



LS Aluminium Products



Leading Solution

**LS aims to develop into a company that provides its clients with a Leading Solution,
contributes to the overall society,
and offers a business environment where the employees can realize their dreams.**

Always with our customers

LS Cable is leading the cable, telecommunication industry. It also represents the LS Group. With its company vision, "Always with our customers." LS Cable continuously drives towards becoming the global leading company providing the technology as required by customers and the solution that others cannot offer.

Towards the global leading company

All employees of LS Cable stand behind the vision of becoming Your No.1 Creative Partner and are doing their best to realize our customers' satisfaction. Securing and establishing a firm growth engine, LS Cable will be reborn as an enterprise to leap worldwide





LS Cable

Korea's foremost cable maker in both product list and service range, LS Cable has an integrated supply system from basic raw materials to ultrahigh voltage cables, optical fiber cables, system engineering and installation works. In non-cable sector as well, LS Cable flourishes as a top-rate supplier of information and communication networks, connectors, lead frames, industrial rubber, and aluminum products. Reputed for its outstanding technology and quality, LS Cable is at the service of customers within and outside Korea. Armed with the world's leading technology in electric power and optic fiber, it has been successful with four joint ventures in Malaysia and Vietnam. It has thus demonstrated leadership in establishing a global network in the domains of electric power, other energy and information.



LS Aluminium Products





What is LS Cable Aluminium?

LS Cable aluminium is light and non-toxic and possesses good low temperature strength properties. It also has vacuum, heat, and electric conductivity properties.

It is made of environmentally friendly materials that can be easily processed or recycled.

When aluminium is alloyed with copper, manganese, zinc, nickel, magnesium, and silicon, its mechanical features can be greatly improved. Thus, demand for aluminium is expected to increase for electric, electronic, civil engineering, vehicle, shipbuilding and aerospace applications.



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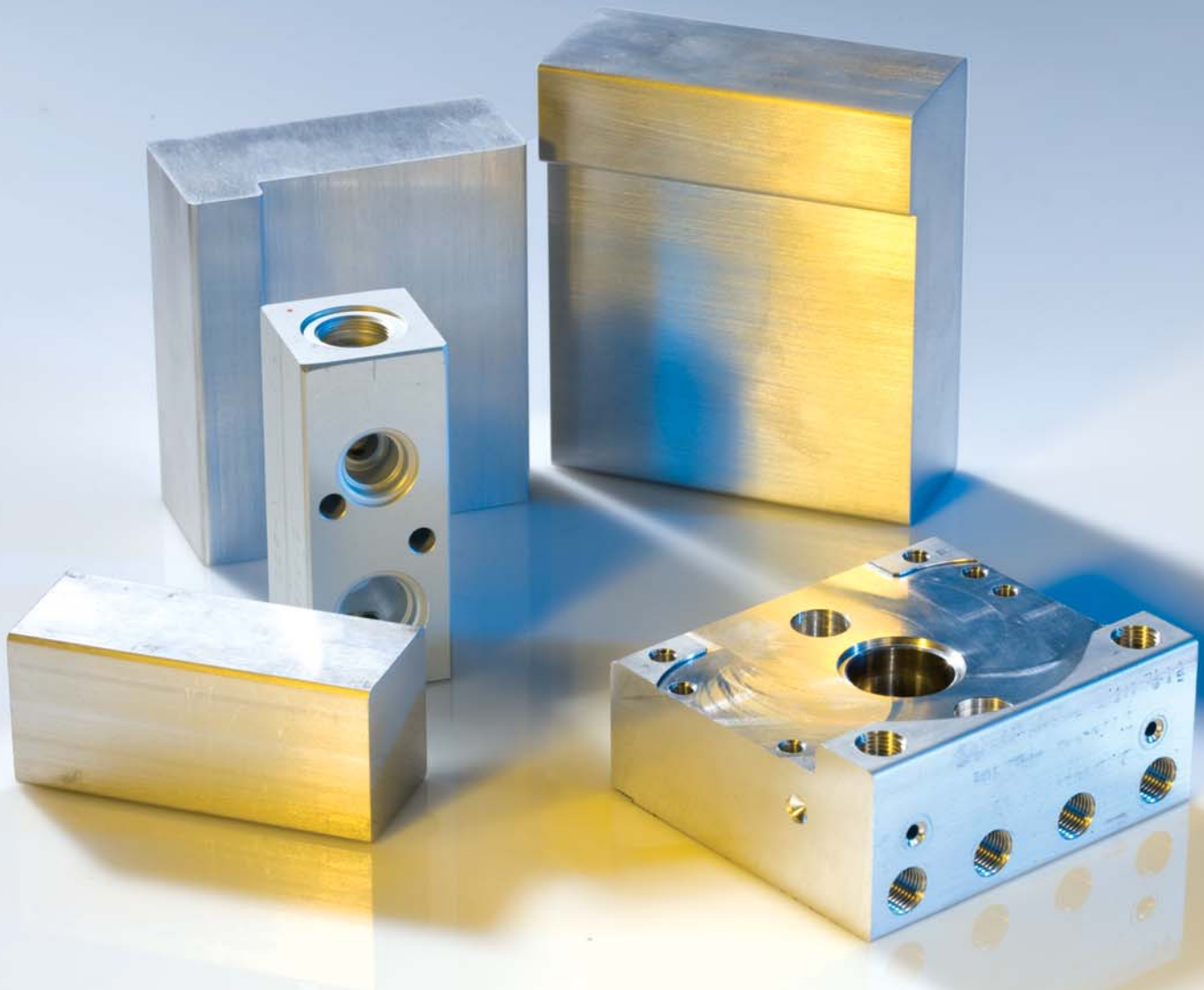
Global Network 19

