LS Cable & System
Leading Solution

# RailSol™-Saflex

LS Total Solution for Rolling Stock


Energy Cables & Systems
LS Cable & System-setting the standards in power solution business
Industrial Materials
Realizing a convenient future with cutting-edge materials
Telecommunications
Providing cutting-edge, innovative technologies for a ubiquitous network
Integrated Modules & Cable Systems
Providing the best customized cable solutions for all environments

# 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.

# 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.

# RailSol™-Saflex

LS Total Solution for Rolling Stock

## Application Business

The Leading Solution Provider, LS Cable & System introduced a new marketing concept, which is providing collected items applicable to an industry as a package instead of separately providing a single item. These LS Cable & System's business solutions are applicable to following industries : Wind Power Generation, Railway & Rolling stock, Airport, Power Transmission & distribution, Marine & Offshore, and Automotive. The Application Business manages various departments and their products to satisfy our customers' specific needs and convenience.

## RailSol™-Saflex

Rolling stock technology has been developed in the last few years and this development has been driven by high speed train network. Rolling stock for metro, commute and regional line are covered by this development.
To reduce both size and weight has been always required to cable manufacturers. LS Cable & System has developed products to meet our customer and offers a wide range of products for rolling stock.
LS Cable & System supplies cables which pass the fire tests relevant to rolling stock standard, and these cables have low toxicity and excellent flame resistance.
Moreover, thanks to compact construction and excellent material performance, LS Cable & System offers particularly space and weight saving.

RailSol™-Saflex which is LS Cable & System's rolling stock solution covers wide range of rolling stock product such as single and multi-core power cables, signal and control cables, multimedia and telecommunication cables, MV roof cable, winding wires for transformer and traction motor, rubber flooring, RF antenna and connector, components for harness and jumper cable in various versions customized with combinations of cores and cables.

LS Cable & System

Always with Our Customers

The enterprise that is together with human beings through
the information and energy transmission technology


# Content

RailSol™-Saflex
LS Total Solution for Rolling Stock

# Power Cables

# Reduced Dimension Power Cables

## HF-RMSG-RD 600V

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 120°C for 20,000 working hours

### Design standard

EN 50264-3-1

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5 |
| Insulation | Halogen-free polyolefin(EI 109) |

### Technical Data

| | |
|---|---|
| Voltage | 0.6/1 kV |
| Temperature Range | -40 ~ +90 ℃ |
| Wall Thickness | Reduced |
| Fire Performance | NFPA130 : 2010, BS6853 : Cat. Ia |

### Properties

Halogen Free — EN 50264-1
Flame Retardant — EN 60332-1, EN 50266-2, NF F 16-101
Low Smoke — EN 61304-2
Oil Resistant — EN 60811-2-1
Ozone Resistant — EN 50305
Toxicity Index — BS6853 Annex B.1, BSS 7239

### Product List

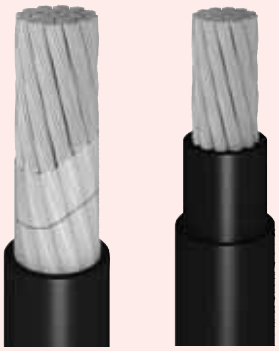
| Conductor | | Insulation | Overal | Cable |
|---|---|---|---|---|
| ㎟ | Φ(㎜) | Thickness(㎜) | Φ(㎜) | Weight(㎏/㎞) |
| 1.0 | 1.2 | 0.6 | 2.5 | 12.1 |
| 1.5 | 1.5 | 0.7 | 3.0 | 17.6 |
| 2.5 | 1.9 | 0.7 | 3.4 | 26.9 |
| 4.0 | 2.4 | 0.7 | 3.9 | 40.4 |
| 6.0 | 3.0 | 0.7 | 4.5 | 57.6 |
| 10 | 3.9 | 0.7 | 5.4 | 95.2 |
| 16 | 5.0 | 0.7 | 6.6 | 152.8 |
| 25 | 6.4 | 0.9 | 8.4 | 236.6 |
| 35 | 7.7 | 0.9 | 9.7 | 322.3 |

| Conductor | | Insulation | Overal | Cable |
|---|---|---|---|---|
| ㎟ | Φ(㎜) | Thickness(㎜) | Φ(㎜) | Weight(㎏/㎞) |
| 50 | 9.2 | 1.0 | 11.4 | 458.5 |
| 70 | 11.0 | 1.1 | 13.4 | 671.8 |
| 95 | 12.5 | 1.1 | 15.1 | 855.1 |
| 120 | 14.2 | 1.2 | 17.0 | 1110.6 |
| 150 | 15.8 | 1.4 | 19.0 | 1375.1 |
| 185 | 17.5 | 1.6 | 21.1 | 1670.4 |
| 240 | 20.1 | 1.7 | 23.9 | 2206.6 |
| 300 | 22.5 | 1.8 | 26.5 | 2729.2 |
| 400 | 25.8 | 2.0 | 30.3 | 3917.9 |

Other range on request.

# Reduced Dimension Power Cables

## HF-RMSG-RD 1.8kV



### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 120°C for 20,000 working hours

### Design standard

EN 50264-3-1

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5 |
| Insulation | Halogen-free polyolefin(EI 109) |
| Sheath | Cross-linked halogen-free polyolefin(EM 104) |

### Technical Data

| | |
|---|---|
| Voltage | 1.8/3 kV |
| Temperature Range | -40 ~ +90℃ |
| Wall Thickness | Reduced |
| Fire Performance | NFPA130 : 2010, BS6853 : Cat. Ia |

### Properties

Halogen Free — EN 50264-1
Flame Retardant — EN 60332-1, EN 50266-2, NF F 16-101
Low Smoke — EN 61304-2
Oil Resistant — EN 60811-2-1
Ozone Resistant — EN 50305
Toxicity Index — BS6853 Annex B.1, BSS 7239

