



LS TOTAL SOLUTION FOR AUTOMOTIVE

Environment-friendly cable for the safety of your car



THE WORLD BEST CABLE SOLUTION LEADER

LS Cable & System supplies various cables and materials used for power grids and communication networks around the world across all industries providing its top class technology and excellent quality. The company has also developed state of the art products, such as superconductors, HVDC and submarine cables that will lead the future energy industry.

LS spun off from LG in 2003 as a group specializing in electronics, electrical systems, energy and materials.



LS Cable & System
Transmission Cable
Distribution Cable
Submarine Cable
Telecommunication Cable
Industrial Cable
Industrial Material

LS ELECTRIC
Electric &
Automatic Equipments

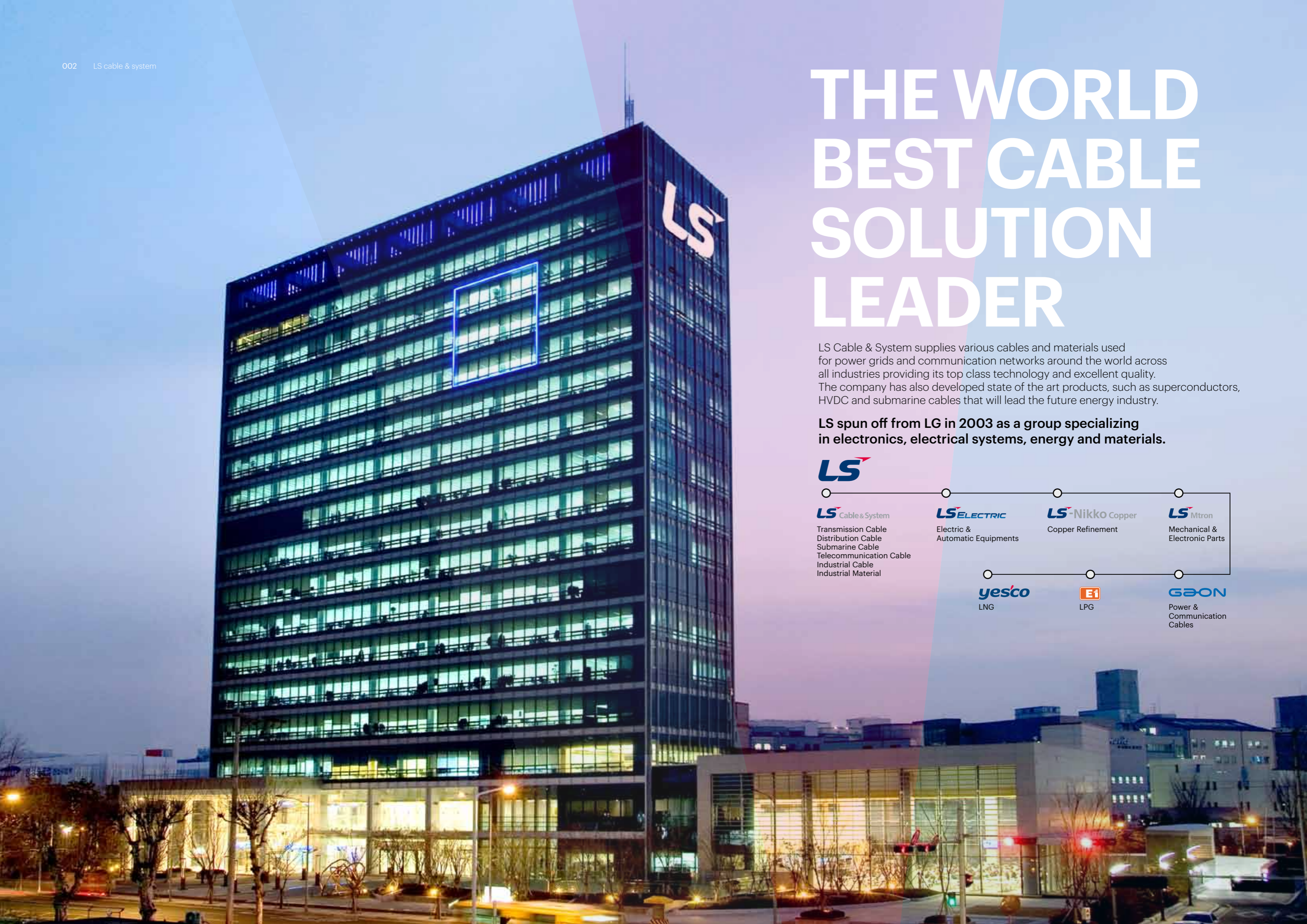
LS-Nikko Copper
Copper Refinement

LS Mitron
Mechanical &
Electronic Parts

yesco
LNG

E1
LPG

GBON
Power &
Communication
Cables





Contents

Eco & Weight Reduction	06	ADAS Solution	12
Certified Standard Cable		Sensor Cable	
High-Voltage Cable		Flexible Flat Cable	
Magnet Wire		Coaxial Cable	
Aluminum Cable		Heating Wire	
Ultra Thin Wall Wire			
Protection	18	Materials	22
HST for Fuel/Brake Pipe		Aluminum Tube	
HST for Wiring Harness		Aluminum Profile	
Protector (LS-PRO)		Aluminum Rod	
Protector (LS-TEC)			

LS Automotive Wire & Cable

LS Automotive Wire & Cable, a division of LS cable is one of the recognized market leaders in design, test, and manufacture of harsh environment interconnection system including electric wires and connectors for wire harness. We provide ISO 9001, IATF 16949 and ISO 14001 certified wires and cables such as, PVC/XLPE/HF-PP insulated low-tension wires, thin wall-type low voltage and light-weight wires (suitable for compact wiring), low-tension wire cross-linked by irradiation. The shielded wires for engine harness and highly flexible battery wiring show great durability and are specially designed to resist extremely high temperature as inside automotive engines. Particularly the irradiated wires are highly rated in terms of quality and price in the global market. Our environment-friendly products, such as halogen-free wires and lead-free PVC wires address the elevated concerns on the environment among the global society. Major auto-makers around the world recognize and use our products, which meet the standards of DIN in Europe, SAE in the U.S.A.S, and JASO in Japan.



