



LS Cable & System **Flat Wire and Wrapped Wire**

Higher Performance with Greater Reliability

About LS Cable & System

LS spun off from LG in 2003 as a group specializing in the Electrics, Electronics, Energy, and Material.

LS consists of about 40 affiliates including LS Cable & System, LSIS, LS-Nikko Copper, LS Mtron, Gaon Cable, E1 and Yesco.

LS Cable&System is No.1 cable maker in Korea and its business field are telecommunication, electric power.

LS Cable&System 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.

Major business : elecommunication, Electric Power, Materials.

History

2008~2011

Mar. 2011

LS Cable was renamed LS Cable & System

Nov. 2009

Completed Submarine Cable
Plant in Donghae, Korea

Sep. 2009

Took over LS HongQi Cable, China

Aug. 2008

Acquired all of shares of Superior Essex, US

1978~2005

Sep. 2005

Completed LS industry Complex in Wuxi, China

Mar. 2005

LG Cable was renamed LS Cable

Nov. 2003

Spun off from LS Group

May. 1978

Completed Plant in Gumi, Korea

1962~1977

Jun. 1977

Listed on KOSPI
(Korea Composite Stock Price Index)

Jan. 1969

Established Goldstar Cable

May. 1962

Established Korea Cable Industry



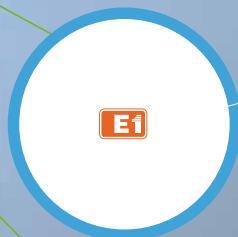
Total Solution Provider for Electric Power and Telecommunication Industries

LS Cable & System, the longtime de facto holding company of LS Group, officially transformed into a holding company in July of 2008. The company's operations now encompass a total solution for electric power and telecommunication industries.

The latest change in corporate structure comes as the company is accelerating efforts to improve management efficiency in rapidly expanding markets. The move also results from efforts to effect a more responsible and transparent management structure. Management is now prepared to take more aggressive action to enhance our businesses and to identify new growth engines. The holding company will take the lead in fostering new growth engines and in identifying lucrative investment opportunities, while the company's other business units will focus on improving management and on making operations more efficient. With the continued support of the holding company, LS Cable & System will spearhead efforts to strengthen our business expertise, corporate competitiveness and management.



LNG, CNG



Supply of LPG for residential&commercial, transportation, industrial and petrochemical uses in domestic market. Import & Export of LPG etc.



Components, Machinery



Control Cable, Power Cable, Elevator Cable, etc



Electrolytic Copper Cathode, Gold, Silver, Chemicals Product etc.

Toward the Global Leading Cable Company

In August of 2008 LS Cable & System acquired Superior Essex, North America's largest cable company, making LS Cable & System the third-largest player in the global cable industry. Superior Essex's flagship line of magnet wires and telecommunication cables further strengthened LS Cable & System's product lineup, which had focused on power cables, fiber optic cables and industrial materials. Superior Essex's extensive North America and European production and distribution networks will help LS Cable & System cement a presence in the region and bring the company one step closer to becoming a full-fledged global enterprise.

Superior Essex

Superior Essex Inc., a FORTUNE 1,000 company, is one of the largest wire and cable manufacturers in the world. The company manufactures and supplies a broad portfolio of wire and cable products for the communications, energy, automotive, industrial, and commercial & residential end-markets. It is a leading manufacturer of magnet wire, fabricated insulation products, and copper and fiber optic communications wire and cable. It is also a leading distributor of magnet wire, insulation and related products.

LS Cable & System Flat Wire and Wrapped 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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Fine Flat Wire (Enamelled)

Better Performance with Higher Reliability

Introduction

In order to raise the efficiency of a motor, you should put as many wires as possible into a slot and increase the space factor. In order to solve this issue, flat wires, rather than round wires, are used to acquire even higher space factor. Recently, fine flat wires are adopted for high-efficiency vehicle motors.

