



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.**

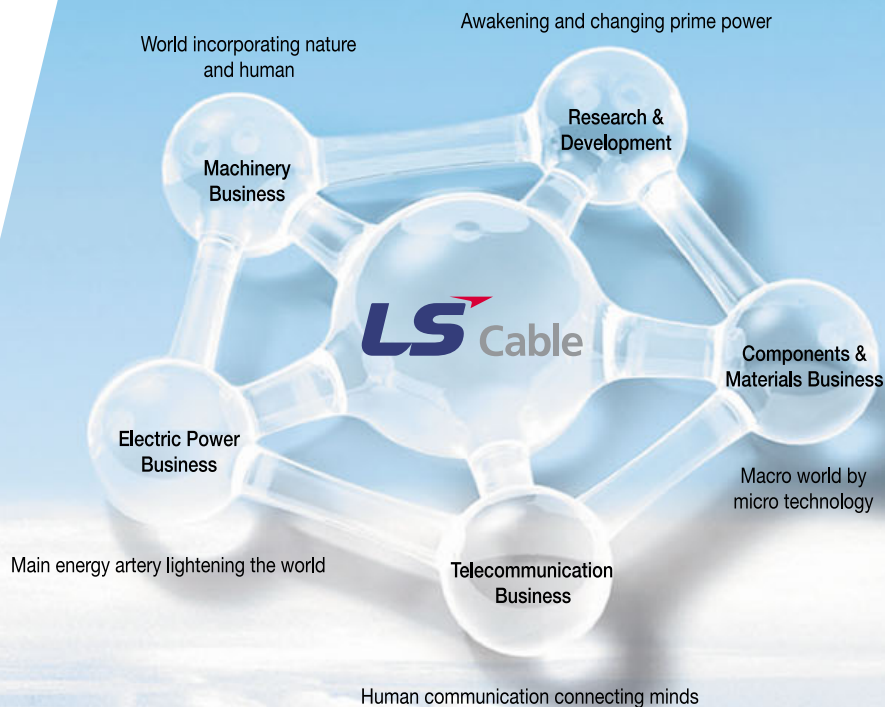
New Dream, New Start

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.



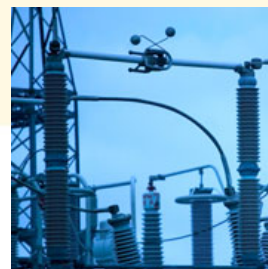
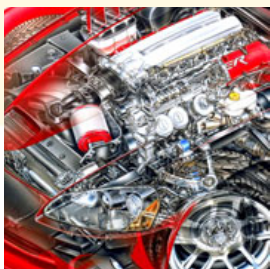
LS Magnet Wire

Higher Performance with Greater Reliability



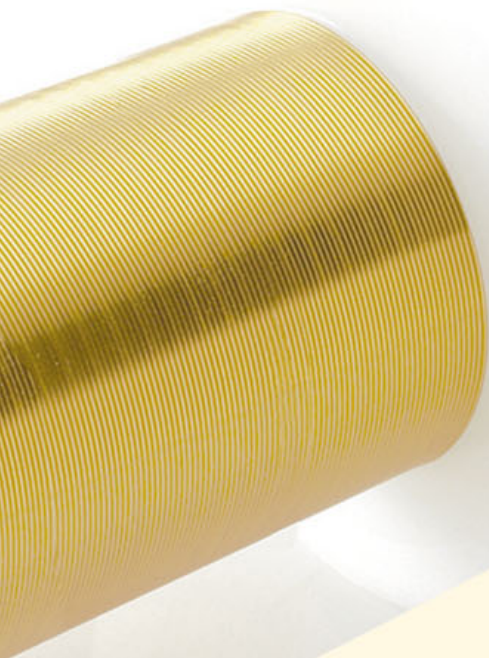
At the heart of the energy conversion system between electrical, electromagnetic, mechanical and other forms of energy, which system corresponds to the nerves and blood vessels of the electrical equipment and their properties, our products show high performance with great reliability. Our ceaseless effort 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.