Certified Standard Wire JASO / ISO / SAE Cable

Complying with international standards such as JASO D 611 and 618, ISO 6722, SAE J 1128 Cable standardized products and wires satisfying the properties required by each standard.

<p>Benefit</p>	<ul style="list-style-type: none"> • Available in a variety of applications as a wire cable conforming to international standards. • Each cable that meets the required standard and other properties. 																																												
<p>Features</p>	<table border="1"> <thead> <tr> <th colspan="3">Classification</th> <th colspan="3">International Std</th> </tr> <tr> <th>Class</th> <th></th> <th>Temp.</th> <th>JASO</th> <th>ISO/DIN</th> <th>SAE</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Class A</td> <td rowspan="2">T1</td> <td>80</td> <td>AV(SS), HEB HFSS, CHFS CAV(HF)US</td> <td>-</td> <td>ST(G)T(R) TWP, GPT, HTS</td> </tr> <tr> <td>85</td> <td>HF</td> <td>FLY</td> <td>STT, GPT</td> </tr> <tr> <td>Class B</td> <td>T2</td> <td>100</td> <td>AVX, AVSSXF HEBX, AVSSH</td> <td>FLRY</td> <td>-</td> </tr> <tr> <td rowspan="2">Class C</td> <td rowspan="2">T3</td> <td>120</td> <td>AEX, AESSXF</td> <td>-</td> <td>ST(G)E</td> </tr> <tr> <td>125</td> <td>-</td> <td>FLR2X FLR9Y</td> <td>ST(G)X T(G,S)XL</td> </tr> <tr> <td>Class D</td> <td>T4</td> <td>150</td> <td>AEXHF</td> <td>FLR91X FLR33X</td> <td>-</td> </tr> </tbody> </table>	Classification			International Std			Class		Temp.	JASO	ISO/DIN	SAE	Class A	T1	80	AV(SS), HEB HFSS, CHFS CAV(HF)US	-	ST(G)T(R) TWP, GPT, HTS	85	HF	FLY	STT, GPT	Class B	T2	100	AVX, AVSSXF HEBX, AVSSH	FLRY	-	Class C	T3	120	AEX, AESSXF	-	ST(G)E	125	-	FLR2X FLR9Y	ST(G)X T(G,S)XL	Class D	T4	150	AEXHF	FLR91X FLR33X	-
Classification			International Std																																										
Class		Temp.	JASO	ISO/DIN	SAE																																								
Class A	T1	80	AV(SS), HEB HFSS, CHFS CAV(HF)US	-	ST(G)T(R) TWP, GPT, HTS																																								
		85	HF	FLY	STT, GPT																																								
Class B	T2	100	AVX, AVSSXF HEBX, AVSSH	FLRY	-																																								
Class C	T3	120	AEX, AESSXF	-	ST(G)E																																								
		125	-	FLR2X FLR9Y	ST(G)X T(G,S)XL																																								
Class D	T4	150	AEXHF	FLR91X FLR33X	-																																								
<p>Standards</p>	<ul style="list-style-type: none"> • JASO D 611 / 618 • ISO 6722 • SAE J 1127 / 1128 																																												

High-Voltage cable for Automotive High-Voltage Cable (JASO, ISO certified Cable)

A high-voltage cable that meets ISO 6722, LV 216 and JASO D 624 standard that are Applied to vehicles such as environmentally friendly and 600V corresponding EV, HEV, PHEV.

<p>Benefit</p>	<ul style="list-style-type: none"> • Reliable to 600V high voltage & current conditions • Maximum temp. ISO 6722, Class F 200°C • Flexible & Easy to handle for harnessing • Eco-friendly designed materials (Non PBDE, PBBs, Pb, Cr, Cd, Hg)
<p>Features</p>	
<p>Achievement & Expectation</p>	<ul style="list-style-type: none"> • Standard, custom and composite configurations. • Withstands severe temperature extremes, harsh environments, heat & cold resistance, abrasion and more. • Superior flexibility than other cable. • Eco-friendly, utilizing halogen free materials.



Magnet Wire for Vehicle Motor

EXLW Flat Wire

(For High Performance Motor)

Flat wire makes compact motor possible for Vehicle
 - AC Generator and Traction motor

<p>Benefit</p>	<ul style="list-style-type: none"> Conventional Round Wire Flat Wire <ul style="list-style-type: none"> Flat wire make it possible to increase fill factor of Stator slot <ul style="list-style-type: none"> - High Fill Factor in Same Slot Size -> Higher output power - Same Output Power -> Smaller size of motor
<p>Features</p>	<ul style="list-style-type: none"> Insulation PAI (220°C) single layer insulation of thickness 50μm Characteristics <ol style="list-style-type: none"> Bending on Small Dia <ul style="list-style-type: none"> - Good Adhesion of Film Optional <ul style="list-style-type: none"> - Oxygen Free Copper - Anti Inverter Surge Voltage - Suitable for Welding Process <p>[Example of Motor]</p>
<p>Achievement & Expectation</p>	<ul style="list-style-type: none"> Sole vendor for Alternator Application in Korea Market Customized Insulation Design for Various type Application Commercial Production for Traction motor for Electric Vehicle

Magnet Wire for Vehicle Motor

EXLW Round Wire

(For High Performance Motor)

Excellent wire makes high tension winding possible
 - EPS(Electric Power Steering) motor and High Fill Factor Alternator