LS Cable&System has developed and produced fine flat wires for motors, and has product lines with various insulation classes to meet various demands of customers

Characteristics

- ETP Copper or OFC Copper
- Stable dielectric strength with uniform insulation film thickness at the edge of wire (Edge coverage of 80~100%.)
- Superior flexibility under harsh wire processing condition
- Lower Edge Radius value (min 0.3mm~) provide superior conductance and improve motor output

Technical Data

Standard	Class 200 NEMA MW 36C , IEC 60317-29 Class 220 Non NEMA , IEC	
Test Method	NEMA MW1000 or IEC 60851	
Material	Copper	ETP or OFC according to ASTM B 49 Cu + Ag > 99.90% for Cu-ETP , Cu + Ag > 99.95% for OFC Conductivity ≥ 100% IACS at 20°C
Chemical Base	Polyester(imide) over coated with Polyamideimide Polyamideimide Polyester(imide) over coated with Polyimide	Thermal Index 200 Thermal Index 220 Over Thermal Index 220
Insulation Thickness	Single / Heavy Build according to NEMA MW1000 Grade 1 , Grade 2 according to IEC 60317-0-2 Customer specification	



Applications : High Efficiency Alternator, Hybrid Vehicle Traction Motor





Flat Wire (Enamelled)

Better Performance with Higher Reliability

Introduction

Various sizes of Enamel-coated flat wires are produced for industrial generators or transformers which require high electric current.

The flat wire shows high dielectric resistance despite of relatively thin insulation with regular coating thickness even at the edge of the wire.

These wires also have superior flexibility, it makes possible harsh wire processing.

Characteristics

- ETP Copper or OFC Copper
- Superior flexibility for high bending performance despite of large cross section
- Various Thermal Class (F:155°C, N:200°C, C:220°C)
- Various sizes from 10 to 50 sqmm
- Thickness : Width = 1:1~1:8

Technical Data

Standard	Class 155 Non NEMA, IEC 60317-16 Class 200 NEMA MW 36C, IEC 60317-29 Class 220 Non NEMA, IEC		
Test Method	NEMA MW1000 or IEC 60851 or Customer's specification		
Material	Copper	ETP or OFC according to ASTM B 49 Cu + Ag > 99.90% for Cu-ETP, Cu + Ag > 99.95% for OFC Conductivity ≥ 100% IACS at 20°C	
Chemical Base	Polyester Polyester(imide) over coated with Polyamideimide Polyamideimide	Thermal Index 155 Thermal Index 200 Thermal Index 220	
Insulation Layer	Single / Heavy Build according to NEMA MW1000 Grade 1, Grade 2 according to IEC 60317-0-2 or Customer's specification		



Applications : Large Generator, Large Transformer, Windmill Generator, Heavy Power Motor





Wrapped Flat Wire (Polyimide Tape)

Better Performance with Higher Reliability

Introduction

Polyimide tape is covered with a thin coating of various Fluoro-polymers on either or both side of the film to improve adhesion. The principal advantage of this served tape insulation is its uniform, pinhole free covering and thermal stability. It has exceptional thermoplastic flow resistance under extreme temperature and pressure conditions. This tightly sealed polyimide tape insulation offers excellent moisture protection and because it is smooth and thin, it has a space advantage over glass, Dacron glass, paper or fiber over film construction. It is compatible with most standard varnishes and is highly resistant to solvent attack. The product fulfills various demands of customers with various conductor (Copper or aluminum) and the corona-resistance property.

Characteristics

- ETP Copper or OFC Copper or Aluminum, Super conductor
- Thermal Class 240
- Excellent adhesion despite of mandrel bending of 4 times of width and thickness
- Various sizes from 10 to 50 sqmm
- Thickness : Width = 1:1~1:8