### Product List

| Unsheathed | | | | | Sheathed | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Conductor | | Insulation | Overal | Cable | Conductor | | Insulation | Sheath | | Cable |
| mm² | Φ(mm) | Thickness(mm) | Φ(mm) | Weight( kg/km) | mm² | Φ(mm) | Thickness(mm) | Thickness(mm) | Φ( mm) | Weight( kg/km) |
| 1.5 | 1.5 | 2.0 | 5.7 | 45.1 | 1.5 | 1.5 | 1.3 | 0.8 | 5.9 | 47.7 |
| 2.5 | 1.9 | 2.0 | 6.2 | 57.2 | 2.5 | 1.9 | 1.3 | 0.8 | 6.4 | 60.0 |
| 4.0 | 2.4 | 2.0 | 6.7 | 74.1 | 4.0 | 2.4 | 1.3 | 0.8 | 6.9 | 77.1 |
| 6.0 | 3.0 | 2.0 | 7.2 | 94.5 | 6.0 | 3.0 | 1.3 | 0.8 | 7.4 | 98.2 |
| 10 | 3.9 | 2.0 | 8.1 | 138.2 | 10 | 3.9 | 1.5 | 0.8 | 8.8 | 150.1 |
| 16 | 5.0 | 2.0 | 9.3 | 204.0 | 16 | 5.0 | 1.5 | 0.8 | 9.9 | 216.5 |
| 25 | 6.4 | 2.0 | 10.7 | 289.9 | 25 | 6.4 | 1.8 | 1.0 | 12.4 | 331.7 |
| 35 | 7.7 | 2.0 | 12.0 | 382.9 | 35 | 7.7 | 1.8 | 1.0 | 13.7 | 429.4 |
| 50 | 9.2 | 2.0 | 13.5 | 522.9 | 50 | 9.2 | 1.8 | 1.0 | 15.2 | 574.8 |
| 70 | 11.0 | 2.0 | 15.3 | 725.5 | 70 | 11.0 | 1.8 | 1.0 | 17.0 | 785.0 |
| 95 | 12.5 | 2.2 | 17.4 | 929.4 | 95 | 12.5 | 2.2 | 1.0 | 19.5 | 1012.7 |
| 120 | 14.2 | 2.2 | 19.0 | 1181.8 | 120 | 14.2 | 2.2 | 1.0 | 21.2 | 1276.9 |
| 150 | 15.8 | 2.2 | 20.6 | 1437.0 | 150 | 15.8 | 2.2 | 1.2 | 23.2 | 1536.1 |
| 185 | 17.5 | 2.4 | 22.8 | 1743.9 | 185 | 17.5 | 2.4 | 1.2 | 25.3 | 1847.9 |
| 240 | 20.1 | 2.4 | 25.4 | 2278.9 | 240 | 20.1 | 2.4 | 1.2 | 27.9 | 2394.3 |
| 300 | 22.5 | 2.4 | 27.8 | 2797.6 | 300 | 22.5 | 2.4 | 1.2 | 30.3 | 2923.4 |
| 400 | 25.8 | 2.6 | 31.5 | 3995.8 | 400 | 25.8 | 2.6 | 1.4 | 34.5 | 4165.1 |

Other range on request.

# Reduced Dimension Power Cables

## HF-RMSG-RD 3.6kV

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 120°C for 20,000 working hours

### Design standard

EN 50264-3-1

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5 |
| Insulation | Halogen-free polyolefin(EI 109) |
| Sheath | Cross-linked halogen-free polyolefin(EM 104) |

### Technical Data

| | |
|---|---|
| Voltage | 3.6/6kV |
| Temperature Range | -40 ~ +90 ℃ |
| Wall Thickness | Reduced |
| Fire Performance | NFPA130 : 2010, BS6853 : Cat. Ia |

### Properties

Halogen Free — EN 50264-1
Flame Retardant — EN 60332-1, EN 50266-2, NF F 16-101
Low Smoke — EN 61304-2
Oil Resistant — EN 60811-2-1
Ozone Resistant — EN 50305
Toxicity Index — BS6853 Annex B.1, BSS 7239

### Product List

| Conductor | | Insulation | Sheath | | Cable |
|---|---|---|---|---|---|
| mm² | Φ(mm) | Thickness(mm) | Thickness(mm) | Φ(mm) | Weight(kg/km) |
| 2.5 | 1.9 | 2.6 | 0.8 | 9.1 | 105.5 |
| 4.0 | 2.4 | 2.6 | 0.8 | 9.6 | 125.6 |
| 6.0 | 3.0 | 2.6 | 0.8 | 10.1 | 149.4 |
| 10 | 3.9 | 2.6 | 0.8 | 11.1 | 199 |
| 16 | 5.0 | 2.6 | 0.8 | 12.3 | 272.2 |
| 25 | 6.4 | 2.9 | 1.0 | 14.7 | 399 |
| 35 | 7.7 | 2.9 | 1.0 | 16 | 503.2 |
| 50 | 9.2 | 2.9 | 1.0 | 17.5 | 656.1 |

| Conductor | | Insulation | Sheath | | Cable |
|---|---|---|---|---|---|
| mm² | Φ(mm) | Thickness(mm) | Thickness(mm) | Φ(mm) | Weight(kg/km) |
| 70 | 11.0 | 2.9 | 1.0 | 19.3 | 868.5 |
| 95 | 12.5 | 2.9 | 1.0 | 21.0 | 1071.9 |
| 120 | 14.2 | 2.9 | 1.2 | 23.0 | 1332.9 |
| 150 | 15.8 | 2.9 | 1.2 | 24.6 | 1599.8 |
| 185 | 17.5 | 3.2 | 1.2 | 27.0 | 1934.1 |
| 240 | 20.1 | 3.4 | 1.4 | 30.4 | 2564.8 |
| 300 | 22.5 | 3.4 | 1.4 | 32.8 | 3080.4 |
| 400 | 25.8 | 3.4 | 1.4 | 36.1 | 4282.4 |

Other range on request.

# Standard Dimension Power Cables

## 750V HF-RMSG

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 105°C for 20,000 working hours

### Design standard

BS 3G 230 / NF F 63-826

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5 |
| Insulation | Halogen-free polyolefin |
| Sheath | Cross-linked halogen-free polyolefin |

### Technical Data

| | |
|---|---|
| Voltage | 0.6/1kV |
| Temperature Range | -40 ~ +90℃ |
| Wall Thickness | Standard |