<p>Benefit</p>	<div style="display: flex; justify-content: space-around;"> <div data-bbox="1878 888 2294 1182"> <p>Standard Insulation</p> </div> <div data-bbox="2323 888 2745 1167"> <p>Example of High Tension Winding Motor</p> </div> </div> <ul style="list-style-type: none"> EXLW wire makes high tension winding possible <ul style="list-style-type: none"> - High Tension Winding -> Compact motor - High Fill Factor -> Higher Output Power 						
<p>Features</p>	<div style="display: flex; justify-content: space-around;"> <div data-bbox="1917 1356 2273 1644"> <p>Adhesion</p> </div> <div data-bbox="2362 1356 2680 1644"> <p>Scrape Resistance</p> <table border="1"> <caption>Scrape Resistance Data</caption> <thead> <tr> <th>Wire Type</th> <th>Scrape Resistance (N)</th> </tr> </thead> <tbody> <tr> <td>Normal</td> <td>12.3</td> </tr> <tr> <td>EXLW-N</td> <td>14.5</td> </tr> </tbody> </table> </div> </div>	Wire Type	Scrape Resistance (N)	Normal	12.3	EXLW-N	14.5
Wire Type	Scrape Resistance (N)						
Normal	12.3						
EXLW-N	14.5						
<p>Achievement & Expectation</p>	<ul style="list-style-type: none"> High Tension Winding possible Customized Insulation Design for Various type of Application Commercial Production for EPS motor 						



Aluminum cable for Automotive

Aluminum Cable (JASO, ISO certified Cable)

Ultra thin wall wire for Automotive

CHFUS / CIVUS

Satisfying JASO D 603 and ISO 6722-2 (Aluminum wire), wire weight and completed the development of an aluminum wire of various sizes to joint terminal technology.

Conforming to international standards that meet ISO 6722, JASO D 611 and 618 applied to compressed wire and ultra thin insulation thickness.

<p>Benefit</p>	<p>Weight savings from the same electrical conductivity point of view (Cu:Al)</p> <p>Diameter / weight comparison at the same allowable current</p>															
<p>Features</p>	<ul style="list-style-type: none"> • Size : 0.75 ~ 85SQ • Insulation material : PVC, XLPO(H/F) • Type : Non-Shield & Shield Braid Type • Conductor tensile strength : 95 MPa ↑ • Elongation : BATT. 25 % ↑ , Signal 16 % ↑ 															
<p>Achievement & Expectation</p>	<table border="1"> <thead> <tr> <th>Cu Section (mm²)</th> <th>Al Section (mm²)</th> <th>Weight saving (g/m)</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>16</td> <td>45</td> </tr> <tr> <td>20</td> <td>32</td> <td>90</td> </tr> <tr> <td>30</td> <td>48</td> <td>135</td> </tr> <tr> <td>50</td> <td>80</td> <td>224</td> </tr> </tbody> </table> <ul style="list-style-type: none"> • Al and Cu same Electrical conductivity perspective based on cross section • Conversion Factor = 1.6 • specific gravity (Cu/Al) : 8.9/2.7 	Cu Section (mm ²)	Al Section (mm ²)	Weight saving (g/m)	10	16	45	20	32	90	30	48	135	50	80	224
Cu Section (mm ²)	Al Section (mm ²)	Weight saving (g/m)														
10	16	45														
20	32	90														
30	48	135														
50	80	224														

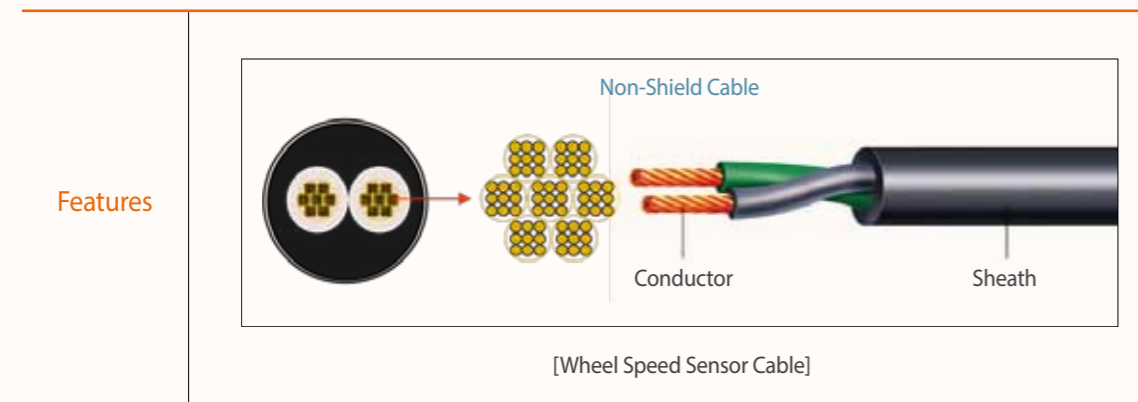
<p>Benefit</p>	<ul style="list-style-type: none"> • Available in a variety of applications as a wire cable conforming to international standards • Reduce harness weight by downsizing 0.35, 0.35Q wires for existing signal to 0.22, 0.13SQ 																																															
<p>Features</p>	<table border="1"> <thead> <tr> <th rowspan="2">Name</th> <th colspan="2">Domestic</th> <th colspan="2">Oversea</th> </tr> <tr> <th>AVSS</th> <th>CHFUS</th> <th>FLRY</th> <th>CHFUS</th> </tr> </thead> <tbody> <tr> <td>Size (mm²)</td> <td>0.30</td> <td>0.22</td> <td>0.35</td> <td>0.13</td> </tr> <tr> <td>Construction (No./mm)</td> <td>7/0.260</td> <td>7/Round compression (Avg. 0.203)</td> <td>7/0.250</td> <td>7/Round compression (Avg. 0.160)</td> </tr> <tr> <td>Conductor material</td> <td>Cu</td> <td>Cu</td> <td>Cu</td> <td>CuSn 0.2%</td> </tr> <tr> <td rowspan="2">Insulation Thickness (mm)</td> <td>Nom.</td> <td>0.30</td> <td>0.25</td> <td>0.20</td> </tr> <tr> <td>Min.</td> <td>0.24</td> <td>0.16</td> <td>0.16</td> </tr> <tr> <td rowspan="2">Insulation diameter (mm)</td> <td>Min.</td> <td>1.30</td> <td>0.95</td> <td>1.20</td> </tr> <tr> <td>Max.</td> <td>1.50</td> <td>1.05</td> <td>1.40</td> </tr> <tr> <td>Weight (g/m)</td> <td>Avg.</td> <td>5.0</td> <td>3.0</td> <td>4.4</td> </tr> </tbody> </table>	Name	Domestic		Oversea		AVSS	CHFUS	FLRY	CHFUS	Size (mm ²)	0.30	0.22	0.35	0.13	Construction (No./mm)	7/0.260	7/Round compression (Avg. 0.203)	7/0.250	7/Round compression (Avg. 0.160)	Conductor material	Cu	Cu	Cu	CuSn 0.2%	Insulation Thickness (mm)	Nom.	0.30	0.25	0.20	Min.	0.24	0.16	0.16	Insulation diameter (mm)	Min.	1.30	0.95	1.20	Max.	1.50	1.05	1.40	Weight (g/m)	Avg.	5.0	3.0	4.4
Name	Domestic		Oversea																																													
	AVSS	CHFUS	FLRY	CHFUS																																												
Size (mm ²)	0.30	0.22	0.35	0.13																																												
Construction (No./mm)	7/0.260	7/Round compression (Avg. 0.203)	7/0.250	7/Round compression (Avg. 0.160)																																												
Conductor material	Cu	Cu	Cu	CuSn 0.2%																																												
Insulation Thickness (mm)	Nom.	0.30	0.25	0.20																																												
	Min.	0.24	0.16	0.16																																												
Insulation diameter (mm)	Min.	1.30	0.95	1.20																																												
	Max.	1.50	1.05	1.40																																												
Weight (g/m)	Avg.	5.0	3.0	4.4																																												
<p>Standards</p>	<ul style="list-style-type: none"> • JASO D 611 / 618 • ISO 6722 																																															