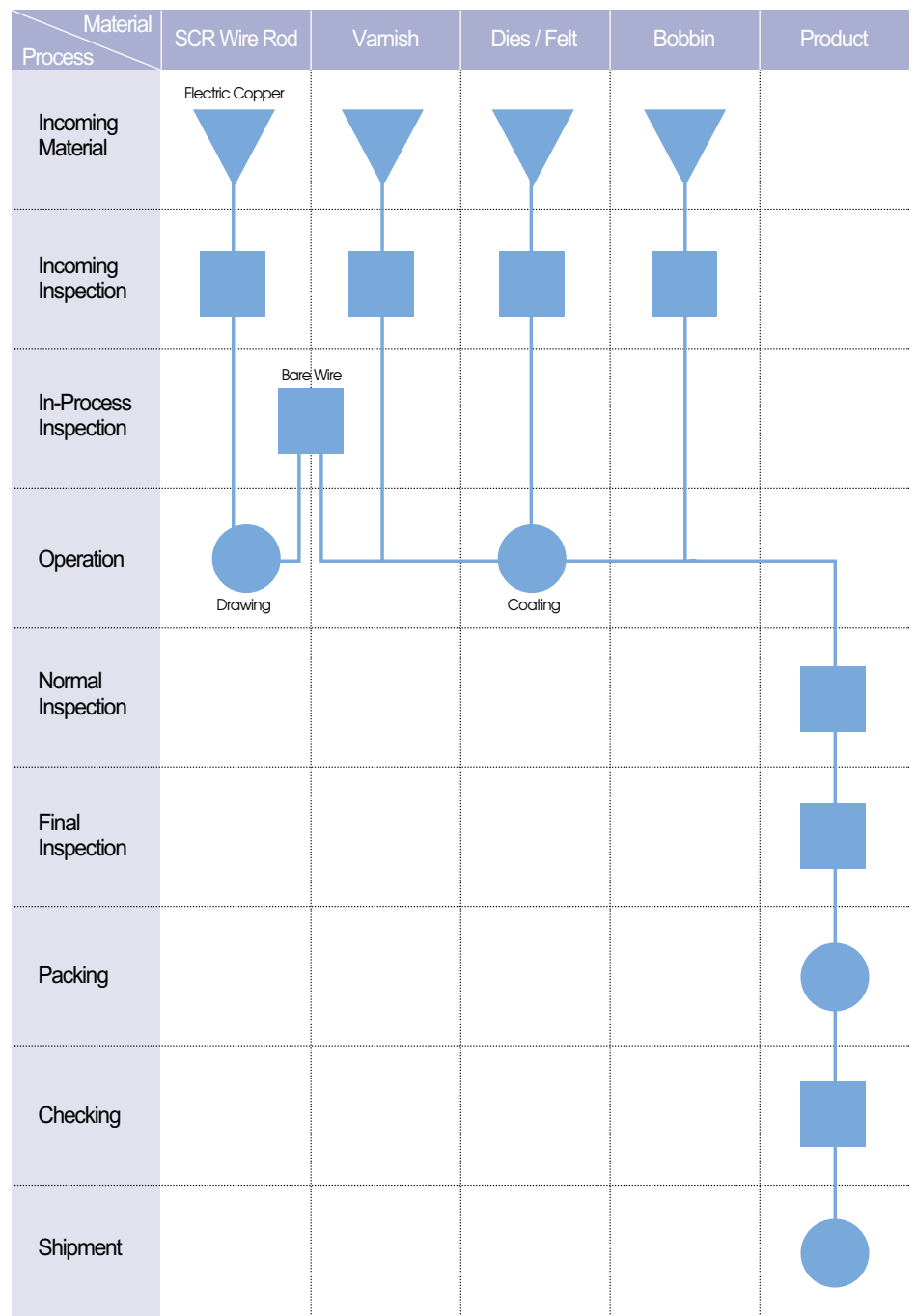


Contents

Introduction	4
1. Production Process of Magnet Wires	6
2. Type of Enameled Wires	7
2-1. Single-Coated (Monolithic) Enameled Wires	9
2-2. Double-Coated Enameled Wires	11
2-3. Litz Wires	18
3. Dimension of Enameled Wires	19
3-1. NEMA Standard	20
3-2. BS (British Standard)	21
3-3. KS : CLASS 0 (Zero) Enameled Wires	22
3-4. KS : CLASS 1 Enameled Wires	23
3-5. KS : CLASS 2 Enameled Wires	24
3-6. SBH-EIW	25
3-7. GADW (GADWC)	26
3-8. Litz Wires	27
4. Engineering Data	28
4-1. Solvent Resistance of Enameled Wires	29
4-2. Properties of Various Enameled Wires after being Elongated	30
4-3. Critical Properties of Various Enameled Wires	31
4-4. Refrigerant Resistance of Various Enameled Wires	32
4-5. Crazing and Cure Effect of Various Enameled Wires	32
4-6. Tension Table for Coiling	33
5. Bobbin for Enameled Wires	34
5-1. Bobbin Dimensions	35
5-2. Bobbin Patterns for Enameled Wires	36
6. Notes and Warnings	37
Quality Certificates	38
Products & Systems of LS Cable	40
Global Network	42



