Product range	0.3 ~ 1.2 mm

Features
- Suitable for high speed winding

Applications
- Motors (General purpose)
- Motors for home appliance
- Magnet coils

2 · 2. Double-Coated Enameled wires

2·2·4. Aluminium Enameled Wires



GADW

Double-Coated
Aluminium Enameled Wire

Specification	LSC
Thermal index	N(200℃)
UL file number	E84441
Product range	0.34 ~ 2.3 mm

Features
- Lighter than copper products
- Good electrical characteristics
- Good heat-shock resistance

Applications
- High voltage transformers for microwave oven

GADWC

Double-Coated
Aluminium Enameled Wire

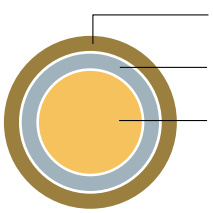
Specification	LSC, NEMA MW35-A
Thermal index	C(220℃)
UL file number	E84441
Product range	0.34 ~ 2.3 mm

Features
- Lighter than copper products
- Good electrical characteristics
- Good heat-shock resistance

Applications
- High voltage transformers for microwave oven

2 · 2. Double-Coated Enameled wires

2·2·5. AI-EIW / MRW



AI-EIW

Polyamideimide Overcoated
Polyesterimide Enameled Wire

Specification	NEMA MW35-C
Thermal index	N(200℃)
UL file number	E84441
Product range	0.2 ~ 3.2 mm

Features
- High resistance to overload and cut-through
- Good heat-shock resistance

Applications
- High voltage transformers for micro-wave oven
- Electric components for automobile

MRW

Polyamideimide Overcoated
Polyesterimide Enameled Wire

Specification	NEMA MW35-C
Thermal index	R(220℃)
UL file number	E84441
Product range	0.2 ~ 3.2 mm

Features
- High resistance to overload and cut-through
- Good heat-shock resistance

Applications
- High voltage transformers for micro-wave oven
- Electric components for automobile

EXLW-C

Polyamideimide Enameled Wire

Specification	JCS 334A
Thermal index	C(220℃)
UL file number	E84441
Product range	0.20 ~ 2.0 mm

Features
- Increase efficiency of motor by High Space Factor
- Improve efficiency by optimized design for surface lubricity and toughness
- Provide excellent mechanical protection during winding and insertion

Applications
- Typical motor, Automobile component, Compressor
- High speed motor windings with difficult insertion and winding characteristics

EXLW-N

Polyamideimide Overcoated
Polyesterimide Enameled Wire

Specification	NEMA MW35-C
Thermal index	N(200℃)
UL file number	E84441
Product range	0.2 ~ 2.5 mm

Features
- Increase efficiency of motor by High Space Factor
- Improve efficiency by optimized design for surface lubricity and toughness
- Provide excellent mechanical protection during winding and insertion

Applications
- Typical motor, Automobile component, Compressor
- High speed motor windings with difficult insertion and winding characteristics

EXLW-P

Polyamideimide Overcoated
Polyesterimide Enameled Wire

Specification	NEMA MW35-C
Thermal index	N(200℃)
UL file number	E84441
Product range	0.2 ~ 2.5 mm

Features
- Prolong the life of Inverter Driven Motor by using the strong material against the partial discharge
- High performance of scrape resistance

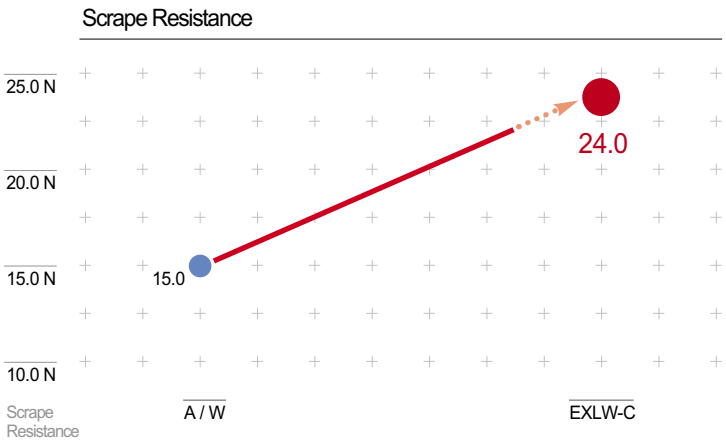
Applications
- Inverter Driven Motor : Motor for heavy electric machine, hybrid electric vehicle

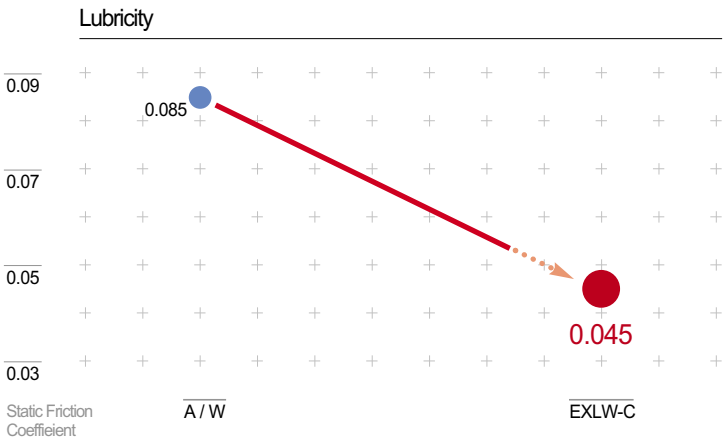
2 · 2. Double-Coated Enameled wires

EXLW-C

PolyamideimideEnameled Wire

Item	Unit	Polyamideimide (H Class, 1.5mm)	
		A / W	EXLW-C
Film Thickness	mm	0.033	0.033
BDV	kV	12.0	12.0
Scrape Resistance(Unidirectional)	N	15.0	24.0
Static Friction Coefficient	-	0.085	0.045
Cut Through	℃	420	420



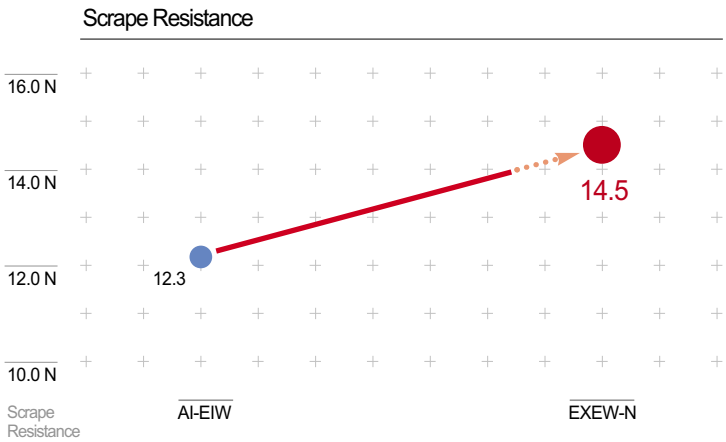


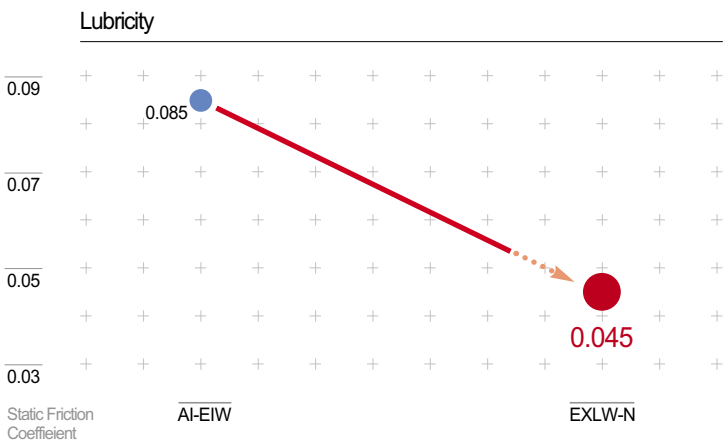
2 · 2. Double-Coated Enameled wires

EXLW-N

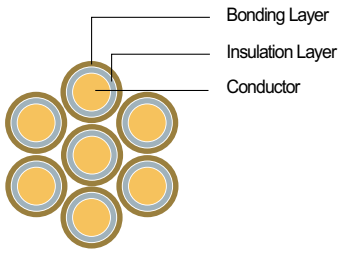
Polyamideimide Overcoated / Polyesterimide Enameled Wire

Item	Unit	Polyamideimide Overcoated with Polyaimdeimide (H Class, 0.85mm)	
		AI - EIW	EXLW - N
Film Thickness	mm	0.036	0.036
BDV	kV	13.0	13.5
Scrape Resistance(Unidirectional)	N	12.3	14.5
Static Friction Coefficient	-	0.085	0.045
Cut Through	℃	391	420





2 · 3. Litz Wires



LZSW

H Class Litz Wire

Specification	LSC
Thermal index	H(180℃)
UL file number	
Product range	0.12 ~ 0.3 mm (Single element wire)

Features

- Superior characteristics at high frequency
- Bondable by heating without impregnating

Applications

- High frequency applications
- Deflection yoke coils for monitor

SLZSW

Solderable Litz Wire

Specification	LSC
Thermal index	F(155℃)
UL file number	
Product range	0.12 ~ 0.3 mm (Single element wire)