### Properties

Halogen Free
IEC 60754-2
IEC 60684-2

Flame Retardant
NF C 32-070
IEC 60332-1/2/3

Low Smoke
NF F 16-101

UV Resistant
ASTM G53

Oil Resistant
BS 2G 230 29

Ozone Resistant
UIC 895 OR

Toxicity Index
BS6853 Annex B.1
BSS 7239

### Product List

| Nominal cross-sectional | Overall diameter D | | Approx. Weight |
|---|---|---|---|
| | min. | max. | |
| ㎟ | ㎜ | ㎜ | kg/㎞ |
| 1.0 | 3.6 | 4.0 | 22 |
| 1.5 | 3.6 | 4.0 | 29 |
| 2.5 | 4.1 | 4.5 | 41 |
| 4.0 | 4.4 | 4.9 | 55 |
| 6.0 | 5.1 | 5.6 | 79 |
| 10 | 6.2 | 6.9 | 125 |
| 16 | 7.6 | 8.5 | 192 |
| 25 | 9.2 | 10.3 | 284 |
| 35 | 10.7 | 11.9 | 408 |

| Nominal cross-sectional | Overall diameter D | | Approx. Weight |
|---|---|---|---|
| | min. | max. | |
| ㎟ | ㎜ | ㎜ | kg/㎞ |
| 50 | 12.9 | 14.1 | 583 |
| 70 | 14.9 | 16.3 | 786 |
| 95 | 17.4 | 18.8 | 1049 |
| 120 | 19.1 | 20.5 | 1345 |
| 150 | 21.1 | 22.9 | 1652 |
| 185 | 23.5 | 25.3 | 1968 |
| 240 | 26.9 | 28.7 | 2562 |
| 300 | 30.1 | 32.3 | 3062 |
| 400 | 34.1 | 36.3 | 3981 |

Other range on request.

# Standard Dimension Power Cables

## 1500V HF-RMSG

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 105°C for 20,000 working hours

### Design standard

BS 3G 230 / NF F 63-826

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5, Class6 |
| Insulation | Halogen-free polyolefin |
| Sheath | Cross-linked halogen-free polyolefin |

### Technical Data

| | |
|---|---|
| Voltage | 1.8/3kV |
| Temperature Range | -40 ~ +90℃ |
| Wall Thickness | Standard |

### Properties

Halogen Free — IEC 60754-2, IEC 60684-2
Flame Retardant — NF C 32-070, IEC 60332-1/2/3
Low Smoke — NF F 16-101
UV Resistant — ASTM G53
Oil Resistant — BS 2G 230 29
Ozone Resistant — UIC 895 OR
Toxicity Index — BS6853 Annex B.1, BSS 7239

### Product List

| Flexible (Copper Class5) | | | | Ultra Flexible (Copper Class6) | | | |
|---|---|---|---|---|---|---|---|
| Nominal cross-sectional | Overall diameter D | | Approx. Weight | Nominal cross-sectional | Overall diameter D | | Approx. Weight |
| | min. | max. | | | min. | max. | |
| ㎟ | ㎜ | ㎜ | kg/㎞ | ㎟ | ㎜ | ㎜ | kg/㎞ |
| 1.5 | 4.4 | 4.7 | 36 | 1.5 | 3.20 | 4.91 | 30.19 |
| 2.5 | 4.9 | 5.3 | 49 | 2.5 | 5.43 | 5.99 | 54.02 |
| 4.0 | 5.4 | 5.9 | 68 | 4.0 | 5.80 | 6.41 | 70.85 |
| 6.0 | 5.9 | 6.4 | 90 | 6.0 | 6.57 | 7.52 | 97.77 |
| 10 | 7.0 | 7.6 | 138 | 10 | 7.69 | 8.47 | 142.80 |
| 16 | 8.4 | 9.2 | 208 | 16 | 8.76 | 9.66 | 208.08 |
| 25 | 10.0 | 11.0 | 302 | 25 | 10.67 | 11.76 | 308.22 |
| 35 | 11.2 | 12.3 | 416 | 35 | 12.00 | 13.23 | 415.79 |
| 50 | 12.9 | 14.1 | 579 | 50 | 13.71 | 15.12 | 574.42 |
| 70 | 18.8 | 16.3 | 860 | 70 | 15.70 | 17.30 | 787.09 |
| 95 | 17.3 | 18.6 | 1043 | 95 | 18.29 | 20.16 | 1039.48 |
| 120 | 19.1 | 20.5 | 1307 | 120 | 20.48 | 22.58 | 1305.12 |
| 150 | 20.8 | 22.3 | 1591 | 150 | 21.28 | 23.46 | 1567.16 |
| 185 | 22.7 | 24.2 | 1915 | 185 | 23.52 | 25.93 | 1884.50 |
| 240 | 26.6 | 28.2 | 2536 | 240 | 27.33 | 30.14 | 2538.28 |
| 300 | 31.7 | 33.6 | 3171 | 300 | 30.10 | 33.18 | 3150.89 |
| 400 | 36.1 | 38.1 | 4143 | | | | |

Other range on request.

# Standard Dimension Power Cables

## 3000V HF-RMSG

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 105°C for 20,000 working hours

### Design standard

BS 3G 230 / NF F 63-826

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5 |
| Insulation | Halogen-free polyolefin |
| Sheath | Cross-linked halogen-free polyolefin |

### Technical Data

| | |
|---|---|
| Voltage | 3.6/6kV |
| Temperature Range | -40 ~ +90℃ |
| Wall Thickness | Standard |

### Properties

Halogen Free
IEC 60754-2
IEC 60684-2

Flame Retardant
NF C 32-070
IEC 60332-1/2/3

Low Smoke
NF F 16-101

UV Resistant
ASTM G53

Oil Resistant
BS 2G 230 29

Ozone Resistant
UIC 895 OR

Toxicity Index
BS6853 Annex B.1
BSS 7239

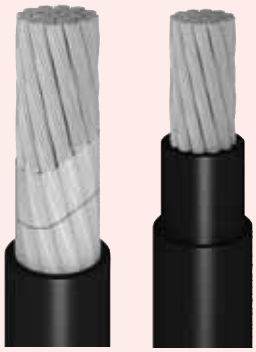
### Product List

| Nominal cross-sectional | Overall diameter D | | Approx. Weight |
|---|---|---|---|
| | min. | max. | |
| mm² | mm | mm | kg/km |
| 10 | 10.6 | 11.8 | 210 |
| 16 | 12.5 | 13.9 | 300 |
| 25 | 14.1 | 15.5 | 400 |
| 35 | 15.5 | 17.1 | 520 |
| 50 | 17.4 | 19.2 | 690 |
| 70 | 19.5 | 21.5 | 920 |
| 95 | 21.4 | 23.6 | 1160 |
| 120 | 23.4 | 25.8 | 1440 |
| 150 | 25.4 | 28.0 | 1740 |
| 185 | 27.7 | 30.7 | 2100 |
| 240 | 30.4 | 33.6 | 2700 |

Other range on request.