Sensor cable for Automotive WSS Cable Knock Sensor Cable

Sensor cable for Automotive CKP Cable EPS Cable

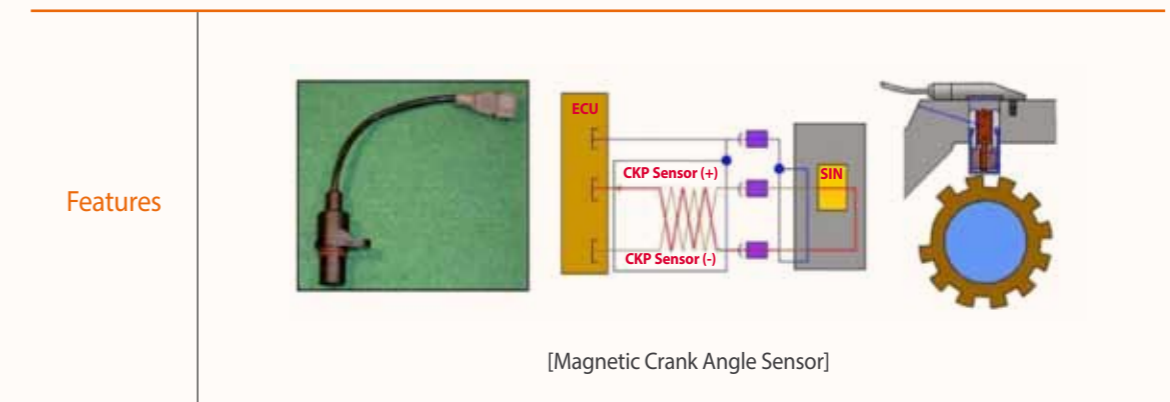
WSS Cable (ABS-PS, FLR2X11Y)

Responsible for control of a cable attached to the (Wheel Speed Sensor) WSS for the car, including ABS (Anti-lock Brake system) and the brake ECU.



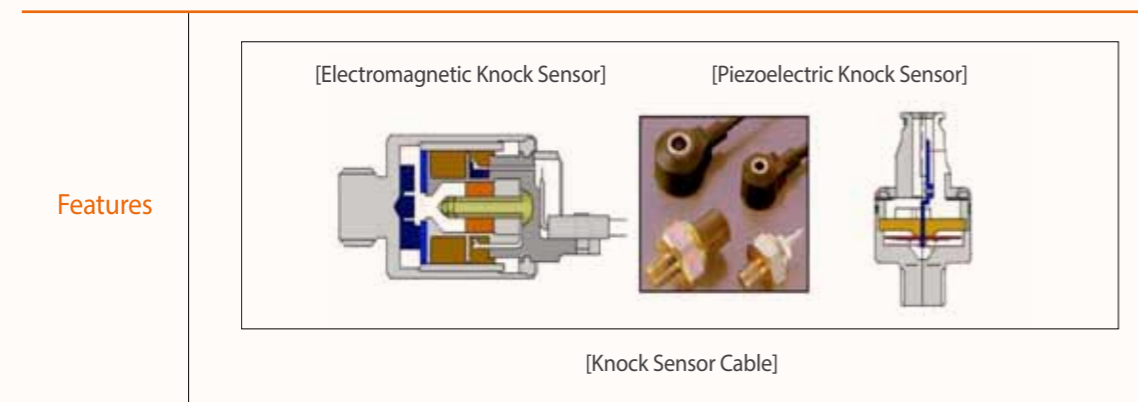
CKP Cable (ACKPH-ALS)

The crank angle sensor (CKP) to determine the piston position by checking the rotation angle of the crankshaft required for control Sensor, and ECU controls injection amount correction, ignition timing, etc.