Automotive · Transport

Aluminium can save the fuel of transportation vehicle and simultaneously obtain heat exchange efficiency as heat exchanger parts, utilizing the light weight, high strength and high thermal conductivity of aluminium.

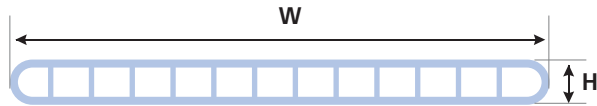
Product

Multi-port Extruded Tube	Precision Tube	DURACOT®	Profiles
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Multi-port Extruded Tube

Cross section



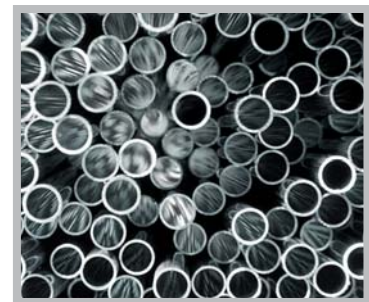
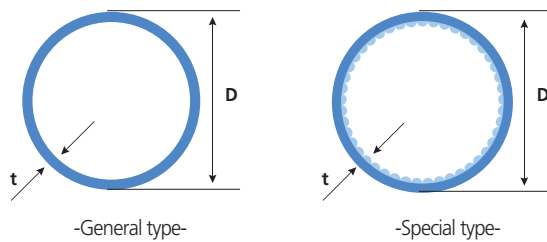
Dimension & Tolerance

Items	Dimension	Tolerance
Diameter (D)	1.0~4.0mm	±0.02
Thickness (T)	10~38mm	±0.02
Wall Thickness	Normal 0.5mm Min. 0.2mm	
Cutting Length	200~3000	±0.5

Application : Condenser, Evaporator, Radiator, Oil-cooler etc

Precision Tube

Cross section



Dimension & Tolerance

Items	Dimension	Tolerance
Diameter(D)	4~22mm	±0.05
Thickness(T)	0.5~1.8mm	±0.05
Cutting Length	200~3000	±0.5

* Material: 1xxx, 3xxx, 6xxx.

Automotive · Transport

Functional Multi-port Extruded Tube (Pre-flux Tube, Sil-flux Tube)

Pre-flux Tube

Features

Coating Material	NOCOLOK Flux
Zn-spray	O/X
Fin	3-layer Clad fin(4XXX / 3XXX / 4XXX)
Filler Metal	Clad Material(4XXX)
Benefit	- No need flux-spray process in brazing line - Easy to keep clean the brazing area