# High Temperature Power Cables

## HF-RMSG-HT 1.8/3kV, 3.6/6kV (Unsheathed)



### Application
High Voltage Power cable for installations inside and outside of Rolling Stock in high temperature conditions motor connection application

### Design standard
EN 50382-2

### Construction

| | |
|---|---|
| Conductor | Flexible stranded copper class 5 or class6<br>*tinned copper for 120 ℃ class<br>*plain copper for 150 ℃ class |
| Insulation | Halogen-free silicone rubber(EI 111) |
| Sheath | Halogen-free silicone rubber (BK)(EM 107) |

### Technical Data

| | |
|---|---|
| Voltage | 1.8/3kV, 3.6/6kV |
| Temperature Range | -40 ~ +150 ℃ |
| Wall Thickness | Standard |

### Properties

| Halogen Free | Flame Retardant | Low Smoke | Ozone Resistant | Oil Resistant | Cold Resistant @-40°C |
|---|---|---|---|---|---|
| IEC 60754-2 | IEC 60332-1/2/3 | IEC 61034 | EN 50382 | EN 50382 | EN 60811-1-4 |

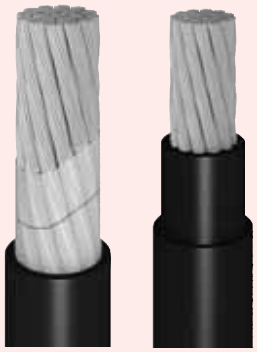
### Product List

| 1.8/3 kV | | | | | 3.6/6 kV | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Conductor | | Insulation | Overal | Cable | Conductor | | Insulation | Overal | Cable |
| ㎟ | Φ(㎜) | Thickness(㎜) | Φ(㎜) | Weight(㎏/㎞) | ㎟ | Φ(㎜) | Thickness(㎜) | Φ(㎜) | Weight(㎏/㎞) |
| 1.5 | 1.5 | 2.5 | 6.7 | 53.7 | 2.5 | 1.9 | 3.0 | 8.1 | 81.7 |
| 2.5 | 1.9 | 2.5 | 7.1 | 66.2 | 4.0 | 2.4 | 3.0 | 8.7 | 100.1 |
| 4.0 | 2.4 | 2.5 | 7.6 | 83.6 | 6.0 | 3.0 | 3.0 | 9.2 | 122.1 |
| 6.0 | 3.0 | 2.5 | 8.2 | 104.9 | 10 | 3.9 | 3.0 | 10.1 | 168.5 |
| 10 | 3.9 | 2.5 | 9.1 | 149.5 | 16 | 5.0 | 3.0 | 11.3 | 237.8 |
| 16 | 5.0 | 2.5 | 10.2 | 215.4 | 25 | 6.4 | 3.0 | 12.7 | 327.7 |
| 25 | 6.4 | 2.5 | 11.7 | 303.2 | 35 | 7.7 | 3.0 | 14.0 | 424.6 |
| 35 | 7.7 | 2.5 | 13.0 | 397.5 | 50 | 9.2 | 3.0 | 15.5 | 569.0 |
| 50 | 9.2 | 2.5 | 14.5 | 538.9 | 70 | 11.0 | 3.0 | 17.3 | 773.0 |
| 70 | 11.0 | 2.5 | 16.3 | 742.2 | 95 | 12.5 | 3.0 | 18.9 | 967.3 |
| 95 | 12.5 | 2.7 | 18.3 | 946.7 | 120 | 14.2 | 3.0 | 20.5 | 1222.9 |
| 120 | 14.2 | 2.7 | 20.0 | 1204.7 | 150 | 15.8 | 3.1 | 22.3 | 1489.5 |
| 150 | 15.8 | 2.7 | 21.6 | 1461.6 | 185 | 17.5 | 3.2 | 24.4 | 1790.7 |
| 185 | 17.5 | 2.7 | 23.3 | 1746.6 | 240 | 20.1 | 3.4 | 27.4 | 2350.8 |
| 240 | 20.1 | 2.7 | 25.9 | 2281.6 | 300 | 22.5 | 3.4 | 29.8 | 2875.8 |
| 300 | 22.5 | 2.7 | 28.3 | 2800.3 | 400 | 25.8 | 3.4 | 33.1 | 4056.4 |
| 400 | 25.8 | 2.9 | 32.0 | 3995.8 | | | | | |

Other range on request.

# High Temperature Power Cables

## HF-RMSG-HT 1.8/3kV, 3.6/6kV (Sheathed)



### Application

High Voltage Power cable for installations inside and outside of Rolling Stock in high temperature conditions motor connection application

### Design standard

EN 50382-2

### Construction

| | |
|---|---|
| Conductor | Flexible stranded copper class 5 or class6<br>*tinned copper for 120℃ class<br>*plain copper for 150℃ class |
| Insulation | Halogen-free silicone rubber(EI 111) |
| Sheath | Halogen-free silicone rubber (BK)(EM 107) |

### Technical Data

| | |
|---|---|
| Voltage | 1.8/3kV, 3.6/6kV |
| Temperature Range | -40 ~ +150℃ |
| Wall Thickness | Standard |

### Properties

| Halogen Free | Flame Retardant | Low Smoke | Ozone Resistant | Oil Resistant | Cold Resistant @-40℃ |
|---|---|---|---|---|---|
| IEC 60754-2 | IEC 60332-1/2/3 | IEC 61034 | EN 50382 | EN 50382 | EN 60811-1-4 |