1. Production Process of Magnet Wires



02

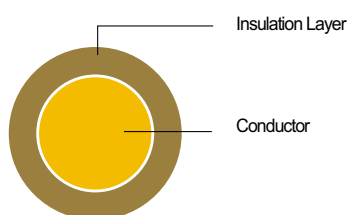
TYPE OF ENAMELED WIRES

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°C)
	GADWC	Double-Coated Aluminium Enameled Wire (UL (Aluminium Conductor, 220°C)
	AI-EIW	Polyamideimide Overcoated Polyesterimide Enameled Wire (UL, Thermal Index : 200°C)
	MRW	Polyamideimide Overcoated Polyesterimide Enameled Wire (UL, Thermal Index : 220°C)
	EXLW-C	Polyamideimide Enameled Wire
	EXLW-N	Polyamideimide Overcoated Polyesterimide Enameled Wire
	EXLW-P	Polyamideimide Overcoated Polyesterimide Enameled Wire (UL, Thermal Index : 200°C)
Litz Wires	LZSW	H Class Litz Wire
	SLZSW	Solderable Litz Wire

2. Type of Enameled Wires

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



PEW

Polyester Enameled Wire

Specification	KSC 3107, JISC 3202
Thermal index	B(130°C), F(155°C)
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°C), E(120°C), B(130°C), F(155°C)
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°C), B(130°C)
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°C)
UL file number	E84441
Product range	0.08 ~ 2.5 mm

Features

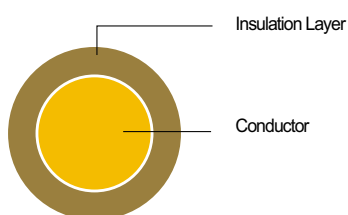
- Excellent heat resistance
- Excellent heat-shock resistance

Applications

- Motors

2. Type of Enameled Wires

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



EIW(F)

Polyesterimide Enameled Wire

Specification	NEMA MW5
Thermal index	F(155°C)
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°C)
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°C)
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°C)
UL file number	
Product range	0.10 ~ 0.35 mm

Features

- Solderable without stripping off

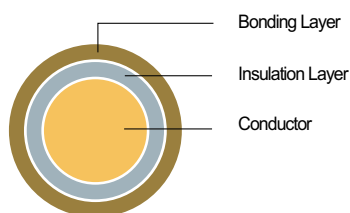
Applications

- Apparatus for high operating temperature

2. Type of Enameled Wires

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°C)
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°C)
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°C)
UL file number	E84441
Product range	0.50 ~ 1.50 mm

Features

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

Applications

- Motors for automobile

SMUW

Urethane Overcoated With
Self-Bonding Enameled Wire

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

Features

- Bondable by heating without impregnating
- Solderable without stripping off

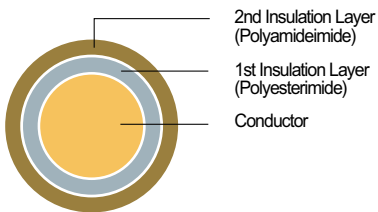
Applications

- Deflection yoke coils
- Magnet coils

2. Type of Enameled Wires

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°C)
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°C)
UL file number	E84441
Product range	0.29 ~ 1.5 mm

Features

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

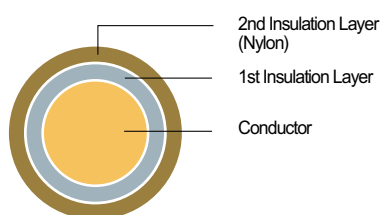
Applications

- Compressors for refrigerators & air-conditioner

2. Type of Enameled Wires

2 · 2. Double-Coated Enameled wires

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



NY-UW

Nylon overcoated Polyurethane Enameled Wire

Specification	NEMA MW 28
Thermal index	B(130°C)
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°C)
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°C), H(180°C)
UL file number	E84441
Product range	0.3 ~ 1.2 mm