Features

- Superior characteristics at high frequency
- Bondable by heating without impregnating
- Solderable without stripping off

Applications

- High frequency applications
- Deflection yoke coils for monitor

03

DIMENSION OF ENAMELED WIRES

3 · 1. NEMA Standard

AWG Size	Conductor						Single Build				Heavy Build			
	Nom.		Min.		Max.		Min. Increase in Dia.		Max. Overall Dia.		Min. Increase in Dia.		Max. Overall Dia.	
	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)
10	2.588	0.1019	2.563	0.1009	2.601	0.1024					0.079	0.0031	2.695	0.1061
11	2.304	0.0907	2.281	0.0898	2.316	0.0912					0.076	0.0030	2.408	0.0948
12	2.052	0.0808	2.032	0.0800	2.062	0.0812					0.074	0.0029	2.151	0.0847
13	1.829	0.0720	1.811	0.0713	1.839	0.0724					0.071	0.0028	1.923	0.0757
14	1.628	0.0641	1.613	0.0635	1.636	0.0644	0.041	0.0016	1.692	0.0666	0.081	0.0032	1.732	0.0682
15	1.450	0.0571	1.435	0.0565	1.458	0.0574	0.038	0.0015	1.509	0.0594	0.076	0.0030	1.547	0.0609
16	1.290	0.0508	1.278	0.0503	1.298	0.0511	0.036	0.0014	1.349	0.0531	0.074	0.0029	1.384	0.0545
17	1.151	0.0453	1.138	0.0448	1.156	0.0455	0.036	0.0014	1.207	0.0475	0.071	0.0028	1.240	0.0488
18	1.024	0.0403	1.013	0.0399	1.029	0.0405	0.033	0.0013	1.077	0.0424	0.066	0.0026	1.110	0.0437
19	0.912	0.0359	0.902	0.0355	0.917	0.0361	0.030	0.0012	0.963	0.0379	0.064	0.0025	0.993	0.0391
20	0.813	0.0320	0.805	0.0317	0.818	0.0322	0.030	0.0012	0.861	0.0339	0.058	0.0023	0.892	0.0351
21	0.724	0.0285	0.716	0.0282	0.726	0.0286	0.028	0.0011	0.770	0.0303	0.056	0.0022	0.798	0.0314
22	0.643	0.0253	0.635	0.0250	0.645	0.0254	0.028	0.0011	0.686	0.0270	0.053	0.0021	0.714	0.0281
23	0.574	0.0226	0.569	0.0224	0.577	0.0227	0.025	0.0010	0.617	0.0243	0.051	0.0020	0.643	0.0253
24	0.511	0.0201	0.505	0.0199	0.513	0.0202	0.025	0.0010	0.551	0.0217	0.048	0.0019	0.577	0.0227
25	0.455	0.0179	0.450	0.0177	0.457	0.0180	0.023	0.0009	0.493	0.0194	0.046	0.0018	0.516	0.0203
26	0.404	0.0159	0.399	0.0157	0.406	0.0160	0.023	0.0009	0.439	0.0173	0.043	0.0017	0.462	0.0182
27	0.361	0.0142	0.358	0.0141	0.363	0.0143	0.020	0.0008	0.396	0.0156	0.041	0.0016	0.417	0.0164
28	0.320	0.0126	0.318	0.0125	0.323	0.0127	0.020	0.0008	0.356	0.0140	0.041	0.0016	0.373	0.0147
29	0.287	0.0113	0.284	0.0112	0.290	0.0114	0.018	0.0007	0.320	0.0126	0.038	0.0015	0.338	0.0133
30	0.254	0.0100	0.251	0.0099	0.257	0.0101	0.018	0.0007	0.284	0.0112	0.036	0.0014	0.302	0.0119
31	0.226	0.0089	0.224	0.0088	0.229	0.0090	0.015	0.0006	0.254	0.0100	0.033	0.0013	0.274	0.0108
32	0.203	0.0080	0.201	0.0079	0.206	0.0081	0.015	0.0006	0.231	0.0091	0.030	0.0012	0.249	0.0098
33	0.180	0.0071	0.178	0.0070	0.183	0.0072	0.013	0.0005	0.206	0.0081	0.028	0.0011	0.224	0.0088
34	0.160	0.0063	0.157	0.0062	0.163	0.0064	0.013	0.0005	0.183	0.0072	0.025	0.0010	0.198	0.0078
35	0.142	0.0056	0.140	0.0055	0.145	0.0057	0.010	0.0004	0.163	0.0064	0.023	0.0009	0.178	0.0070
36	0.127	0.0050	0.124	0.0049	0.130	0.0051	0.010	0.0004	0.147	0.0058	0.020	0.0008	0.160	0.0063
37	0.114	0.0045	0.112	0.0044	0.117	0.0046	0.008	0.0003	0.132	0.0052	0.020	0.0008	0.145	0.0057
38	0.102	0.0040	0.099	0.0039	0.104	0.0041	0.008	0.0003	0.119	0.0047	0.018	0.0007	0.130	0.0051
39	0.089	0.0035	0.086	0.0034	0.091	0.0036	0.005	0.0002	0.104	0.0041	0.015	0.0006	0.114	0.0045
40	0.079	0.0031	0.076	0.0030	0.081	0.0032	0.005	0.0002	0.094	0.0037	0.015	0.0006	0.102	0.0040
41	0.071	0.0028	0.069	0.0027	0.074	0.0029	0.005	0.0002	0.084	0.0033	0.013	0.0005	0.091	0.0036
42	0.064	0.0025	0.061	0.0024	0.066	0.0026	0.005	0.0002	0.076	0.0030	0.010	0.0004	0.081	0.0032

3 · 2. BS (British Standard)

Conductor			Single Build		Heavy Build	
Nom.	Min.	Max.	Min. Increase in Dia.	Max. Overall Dia.	Min. Increase in Dia.	Max. Overall Dia.
(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
3.150	3.182	3.118	0.045	3.233	0.084	3.276
3.000	3.030	2.970	0.045	3.083	0.084	3.126
2.800	2.828	2.772	0.043	2.880	0.081	2.922
2.650	2.677	2.623	0.043	2.730	0.081	2.772
2.500	2.525	2.475	0.042	2.578	0.079	2.618
2.360	2.384	2.336	0.042	2.438	0.079	2.478
2.240	2.262	2.218	0.041	2.316	0.077	2.355
2.120	2.141	2.099	0.041	2.196	0.077	2.235
2.000	2.020	1.980	0.040	2.074	0.075	2.112
1.900	1.919	1.881	0.040	1.974	0.075	2.012
1.800	1.818	1.782	0.039	1.872	0.073	1.909
1.700	1.717	1.683	0.039	1.772	0.073	1.809
1.600	1.616	1.584	0.038	1.670	0.071	1.706
1.500	1.515	1.485	0.038	1.570	0.071	1.606
1.400	1.414	1.386	0.036	1.468	0.069	1.502
1.320	1.333	1.307	0.036	1.388	0.069	1.422
1.250	1.263	1.237	0.035	1.316	0.067	1.349
1.180	1.192	1.168	0.035	1.246	0.067	1.279
1.120	1.131	1.109	0.034	1.184	0.065	1.217
1.060	1.071	1.049	0.034	1.124	0.065	1.157
1.000	1.010	0.990	0.034	1.062	0.063	1.094
0.950	0.960	0.940	0.034	1.012	0.063	1.044
0.900	0.909	0.891	0.032	0.959	0.060	0.989
0.850	0.859	0.841	0.032	0.909	0.060	0.939
0.800	0.808	0.792	0.030	0.855	0.056	0.884
0.750	0.758	0.742	0.030	0.805	0.056	0.834
0.710	0.717	0.703	0.028	0.762	0.053	0.789
0.670	0.677	0.663	0.028	0.722	0.053	0.749
0.630	0.636	0.624	0.027	0.679	0.050	0.704
0.600	0.606	0.594	0.027	0.649	0.050	0.674
0.560	0.566	0.554	0.025	0.606	0.047	0.630
0.530	0.536	0.524	0.025	0.576	0.047	0.600
0.500	0.505	0.495	0.024	0.544	0.045	0.566
0.475	0.480	0.470	0.024	0.519	0.045	0.541
0.450	0.455	0.445	0.022	0.491	0.042	0.513
0.425	0.430	0.420	0.022	0.466	0.042	0.488
0.400	0.405	0.395	0.021	0.439	0.040	0.459
0.375	0.380	0.370	0.021	0.414	0.040	0.434
0.355	0.359	0.351	0.020	0.392	0.038	0.411
0.335	0.339	0.331	0.020	0.372	0.038	0.391
0.315	0.319	0.311	0.019	0.349	0.035	0.367
0.300	0.304	0.296	0.019	0.334	0.035	0.352
0.280	0.284	0.276	0.018	0.312	0.033	0.329
0.265	0.269	0.261	0.018	0.279	0.033	0.314
0.250	0.254	0.246	0.017	0.281	0.032	0.297
0.236	0.240	0.232	0.017	0.267	0.032	0.283
0.224	0.227	0.221	0.015	0.252	0.029	0.266
0.212	0.215	0.209	0.015	0.240	0.029	0.254
0.200	0.203	0.197	0.014	0.226	0.027	0.239
0.190	0.193	0.187	0.014	0.216	0.027	0.228
0.180	0.183	0.177	0.013	0.204	0.025	0.271
0.170	0.173	0.167	0.013	0.194	0.025	0.205
0.160	0.163	0.157	0.012	0.182	0.023	0.194
0.150	0.153	0.147	0.012	0.171	0.023	0.182
0.140	0.143	0.137	0.011	0.160	0.021	0.171
0.132	0.135	0.129	0.011	0.152	0.021	0.162
0.125	0.128	0.122	0.010	0.144	0.019	0.154
0.112	0.115	0.109	0.009	0.130	0.017	0.139
0.100	0.103	0.097	0.008	0.117	0.016	0.125