### Product List

| 1.8/3 kV | | | | | | 3.6/6 kV | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Conductor | | Insulation | Sheath | | Cable | Conductor | | Insulation | Sheath | | Cable |
| mm² | Φ(mm) | Thickness(mm) | Thickness(mm) | Φ(mm) | Weight(kg/km) | mm² | Φ(mm) | Thickness(mm) | Thickness(mm) | Φ(mm) | Weight(kg/km) |
| 1.5 | 1.5 | 1.3 | 1.4 | 7.1 | 59.3 | 2.5 | 1.9 | 2.6 | 1.4 | 10.2 | 118.9 |
| 2.5 | 1.9 | 1.3 | 1.4 | 7.5 | 72.2 | 4.0 | 2.4 | 2.6 | 1.4 | 10.7 | 139.3 |
| 4.0 | 2.4 | 1.3 | 1.4 | 8.0 | 89.9 | 6.0 | 3.0 | 2.6 | 1.4 | 11.2 | 163.4 |
| 6.0 | 3.0 | 1.3 | 1.4 | 8.6 | 111.7 | 10 | 3.9 | 2.6 | 1.4 | 12.2 | 213.6 |
| 10 | 3.9 | 1.5 | 1.4 | 9.9 | 164.9 | 16 | 5.0 | 2.6 | 1.4 | 13.4 | 287.5 |
| 16 | 5.0 | 1.5 | 1.4 | 11.1 | 232.6 | 25 | 6.4 | 2.9 | 1.4 | 15.4 | 401.3 |
| 25 | 6.4 | 1.8 | 1.4 | 13.1 | 338.1 | 35 | 7.7 | 2.9 | 1.4 | 16.7 | 504.9 |
| 35 | 7.7 | 1.8 | 1.4 | 14.4 | 436.0 | 50 | 9.2 | 2.9 | 1.5 | 18.4 | 664.4 |
| 50 | 9.2 | 1.8 | 1.4 | 15.9 | 581.6 | 70 | 11.0 | 2.9 | 1.5 | 20.2 | 879.1 |
| 70 | 11.0 | 1.8 | 1.5 | 17.9 | 800.8 | 95 | 12.5 | 2.9 | 1.6 | 22.0 | 1091.5 |
| 95 | 12.5 | 2.2 | 1.5 | 20.4 | 1027.4 | 120 | 14.2 | 2.9 | 1.6 | 23.6 | 1356.7 |
| 120 | 14.2 | 2.2 | 1.6 | 22.3 | 1301.2 | 150 | 15.8 | 2.9 | 1.7 | 25.4 | 1634.8 |
| 150 | 15.8 | 2.2 | 1.6 | 23.9 | 1565.3 | 185 | 17.5 | 3.2 | 1.8 | 28.1 | 1980.2 |
| 185 | 17.5 | 2.4 | 1.7 | 26.2 | 1887.9 | 240 | 20.1 | 3.4 | 1.9 | 31.3 | 2601.3 |
| 240 | 20.1 | 2.4 | 1.8 | 29.0 | 2449.2 | 300 | 22.5 | 3.4 | 1.9 | 33.7 | 3118.7 |
| 300 | 22.5 | 2.4 | 1.9 | 31.6 | 2995 | 400 | 25.8 | 3.4 | 2.0 | 37.2 | 4338.2 |
| 400 | 25.8 | 2.6 | 2.0 | 35.5 | 4228.8 | | | | | | |

Other range on request.

# Standard Dimension Power Cables

## HF-RMSG-SD 600V

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 120°C for 20,000 working hours

### Design standard

EN50264-2-1

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5 |
| Insulation | Halogen-free polyolefin(EI 104) |

### Technical Data

| | |
|---|---|
| Voltage | 0.6/1 kV |
| Temperature Range | -40 ~ +90 ℃ |
| Wall Thickness | Standard |

### Properties

Halogen Free — EN 50264-1
Flame Retardant — EN 60332-1, EN 50266-2, NF F 16-101
Low Smoke — EN 61304-2
Oil Resistant — EN 60811-2-1
Ozone Resistant — EN 50305

### Product List

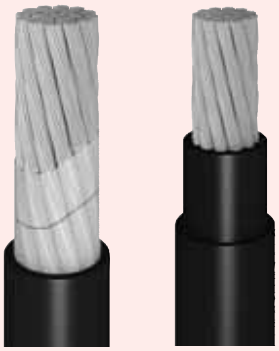
| Conductor | | Insulation | Overal | Cable |
|---|---|---|---|---|
| ㎟ | Φ(㎜) | Thickness(㎜) | Φ(㎜) | Weight(㎏/㎞) |
| 1 | 1.2 | 0.8 | 2.9 | 14.2 |
| 1.5 | 1.5 | 0.8 | 3.2 | 18.8 |
| 2.5 | 1.9 | 0.8 | 3.6 | 28.3 |
| 4.0 | 2.4 | 0.8 | 4.1 | 42.0 |
| 6.0 | 3.0 | 0.9 | 4.9 | 61.3 |
| 10 | 3.9 | 1.1 | 6.2 | 104.6 |
| 16 | 5.0 | 1.1 | 7.3 | 164.1 |
| 25 | 6.4 | 1.3 | 9.2 | 251.1 |
| 35 | 7.7 | 1.3 | 10.5 | 339 |

| Conductor | | Insulation | Overal | Cable |
|---|---|---|---|---|
| ㎟ | Φ(㎜) | Thickness(㎜) | Φ(㎜) | Weight(㎏/㎞) |
| 50 | 9.2 | 1.5 | 12.4 | 483.2 |
| 70 | 11.0 | 1.5 | 14.2 | 694.8 |
| 95 | 12.5 | 1.6 | 16.1 | 887.6 |
| 120 | 14.2 | 1.6 | 17.8 | 1139.7 |
| 150 | 15.8 | 1.9 | 20.0 | 1415.9 |
| 185 | 17.5 | 1.9 | 21.7 | 1697.3 |
| 240 | 20.1 | 2.1 | 24.7 | 2247.4 |
| 300 | 22.5 | 2.2 | 27.3 | 2774.5 |
| 400 | 25.8 | 2.3 | 30.8 | 3956.5 |

Other range on request.

# Standard Dimension Power Cables

## HF-RMSG-SD 1.8kV



### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 120°C for 20,000 working hours

### Design standard

EN50264-2-1

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5 |
| Insulation | Halogen-free polyolefin(EI 104) |
| Sheath | Cross-linked halogen-free polyolefin(EM 104) |

### Technical Data

| | |
|---|---|
| Voltage | 1.8/3 kV |
| Temperature Range | -40 ~ +90℃ |
| Wall Thickness | Standard |

### Properties

Halogen Free — EN 50264-1
Flame Retardant — EN 60332-1, EN 50266-2, NF F 16-101
Low Smoke — EN 61304-2
Oil Resistant — EN 60811-2-1
Ozone Resistant — EN 50305