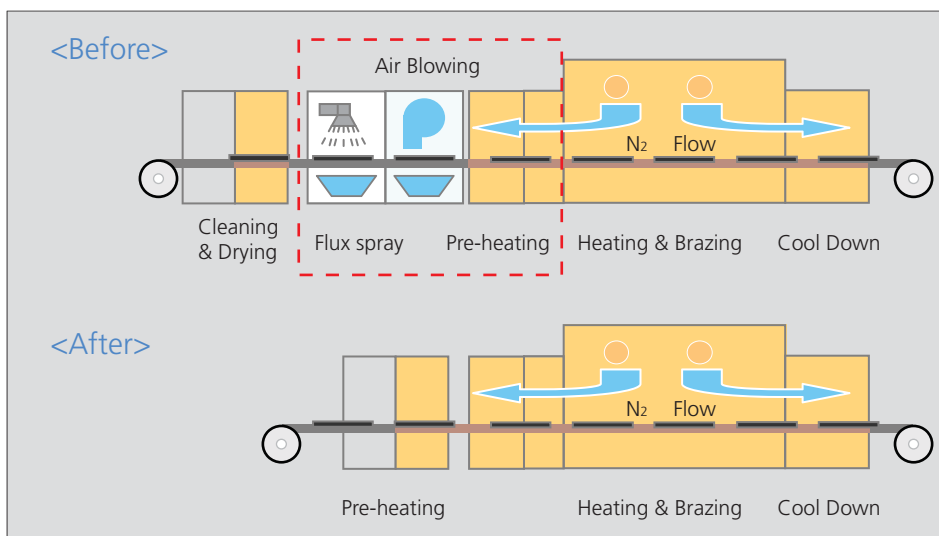
Sil-flux Tube

Features

Coating Material	Silicon Powder + NOCOLOK Flux
Zn-spray	O/X
Fin	Bare Fin(3xxx)
Filler Metal	Si-powder in the mixture
Benefit	- No need flux-spray process in brazing line - Only use bare fin instead of Al-Si clad fin - Save the material cost and processing cost(Using bare fin)



Brazing Process(Using Pre / Sil-flux Tube)



PA 12 Coated Aluminium Tube

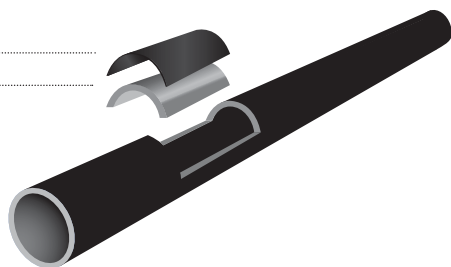
Features

- Excellent resistance to salt corrosion
- Same work ability as for the Aluminium Tube without PA12 coating
- High cleanliness
- High resistance to stone chips
- High Durability
- Low weight and therefore lower fuel consumption
- Recyclable



Construction

- Polyamide 12 Coating
- Aluminium



Application

Tube material

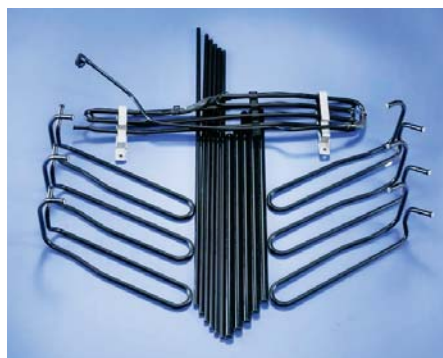
- Core : AA3003
- Coating : PA 12

Coating colors

- Black

Tube mechanical Properties

Property	Value
Tensile strength(N / mm ²)	105 ↑
Elongation(%)	15 ↑



Tube cleanliness

All internal and external surface are free from foreign materials that might impair the performance.

Cut-to-length

- Length : 100 ~ 4,000 mm

Main dimension and tolerance of tube

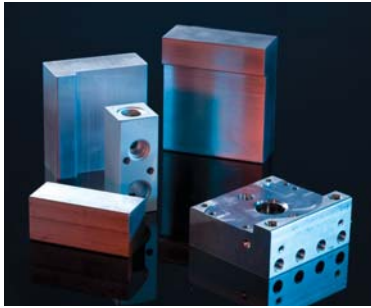
- Outer diameter of tube : 4 ~ 22 mm
- Thickness of tube : 0.5 ~ 1.8 mm
- Coating thickness : 100 ~ 1,000 μm
- Tolerance : According to KSD 6761