3 · 3. KS(JIS) : Class 0(Zero) Enameled Wires

Conductor		Min. Thickness of Film	Max. Overall Dia.	Max. Conductor Resistance
Dia.	Tolerance of Dia.			
(mm)	±(mm)	(mm)	(mm)	20℃(Ω/km)
3.20	0.04	0.049	3.388	2.198
3.00	0.03	0.049	3.178	2.489
2.90	0.03	0.049	3.078	2.665
2.80	0.03	0.049	2.978	2.861
2.70	0.03	0.049	2.878	3.079
2.60	0.03	0.049	2.778	3.324
2.50	0.03	0.049	2.678	3.598
2.40	0.03	0.048	2.574	3.908
2.30	0.03	0.046	2.468	4.260
2.20	0.03	0.046	2.368	4.662
2.10	0.03	0.045	2.266	5.123
2.00	0.03	0.044	2.162	5.657
1.90	0.03	0.044	2.062	6.278
1.80	0.03	0.042	1.956	7.007
1.70	0.03	0.042	1.856	7.871
1.60	0.03	0.041	1.754	8.906
1.50	0.03	0.041	1.654	10.16
1.40	0.03	0.039	1.548	11.70
1.30	0.03	0.039	1.448	13.61
1.20	0.03	0.037	1.342	16.04
1.10	0.03	0.037	1.242	19.17
1.00	0.03	0.036	1.138	23.33
0.95	0.02	0.034	1.072	25.38
0.90	0.02	0.033	1.020	28.35
0.85	0.02	0.032	0.966	31.87
0.80	0.02	0.031	0.914	36.08
0.75	0.02	0.03	0.860	41.19
0.70	0.02	0.028	0.804	47.47
0.65	0.02	0.027	0.752	55.31
0.60	0.02	0.026	0.698	65.26
0.55	0.02	0.025	0.646	78.15
0.50	0.01	0.025	0.586	91.43
0.45	0.01	0.024	0.532	114.2
0.40	0.01	0.023	0.480	145.3
0.37	0.01	0.022	0.446	170.6
0.35	0.01	0.021	0.424	191.2
0.32	0.01	0.021	0.394	230.0
0.30	0.01	0.021	0.374	262.9
0.29	0.01	0.020	0.360	285.7
0.28	0.010	0.020	0.350	307.3
0.27	0.010	0.020	0.340	331.4
0.26	0.010	0.020	0.330	358.4
0.25	0.008	0.020	0.318	382.5
0.24	0.008	0.020	0.308	416.2
0.23	0.008	0.020	0.293	454.5
0.22	0.008	0.019	0.286	498.4
0.21	0.008	0.019	0.276	549.0
0.20	0.008	0.019	0.266	607.6
0.19	0.008	0.019	0.256	676.2
0.18	0.008	0.019	0.246	757.2
0.17	0.008	0.018	0.232	853.5
0.16	0.008	0.018	0.222	969.5
0.15	0.008	0.017	0.210	1,111
0.14	0.008	0.017	0.200	1,286
0.13	0.008	0.017	0.190	1,505
0.12	0.008	0.017	0.180	1,786
0.11	0.008	0.016	0.166	2,153
0.10	0.008	0.016	0.156	2,647

3 · 4. KS(JIS) : Class 1 Enameled Wires

Conductor		Min. Thickness of Film	Max. Overall Dia.	Max. Conductor Resistance
Dia.	Tolerance of Dia.			
(mm)	±(mm)	(mm)	(mm)	20℃(Ω /km)
3.20	0.04	0.034	3.338	2.198
3.00	0.03	0.034	3.128	2.489
2.90	0.03	0.034	3.028	2.665
2.80	0.03	0.034	2.928	2.861
2.70	0.03	0.034	2.828	3.079
2.60	0.03	0.034	2.728	3.324
2.50	0.03	0.034	2.628	3.598
2.40	0.03	0.033	2.526	3.908
2.30	0.03	0.032	2.422	4.260
2.20	0.03	0.032	2.322	4.662
2.10	0.03	0.031	2.220	5.123
2.00	0.03	0.030	2.118	5.656
1.90	0.03	0.030	2.018	6.278
1.80	0.03	0.029	1.914	7.007
1.70	0.03	0.029	1.814	7.871
1.60	0.03	0.028	1.712	8.906
1.50	0.03	0.028	1.612	10.16
1.40	0.03	0.027	1.508	11.70
1.30	0.03	0.027	1.408	13.61
1.20	0.03	0.026	1.304	16.04
1.10	0.03	0.026	1.204	19.17
1.00	0.03	0.025	1.102	23.33
0.95	0.02	0.024	1.038	25.38
0.90	0.02	0.023	0.986	28.35
0.85	0.02	0.022	0.934	31.87
0.80	0.02	0.021	0.882	36.08
0.75	0.02	0.020	0.830	41.19
0.70	0.02	0.019	0.776	47.47
0.65	0.02	0.018	0.724	55.31
0.60	0.02	0.017	0.672	65.26
0.55	0.02	0.017	0.620	78.15
0.50	0.01	0.017	0.560	91.43
0.45	0.01	0.016	0.508	114.2
0.40	0.01	0.015	0.456	145.3
0.37	0.01	0.014	0.424	170.6
0.35	0.01	0.014	0.402	191.2
0.32	0.01	0.014	0.372	230.0
0.30	0.01	0.014	0.352	262.9
0.29	0.01	0.013	0.340	285.7
0.28	0.01	0.013	0.330	307.3
0.27	0.010	0.013	0.320	331.4
0.26	0.010	0.013	0.310	358.4
0.25	0.008	0.013	0.298	382.5
0.24	0.008	0.013	0.288	416.2
0.23	0.008	0.013	0.278	454.5
0.22	0.008	0.012	0.266	498.4
0.21	0.008	0.012	0.256	549.0
0.20	0.008	0.012	0.246	607.6
0.19	0.008	0.012	0.236	676.2
0.18	0.008	0.012	0.226	757.2
0.17	0.008	0.011	0.214	853.5
0.16	0.008	0.011	0.204	969.5
0.15	0.008	0.010	0.192	1,111
0.14	0.008	0.010	0.182	1,286
0.13	0.008	0.010	0.172	1,505
0.12	0.008	0.010	0.162	1,786
0.11	0.008	0.009	0.150	2,153
0.10	0.008	0.009	0.140	2,647

3 · 5. KS(JIS) : Class 2 Enameled Wires

Conductor		Min. Thickness of Film	Max.Overall Dia.	Max.Conductor Resistance
Dia.	Tolerance of Dia.			
(mm)	±(mm)	(mm)	(mm)	20℃(Ω/km)
1.00	0.012	0.017	1.062	22.49
0.95	0.010	0.017	1.008	24.84
0.90	0.010	0.016	0.956	27.71
0.85	0.010	0.015	0.904	31.11
0.80	0.010	0.015	0.852	35.17
0.75	0.008	0.014	0.798	39.87
0.70	0.008	0.013	0.746	45.84
0.65	0.008	0.012	0.694	53.26
0.60	0.008	0.012	0.644	62.64
0.55	0.006	0.012	0.592	74.18
0.50	0.006	0.012	0.542	89.95
0.45	0.006	0.011	0.490	112.1
0.40	0.005	0.011	0.439	141.7
0.37	0.005	0.010	0.407	165.9
0.35	0.005	0.010	0.387	185.7
0.32	0.005	0.010	0.357	222.8
0.30	0.005	0.010	0.337	254.0
0.29	0.004	0.009	0.324	273.9
0.28	0.004	0.009	0.314	294.1
0.27	0.004	0.009	0.304	316.6
0.26	0.004	0.009	0.294	341.8
0.25	0.004	0.009	0.284	370.2
0.24	0.004	0.009	0.274	402.2
0.23	0.004	0.009	0.264	438.6
0.22	0.004	0.008	0.252	480.1
0.21	0.003	0.008	0.241	522.8
0.20	0.003	0.008	0.231	577.2
0.19	0.003	0.008	0.221	640.6
0.18	0.003	0.008	0.211	715.0
0.17	0.003	0.007	0.199	803.2
0.16	0.003	0.007	0.189	908.8
0.15	0.003	0.006	0.177	1,037
0.14	0.003	0.006	0.167	1,193
0.13	0.003	0.006	0.157	1,389
0.12	0.003	0.006	0.147	1,636
0.11	0.003	0.005	0.135	1,957
0.10	0.003	0.005	0.125	2,381
0.09	0.003	0.005	0.113	2,959
0.08	0.003	0.005	0.103	3,778
0.07	0.003	0.004	0.091	4,990
0.06	0.003	0.004	0.081	6,966