### Product List

| Unsheathed | | | | | Sheathed | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Conductor | | Insulation | Overal | Cable | Conductor | | Insulation | Sheath | | Cable |
| mm² | Φ(mm) | Thickness(mm) | Φ(mm) | Weight(kg/km) | mm² | Φ(mm) | Thickness(mm) | Thickness(mm) | Φ(mm) | Weight(kg/km) |
| 1.5 | 1.5 | 2.5 | 6.7 | 52.0 | 1.5 | 1.5 | 1.3 | 1.4 | 7.1 | 65.5 |
| 2.5 | 1.9 | 2.5 | 7.1 | 64.7 | 2.5 | 1.9 | 1.3 | 1.4 | 7.5 | 79.0 |
| 4.0 | 2.4 | 2.5 | 7.6 | 82.1 | 4.0 | 2.4 | 1.3 | 1.4 | 8.0 | 97.5 |
| 6.0 | 3.0 | 2.5 | 8.2 | 103.2 | 6.0 | 3.0 | 1.3 | 1.4 | 8.6 | 120.0 |
| 10 | 3.9 | 2.5 | 9.1 | 148.0 | 10 | 3.9 | 2.2 | 1.4 | 11.4 | 209.8 |
| 16 | 5.0 | 2.5 | 10.3 | 215.2 | 16 | 5.0 | 2.2 | 1.4 | 12.5 | 282.7 |
| 25 | 6.4 | 2.5 | 11.7 | 302.7 | 25 | 6.4 | 2.2 | 1.4 | 13.9 | 379.5 |
| 35 | 7.7 | 2.5 | 13.0 | 397.2 | 35 | 7.7 | 2.2 | 1.4 | 15.2 | 481.9 |
| 50 | 9.2 | 2.5 | 14.5 | 539.0 | 50 | 9.2 | 2.2 | 1.4 | 16.7 | 632.8 |
| 70 | 11.0 | 2.5 | 16.3 | 758.3 | 70 | 11.0 | 2.2 | 1.5 | 18.7 | 855.7 |
| 95 | 12.5 | 2.7 | 18.3 | 966.5 | 95 | 12.5 | 2.4 | 1.6 | 21.0 | 1084.9 |
| 120 | 14.2 | 2.7 | 19.9 | 1222.3 | 120 | 14.2 | 2.4 | 1.6 | 22.7 | 1355.1 |
| 150 | 15.8 | 2.7 | 21.5 | 1480.9 | 150 | 15.8 | 2.4 | 1.7 | 24.5 | 1634.7 |
| 185 | 17.5 | 2.7 | 23.3 | 1772.9 | 185 | 17.5 | 2.4 | 1.7 | 26.2 | 1932.8 |
| 240 | 20.1 | 2.7 | 25.9 | 2311.2 | 240 | 20.1 | 2.4 | 1.8 | 29.0 | 2500.9 |
| 300 | 22.5 | 2.7 | 28.3 | 2833.0 | 300 | 22.5 | 2.4 | 1.9 | 31.6 | 3053.5 |
| 400 | 25.8 | 2.9 | 32.0 | 4035.9 | 400 | 25.8 | 2.6 | 2.0 | 35.5 | 4299.7 |

Other range on request.

# Standard Dimension Power Cables

## HF-RMSG-SD 3.6kV

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 120°C for 20,000 working hours

### Design standard

EN50264-2-1

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5 |
| Insulation | Halogen-free polyolefin(EI 104) |
| Sheath | Cross-linked halogen-free polyolefin(EM 104) |

### Technical Data

| | |
|---|---|
| Voltage | 3.6/6kV |
| Temperature Range | -40 ~ +90 ℃ |
| Wall Thickness | Standard |

### Properties

Halogen Free — EN 50264-1
Flame Retardant — EN 60332-1, EN 50266-2, NF F 16-101
Low Smoke — EN 61304-2
Oil Resistant — EN 60811-2-1
Ozone Resistant — EN 50305

### Product List

| Conductor | | Insulation | Sheath | | Cable |
|---|---|---|---|---|---|
| ㎟ | Φ(㎜) | Thickness(㎜) | Thickness(㎜) | Φ(㎜) | Weight(㎏/㎞) |
| 2.5 | 1.9 | 2.6 | 1.4 | 10.2 | 131.9 |
| 4.0 | 2.4 | 2.6 | 1.4 | 10.7 | 153.4 |
| 6.0 | 3.0 | 2.6 | 1.4 | 11.2 | 178.6 |
| 10 | 3.9 | 2.6 | 1.4 | 12.2 | 230.8 |
| 16 | 5.0 | 2.6 | 1.4 | 13.4 | 307.2 |
| 25 | 6.4 | 2.9 | 1.4 | 15.4 | 426.3 |
| 35 | 7.7 | 2.9 | 1.4 | 16.7 | 532.9 |
| 50 | 9.2 | 2.9 | 1.5 | 18.4 | 696.8 |

| Conductor | | Insulation | Sheath | | Cable |
|---|---|---|---|---|---|
| ㎟ | Φ(㎜) | Thickness(㎜) | Thickness(㎜) | Φ(㎜) | Weight(㎏/㎞) |
| 70 | 11.0 | 2.9 | 1.5 | 20.2 | 913.3 |
| 95 | 12.5 | 2.9 | 1.6 | 22.0 | 1130.5 |
| 120 | 14.2 | 2.9 | 1.7 | 23.8 | 1410.0 |
| 150 | 15.8 | 2.9 | 1.7 | 25.4 | 1682.3 |
| 185 | 17.5 | 3.2 | 1.8 | 28.1 | 2037.4 |
| 240 | 20.1 | 3.4 | 1.9 | 31.3 | 2669.6 |
| 300 | 22.5 | 3.4 | 1.9 | 33.7 | 3193.4 |
| 400 | 25.8 | 3.4 | 2.0 | 37.2 | 4423.5 |

Other range on request.

# Standard Dimension Power Cables

## Y500S, Y1000S, Y15000S, Y3000S

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 105°C for 20,000 working hours

### Design standard

NF F 63-826

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5<br>(Option : separator tape) |
| Insulation | Halogen-free compound (BK) |

### Technical Data

| | |
|---|---|
| Voltage | 0.5, 1, 1.5, 3 kV |
| Temperature Range | -25 ~ +90 ℃ |
| Wall Thickness | Standard |

### Properties

| Halogen Free | Flame Retardant | Low Smoke | Oil Resistant | Ozone Resistant | Chemical Resistant |
|---|---|---|---|---|---|
| IEC 60754-1 | NF C 32-070<br>IEC 60332-1/2/3 | NF F16-101 | NF C32-028 | NF C32-028 | NF C32-021 |