Features

- Suitable for high speed winding

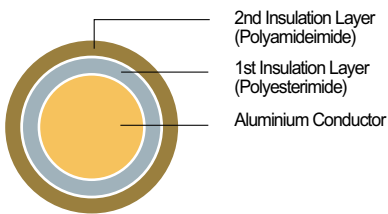
Applications

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

2. Type of Enameled Wires

2 · 2. Double-Coated Enameled wires

2 · 2 · 4. Aluminium Enameled Wires



GADW

Double-Coated Aluminium Enameled Wire

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

Features

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

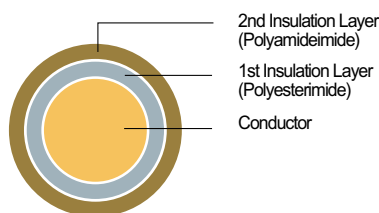
Applications

- High voltage transformers for microwave oven

2. Type of Enameled Wires

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°C)
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°C)
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°C)
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°C)
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°C)
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. Type of Enameled Wires

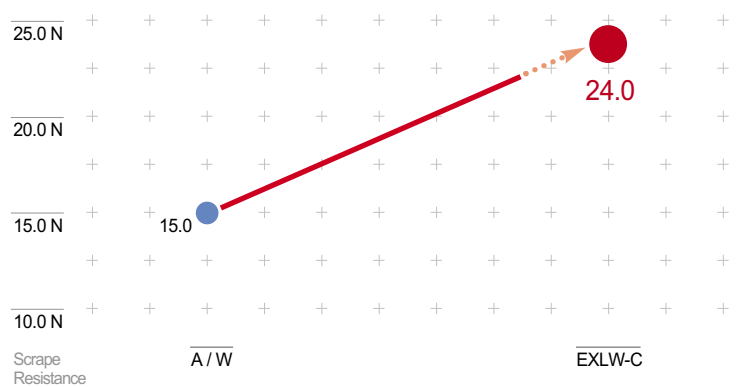
2 · 2. Double-Coated Enameled wires

EXLW-C

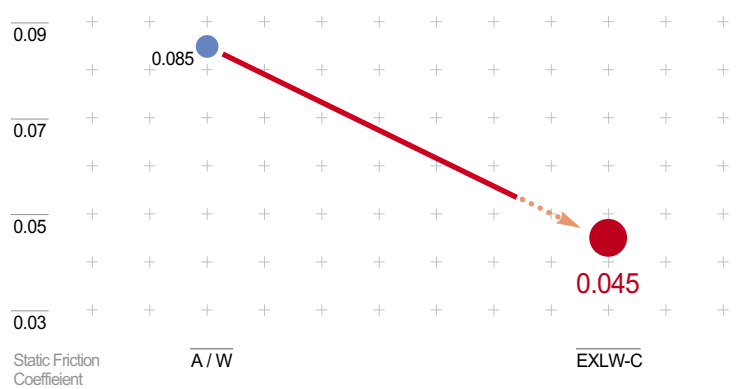
PolyamideimideEnameled Wire

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	°C	420	420

Scrape Resistance



Lubricity



2. Type of Enameled Wires

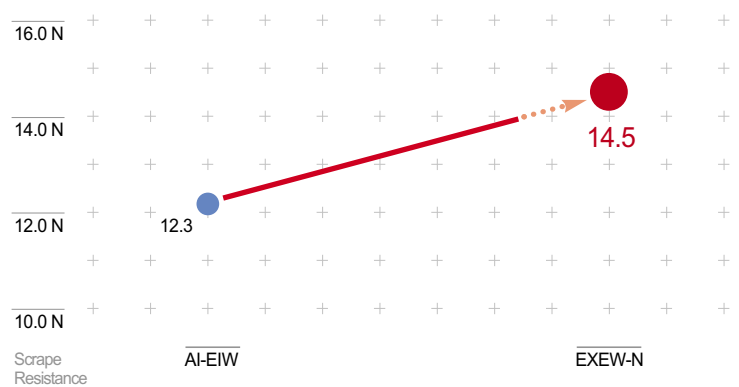
2 · 2. Double-Coated Enameled wires

EXLW-N

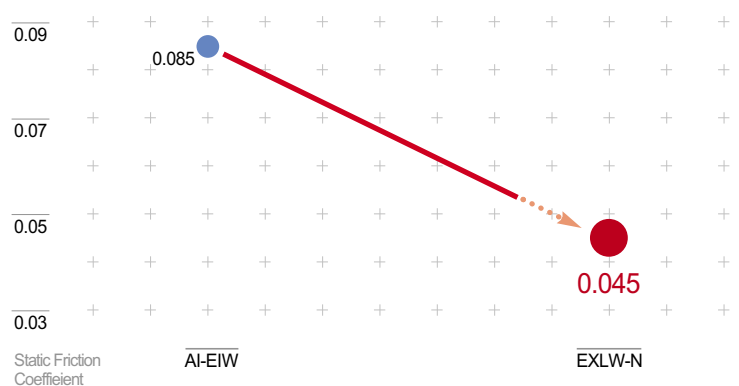
Polyamideimide Overcoated / Polyesterimide Enameled Wire