3 · 6. SBH-EIW (Class 0(Zero))

LSC Standard

Conductor		Min. Insulation Thickness of Film	Max. Bonding Thicknes of Film	Overall Dia.		Max. Conductor Resistance
Dia.	Tolerance of Dia.			Standard	Tolerance of Dia.	
(mm)	±(mm)	(mm)	(mm)	(mm)	±(mm)	20℃(Ω /km)
0.20	0.003	0.017	0.006	0.254	0.003	577.1
0.22	0.003	0.017	0.006	0.274	0.003	480.1
0.24	0.003	0.017	0.006	0.297	0.003	402.2
0.26	0.004	0.018	0.007	0.318	0.003	341.8
0.28	0.004	0.018	0.007	0.338	0.003	285.3
0.30	0.004	0.018	0.007	0.358	0.003	254.0
0.32	0.004	0.019	0.007	0.380	0.003	228.8
0.35	0.004	0.021	0.008	0.416	0.003	185.7
0.37	0.004	0.019	0.008	0.432	0.003	165.9
0.38	0.004	0.019	0.008	0.442	0.003	158.2
0.40	0.004	0.021	0.008	0.466	0.004	141.7
0.42	0.005	0.021	0.008	0.486	0.004	124.5
0.43	0.005	0.023	0.008	0.500	0.004	118.8
0.45	0.005	0.024	0.008	0.522	0.004	112.1
0.47	0.005	0.024	0.008	0.542	0.004	102.7
0.50	0.005	0.024	0.008	0.572	0.004	90.59

3 · 7. GADW (GADWC)

LSC Standard

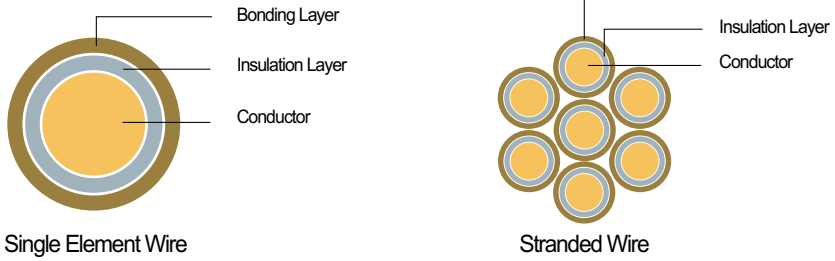
Conductor		Finished Dia.		Max.Conductor Resistance
Dia.	Tolerance of Dia.	Standard	Tolerance	
(mm)	±(mm)	(mm)	(mm)	20℃(Ω/km)
0.34	0.006	0.385	+0.005 -0.004	322.6
0.35	0.006	0.395	+0.005 -0.004	304.1
0.36	0.006	0.406	+0.005 -0.004	287.2
0.37	0.006	0.417	+0.005 -0.004	271.6
0.38	0.006	0.427	+0.005 -0.004	257.3
0.39	0.006	0.438	+0.005 -0.004	244.1
0.40	0.006	0.449	+0.005 -0.004	231.8
0.41	0.006	0.459	+0.005 -0.004	220.5
0.42	0.006	0.469	+0.005 -0.004	210.0
0.43	0.006	0.479	+0.005 -0.004	200.2
0.44	0.006	0.49	+0.005 -0.004	191.1
0.45	0.006	0.501	+0.005 -0.004	182.6
0.46	0.006	0.511	+0.005 -0.004	174.6
0.47	0.006	0.521	+0.005 -0.004	167.2
0.48	0.006	0.528	+0.005 -0.004	160.2
0.49	0.006	0.538	±0.006	153.6
0.50	0.007	0.548	±0.006	148.1
0.51	0.007	0.558	±0.006	142.2
0.52	0.007	0.568	±0.006	136.7
0.53	0.007	0.578	±0.006	131.6
0.54	0.007	0.588	±0.006	126.7
0.55	0.007	0.598	±0.006	122.1
0.60	0.009	0.65	±0.006	103.0
0.90	0.012	0.966	±0.011	45.64
0.95	0.012	1.018	±0.011	40.90
1.00	0.012	1.076	±0.014	36.87
1.05	0.012	1.128	±0.014	33.40
1.10	0.015	1.178	±0.014	30.57
1.15	0.015	1.228	±0.014	27.94
1.20	0.015	1.278	±0.014	25.63
1.25	0.015	1.331	±0.014	23.59
1.30	0.015	1.381	±0.014	21.79
1.35	0.015	1.431	±0.014	20.19
1.40	0.015	1.481	±0.015	18.76
1.45	0.015	1.534	±0.015	17.48
1.50	0.015	1.584	±0.015	16.33
1.55	0.015	1.634	±0.015	15.27
1.60	0.015	1.684	±0.015	14.32
1.65	0.015	1.735	±0.015	13.46
1.70	0.015	1.786	±0.015	12.68
1.75	0.015	1.836	±0.015	11.96
1.80	0.015	1.886	±0.015	11.29

3 · 8. Litz Wires

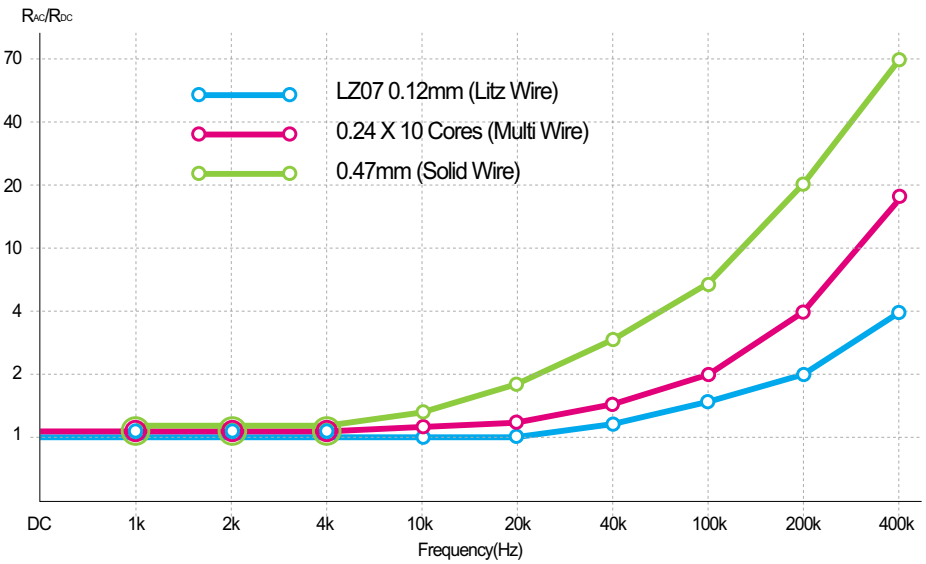
LSC Standard

Type	Single Element Wire								Stranded Wire	
	Conductor		Insulation Coat		Bonding Coat		Max. Conductor Resistance	Thermal Class	Max.Overall Dia.	Number of Class
	Dia.	Tolerance	Min. Thickness of Film	Standard Overall Dia.	Min. Thickness of Film	Standard Overall Dia.				
	(mm)	±(mm)	(mm)	(mm)	(mm)	(mm)	20℃(Ω/km)	(℃)	(mm)	
LZSW08	0.12	0.003	0.009	0.152	0.006	0.170	1636	H(180)	0.588	8
LZSW08	0.13	0.003	0.009	0.170	0.006	0.192	1389	H(180)	0.620	8
LZSW07	0.14	0.003	0.016	0.180	0.006	0.200	1193	H(180)	0.654	7
LZSW08	0.14	0.003	0.016	0.180	0.006	0.200	1193	H(180)	0.712	8
LZSW07	0.16	0.003	0.017	0.206	0.006	0.226	908.8	H(180)	0.732	7
LZSW08	0.16	0.003	0.017	0.206	0.006	0.226	908.8	H(180)	0.796	8
SLZSW07	0.14	0.003	0.016	0.180	0.006	0.200	1193	F(155)	0.654	7
SLZSW10	0.15	0.003	0.016	0.192	0.006	0.207	1037	F(155)	0.832	10
SLZSW11	0.15	0.003	0.016	0.192	0.006	0.207	1037	F(155)	0.873	11
SLZSW07	0.16	0.003	0.017	0.206	0.006	0.226	908.8	F(155)	0.732	7
SLZSW08	0.16	0.003	0.017	0.206	0.006	0.226	908.8	F(155)	0.796	8