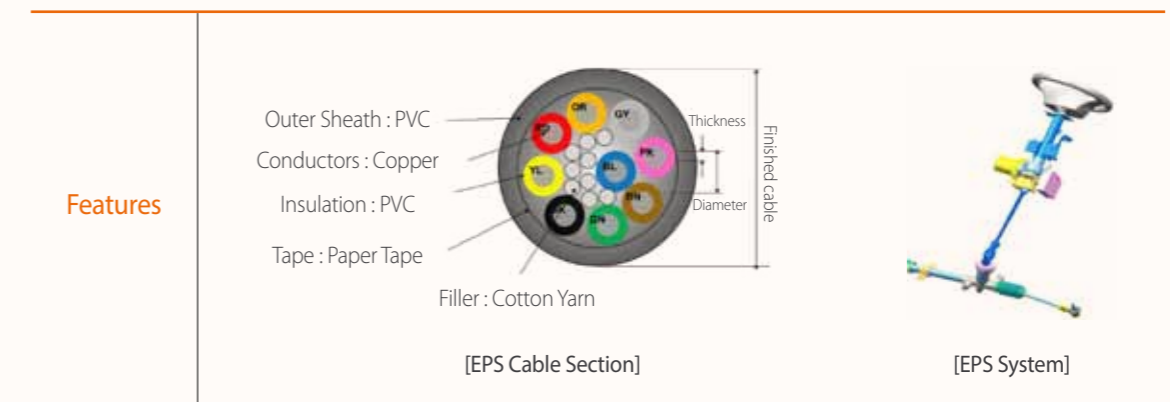
Knock Sensor Cable (AKSH)

Cable is mounted on the knock sensor of the engine (Knock sensor) area. The knock sensor senses vibration of 4 ~ 7Hz caused by knocking, It detects vibration occurrence by accelerometer or piezoelectric element and adjusts ignition timing.



EPS Cable (AVSSV, AVUHSF-BS)

EPS (Electronic Power Steering) system is independent of the engine power steering. This system is equipped with a dedicated motor. As soon as a signal is detected on the steering wheel, System that allows the driver to turn the steering wheel with ease.

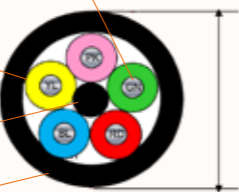



Sensor cable for Automotive Fuel/Oil Pump (Switch) Cable EPB Cable

Flexible Flat Cable(FFC) for Automotive Flexible Flat Cable for Steering Roll Connector


Fuel/Oil Pump (Switch) Cable (AFX-(BS), AFRX)

Cable applicable to fuel pump and oil level switch control part of fuel and oil related parts of automobile satisfying high oil resistance and high heat resistance.



Features	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>Conductor : Tinned Copper (30/0.180TA, 0.75SQ)</p> <p>Insulation : 200°C Grade XLFE</p> <p>Filler : 1mm String</p> <p>Sheath : 200°C Grade XLFE</p> </div> <div style="text-align: center;"> <p>(unit : mm)</p>  <p>6.4±0.3</p> <p>[Fuel / Oil pump cable section]</p> </div> <div style="margin-left: 20px;">  <p>[Fuel/Oil pump]</p> </div> </div>
-----------------	--

EPB Cable (EPB, IEPB)

Products with wheel speed signal transmission and EPB power transmission Unique soft, high durability, low electrical resistance.

Benefit	<ul style="list-style-type: none"> • Reduced product and assembly costs compared to a single WSS - Full integration of WSS functionality to high-end functionality - It has a low resistance to prevent large voltage drop of EPB actuator. <p>Selection of conductor and structure</p> <div style="text-align: center;">  <p>[EPB cable]</p> </div>
----------------	--

It is a device that connects steering wheel connected with all kinds of electrical equipment (A/Bag, Horn, Heated Wheel, Remote Control Switch) and power and signal.

Benefit	<ul style="list-style-type: none"> • Weight savings potential • Customized designs (Different conductor widths) • higher product reliability (Above 10Kcycles at 85°C/95%) 	 <p>[Figure. SRC installation]</p>
Features	<ul style="list-style-type: none"> • Insulation <ul style="list-style-type: none"> - Insulating material : PBT, PET, PPS... - Insulation thickness : 45um to 85um • Conductors <ul style="list-style-type: none"> - Number of conductors : 2 to 16 - Conductor material(bare) : Copper according to DIN/EN 13602 - Strength and elongation : Soft copper : 210 – 280 N/mm2, Elongation > 20% - Edge : natural round or cut copper film 	 <p>[Figure SRC-FFC diagram]</p>
Achievement & Expectation	<ul style="list-style-type: none"> • HKMC(JF,AD), Chrysler(UF) mass production • Strong durability (prevention of FFC cutting) • Various products through Customized production 	



Coaxial cable for Automotive Coaxial Cable for Mobile and Radio Antenna

Heating Wire for Automotive Heating Wire for Seat and Steering Wheel

This cable is a signal-carrying cable so it should be less affected by external disturbances. It is structured so that the external disturbance generated by the outer shield conductor doesn't affect the center conductor.

A type of automobile electric laminate that makes it possible to heat a car seat using heat generated by electrical resistance. Automotive parts or supplies to provide a comfortable driving environment for the driver in winter.

<p>Benefit</p>	<ul style="list-style-type: none"> • Stable impedance & low loss • Dynamical applications (Radio, DMB, GPS, CDMA, LTE & V2X) • High shield effectiveness • Flexible 																															
<p>Features</p>	<table border="1"> <thead> <tr> <th>Item</th> <th>RG-58LL(Low loss)</th> <th>VAX 3.0</th> </tr> </thead> <tbody> <tr> <td>Inner conductor</td> <td>Solid copper 0.94Ø</td> <td>Solid copper 0.65Ø</td> </tr> <tr> <td>Dielectric</td> <td>Foamed PE</td> <td>Foamed PE</td> </tr> <tr> <td>Outer conductor</td> <td>Aluminum tape & braid</td> <td>Aluminum tape & braid</td> </tr> <tr> <td>Jacket</td> <td>HR-PVC, 4.95Ø</td> <td>HR-PVC, 4.85Ø</td> </tr> <tr> <td>Impedance (Ω)</td> <td>50</td> <td>75</td> </tr> <tr> <td rowspan="3">Attenuation (dB/m)</td> <td>0.365 (@0.9GHz)</td> <td>0.095 (@50MHz)</td> </tr> <tr> <td>0.624 (@2.5GHz)</td> <td>0.188 (@300MHz)</td> </tr> <tr> <td>0.981 (@5.8GHz)</td> <td>0.330 (@770MHz)</td> </tr> <tr> <td>Velocity of Propagation (%)</td> <td>80</td> <td>78</td> </tr> <tr> <td>Application</td> <td>Mobile antenna</td> <td>Radio antenna</td> </tr> </tbody> </table> 	Item	RG-58LL(Low loss)	VAX 3.0	Inner conductor	Solid copper 0.94Ø	Solid copper 0.65Ø	Dielectric	Foamed PE	Foamed PE	Outer conductor	Aluminum tape & braid	Aluminum tape & braid	Jacket	HR-PVC, 4.95Ø	HR-PVC, 4.85Ø	Impedance (Ω)	50	75	Attenuation (dB/m)	0.365 (@0.9GHz)	0.095 (@50MHz)	0.624 (@2.5GHz)	0.188 (@300MHz)	0.981 (@5.8GHz)	0.330 (@770MHz)	Velocity of Propagation (%)	80	78	Application	Mobile antenna	Radio antenna
Item	RG-58LL(Low loss)	VAX 3.0																														
Inner conductor	Solid copper 0.94Ø	Solid copper 0.65Ø																														
Dielectric	Foamed PE	Foamed PE																														
Outer conductor	Aluminum tape & braid	Aluminum tape & braid																														
Jacket	HR-PVC, 4.95Ø	HR-PVC, 4.85Ø																														
Impedance (Ω)	50	75																														
Attenuation (dB/m)	0.365 (@0.9GHz)	0.095 (@50MHz)																														
	0.624 (@2.5GHz)	0.188 (@300MHz)																														
	0.981 (@5.8GHz)	0.330 (@770MHz)																														
Velocity of Propagation (%)	80	78																														
Application	Mobile antenna	Radio antenna																														
<p>Achievement & Expectation</p>	<ul style="list-style-type: none"> • Applied of HMC, HKMC, GM and etc. • Various designs for customer needs. • Strong durability 																															