### Product List

| Cross Section (㎟) | Core Dia. (㎜) | Y500S | | Y1000S | | Y1500S | | Y3000S | |
|---|---|---|---|---|---|---|---|---|---|
| | | Max.Dia.(㎜) | Weight( kg/㎞) | Max.Dia.(㎜) | Weight( kg/㎞) | Max.Dia.(㎜) | Weight( kg/㎞) | Max.Dia.(㎜) | Weight( kg/㎞) |
| 10 | 3.9 | 8.1 | 135 | 8.3 | 154 | 9.7 | 16 | 11.3 | 200 |
| 16 | 5.0 | 9.2 | 210 | 9.4 | 218 | 10.8 | 235 | 12.4 | 265 |
| 50 | 9.2 | | | 14.3 | 580 | 15.5 | 610 | 17.2 | 680 |
| 70 | 11.0 | | | 16.3 | 830 | 17.7 | 860 | 19.1 | 930 |
| 95 | 12.5 | | | 18.4 | 1040 | 19.8 | 1070 | 21.4 | 1066 |
| 120 | 14.2 | | | 20.5 | 1310 | 21.9 | 1340 | 23.5 | 1530 |
| 150 | 15.8 | | | | | 23.8 | 1620 | 25.5 | 1740 |
| 185 | 17.5 | | | | | 25.9 | 1940 | 27.6 | 2100 |
| 240 | 20.1 | | | | | 29.1 | 2550 | 31.7 | 2460 |
| 300 | 22.5 | | | | | 31.9 | 2950 | 35.0 | 3050 |

Other range on request.

# Standard Dimension Power Cables

## Y1500S Aluminum

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application

### Design standard

NF F 63-826

### Construction

| | |
|---|---|
| **Conductor** | Flexible aluminum<br>(Option : separator tape) |
| **Insulation** | Halogen-free compound (BK) |

### Technical Data

| | |
|---|---|
| Voltage | 1.5 kV |
| Temperature Range | -25 ~ +90 ℃ |
| Wall Thickness | Standard |

### Properties

| Halogen Free | Flame Retardant | Low Smoke | Oil Resistant | Ozone Resistant | Chemical Resistant |
|---|---|---|---|---|---|
| IEC 60754-1 | NF C 32-070<br>IEC 60332-1/2/3 | NF F16-101 | NF C32-028 | NF C32-028 | NF C32-021 |

### Product List

| Cross Section (㎟) | Core Dia. (㎜) | Insulation Thickness (㎜) | Overall Diameter (㎜) | Weight (kg/㎞) | Max. Current (A) |
|---|---|---|---|---|---|
| 50 | 9.6 | 2.5 | 14.2 | 297 | 189 |
| 70 | 11.8 | 2.7 | 16.1 | 413 | 237 |
| 95 | 13.2 | 2.7 | 18.0 | 491 | 281 |
| 120 | 15.3 | 2.8 | 20.0 | 593 | 324 |
| 150 | 16.7 | 2.8 | 21.8 | 697 | 371 |
| 185 | 19.1 | 2.9 | 23.7 | 850 | 433 |
| 240 | 21.7 | 3.0 | 26.6 | 1059 | 523 |

Other range on request.

# Flexible Multicore Power Cables

## HF-RMSG-RD 300V (Unscreened)

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 120°C for 20,000 working hours

### Design standard

EN50264-3-2

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5 |
| Insulation | Halogen-free compound (BK)(EI 109) |
| Separating tape | Polyester tape |
| Sheath | Halogen-free compound (BK)(EM 104) |

### Technical Data

| | |
|---|---|
| Voltage | 300/500V |
| Temperature Range | -40 ~ +90℃ |
| Wall Thickness | Reduced |

### Properties

| Halogen Free | Flame Retardant | Low Smoke | Oil Resistant | Ozone Resistant |
|---|---|---|---|---|
| IEC 60754-1 | NF C 32-070<br>IEC 60332-1/2/3 | NF F16-101 | NF C32-028 | NF C32-028 |

### Product List

| # of Cores | Conductor | | Sheath | | Cable |
|---|---|---|---|---|---|
| | Φ(mm) | Thickness(mm) | Thickness(mm) | Φ(mm) | Weight(kg/km) |
| 2 | 1 | 1.26 | 0.6 | 5.86 | 38.5 |
| 4 | 1 | 1.26 | 0.6 | 6.78 | 71.9 |
| 7 | 1 | 1.26 | 0.7 | 8.3 | 120.2 |
| 9 | 1 | 1.26 | 0.7 | 9.69 | 152.1 |
| 12 | 1 | 1.26 | 0.7 | 10.87 | 196.9 |
| 19 | 1 | 1.26 | 0.8 | 12.98 | 304.1 |
| 24 | 1 | 1.26 | 1 | 15.63 | 394 |
| 32 | 1 | 1.26 | 1 | 17.19 | 510.2 |
| 37 | 1 | 1.26 | 1 | 17.86 | 581.4 |
| 40 | 1 | 1.26 | 1 | 18.56 | 625.5 |
| 4 | 1.5 | 1.49 | 0.7 | 8.03 | 93.1 |
| 7 | 1.5 | 1.49 | 0.7 | 9.61 | 167.3 |
| 9 | 1.5 | 1.49 | 1 | 11.88 | 227.2 |
| 12 | 1.5 | 1.49 | 1 | 13.3 | 293 |
| 19 | 1.5 | 1.49 | 1 | 15.57 | 441.6 |
| 24 | 1.5 | 1.49 | 1.2 | 18.66 | 568.5 |
| 32 | 1.5 | 1.49 | 1.2 | 20.53 | 736.6 |
| 37 | 1.5 | 1.49 | 1.2 | 21.33 | 839.7 |
| 4 | 2.5 | 1.93 | 0.7 | 9.09 | 133.7 |
| 7 | 2.5 | 1.93 | 0.8 | 11.14 | 252.9 |
| 9 | 2.5 | 1.93 | 1 | 13.48 | 332.9 |
| 12 | 2.5 | 1.93 | 1 | 15.13 | 432.6 |
| 24 | 2.5 | 1.93 | 1.2 | 21.3 | 845.3 |

Other range on request.