Al-Tube : A3003

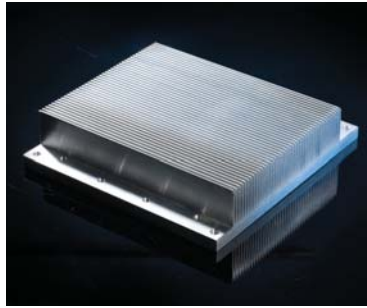
Si	0.6 ↓
Fe	0.7 ↓
Cu	0.05 ~ 0.2
Mn	1.0 ~ 1.5
Zn	0.1 ↓
Others	0.15 ↓

* Coating material : Polyamide 12

Product



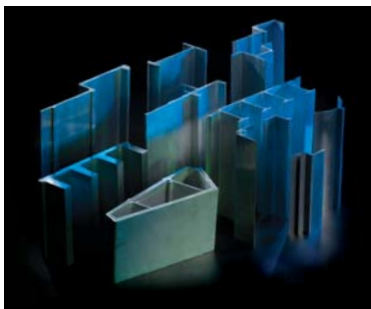
ABS & ESC Pump housing



Heat sink for HEV



Drive shaft bracket



Container profile



Truck side panel



Industrial profiles

We offer extruded aluminium profiles, semi-manufactured components, systems and finished products-meeting our customer's demands for performance, quality, precision and economy. Extrusion is the process that provides virtually unlimited opportunities for adapting product shapes. Costs are cut by using fewer components, which reduce the finishing process and simplify assembly. Customer satisfaction and product excellence are our key goals. Aluminium extrusions inspire creative designs and technical solutions that improve, simplify and reduce costs. At the initial stage, we work together with our customers on product development.

Material

The light weight, high strength and high wear-resistance of aluminium improves the working efficiency of high velocity rotating parts allowing them to be made even smaller. Aluminium is used for everything from automobile compressors to anything else requiring strength and light weight.

Product

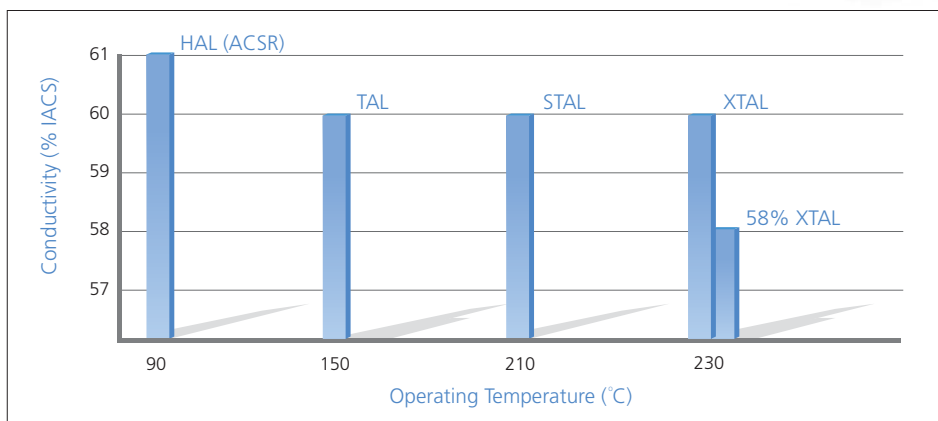
Al-rod	Al-bar(Hi-Si)	AA6024
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Material Al-rod



Thermal Resistant Al-rod



Type	Application	UTS(Mpa)	Conductivity (% IACS)	Operating Temperature (Short time) / (°C)
HAL	ACSR	159 ~ 169 ↑	61.3 ↑	90 (120)
TAL	TACSR	159 ~ 169 ↑	60.0 ↑	150 (180)
STAL	STACIR	159 ~ 176 ↑	60.0 ↑	210 (240)
HITAL	HI-TACSR	225 ~ 238 ↑	55.0 ↑	150
XTAL	XTACIR	159 ~ 169 ↑	58.0 ↑ 60.0 ↑	230 (310)

High Capacity XTAL Alloy Lines

The first of its kind in the world, the main items of the XTAL alloy lines of a 60% level have world-class characteristics. This alloy is used for conductors for overhead power transmission lines that supply power from power plants to substations in suburban areas