<p>Benefit</p>	<ul style="list-style-type: none"> • Weight savings potential • Customized designs (Different conductor resistance) • High durability  <p>[Seat]</p>
<p>Features</p>	<p>Insulation</p> <ul style="list-style-type: none"> • Insulating material : PFA, PA, FRPA ect. • Insulation thickness : 0.15mm to 0.3mm <p>Conductors</p> <ul style="list-style-type: none"> • Number of conductors : 10 to 30 • Conductor : Bare copper, Copper alloy <p>Individual Polyurethane coated wire</p> <ul style="list-style-type: none"> • Prevention of Hot Spot  <p>[Steering Wheel]</p>
<p>Achievement & Expectation</p>	<ul style="list-style-type: none"> • Applied of HMC, HKMC (Seat and steering wheel) • Product family secure of customized products.  <p>[Drawing]</p>

Tube

Heat Shrinkable Tube for Fuel/Brake Pipe

Tube

Heat Shrinkable Tube for Wiring Harness

- It has a very thin wall of hot-melt liner to adhere.
- It is specially designed for the application to the fuel, brake, and power-steering pipes of automobiles.
- It has excellent flexibility and insulation property.

- It covers a wide range of heat shrinkable tubing for wiring harness.
- Single wall tubing is mainly used for insulation and it is available for up to 200°C operating temperature.

<p>Benefit</p>	<ul style="list-style-type: none"> • It is specially designed for the application to the fuel, brake, and power-steering pipes of automobiles. • Prevents pipe corrosion from fluid, water, or chemical penetration and mechanical damage. 	
<p>Features</p>	<ul style="list-style-type: none"> • Jacket <ul style="list-style-type: none"> - Material : XLPO(Crosslinked polyolefin) - Grade : UL 105°C, 3:2 shrink ratio • Hot-melt <ul style="list-style-type: none"> - Material : EVA - Melting point : 115°C 	
<p>Standards</p>	<ul style="list-style-type: none"> • TSM 7600G (Toyota), • MES CE300 (Mazda), • HMC MS231-18 (Hyundai-kia) 	




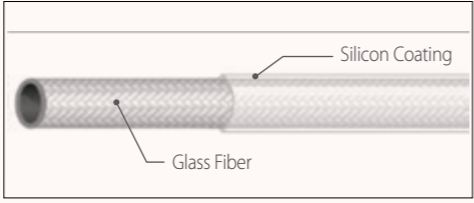
	Single Wall	Dual Wall
<p>Benefit</p>	<ul style="list-style-type: none"> • It shrink to a specified size when it is heated. • It is applied for a cable connection, core identification, insulation and corrosion prevention 	<ul style="list-style-type: none"> • It is applied for insulation and sealing at junctions and ring terminals. • It cover a wide range of diameter
<p>Features</p>	<p>GSHS-1625G</p>  <ul style="list-style-type: none"> • General use • Polyolefin tube • 125°C/600V <p>GSHS-1675</p>  <ul style="list-style-type: none"> • Excellent Chemical resistance • PVDF tube • 150°C/600V <p>LS-V200</p>  <ul style="list-style-type: none"> • For High temperature • Fluoro-elastomer • 200°C/600V 	<p>GSHS-4635WS</p>   <ul style="list-style-type: none"> • Jacket (Outer) <ul style="list-style-type: none"> - Insulation layer - Polyolefin - 125°C/600V - Self-extinguished - High dielectric strength • Adhesive (inner) <ul style="list-style-type: none"> - Excellent Sealing ability - Amide Hot-melt - Softening point : 104 ~ 115°C
<p>Standards</p>	<ul style="list-style-type: none"> • UL 224 • MIL 23053 • AS23053 	<ul style="list-style-type: none"> • ES 91409 (Hyundai-Kia) • UL 224 (125°C/600V)


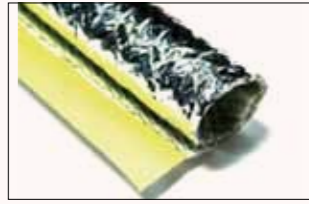


Protec
Automotive Protector
LS-PRO

Protec
Automotive Protector
LS-TEC

- LS-PRO series are fabric tube or sleeve for automotive protection.
- Various raw material like as Glass fiber, Polyester, Aramide can be selected according to the application and required properties.

- LS-TEC series are thermal protector to reflect heat radiant.
- It is consist of various fabrics with aluminum foil, it has excellent heat resistance.