Structure



2) Characteristics of Rac / Rdc vs frequency change



04
ENGINEERING DATA

4 · 1. Solvent Resistance of Enameled Wires

Type of Solvent	Temperature of Solvent(Single and Compound Solvent)	PVF		UEW		PEW, EIW		AIW	
		Cheese Cloth	Nail	Cheese Cloth	Nail	Cheese Cloth	Nail	Cloth	Nail
20℃	Methanol	◎	◎	◎	○	◎	◎	◎	◎
	Ethanol	◎	◎	◎	○	◎	◎	◎	◎
	Buthanol	◎	◎	◎	◎	◎	◎	◎	◎
	Naphtha	◎	◎	◎	◎	◎	◎	◎	◎
	Tung Oil	◎	◎	◎	◎	◎	◎	◎	◎
	Turpentine	◎	◎	◎	◎	◎	◎	◎	◎
	Gasoline	◎	◎	◎	◎	◎	◎	◎	◎
	Benzol	◎	◎	◎	◎	◎	◎	◎	◎
	Cresol	◎	×	○	△	○	△	N.T	N.T
	Naphtha (5) + Buthanol (5)	◎	◎	◎	◎	◎	◎	◎	◎
	Benzol (5) + Buthanol (5)	◎	◎	◎	◎	◎	◎	◎	◎
	Naphtha (5) + Benzol (5)	◎	◎	◎	◎	◎	◎	◎	◎
	Naphtha (5) + Gasoline (5)	◎	◎	◎	◎	◎	◎	◎	◎
65℃	Methanol	◎	○	◎	△	◎	◎	◎	◎
	Ethanol	◎	○	◎	△	◎	◎	◎	◎
	Buthanol	◎	○	◎	◎	◎	◎	◎	◎
	Naphtha	◎	◎	◎	◎	◎	◎	◎	◎
	Tung Oil	◎	◎	◎	◎	◎	◎	◎	◎
	Turpentine	◎	◎	◎	◎	◎	◎	◎	◎
	Gasoline	◎	◎	◎	◎	◎	◎	◎	◎
	Benzol	◎	○	◎	◎	◎	◎	◎	◎
	Cresol	×	×	×	×	×	×	N.T	N.T
	Naphta (5) + Buthanol (5)	◎	×	◎	△	◎	◎	◎	◎
	Benzol (5) + Buthanol (5)	×	×	○	△	◎	◎	◎	◎
	Naphtha (5) + Benzol (5)	◎	◎	◎	◎	◎	◎	◎	◎
	Naphtha (5) + Gasoline (5)	◎	◎	◎	◎	◎	◎	◎	◎

※ Symbol : ◎ Acceptable for use △ Not recommendable ○ Usable after examining × Unusable N.T. : No Test.

4 · 2. Properties of Various Enameled Wires After Being Elongated

Type	Elongation (%)	Dimension (mm) [1]			Pinhole (No./5m)	Mandrel [2] wound	Dielectric [3] Strength (V)	Number of [4] Torsion (Adhesion)	Number of [5] Scrape Resistance
		Conductor Dia.	Film Thickness	Overall Dia.					
PVF	0	1.000	0.041	1.082	0	×1, 0/3	9,780	88.5	151.8
	3	0.985	0.040	1.064	0	×1, 0/3	9,600	86.3	136.3
	6	0.974	0.040	1.054	0	×1, 0/3	9,480	86.1	135.8
	9	0.962	0.039	1.040	0	×1, 0/3	9,460	85.1	135.2
	12	0.947	0.039	1.025	0	×1, 0/3	9,350	81.0	134.8
UEW	0	0.997	0.044	1.084	0	×1, 0/3	9,990	101.3	34.2
	3	0.983	0.044	1.070	0	×1, 0/3	9,830	99.5	34.3
	6	0.970	0.043	1.056	0	×1, 0/3	9,050	93.9	29.2
	9	0.958	0.042	1.041	0	×1, 0/3	8,600	92.9	28.5
	12	0.945	0.041	1.027	0	×1, 0/3	8,690	91.6	25.2
PEW	0	1.002	0.041	1.083	0	×1, 0/3	10,970	100.4	91.5
	3	0.998	0.041	1.069	0	×1, 0/3	10,160	97.0	67.7
	6	0.975	0.040	1.054	0	×1, 0/3	9,800	94.0	59.3
	9	0.964	0.039	1.041	0	×1, 0/3	9,630	91.9	56.8
	12	0.949	0.039	1.026	0	×1, 0/3	9,510	90.0	50.8
EIW	0	1.002	0.043	1.088	0	×1, 0/3	11,500	89.1	63.1
	3	0.987	0.042	1.071	0	×1, 0/3	11,400	87.4	59.1
	6	0.974	0.042	1.058	0	×1, 0/3	11,300	86.0	57.0
	9	0.960	0.041	1.042	0	×1, 0/3	11,200	84.1	55.6
	12	0.947	0.039	1.025	0	×1, 0/3	10,800	82.3	39.0
AIW	0	1.000	0.043	1.086	0	×1, 0/3	11,600	71.8	69.2
	3	0.988	0.042	1.072	0	×1, 0/3	11,400	70.1	57.0
	6	0.976	0.041	1.058	0	×1, 0/3	11,250	68.5	51.4
	9	0.965	0.041	1.047	0	×1, 0/3	11,100	67.4	43.1
	12	0.950	0.040	1.030	0	×1, 0/3	10,830	65.6	38.5

※ Test method.

1. Average value of 10 measurements
2. Numerator: Number of detective wires, Denominator: Number of specimens
3. Average value of a measurements by twist pair method
4. Gauge length: 200mm
5. Repeated scrape test

4 · 3. Critical Properties of Various Enameled Wires

Item / Test	Wires	Test Condition	Not elongated	6% Elongated	12% Elongated
Cut through	PVF	Temperature Causing Short Circuit by heating for 6 hours	200~220℃	200~220℃	200~220℃
	PEW		220~240℃	220~240℃	220~240℃
	EIW		250~300℃	250~300℃	250~300℃
	AIW		350~400℃	350~400℃	350~400℃
Heat shock	PVF	170℃, 1 hour	×1, OK	×1, OK	×1~3, OK
	PEW	170℃, 1 hour	×3~5, OK	×3~5, OK	×1~3, OK
	EIW	250℃, 1 hour	×2~4, OK	×3~5, OK	×4, OK
	AIW	400℃, 1 hour	×1~3, OK	×3~5, OK	×1~3, OK
Aging(Flexibility)	PVF	6 hours after heating at 200℃	×2~3, OK	×1, OK	×1~3, OK
	PEW	6 hours after heating at 200℃	×3~5, OK	×3~5, OK	×1~3, OK
	EIW	6 hours after heating at 200℃	×2~3, OK	×3~5, OK	×1~3, OK
	AIW	6 hours after heating at 200℃	×1~3, OK	×3~5, OK	×1~3, OK

4 · 4. Refrigerant Resistance of Various Enameled Wires

R-11	Freon					
	R-11	R-12	R-21	R-22	R-114	R-134a
PVF	◎	◎	×	×	○	×
RRW	◎	◎	△	◎	◎	○
PEW	◎	◎	×	◎	◎	△
UEW	◎	◎	×	○	◎	△
EIW	◎	◎	△	◎	◎	△
AIW	◎	◎	◎	◎	◎	○

※ Notes : ◎ Acceptable for use △ Not recommendabe ○ Usable after examining × Unusable

4 · 5. Crazing and Cure Effect of Various Enameled Wires

Type of Enameled Wire	In Case of Sample Winding		In Case of fter Immersion	
	After Winding	After Heating for 30 Minutes at 120℃	After Winding	After Heating for 30 Minutes at 120℃
PVF	3/10-5/10	0/10-1/10	8/10-10/10	0/10-1/10
EIW	2/10-3/10	0/10-1/10	6/10-10/10	1/10-3/10
UEW	0/10-2/10	0/10-1/10	5/10-10/10	1/10-3/10
PEW	0/10-1/10	0/10-1/10	0/10-1/10	0/10-1/10

4 · 6. Tension Table for Coiling

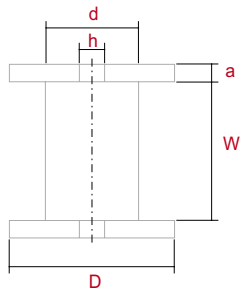
Size (mm)	Tension (g)	Size (mm)	Tension (g)	Size (mm)	Tension (g)	Size (mm)	Tension (g)
0.02	5.1	0.18	225	0.35	745	0.80	3,170
0.025	7.1	0.19	248	0.36	785	0.85	3,520
0.03	10.2	0.2	272	0.37	824	0.90	3,880
0.04	17.3	0.21	292	0.38	864	1.0	4,630
0.05	25.5	0.22	333	0.39	903	1.1	5,283
0.06	33	0.23	356	0.40	946	1.2	6,120
0.07	43	0.24	380	0.42	1,024	1.3	7,220
0.08	54	0.25	412	0.43	1,068	1.4	8,221
0.09	65	0.26	441	0.45	1,160	1.5	9,200
0.10	78	0.27	470	0.47	1,250	1.6	10,200
0.11	93	0.28	503	0.48	1,295	1.7	11,220
0.12	106	0.29	535	0.50	1,395	1.8	12,342
0.13	125	0.3	565	0.55	1,650	1.9	13,464
0.14	143	0.31	600	0.60	1,925	2.0	14,790
0.15	161	0.32	635	0.65	2,220		
0.16	181	0.33	672	0.70	2,520		
0.17	203	0.34	708	0.75	2,830		