Item	Unit	Polyamideimide Overcoated with Polyamideimide (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	°C	391	420

Scrape Resistance

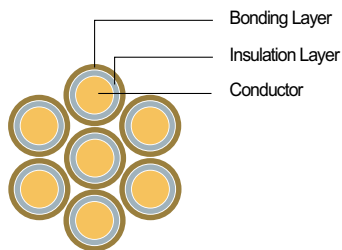


Lubricity



2. Type of Enameled Wires

2 · 3. Litz Wires



LZSW

H Class Litz Wire

Specification	LSC
Thermal index	H(180°C)
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°C)
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. 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. Dimension of Enameled Wires

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	0.211
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. Dimension of Enameled Wires

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°C(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. Dimension of Enameled Wires

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°C(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. Dimension of Enameled Wires

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°C(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. Dimension of Enameled Wires

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°C(Q /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. Dimension of Enameled Wires

3 - 7. GADW (GADWC)

LSC Standard

Conductor		Finished Dia.		Max. Conductor Resistance
Dia.	Tolerance of Dia.	Standard	Tolerance	
(mm)	±(mm)	(mm)	(mm)	20°C(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

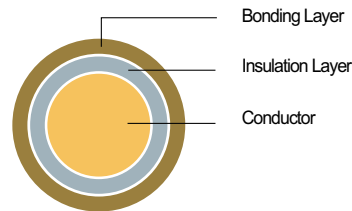
3. Dimension of Enameled Wires

3 - 8. Litz Wires

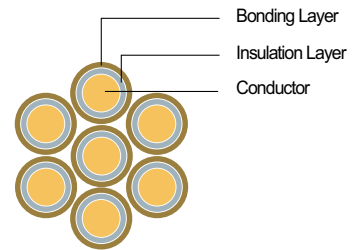
LSC Standard

Type	Single Element Wire								Stranded Wire	
	Conductor		Insulation Coat		Bonding Coat		Max. Conductor Resistance 20°C(Q/km)	Thermal Class (°C)	Max.Overall Dia. (mm)	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)				
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

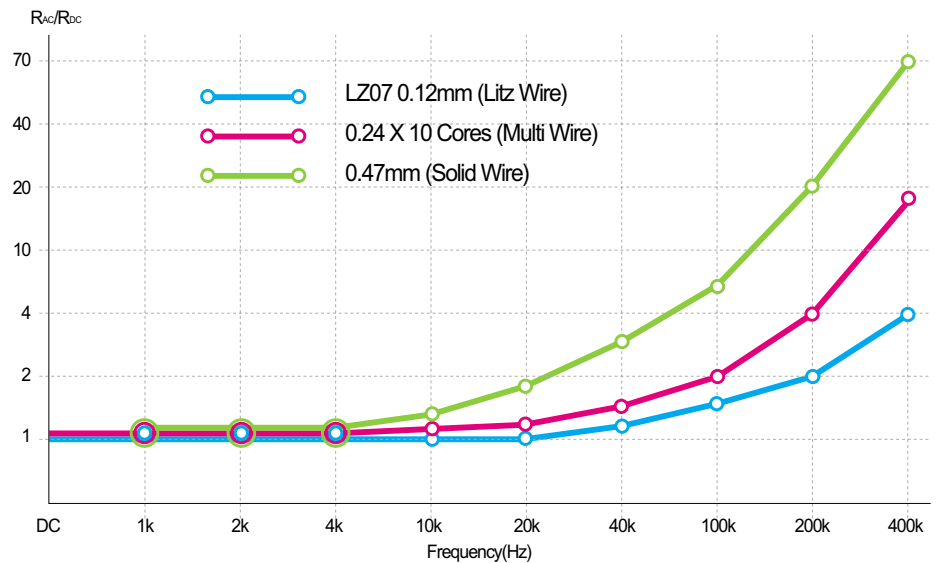


Single Element Wire



Stranded Wire

2) Characteristics of R_{ac} / R_{dc} vs frequency change



04

ENGINEERING DATA

4. 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
	Naphtha (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. Engineering Data