<p>Benefit</p>	<ul style="list-style-type: none"> • The fabric tube for abrasion, noise or physical/electric protection • Product has Various line-up with different material and Shape • Type : Pro-Sleeve, Pro-Shrink, Pro-Selfwrap, Pro-Silicone
<p>Features</p>	<div style="display: flex; justify-content: space-around;"> <div data-bbox="418 1115 706 1304">  <p>[Pro-Sleeve]</p> <ul style="list-style-type: none"> • Excellent noise suppression • Expandable tubular sleeve • Closely contacted to bent part • Polyester/Nylon/Metal </div> <div data-bbox="774 1115 1216 1304">  <p>[Pro-Wrap]</p> <ul style="list-style-type: none"> • Self-wrap design • Excellent noise suppression • Expandable tubular sleeve • Closely contacted to bent part </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div data-bbox="418 1478 706 1667">  <p>[Pro-Shrink]</p> <ul style="list-style-type: none"> • Heat shrink fabric tube • Excellent abrasion resistance • Excellent flexibility • Polyester </div> <div data-bbox="774 1478 1216 1667">  <p>[Pro-sil]</p> <ul style="list-style-type: none"> • Glass fiber braided + silicon rubber coating • Heat resistance : Max.200°C • Dielectric strength : Min. 2,000V </div> </div>

<p>Benefit</p>	<ul style="list-style-type: none"> • Effective for Engine, Fuel pipe, Air conditioner thermal protection • Customizable shape by customer's request • Type : Tec-Sleeve, Tec-Wrap, Tec-Patch, Tec-Knit, Tec-Cover 	
<p>Features</p>	<div style="display: flex; justify-content: space-around;"> <div data-bbox="1902 1115 2190 1304">  <p>[Tec-Sleeve]</p> <ul style="list-style-type: none"> • Excellent reflect insulator • Fluid & Flame resistance • Glass Fiber or Polyester with Al </div> <div data-bbox="2359 1115 2647 1304">  <p>[Tec-Wrap]</p> <ul style="list-style-type: none"> • For thermal protection • Self-wrap with/without adhesive • Expandable tubular design </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div data-bbox="1902 1478 2190 1667">  <p>[Tec-Patch]</p> <ul style="list-style-type: none"> • Stronger than Al tape • Directly attach to part • Thin thickness, good flexibility • Al + Polyester + adhesive </div> <div data-bbox="2359 1478 2647 1667">  <p>[Tec-Cover]</p> <ul style="list-style-type: none"> • Customizable design • Easy installation • Ring snap • Al + Glass fiber + Aramid </div> </div>	

Aluminum Tube

PA12 Coated Aluminum Tube (Fluid Carrying System)

- Tube for Hydraulic Power Steering Return Line
- Tube for Automotive Fuel Line
- Tube for Transmission Warm-up
- Tube for Rear Heater Core

<p>Benefit</p>	<ul style="list-style-type: none"> • Excellent corrosion resistance • High resistance to stone chips • Light weight • Excellent Chemical Resistance • High Durability 						
<p>Features</p>	<ul style="list-style-type: none"> • Polyamide 12 • Aluminium  <p>Material</p> <ul style="list-style-type: none"> • Core : AA 1070, AA3003, AA3103 • Coating : PA 12, PA610 <p>Color</p> <ul style="list-style-type: none"> • Black •Yellow •Brown <p>Mechanical Properties</p> <table border="1" data-bbox="848 1514 1240 1635"> <thead> <tr> <th>Property</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Tensile strength(N / mm²)</td> <td>100 ↑</td> </tr> <tr> <td>Elongation(%)</td> <td>15 ↑</td> </tr> </tbody> </table>	Property	Value	Tensile strength(N / mm ²)	100 ↑	Elongation(%)	15 ↑
Property	Value						
Tensile strength(N / mm ²)	100 ↑						
Elongation(%)	15 ↑						
<p>Achievement & Expectation</p>	<ul style="list-style-type: none"> • HKMC Approved Supplier • DBL 4040 Standard in progress • Eco Friendly / Light Weight (Steel Tube → PA12 Aluminum Tube) 						

Aluminum Tube

PFC/SCC for Automotive HVAC

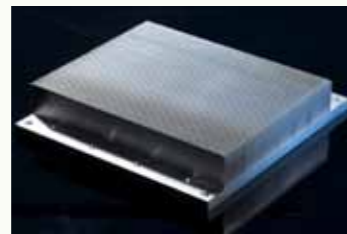
- Tube for Condenser
- Tube for Evaporator
- Tube for Oil Cooler
- Tube for Fuel Cooler
- Tube for Battery Cooler
- Tube for Change Air Cooler


<p>Benefit</p>	<ul style="list-style-type: none"> • Excellent Corrosion Resistance • Custom-designed Flux Coating • Precision Cutting 															
<p>Features</p>	<p>Cross Section</p>  <table border="1" data-bbox="1914 1388 2338 1635"> <thead> <tr> <th></th> <th>Dimension</th> <th>Tolerance</th> </tr> </thead> <tbody> <tr> <td>Height(H)</td> <td>1.0~4.0mm</td> <td>±0.02</td> </tr> <tr> <td>Width(W)</td> <td>10~38mm</td> <td>±0.02</td> </tr> <tr> <td>Wall Thickness</td> <td>Min 0.2mm</td> <td></td> </tr> <tr> <td>Cutting Length</td> <td>180~3,000MM</td> <td>±0.5</td> </tr> </tbody> </table> <p>Material</p> <ul style="list-style-type: none"> • AA1050, AA1100 AA3003, AA3102 AA3001(LSC's Patent Alloy) • Pre-Flux, Zn & Sil Flux Coating 		Dimension	Tolerance	Height(H)	1.0~4.0mm	±0.02	Width(W)	10~38mm	±0.02	Wall Thickness	Min 0.2mm		Cutting Length	180~3,000MM	±0.5
	Dimension	Tolerance														
Height(H)	1.0~4.0mm	±0.02														
Width(W)	10~38mm	±0.02														
Wall Thickness	Min 0.2mm															
Cutting Length	180~3,000MM	±0.5														
<p>Achievement & Expectation</p>	<ul style="list-style-type: none"> • HKMC Approved Supplier • Contributes to improving parts life by improving corrosion resistance of materials. 															