05
BOBBIN FOR ENAMELED WIRES

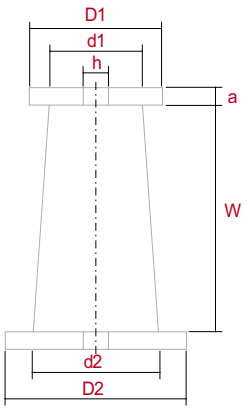
5 · 1. Bobbin Dimensions

Tolerance of net weight : ±30%

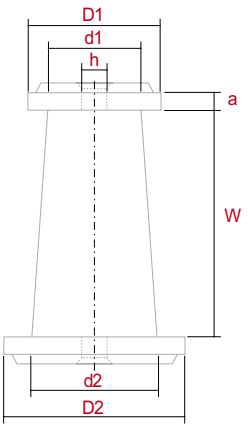
Type	Bobbin	Flange Dia. D(mm)	Barrel Dia. d(mm)	Inside Width W(mm)	Flange Thickness a(mm)	Hole Dia. h(mm)	Width of Bobbin kg	Standard Weight of Enameled Wire Per Bobbin kg
Plastic Bobbin	P-25	300	130	130	15	30	1.40	25



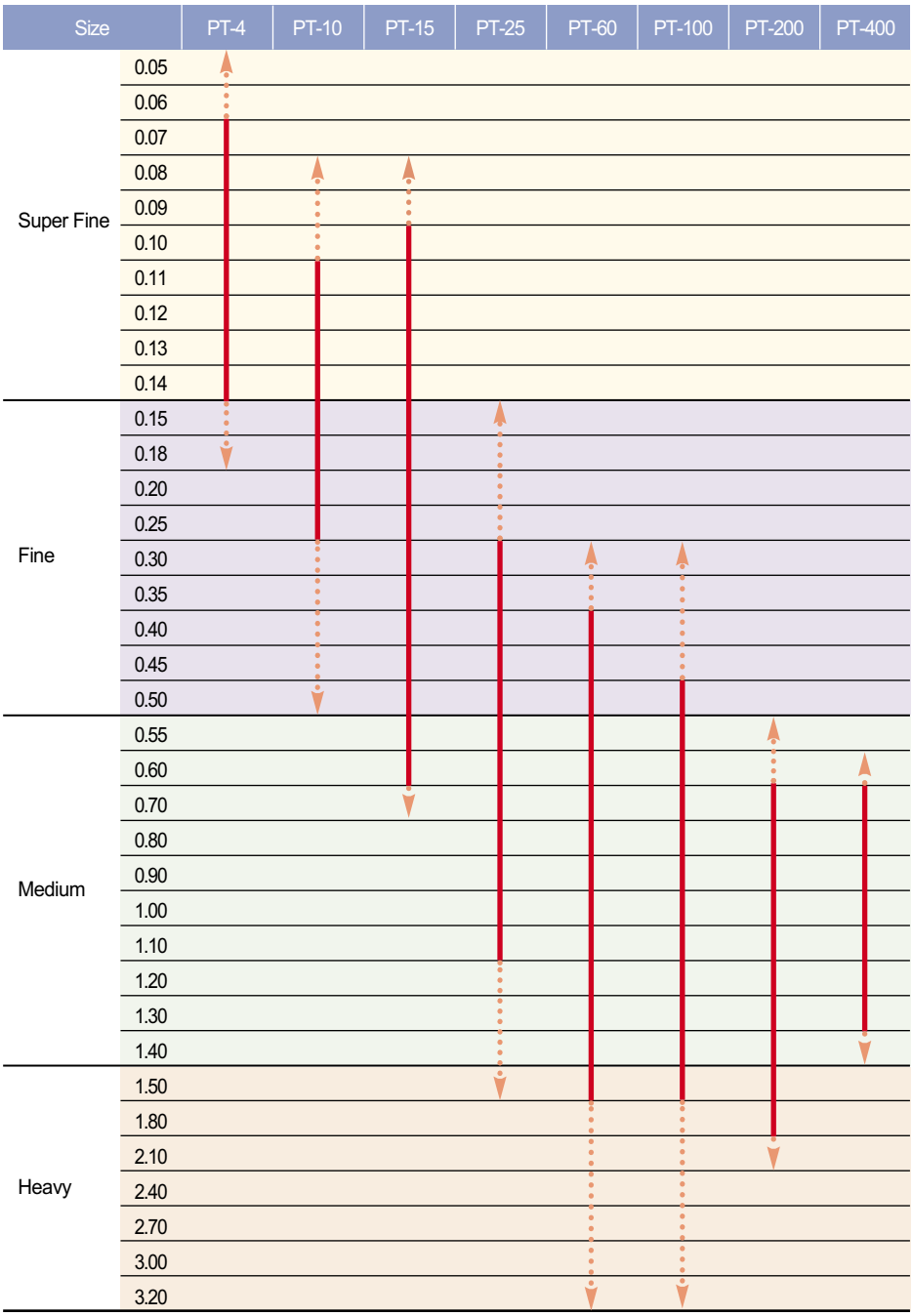
Type	Bobbin	Flange Dia. D(mm)	Barrel Dia. d(mm)	Inside Width W(mm)	Flange Thickness a(mm)	Hole Dia. h(mm)	Width of Bobbin kg	Standard Weight of Enameled Wire Per Bobbin kg
Plastic Taper Bobbin	PT- 4	D1 124 D2 140	d1 74 d2 86	170	15	26	0.34	4
	PT-10	D1 160 D2 180	d1 96 d2 110	200	15	30	0.60	10
	PT-15	D1 180 D2 200	d1 96 d2 110	198	15	30	0.85	15
	PT-25	D1 215 D2 230	d1 110 d2 130	250	15	34	0.93	25
	PT-60	D1 270 D2 300	d1 150 d2 180	350	25	45	2.20	60



Type	Bobbin	Flange Dia. D(mm)	Barrel Dia. d(mm)	Inside Width W(mm)	Flange Thickness a(mm)	Hole Dia. h(mm)	Width of Bobbin kg	Standard Weight of Enameled Wire Per Bobbin kg
	PT-100	D1 300 D2 315	d1 180 d2 200	425	38	100	4.35	90
	PT-200	D1 375 D2 400	d1 224 d2 250	530	50	100	7.30	190
	PT-400	D1 475 D2 500	d1 280 d2 315	670	65	100	15.00	400



5 · 2. Bobbin Pattern for Enameled Wires



6. Notes and Warnings

Checklist and Precaution

1. General Checklist

(1) Please check the following before coil winding

(a) Are the wire diameter and type in accordance with the requirement?
(b) Is there any oxidazation on the conductor surface?
(c) Is there any damage of the film during handling?

(2) Please store the reset after coil winding so as to avoid the dust especially metal powder, moisture and the sun.

(3) Please avoid the damage to product, which may cause the plastic bobbin to be broken.

2. Checklist for Enameled Wire

Please be careful about the followings in case of enameled wire.

(1) Minimize the elongation of the wire during coiling.
Generally speaking, it is better to restrain the elongation up to maximum 5 % table 5 - 6 shows the tension versus elongation.

(2) Please draw deep attention when selection the component impregnating varnish.

(3) Don't spray the chemical solution, film stripper to the magnet wire.

3. Precaution during Coil

(1) Avoid the damage caused by breaking. It is better to use rotating break instead of static break.

(2) Please arrange the winding machine to avoid the damage or the decrease of the diameter of the wire.

(3) Minimize the tension and elongation to the enameled wire during the winding and coiling.

4. Precaution after Winding

(1) Please avoid the transformation of the coil shape, damage of the insulation material.

(2) Please draw deep attention to the handling of the coil before varnish treatment.

(3) Please avoid the dust especially metal powder, moisture during storing the coil.

Handling Instructions and Assurance Period

1. Handling Instruction

(1) Caution at the port Keep dry and don't handle in the rain. Store indoor to avoid moisture damage.

(2) Caution on board
Keep dry.
Don't store on deck.

(3) Caution during inland transportations
Keep dry.
Don't tranship in the rain, not transport without water-proof cover on truck.