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

Type	Elongation (%)	Dimension (mm) ¹			Pinhole (No./5m)	Mandrel wound ²	Dielectric Strength (V) ³	Number of Torsion (Adhesion) ⁴	Number of Scrape Resistance ⁵
		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 defective wires, Denominator: Number of specimens
 3. Average value of a measurements by twist pair method
 4. Gauge length: 200mm
 5. Repeated scrape test

4. Engineering Data

4 · 3. Critical Properties of Various Enameled Wires

Test	Item	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. Engineering Data

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 recommendable ○ 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 After Immersion	
	After Winding	After Heating for 30 Minutes at 120°C	After Winding	After Heating for 30 Minutes at 120°C
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	Tension	Size	Tension	Size	Tension	Size	Tension
(mm)	(g)	(mm)	(g)	(mm)	(g)	(mm)	(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

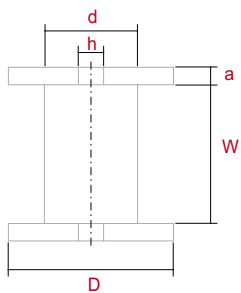
BOBBIN FOR ENAMELED WIRES

5 . Bobbin for Enameled Wires

5 - 1. Bobbin Dimensions

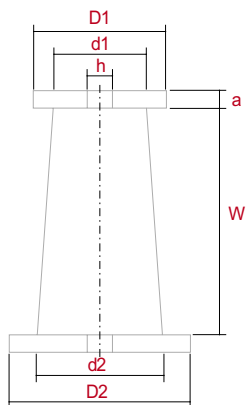
Tolerance of net weight : $\pm 30\%$

Type	Bobbin	Flange Dia.	Barrel Dia.	Inside Width	Flange Thickness	Hole Dia.	Width of Bobbin	Standard Weight of Enameled Wire Per Bobbin
		D(mm)	d(mm)	W(mm)	a(mm)	h(mm)	kg	kg



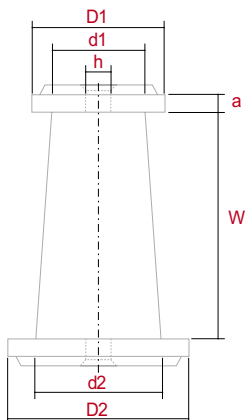
Plastic Bobbin

P-25	300	130	130	15	30	1.40	25
------	-----	-----	-----	----	----	------	----



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



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 . Bobbin for Enameled Wires

5 - 2. Bobbin Pattern for Enameled Wires

Size	PT-4	PT-10	PT-15	PT-25	PT-60	PT-100	PT-200	PT-400
Super Fine	0.05							
	0.06							
	0.07							
	0.08							
	0.09							
	0.10							
	0.11							
	0.12							
	0.13							
	0.14							
Fine	0.15							
	0.18							
	0.20							
	0.25							
	0.30							
	0.35							
	0.40							
	0.45							
	0.50							
Medium	0.55							
	0.60							
	0.70							
	0.80							
	0.90							
	1.00							
	1.10							
	1.20							
	1.30							
	1.40							
Heavy	1.50							
	1.80							
	2.10							
	2.40							
	2.70							
	3.00							
	3.20							

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

[OCD Home](#)
[Quick Guide](#)
[Contact Us](#)
[UL.com](#)

OBMW2.E84441
Magnet Wire - Component

[Page Bottom](#)

Magnet Wire - Component

[See General Information for Magnet Wire - Component](#)

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

E84441

Mtl Dsg	Coat Typ		ANSI Type *	TI
	BC	TC		
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	Polyester- imide	—	MW-5C	155
PEW	Polyurethane	—	—	105
UEW	Polyester- imide	—	MW-5	155#
EIW(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- imide	Polyamide- imide	MW35A	220
MRW	Polyester (amide)(imide)	Polyamide- imide	MW37C	220
RRW-R	Polyester (amide)(imide)	Polyamide- imide	MW35C	200#
EXLW-P	Polyester- imide	Polyamide- imide	MW37C	220

Mtl Dsg	Mark Dsg	Coat Type		ANSI Type	Temp Class
		BC	OC		
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