Mother material for CONFORM® extrusion

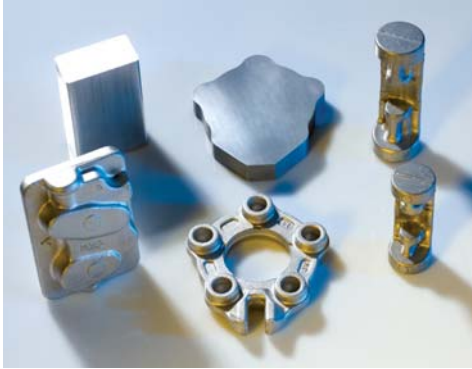
Alloy : AA1050, AA1070, AA1100, AA3003, LLA*™ (Mn,Cu)

*LLA : Long life alloy

Material

Al-bar(High-Si) for forging

Product



Forging Material & Final products

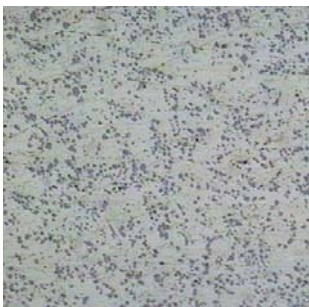


Al-bar

Chemical Composition

Alloy	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Ni	Other	Al
A4032	11.00~13.50	1.00 ↓	0.50~1.30	-	0.80~1.30	0.10 ↓	0.20 ↓	-	0.50~1.30	0.05 ↓	BAL
4000A	10.50~12.50	0.50 ↓	3.50~5.00	0.20 ↓	0.30~1.00	-	-	0.20 ↓	-	0.20 ↓	BAL
AP2X	11.00~12.50	0.20~0.30	4.00~4.60	0.20~0.30	0.50~0.70	-	0.25 ↓	0.30 ↓	-	0.20 ↓	BAL
A332	8.50~10.50	1.20 ↓	2.00~4.00	0.50 ↓	0.50~1.50	-	1.00 ↓	0.25 ↓	0.50 ↓	0.50 ↓	BAL

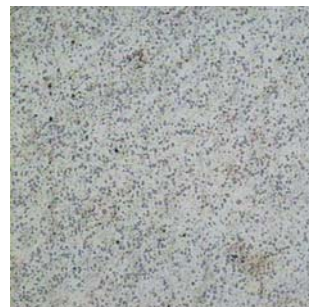
Micro-structure



A4032



AP2X



4000A

Application

- Swash Plate
- Socket Plate
- Piston Rod
- Suction & Discharge
- Clutch Piston

Material

Aluminum Alloy 6024

LS Aluminum, a leading company for the development of new Al alloy, has developed 6024 which is much stronger alloy than conventional 6061 Al alloy in the ways of LS's own.

Corrosion Resistance

Excellent Corrosion Resistance → The lowest cost of maintenance

Strength

Strength -40% higher than 6061 Al alloy

Impact Resistance

Excellent Impact Resistance → The safety is much more improved

6024 Alloy

The 6024, adding Cu, Mn in Al-Mg-Si alloy, is more definitely superior than 6000 alloy.

Chemical Composition

Materials	Si	Fe	Cu	Mn	Mg	Zn	Ti	Cr	N	Other
6061	0.4~0.8	0.7 ↓	0.15~0.4	0.15 ↓	0.8~1.2	0.25 ↓	0.15 ↓	0.04~0.35	-	-
6024	0.7~1.3	0.05~0.7	0.3~0.9	0.6~1.2	0.3~1.0	0.2 ↓	0.1 ↓	-	-	-

Mechanical Properties

Materials	Tensile Strength	Yield Strength	Elongation	Fatigue Property		Impact Resistance
	(kg/mm ²)	(kg/mm ²)	%	Δ(Threshold)	m	J
SS 400 (SS41)	41 ~ 52	25 ~	21	-	-	-
SUS 316	41 ~ 53	20 ~ 28	20 ~ 40	-	-	-
6061	T4 18 ↑	11 ↑	16 ↑	-	-	43.9
	T6 27 ↑	25 ↑	8 ↑	9.64	1.32	16.7
6024	T4 31 ~ 35	23 ~ 26	8 ↑	9.6 ~ 10.8	2.04 ~ 2.8	47.1
	T6 38 ~ 43	33 ~ 41	8 ↑	10.5 ~ 11.0	0.89 ~ 1.30	30.8