(4) Caution during storage after delivery
Keep dry.
Keep clean to avoid the dust, especially metal powder. Don't be exposed to the sun

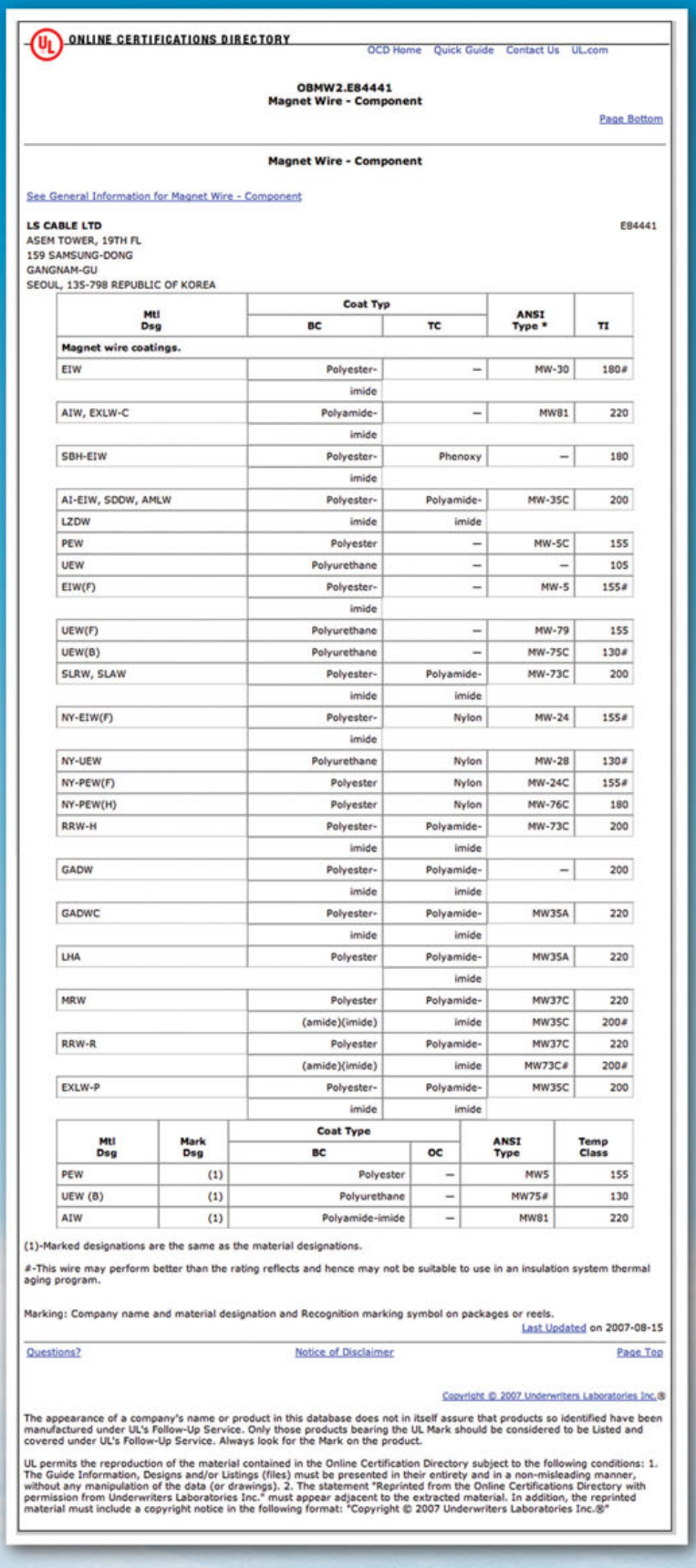
.

2. Assurance Period

Please recheck the properties of the wire, except for self-bonding type, when one year after manufacture.
In case of self-bonding type, please recheck the properties when 6 months pass.

Quality Certificates

UL Recognition



ONLINE CERTIFICATIONS DIRECTORY

OBMW2.E84441
Magnet Wire - Component

Page Bottom

Magnet Wire - Component

See General Information for Magnet Wire - Component

LS CABLE LTD E84441
ASEM TOWER, 19TH FL
159 SAMSUNG-DONG
GANGNAM-GU
SEOUL, 135-798 REPUBLIC OF KOREA

Mtl Dsg	Coat Typ BC	Coat Typ TC	ANSI Type *	TI
Magnet wire coatings.				
EIW	Polyester-imide	—	MW-30	180#
AIW, EXLW-C	Polyamide-imide	—	MW81	220
SBH-EIW	Polyester-imide	Phenoxy	—	180
AI-EIW, SDDW, AMLW	Polyester-imide	Polyamide-imide	MW-35C	200
LZDW				
PEW	Polyester	—	MW-5C	155
UEW	Polyurethane	—	—	105
EIW(F)	Polyester-imide	—	MW-5	155#
UEW(F)	Polyurethane	—	MW-79	155
UEW(B)	Polyurethane	—	MW-75C	130#
SLRW, SLAW	Polyester-imide	Polyamide-imide	MW-73C	200
NY-EIW(F)	Polyester-imide	Nylon	MW-24	155#
NY-UEW	Polyurethane	Nylon	MW-28	130#
NY-PEW(F)	Polyester	Nylon	MW-24C	155#
NY-PEW(H)	Polyester	Nylon	MW-76C	180
RRW-H	Polyester-imide	Polyamide-imide	MW-73C	200
GADW	Polyester-imide	Polyamide-imide	—	200
GADWC	Polyester-imide	Polyamide-imide	MW35A	220
LHA	Polyester	Polyamide-imide	MW35A	220
MRW	Polyester (amide)(imide)	Polyamide-imide	MW37C MW35C	220 200#
RRW-R	Polyester (amide)(imide)	Polyamide-imide	MW37C MW73C#	220 200#
EXLW-P	Polyester-imide	Polyamide-imide	MW35C	200

Mtl Dsg	Mark Dsg	Coat Type BC	Coat Type OC	ANSI Type	Temp Class
PEW	(1)	Polyester	—	MW5	155
UEW (B)	(1)	Polyurethane	—	MW75#	130
AIW	(1)	Polyamide-imide	—	MW81	220

(1)-Marked designations are the same as the material designations.

#-This wire may perform better than the rating reflects and hence may not be suitable to use in an insulation system thermal aging program.

Marking: Company name and material designation and Recognition marking symbol on packages or reels.

Last Updated on 2007-08-15

Questions? Notice of Disclaimer Page Top

UL & KS Recognition

UNDERWRITERS LABORATORIES INC.

ENVIRONMENTAL MANAGEMENT SYSTEM REGISTRATION

ISO 14001

LS Cable Ltd.

Gumi Plant
190 Gondan-Dong
Gumi- Si
Gyeongsangbuk-Do, 730-708
Korea

Indong Plant
643 Jinpyeong-Dong
Gumi-Si
Gyeongsangbuk-Do, 730-735
Korea

Underwriters Laboratories Inc.® (UL) issues this certificate to the Firm named above, after assessing the Firm's environmental management system and finding it in compliance with

ISO 14001:1996

ENVIRONMENTAL MANAGEMENT SYSTEM
KS A 14001:2001

for the following scope of registration

The environmental management system of LS Cable Ltd. associated with the design and manufacture of copper and optical fiber telecommunication cables, power cable, power cable accessories, aluminum extruded products and rubber hoses and assemblies for automotive application and manufacture of magnet wires, communication cables (LAN), optical fibers, curtain walls, aluminum billet and rods, aluminum tubes and copper rods at Gumi and Indong Plants, Gumi-Si, Gyeongsangbuk-Do, Korea.

This environmental management system registration is included in UL's Directory of Registered Firms and applies to the operations of the address(es) shown above. By issuance of this certificate the firm represents that it will maintain its registration in accordance with the applicable requirements. This certificate is not transferable and remains the property of Underwriters Laboratories Inc. ®.

File Number: A5120
Volume: 1
Original Certification Date: January 30, 1997
ISO 14001 Issue Date: January 30, 1997
Revision Date: April 24, 2005
Renewal Date: January 29, 2008

S. Joe Bhatia
Executive Vice President, International

UL REGISTERED FIRM

UNDERWRITERS LABORATORIES INC.

CERTIFICATE OF REGISTRATION

ISO 9000

LS Cable Ltd.

Anyang Plant
555 Hogwe-Dong
Dongan-Gu,
Anyang-Si
Gyeonggi-Do 431-831, Korea

Indong Plant
643 Jinpyeong-Dong
Gumi-Si
Gyeongbuk 730-360, Korea

Gumi Plant
190 Gongdan-Dong
Gumi-Si
Gyeongbuk 730-708
Korea

with a remote location located at:

19F ASEM Tower
159 Samsung-Dong
Gangnam-Gu
Seoul 135-090 Korea

Underwriters Laboratories Inc.® (UL), Melville, NY, USA, issues this certificate to the Firm named above, after assessing the Firm's quality system and finding it in compliance with

ISO 9001:2000

EN ISO 9001:2000; BS EN ISO 9001:2000; ANSI/ASQ Q9001:2000; KS A 9001:2001

for the following scope of registration

3357 (US) : Drawing and Insulating of Nonferrous Wire.
3082 (US) : Unsupported Plastics Profile Shapes

The manufacture of magnet wires, cables, and extruded tubings and sleevings.