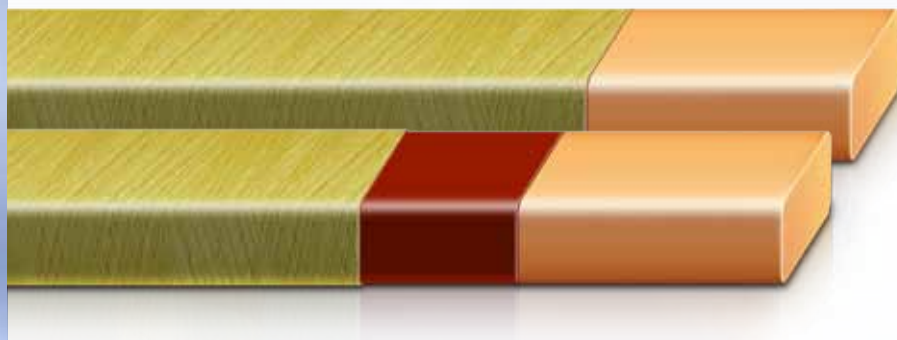
Technical Data

Standard	Class 240 NEMA MW 64-C, IEC 60317-44	
Test Method	NEMA MW1000 or IEC 60851	
Material	Copper	ETP or OFC according to ASTM B 49 Cu + Ag > 99.90% for Cu-ETP, Cu + Ag > 99.95% for OFC Conductivity ≥ 100% IACS at 20°C
	Aluminium	According to ASTM B211(M), B221(M), B234(M), B236(M) Purity > 99.7%, Conductivity ≥ 61%, IACS at 20°C
Chemical Base	Aromatic polyimide tape coated one or both side with an adhesive layer of Fluoro-polymer	
Insulation Layer	One or Two layer of tape and up to 66% overlap	



Applications : Train Traction Motor





Wrapped Flat Wire (Glass Fibers and Various Tape)

Better Performance with Higher Reliability

Introduction

Wrapped wire are used for various industrial field.

Different insulation material are used depending on their application and circumstances.

Glass yarn wrapped flat wire have superior physical abrasion strength under physical stress.

Glass yarn or Polyester-Glass fiber mixed yarn wrapped conductor bonded with various varnish (epoxy, polyester, silicone) could protect inner insulation and conductor while being inserted into a slot of heavy turbine generator or big motor.

Characteristics

- ETP Copper or OFC Copper
- Mica, Glass Yarn, Mixed Yarn and Nomex, combined wrapping over enameled
- Excellent adhesion between Yarn & Conductor
- Various sizes from 10 to 50 sqmm
- Thickness : Width = 1:1~1:8

Technical Data

Standard	According to customer's specification for mica and Nomex wrapped wire Class 155,180,200 as IEC 60317-31, 32, 33 for yarn wrapped wire	
Test Method	NEMA MW1000 or IEC 60851 or Customer's specification	
Material	Copper	ETP or OFC according to ASTM B 49 Cu + Ag > 99.90% for Cu-ETP , Cu + Ag > 99.95% for OFC Conductivity ≥ 100% IACS at 20°C
Chemical Base	Nomex 410 , 411 , 414 , 418 , 419 Mica paper and Mica+Epoxy resin as binder Bare conductor (or Enamel wire) + Glass yarn + resin as binder (epoxy or others) Bare conductor (or Enamel wire) + PE-Glass yarn + resin as binder (epoxy or others)	
Insulation Layer	1~4 layer of mica wrapped wire One or Two layer of yarn wrapped wire	