Material Properties

Materials	Tensile Strength	Corrosion Resistance	Weldability	Machinability	Microstructure
STEEL	100	D	A, B	B	-
6061	75	B	A, B	C	B, C
6024	~ 100	B	A, B	B	A

Certificates

UNDERWRITERS LABORATORIES INC.
ENVIRONMENTAL MANAGEMENT SYSTEM REGISTRATION

ISO 14001

LS Cable Ltd.
Gumi Plant Indong Plant
190 Gondan-Dong Gumi-Si
Gumi-Si 643 Jinpyeong-Dong
Gyeongsangbuk-Do, 730-708 Gyeongsangbuk-Do, 730-735
Korea Korea

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

ISO 14001:2004
ENVIRONMENTAL MANAGEMENT SYSTEM
KS A 14001:2004

for the following scope of registration

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

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

File Number: A5120
Volume: 1
Original Certification Date: January 30, 1997
ISO 14001:2004 Issue Date: September 8, 2005
Revision Date: September 3, 2007
Recertification Date: January 30, 2008
Renewal Date: January 29, 2011

John H. Schmidt
John H. Schmidt
Senior Vice President, Chief Development Officer



UNDERWRITERS LABORATORIES INC.
CERTIFICATE OF REGISTRATION

LS Cable Ltd.
Indong Plant Gumi Plant
643 Jinpyeong-Dong 190 Gongdan-Dong
Gumi-Si Gumi-Si
Gyeongsangbuk-Do Gyeongsangbuk-Do,
730-360 Korea 730-030 Korea

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

OHSAS 18001:1999
OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM


for the following scope of the Conformance Assessment:

The occupational safety and health management system of LS Cable Ltd. associated with the design and manufacture of copper and optical fiber telecommunication cables, power cables, power cable accessories, aluminum extruded products, UC(Ultracapacitor) and rubber hoses and assemblies for automotive application and manufacture of magnet wires, communication cables(LAN), optical fibers, curtain walls, aluminum billet and rods, aluminum tubes and copper rods at Indong and Gumi Plants, Gumi, Korea to the requirements of OHSAS 18001.

This occupational health and safety management system certificate applies to the operations of the addressee(s) shown above. By issuance of this certificate the firm represents that it will maintain its system in accordance with the applicable requirements. This certificate is not transferable and remains the property of Underwriters Laboratories Inc. ®.

File Number: A13352
Volume: 1
Original Certification Date: September 7, 2004
ISO 18001 Issue Date: September 7, 2004
Revision Date: September 3, 2007
Recertification Date: September 7, 2007
Renewal Date: September 6, 2010

John H. Schmidt
John H. Schmidt
Senior Vice President, Chief Development Officer



UNDERWRITERS LABORATORIES INC.
CERTIFICATE OF REGISTRATION

LS Cable Ltd.
Indong Plant
643 Jinpyeong-Dong
Gumi-Si
Gyeongsangbuk 730-360 Korea

With remote supporting functions at:
ISF ASEM Tower Anyang Plant
108 Seomung-Dong 555 Higeun-Dong
Ganghwa-Gu Dongan-Gu Anyang-Si
Seoul, 130-090 Korea Gyeonggi-Do 431-831 Korea

Underwriters Laboratories Inc. ® (U.L.), Seattle, WY, USA, issues this certificate to the Firm named above (and where applicable in the annexes) to this certificate, after assessing the Firm's quality system and finding it in compliance with

ISO/TS 16949: 2002

for the following scope of registration


3052 (US) : Rubber and Plastics Hose and Belting 3714 (US) : Motor Vehicle Parts and Accessories
3365 (US) : Aluminum Foundries 3395 (US) : Aluminum Rolling and Drawing, Not Elsewhere Classified
3354 (US) : Aluminum Extruded Products 2448 (US) : Miscellaneous Structural Metal Work
3629 (US) : Electrical Industrial Apparatus, Not Elsewhere Classified


The design and manufacture of rubber hoses and assemblies. The manufacture of aluminum micro, multi-port and round tubes and aluminum-alloyed bars and rods. The remote location at Anyang Plant performs internal audit, management review and document control as a corporate function. The remote location at Anyang Plant performs product design of ultra capacitors as a corporate function. The remote location at Gangnam-Gu, Seoul performs the following primary functions: overseas sales.