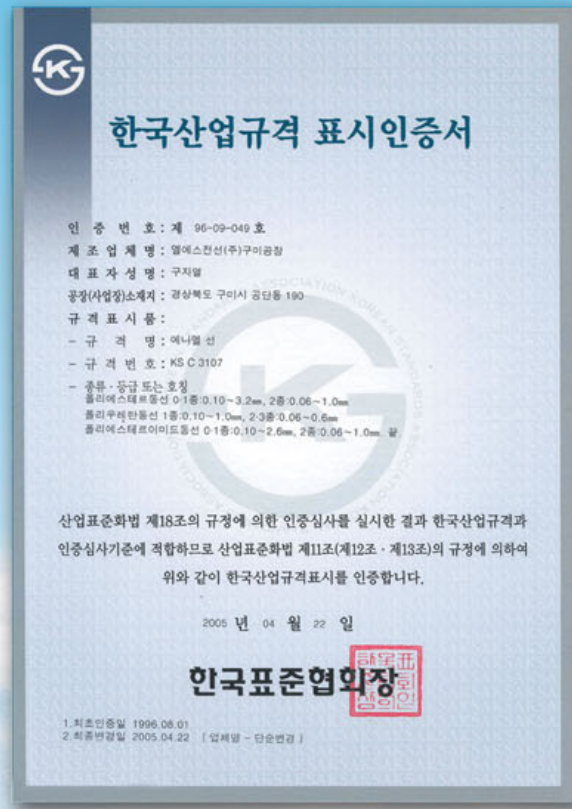
[Questions?](#)
[Notice of Disclaimer](#)
[Page Top](#)

Copyright © 2007 Underwriters Laboratories Inc.®

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Listed and covered under UL's Follow-Up Service. Always look for the Mark on the product.

UL permits the reproduction of the material contained in the Online Certification Directory subject to the following conditions: 1. The Guide Information, Designs and/or Listings (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from Underwriters Laboratories Inc." must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "Copyright © 2007 Underwriters Laboratories Inc.®"

UL & KS Recognition

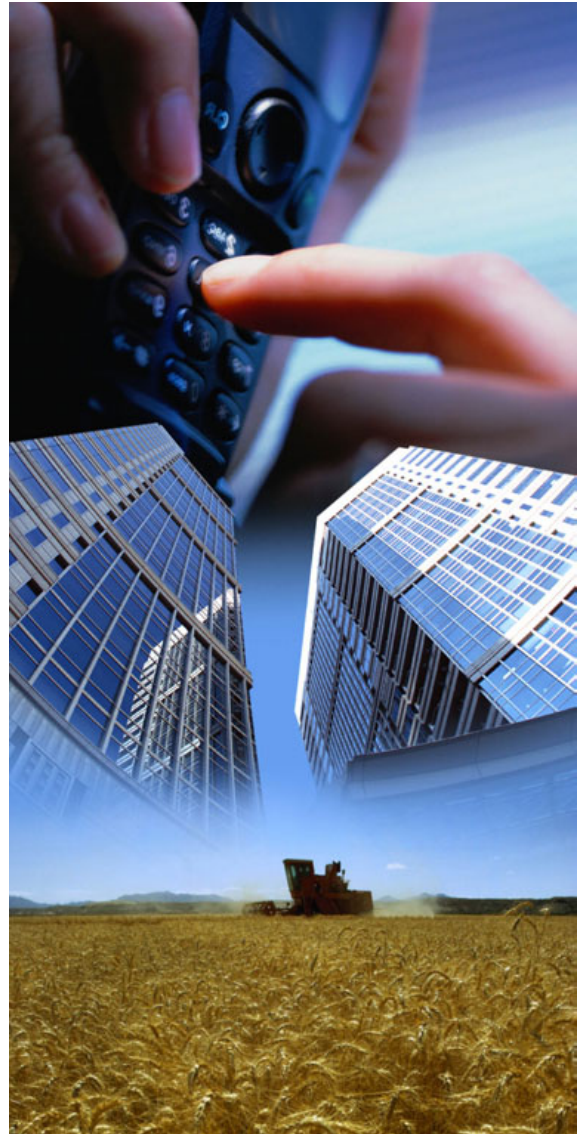


Products & Systems of LS Cable



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 | 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)



Branches

Japan Office

E 16th Fl. Akasaka Twin Tower 17-22, 2-Chome Akasaka, Minato-Ku, Tokyo, Japan
Tel. +81-3-3582-9129 Fax. +81-3-3582-7363

Singapore Office

300 Beach Road #25-07 The Concourse, Singapore 199555
Tel. +65-6342-9162~3 Fax. +65-6342-9164

India Office

C-1, 3rd Fl. Community Centre (Opp. I.I.T Gate)
Safdarjung Development Area, New Delhi 110016 India
Tel. +91-11-4602-1657, 1658 Fax. +91-11-4602-1659