Applications : Large Generator, Windmill Generator, Large Traction Motor



Dimensions

Dimensions for Enamel and Wrapped Flat Wire

Nominal Width (mm)	Nominal Thickness (mm)															
	1.12	1.25	1.40	1.60	1.80	2.00	2.24	2.50	2.80	3.00	3.15	3.55	4.00	4.50	5.00	5.60
	Corner Radius 0.5mm			Corner radius 0.65mm				Corner Radius 0.8mm					Corner Radius 1.0mm			
	Nominal Cross Sections (mm²)															
3.55								8.32								
3.75							8.04	8.82								
4.00							8.60	9.45	10.65							
4.25						8.14	9.16	10.07	11.35							
4.50						8.64	9.72	10.70	12.05	12.95	13.62					
4.75					8.19	9.14	10.28	11.32	12.75	13.70	14.41					
5.00					8.64	9.64	10.84	11.95	13.45	14.45	15.20	17.20				
5.30				8.27	9.18	10.24	11.51	12.70	14.29	15.35	16.14	18.26				
5.60				8.75	9.72	10.84	12.18	13.45	15.13	16.25	17.09	19.33	21.54			
6.00			8.19	9.39	10.44	11.64	13.08	14.45	16.25	17.45	18.35	20.75	23.14			
6.30			8.61	9.87	10.98	12.24	13.75	15.20	17.09	18.35	19.29	21.81	24.34	27.49		
6.70		8.16	9.17	10.51	11.70	13.04	14.64	16.20	18.21	19.55	20.55	23.23	25.94	29.29		
7.10		8.66	9.73	11.15	12.42	13.84	15.54	17.20	19.33	20.75	21.81	24.65	27.54	31.09	34.64	
7.50	8.19	9.16	10.29	11.79	13.14	14.64	16.44	18.20	20.45	21.95	23.07	26.07	29.14	32.89	36.64	
8.00	8.75	9.79	10.99	12.59	14.04	15.64	17.56	19.45	21.85	23.45	24.65	27.85	31.14	35.14	39.14	43.94
8.50	9.31	10.41	11.69	13.39	14.94	16.64	18.68	20.70	23.25	24.95	26.22	29.62	33.14	37.39	41.64	46.74
9.00	9.87	11.04	12.39	14.19	15.84	17.64	19.80	21.95	24.65	26.45	27.80	31.40	35.14	39.64	44.14	49.54
9.50		11.66	13.09	14.99	16.74	18.64	20.92	23.20	26.05	27.95	29.37	33.17	37.14	41.89	46.64	
10.00		12.29	13.79	15.79	17.64	19.64	22.04	24.45	27.45	29.45	30.95	34.95	39.14	44.14	49.14	
10.60			14.63	16.75	18.72	20.84	23.38	25.95	29.13	31.25	32.84	37.08	41.54	46.84		
11.20			15.47	17.71	19.80	22.04	24.72	27.45	30.81	33.05	34.73	39.21	43.94	49.54		
11.80				18.67	20.88	23.24	26.07	28.95	32.49	34.85	36.62	41.34	46.34			
12.50				19.79	22.14	24.64	27.64	30.70	34.45	36.95	38.82	43.82	49.14			
13.20					23.40	26.04	29.20	32.45	36.41	39.05	41.03	46.31				
14.00					24.84	27.64	31.00	34.45	38.65	41.45	43.55	49.15				
15.00						29.64	33.24	36.95	41.45	44.45	46.70					
16.00						31.64	35.48	39.45	44.25	47.45	49.85					

* Half of nominal thickness

Dimensions for Fine Flat Wire

Nominal Width (mm)	Nominal Thickness (mm)									
	0.80	0.90	1.00	1.12	1.25	1.40	1.60	1.80	2.00	2.24
	Corner Radius *			Corner Radius 0.5mm				Corner Radius 0.65mm		
	Nominal Cross Sections (mm ²)									
1.50	1.062	1.176	1.285	1.465						
2.00	1.462	1.626	1.785	2.025	2.285	2.585				
2.12	1.558	1.734	1.905	2.159	2.435	2.753				
2.24	1.654	1.842	2.025	2.294	2.585	2.921	3.369			
2.36	1.75	1.95	2.145	2.428	2.735	3.089	3.561			
2.50	1.862	2.076	2.285	2.585	2.91	3.285	3.785	4.137		
2.65	1.982	2.211	2.435	2.753	3.098	3.495	4.025	4.407		
2.80	2.102	2.346	2.585	2.921	3.285	3.705	4.265	4.677	5.237	
3.00	2.262	2.526	2.785	3.145	3.535	3.985	4.585	5.037	5.637	
3.15	2.382	2.661	2.935	3.313	3.723	4.195	4.825	5.307	5.937	6.693
3.35	2.542	2.841	3.135	3.537	3.973	4.475	5.145	5.667	6.337	7.141
3.55	2.702	3.021	3.335	3.761	4.223	4.755	5.465	6.027	6.737	
3.75	2.862	3.201	3.535	3.985	4.473	5.035	5.785	6.387	7.137	
4.00	3.062	3.426	3.785	4.265	4.785	5.385	6.185	6.837		
4.25		3.651	4.035	4.545	5.098	5.735	6.585	7.287		
4.50		3.876	4.285	4.825	5.41	6.085	6.985			
4.75			4.535	5.105	5.723	6.435	7.385			
5.00			4.785	5.385	6.035	6.785				

* Half of nominal thickness



Global Network