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

Certificate File Number: A9591-02 Volume: 1 of 2
Page 2 of 4
Original Issue Date: December 7, 2004
ISO/TS 16949:2002 Issue Date: December 7, 2004
Revision Date: December 5, 2007
Recertification Date: December 5, 2007
Renewal Date: December 4, 2010

John H. Schmidt
John H. Schmidt
Senior Vice President, Chief Development Officer



The Aluminum Association 

800 19th St. N.W. Phone (202) 862-5100
Washington, D.C. 20006 Fax (202) 862-5194
Website www.aluminum.org

April 9, 2002

TO: Signatories of the Declaration of Accord - Wrought

RE: International Registration of a New International Alloy Designation 6024

Ladies and Gentlemen:

Since there were no objections, alloy designation 6024 with the following chemical composition limits is assigned for international registration.

REGISTERED BY: Korea

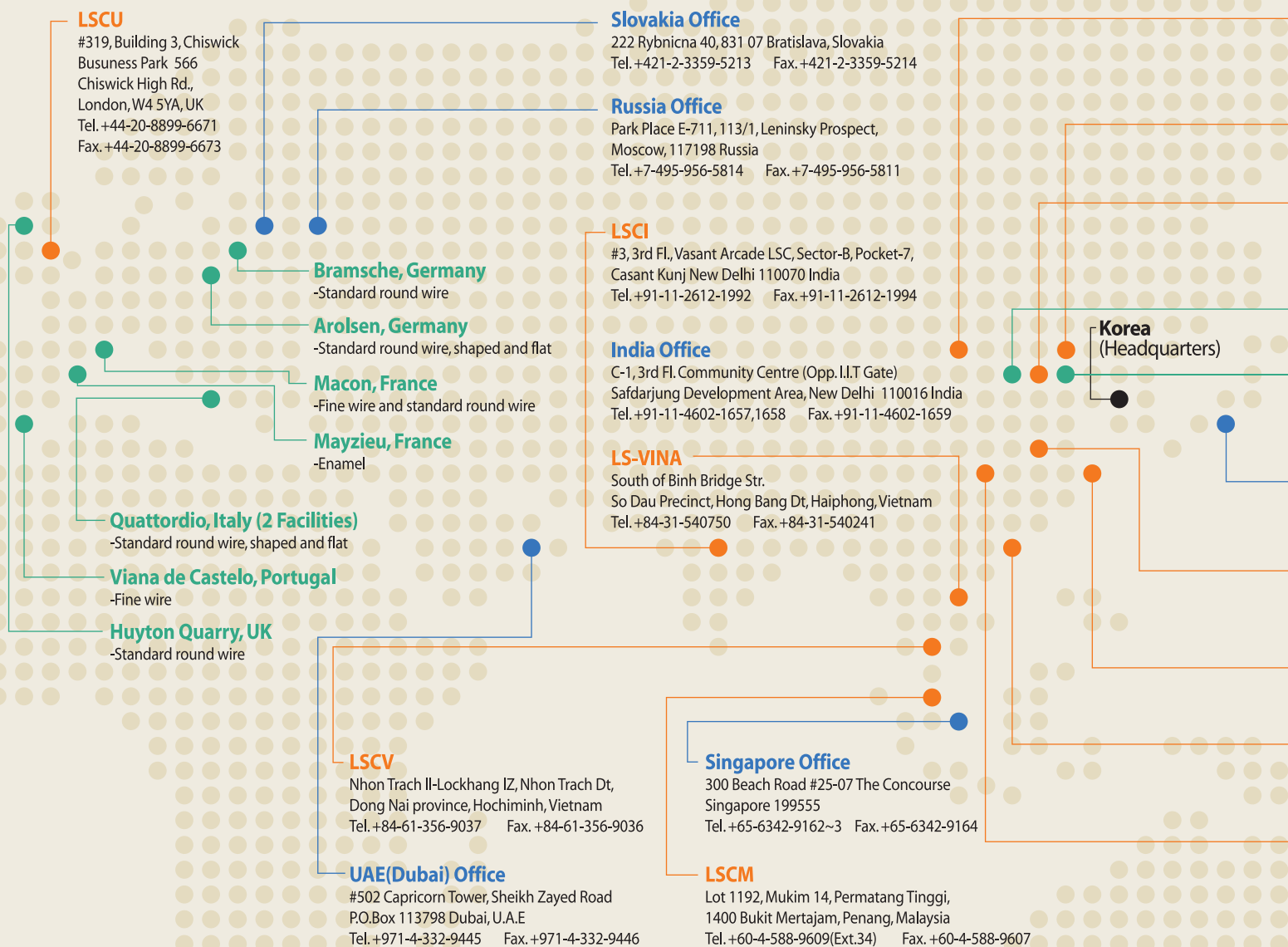
REGISTRATION DATE: 2001 November 20

REGISTERED COMPOSITION LIMITS - Alloy 6024		DENSITY:
Silicon	0.7-1.3	U.S. Customary 0.089 lbs/in ³
Iron	0.05-0.7	Metric2.72 kg/m ³ *10 ³
Copper	0.30-0.9	
Manganese	0.30-1.2	
Magnesium	0.30-1.0	
Chromium	0.20	
Zinc	0.20	
Titanium	0.20	
Others, Each	0.05	
Others, Total	0.15	
Aluminum	Remainder	

APPLICATION This alloy has been developed by the registrant as extrusions for use mainly in structural applications.

Parvaneh Shafiq
Parvaneh Shafiq
Manager, Alloy and Temper Registrations

Global Network



Korea Operations



Headquarters

LS Tower 1026-6 Hogye-dong
Dongan-gu, Anyang, Gyeonggi-do
431-830 Korea
Tel. +82-2-2189-9114



Anyang Plant

555 Hogye-dong, Dongan-gu
Anyang, Gyeonggi-do
431-830 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



R&D Center

555 Hogye-dong, Dongan-gu
Anyang, Gyeonggi-do
431-830 Korea
Tel. +82-31-450-8114

LSIC (Beijing Office)

#02 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 Entrance, Beichen, Tianjin, China