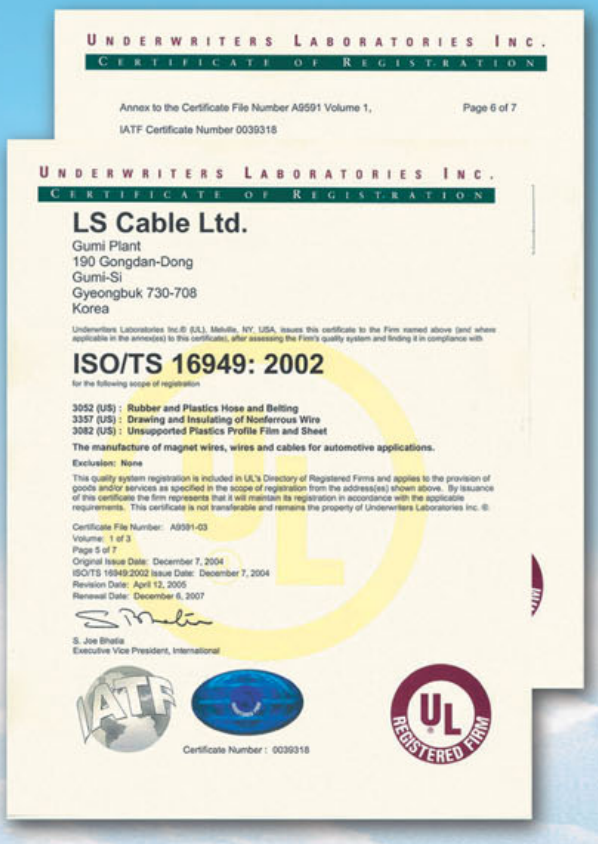
The remote location in Seoul performs overseas sales function.

This quality system registration is included in UL's Directory of Registered Firms and applies to the provision of goods and/or services as specified in the scope of registration from the address(es) shown above. By issuance of this certificate the firm represents that it will maintain its registration in accordance with the applicable requirements. This certificate is not transferable and remains the property of Underwriters Laboratories Inc. ®.

File Number: A9591 Volume: 2 of 3
Original Certification Date: August 21, 2000
ISO 9001:2000 Issue Date: December 7, 2004
Revision Date: April 12, 2005
Renewal Date: December 6, 2007

S. Joe Bhatia
Executive Vice President, International

UL REGISTERED FIRM



UNDERWRITERS LABORATORIES INC.

CERTIFICATE OF REGISTRATION

Annex to the Certificate File Number A9591 Volume 1, Page 6 of 7

IATF Certificate Number 0039318

UNDERWRITERS LABORATORIES INC.

CERTIFICATE OF REGISTRATION

LS Cable Ltd.

Gumi Plant
190 Gongdan-Dong
Gumi-Si
Gyeongbuk 730-708
Korea

Underwriters Laboratories Inc.® (UL), Melville, NY, USA, issues this certificate to the Firm named above (and where applicable in the annex(es) to this certificate), after assessing the Firm's quality system and finding it in compliance with

ISO/TS 16949: 2002

for the following scope of registration

3052 (US) : Rubber and Plastics Hose and Belting
3357 (US) : Drawing and Insulating of Nonferrous Wire
3082 (US) : Unsupported Plastics Profile Film and Sheet

The manufacture of magnet wires, wires and cables for automotive applications.

Exclusion: None

This quality system registration is included in UL's Directory of Registered Firms and applies to the provision of goods and/or services as specified in the scope of registration from the address(es) shown above. By issuance of this certificate the firm represents that it will maintain its registration in accordance with the applicable requirements. This certificate is not transferable and remains the property of Underwriters Laboratories Inc. ®.

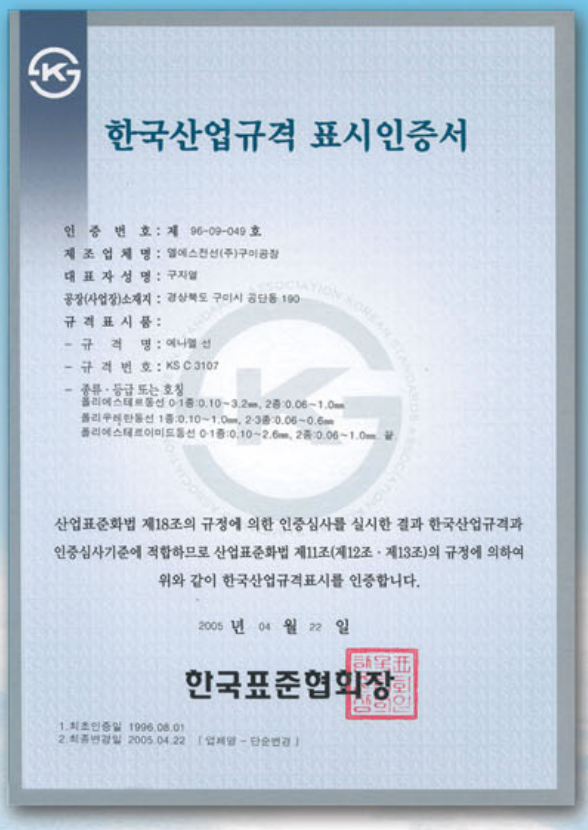
Certificate File Number: A9591-03
Volume: 1 of 3
Page 5 of 7
Original Issue Date: December 7, 2004
ISO/TS 16949:2002 Issue Date: December 7, 2004
Revision Date: April 12, 2005
Renewal Date: December 6, 2007

S. Joe Bhatia
Executive Vice President, International

IATF

Certificate Number : 0039318

UL REGISTERED FIRM



한국산업규격 표시인증서

인 증 번 호 : 제 96-09-049 호
제 조 업 체 명 : 엘에스전선(주)구미공장
대 표 자 성 명 : 구자열
공장(사업장)소재지 : 경상북도 구미시 공단동 190
규 격 표 시 품 :
- 규 격 명 : 에나멜 선
- 규 격 번 호 : KS C 3107
- 종류·등급 또는 호칭
폴리에스테르동선 0·1종:0.10~3.2㎜, 2종:0.06~1.0㎜
폴리우레탄동선 1종:0.10~1.0㎜, 2·3종:0.06~0.6㎜
폴리에스테르이미드동선 0·1종:0.10~2.6㎜, 2종:0.06~1.0㎜ 끝

산업표준화법 제18조의 규정에 의한 인증심사를 실시한 결과 한국산업규격과 인증심사기준에 적합하므로 산업표준화법 제11조(제12조·제13조)의 규정에 의하여 위와 같이 한국산업규격표시를 인증합니다.

2005 년 04 월 22 일

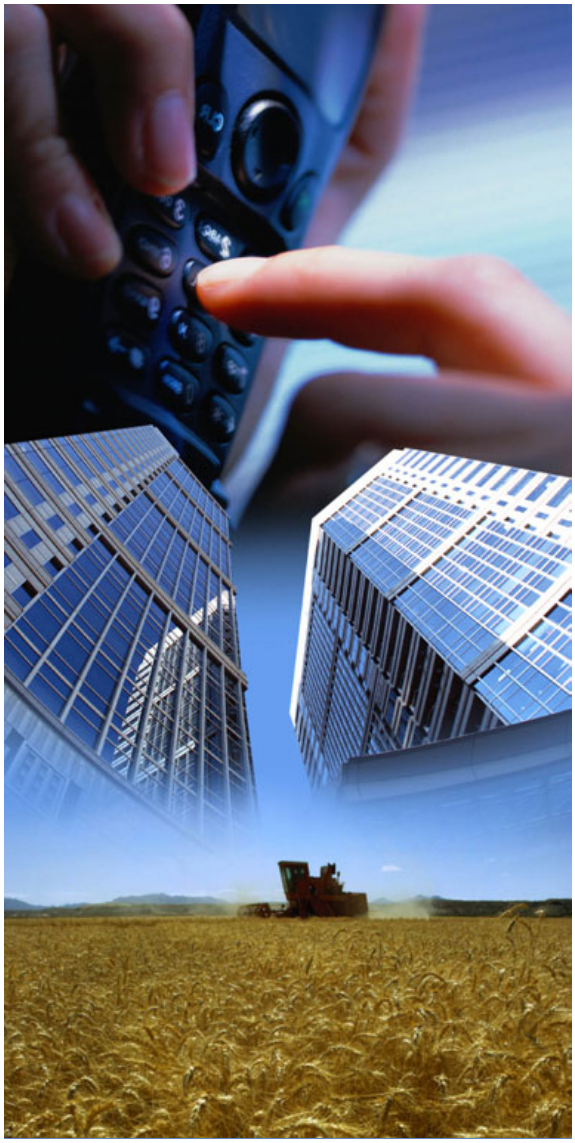
한국표준협회장

1.최초인증일 1996.08.01
2.최종변경일 2005.04.22 [업체명 - 단순변경]

Products & Systems of LS Cable

Electronic Components & Materials

Magnet Wire | Copper Wire Rod
Connector | Lead Frame | ACF | Antenna | Elastomer |
Copper Foil | FCCL | Heat Shrinkable Tube |
Ultracapacitor | Automotive Wire & Cable | Electronic
Wire & Cable | FA Cable |
High Frequency Coaxial Cable | Micro Coaxial Cable |



Industrial Machinery

Tractor
Air Conditioning System
Injection Molding System
Military Defense Equipment

Power Transmission & Distribution System

Extra High Voltage Cable System
Overhead Transmission Line System
OPGW I Busduct System
Onshore & Offshore Cable System
Medium & Low Voltage Cable
Control & Instrumentation Cable

Telecommunication System

Optical Fiber
Optical Fiber Cable
RF Feeder Cable
LAN Cable
FTTH
HFC (Hybrid Fiber Coaxial Cable)



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Penang (LSCM)

Singapore