UAE Office

#502 Capricorn Tower, Sheikh Zayed Rd., Dubai, UAE, PO Box 113798
Tel. +971-4-332-9445 Fax. +971-4-332-9446

Jordan Office

#307 4th Fl. Mid Town Plaza, Sweifieh-Subhi Al-Omari St.
P.O. Box 851885 Amman 11185 Jordan
Tel. +962-6-583-3357 Fax. +962-6-583-3359

Russia Office

Park Place Moscow 113/1 Leninsky Prospect E-711, Moscow 117198 Russia
Tel. +7-495-956-5814 Fax. +7-495-956-5811

Slovakia Office

222 Rybnicka 40, 831 07 Bratislava, Slovakia
Tel. +421-2-3359-5213 Fax. +421-2-3359-5214

Subsidiaries

LSIC : China Head Office

12th Fl. Huamin Empire Plaza, 726 West Yan'an Rd., Shanghai 200050 China
Tel. +86-21-5237-3399, 8997 Fax. +86-21-5237-8996

LSIC : Beijing Office

#05 B-17th Fl. Global Trade Center, 36 Beisanhuan-Dong Rd, Dongcheng Dt. Beijing, China
Tel. +86-10-5825-6011 Fax. +86-10-5825-6015

LSCT

East of Jing-Jin, Express Yixingbu Toll Gate Beichen, Tianjin, China
Tel. +86-22-2699-7618 Fax. +86-22-2699-7617

LSAS

Yu-Huangling Industrial Area, Xiazhuang, Chengyang District, Qingdao, China.
Tel. +86-532-8096-8888 Fax. +86-532-8096-5688

LSEQ

Yuhuangling Industrial Area, Xiazhuang, Chengyang District, Qingdao, China
Tel. +86-532-8096-2266 Fax. +86-532-8096-2288

LSCW

LS Industrial Park, Xin Mei Rd., New Dt. Wuxi 214028, China
Tel. +86-510-8811-9000 Fax. +86-510-8534-5341

LSMW

LS Industrial Park, Xin Mei Rd., New Dt. Wuxi 214028, China
Tel. +86-510-8299-3888 Fax. +86-510-8299-3889

LS-VINA

So Dau Precinct, Hong Bang Dt., Hai Phong, Vietnam
Tel. +84-31-540750 Fax. +84-31-540241

LSCV

Nhon Trach II-Lockhang IZ, Nhon Trach District, Dong Nai Province, Hochiminh, Vietnam
Tel. +84-61-356-9037 Fax. +84-61-356-9036

LSCM

Suite 7A, Menara Northam, 55 Jalan Sultan
Ahmad Shah, Penang 10050 Malaysia
Tel. +60-4-588-9609(34) Fax. +60-4-588-9607

LSCA

920 Sylvan Avenue, Englewood Cliffs, NJ 07632, USA
Tel. +1-201-816-2253 Fax. +1-201-816-2984

■ New Jersey (LSCA)

Global Network

Korea Operations

Head Quarters

21st Fl. ASEM Tower, 159 Samsung-dong, Gangnam-gu Seoul 135-798 Korea
Tel. +82-2-2189-9114

Anyang Plant

555 Hogwe-dong, Dongan-gu Anyang, Gyeonggi-do 431-831 Korea
Tel. +82-31-428-4114

Gumi Plant

190 Gongdan-dong, Gumi Gyeongsangbuk-do 730-708 Korea
Tel. +82-54-469-7114

Indong Plant

643 Jinpyeong-dong, Gumi Gyeongsangbuk-do 730-735 Korea
Tel. +82-54-469-7050

Jeongeup Plant

938 Jeongeup 3 Industrial Complex Taegok-ri, Buk-myeon, Jeongeup Jeollabuk-do 580-812 Korea
Tel. +82-63-530-4114

Jeonju Plant

778 Jeonju 3 Industrial Complex Yongnam-ri, Bongdong-eup Wanju-gun, Jeollabuk-do 565-904 Korea
Tel. +82-63-279-5114

R&D Center

555 Hogwe-dong, Dongan-gu Anyang, Gyeonggi-do 431-831 Korea
Tel. +82-31-450-8114



■ Moscow

■ Bratislava

■ Amman

■ Dubai

■ New Delhi

Beijing (LSIC : Beijing Office)

Qingdao (LSEQ, LSAS)

Wuxi (LSCW, LSMW)

Shanghai (LSIC : China Head Office)

Tianjin (LSCT)

■ Tokyo

■ Haiphong (LS-VINA)

■ Hochiminh(LSCV)

■ Penang (LSCM)

■ Singapore