Tel. +86-22-2699-7618 Fax. +86-22-2699-7617

LSIC (Shenyang Office)

Room B, 15th Fl. XinGangAo Building, 51 Beizhan Rd. Shenhe Dt.
Shenyang 110013 China
Tel. +86-24-2256-6541 Fax. +86-24-2256-6539

Tianjin, China

-Flat and shaped products

Suzhou, China

-Standard round wire

Japan Office

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

LSCW

LS Industrial Park, Xin Mei Rd, National High-tech Industrial Development Zone.
Wuxi, Jiangsu Province, 214028 China
Tel. +86-510-8534-5943 Fax. +86-510-8534-5341

LSIC (China Head Office)

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

LSIC (Shenzhen Office)

#611-612, 6013 Shennan Rd. Futian Dt.
Shenzhen, China
Tel. +86-755-8275-0470 Fax. +86-755-8275-0545

LSIC (Chendu Office)

#2606, 26th Fl. CCB Sichuan Building, 88 Ti Du Street,
Chengdu 610017 China
Tel. +86-28-8676-7951 Fax. +86-28-8676-7953

Columbia City, Indiana USA

-Copper rod production

Franklin, Indiana USA (Femcoe JV)

-Standard round wire

Kendallville, Indiana USA

-Fine wire

Willowbrook, Illinois USA

-Fabricated insulation

Fort Wayne, Indiana USA

-Standard round wire, flat wire, enamel

Torreon, Mexico

-Standard round wire

Brownwood, Texas USA

-OSP, Fiber

Hoisington, Kansas USA

-Premise, OSP

Franklin, Tennessee USA

-Standard round wire (Cu and Al)

Atlanta, Georgia

(Headquarters)

Tarboro, North Carolina USA

-OSP

LSCA

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

Clifton Park, New York USA

-Fabricated insulation

Simcoe, Canada

-Round, flat and shaped wire

● Subsidiaries ● Branches ● Superior Essex



Aluminium Team

Head Office 14F, LS Tower, 1026-6, Hoge-dong, Dongan-gu, Anyang-si, Gyeonggi-do, 431-080, Korea
Tel. +82-2-2189-9114 Fax. +82-2-2189-9379

Factory 643 Jinpyeong-dong, Gumi-si, Gyeongsangbuk-do, 730-735, Korea
Tel. +82-54-469-7814 Fax. +82-54-469-7707