Aluminum Profile Extrusion Product for Automotive Parts

- Block for ABS/ESP System
- Aluminum Bar for Forging

- Bracket for Drive Shaft
- Heat Sink for HEV


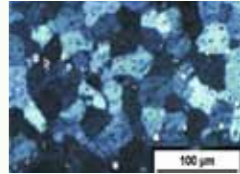


Benefit	<ul style="list-style-type: none"> • in-house Billet Casting → Extrusion → Machining • Precision Size Control • Hardness Control • Various Heat Treatment 																			
Features	<div style="display: flex; align-items: flex-start;">  <div> <p>Material</p> <ul style="list-style-type: none"> • A6082 / A6063 / A6061 / A6024 • AHS-2 / A4032/ A332 • LS604A New Alloy which has better Machinability (30% ↑) </div> </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr style="background-color: #92d050;"> <th></th> <th>Material</th> <th>T.S(Kgf/mm²)</th> <th>Y.S(Kgf/mm²)</th> </tr> </thead> <tbody> <tr> <td>Steel</td> <td>SS 400</td> <td>41~52</td> <td>25~</td> </tr> <tr> <td rowspan="2">Extrusion</td> <td>6061-T6</td> <td>27 ↓</td> <td>25 ↓</td> </tr> <tr style="background-color: #92d050;"> <td>6024-T6</td> <td>33~43</td> <td>30~40</td> </tr> <tr> <td>Casting</td> <td>AC7A-F</td> <td>14 ↓</td> <td></td> </tr> </tbody> </table>		Material	T.S(Kgf/mm ²)	Y.S(Kgf/mm ²)	Steel	SS 400	41~52	25~	Extrusion	6061-T6	27 ↓	25 ↓	6024-T6	33~43	30~40	Casting	AC7A-F	14 ↓	
	Material	T.S(Kgf/mm ²)	Y.S(Kgf/mm ²)																	
Steel	SS 400	41~52	25~																	
Extrusion	6061-T6	27 ↓	25 ↓																	
	6024-T6	33~43	30~40																	
Casting	AC7A-F	14 ↓																		
Achievement & Expectation	<ul style="list-style-type: none"> • Mobis Approved Supplier • Contribute to driver safety through tight quality control. • Better Fuel Efficiency through weight lightening 																			

Aluminum Rod Aluminum Alloy Rod for Automotive Wire

- 8XXX Series Aluminum Rod For Signal Cable
- 6XXX Series Aluminum Rod For Special Cable



Benefit	<ul style="list-style-type: none"> • Light-weight and Cost-saving compared to Copper Cable • High Strength and Good Electric Conductivity 																				
Features	<div style="display: flex; align-items: flex-start;"> <div style="flex: 1;"> <p>Material</p> <ul style="list-style-type: none"> • 8xxx (LSC's Patent Alloy) • 6xxx (LSC's Patent Alloy) • 1xxx <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr style="background-color: #92d050;"> <th></th> <th>T.S.(MPa)</th> <th>Elongation(%)</th> <th>E.C(%IACS)</th> </tr> </thead> <tbody> <tr> <td>JASO D603</td> <td>70</td> <td>10</td> <td>58</td> </tr> <tr> <td>8xxx</td> <td>90~140</td> <td>10 ↑</td> <td>58</td> </tr> <tr> <td>JASO D603</td> <td>150</td> <td>8</td> <td>48</td> </tr> <tr> <td>6xxx</td> <td>180~250</td> <td>8 ↑</td> <td>50</td> </tr> </tbody> </table> </div> <div style="flex: 0.5; text-align: center; margin-left: 10px;">  <p>[Microstructure of LS 803A]</p>  <p>[Microstructure of LS 605A, Precipitation Heat treated]</p> </div> </div>		T.S.(MPa)	Elongation(%)	E.C(%IACS)	JASO D603	70	10	58	8xxx	90~140	10 ↑	58	JASO D603	150	8	48	6xxx	180~250	8 ↑	50
	T.S.(MPa)	Elongation(%)	E.C(%IACS)																		
JASO D603	70	10	58																		
8xxx	90~140	10 ↑	58																		
JASO D603	150	8	48																		
6xxx	180~250	8 ↑	50																		
Achievement & Expectation	<ul style="list-style-type: none"> • Cooperation with Global Wire Harness Company • Candidate of HKMC Approved Supplier 																				


GLOBAL NETWORK

More than 60 Factories,
Sales and Production Sites
in 20 Countries.


- Factory
- Sales office
- Branch office




KOREA



Gumi Plant
EHV / MV / LV cable
UTP, Coaxial cable
SCR, Magnet wire
Overhead cable, Bus duct



Indong Plant
Optical fiber
Optical cable



Donghae Plant
Submarine cable
Industrial specialty cable

CHINA




LSHQ(Yichang)
EHV / MV / LV cable
Industrial specialty cable




LSCW(Wuxi)
Industrial devices cable
Automotive cable
Harness & module
Aluminum, Bus duct

VIETNAM



LS-VINA(Haiphong)
EHV / MV / LV cable
SCR, ACSR
Overhead cable



LSCV(HO Chi Minh)
MV / LV cable
UTP, Optical cable
Overhead cable

INDIA




LSCI(Bawal)
EHV / MV / LV cable
Coaxial cable
Overhead cable

USA



LSCUS(Tarboro)
MV / LV cable
Control, Instrument cable

POLAND



LS EV Poland./LSCP (Dzierzoniow)
Automotive battery components
Optical cable



www.lscns.com

LS Total Solutions for Automotive

12-17F, LS Tower, 127, LS-ro, Dongan-gu, Anyang-si, Gyeonggi-do, 14119, Korea
Tel. 82-2-2189-9114

©2020 LS Cable & System Ltd. All right reserved.

This product or document is protected by copyright and distributed under licenses restricting its use, copying, distribution, and recompilation. No part of this product or document may be reproduced in any form by any means without prior written authorization of LS Cable&System and its licensors, if any.

Products shown on this catalog are subject to change without any prior notice.