# Flexible Multicore Power Cables

## HF-RMSG-RD 300V (Screened)

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 120°C for 20,000 working hours

### Design standard

EN50264-3-2

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5 |
| Insulation | Halogen-free compound (BK)(EI 109) |
| Separating tape | Polyester tape |
| Sheath | Halogen-free compound (BK)(EM 104) |

### Technical Data

| | |
|---|---|
| Voltage | 300/500V |
| Temperature Range | -40 ~ +90 ℃ |
| Wall Thickness | Reduced |

### Properties

| Halogen Free | Flame Retardant | Low Smoke | Oil Resistant | Ozone Resistant |
|---|---|---|---|---|
| IEC 60754-1 | NF C 32-070<br>IEC 60332-1/2/3 | NF F16-101 | NF C32-028 | NF C32-028 |

### Product List

| # of Cores | Conductor | | Insulation | Sheath | | Cable |
|---|---|---|---|---|---|---|
| | mm² | Φ(mm) | Thickness(mm) | Thickness(mm) | Φ(mm) | Weight(kg/km) |
| 2 | 1.0 | 1.26 | 0.4 | 0.6 | 6.7 | 57.4 |
| 4 | 1.0 | 1.26 | 0.4 | 0.6 | 7.7 | 87.0 |
| 7 | 1.0 | 1.26 | 0.4 | 0.7 | 9.2 | 134.6 |
| 9 | 1.0 | 1.26 | 0.4 | 0.7 | 10.8 | 179.1 |
| 12 | 1.0 | 1.26 | 0.4 | 0.7 | 12.0 | 224.3 |
| 19 | 1.0 | 1.26 | 0.4 | 0.8 | 14.4 | 343.1 |
| 24 | 1.0 | 1.26 | 0.4 | 1.0 | 17.0 | 437.5 |
| 32 | 1.0 | 1.26 | 0.4 | 1.0 | 18.6 | 548.5 |
| 37 | 1.0 | 1.26 | 0.4 | 1.0 | 19.2 | 614.5 |
| 40 | 1.0 | 1.26 | 0.4 | 1.0 | 19.9 | 657.3 |
| 4 | 1.5 | 1.49 | 0.5 | 0.7 | 8.9 | 119.0 |
| 7 | 1.5 | 1.49 | 0.5 | 0.7 | 10.7 | 192.7 |
| 9 | 1.5 | 1.49 | 0.5 | 1.0 | 13.0 | 255.7 |
| 12 | 1.5 | 1.49 | 0.5 | 1.0 | 14.4 | 320.8 |
| 19 | 1.5 | 1.49 | 0.5 | 1.0 | 16.9 | 480.5 |
| 24 | 1.5 | 1.49 | 0.5 | 1.2 | 20.0 | 611.2 |
| 32 | 1.5 | 1.49 | 0.5 | 1.2 | 21.9 | 770.2 |
| 37 | 1.5 | 1.49 | 0.5 | 1.2 | 22.7 | 865.2 |
| 4 | 2.5 | 1.93 | 0.5 | 0.7 | 10.2 | 173.9 |
| 7 | 2.5 | 1.93 | 0.5 | 0.8 | 12.3 | 273.0 |
| 9 | 2.5 | 1.93 | 0.5 | 1.0 | 14.9 | 369.4 |
| 12 | 2.5 | 1.93 | 0.5 | 1.0 | 16.5 | 466.4 |
| 24 | 2.5 | 1.93 | 0.5 | 1.2 | 22.7 | 863.6 |

Other range on request.

# Flexible Multicore Power Cables

## HF-RMSG-RD 600V (Unscreened)

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 120°C for 20,000 working hours

### Design standard

EN50264-3-2

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5 |
| Insulation | Halogen-free compound (BK)(EI 109) |
| Separating tape | Polyester tape |
| Sheath | Halogen-free compound (BK)(EM 104) |

### Technical Data

| | |
|---|---|
| Voltage | 0.6/1kV |
| Temperature Range | -40 ~ +90℃ |
| Wall Thickness | Reduced |

### Properties

| Halogen Free | Flame Retardant | Low Smoke | Oil Resistant | Ozone Resistant |
|---|---|---|---|---|
| IEC 60754-1 | NF C 32-070<br>IEC 60332-1/2/3 | NF F16-101 | NF C32-028 | NF C32-028 |

### Product List

| # of Cores | Conductor | | Sheath | | Cable |
|---|---|---|---|---|---|
| | Φ(mm) | Thickness(mm) | Thickness(mm) | Φ(mm) | Weight(kg/km) |
| 2 | 1.5 | 1.49 | 0.7 | 7.76 | 62.6 |
| 2 | 2.5 | 1.93 | 0.7 | 8.64 | 84.9 |
| 2 | 4.0 | 2.44 | 0.7 | 9.66 | 116.3 |
| 2 | 6.0 | 2.97 | 0.8 | 10.93 | 159.4 |
| 2 | 10.0 | 3.91 | 1.0 | 13.22 | 254.5 |
| 2 | 16.0 | 5.00 | 1.0 | 15.40 | 380.9 |
| 2 | 25.0 | 6.40 | 1.2 | 19.44 | 584.5 |
| 2 | 35.0 | 7.70 | 1.2 | 22.04 | 772.1 |
| 2 | 50.0 | 9.20 | 1.4 | 25.86 | 1088.5 |
| 3 | 1.5 | 1.49 | 0.7 | 8.22 | 83.9 |
| 3 | 2.5 | 1.93 | 0.7 | 9.17 | 116.1 |
| 3 | 4.0 | 2.44 | 0.7 | 10.27 | 161.7 |

| # of Cores | Conductor | | Sheath | | Cable |
|---|---|---|---|---|---|
| | Φ(mm) | Thickness(mm) | Thickness(mm) | Φ(mm) | Weight(kg/km) |
| 3 | 6.0 | 2.97 | 0.8 | 11.61 | 222.9 |
| 3 | 10.0 | 3.91 | 1.0 | 14.05 | 357.6 |
| 3 | 16.0 | 5.00 | 1.0 | 16.39 | 543.0 |
| 3 | 25.0 | 6.40 | 1.2 | 20.70 | 834.0 |
| 3 | 35.0 | 7.70 | 1.2 | 23.49 | 1109.4 |
| 3 | 50.0 | 9.20 | 1.4 | 27.57 | 1566.3 |
| 4 | 1.5 | 1.49 | 0.7 | 9.030 | 106.4 |
| 4 | 2.5 | 1.93 | 0.7 | 10.09 | 148.6 |
| 4 | 4.0 | 2.44 | 0.8 | 11.52 | 213.6 |
| 4 | 6.0 | 2.97 | 1.0 | 13.21 | 299.4 |
| 4 | 10.0 | 3.91 | 1.0 | 15.48 | 463.6 |
| 4 | 25.0 | 6.40 | 1.4 | 23.29 | 1108.4 |

Other range on request.

# Flexible Multicore Power Cables

## HF-RMSG-RD 600V (Screened)

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 120°C for 20,000 working hours

### Design standard

EN50264-3-2

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5 |
| Insulation | Halogen-free compound (BK)(EI 109) |
| Separating tape | Polyester tape |
| Sheath | Halogen-free compound (BK)(EM 104) |

### Technical Data

| | |
|---|---|
| Voltage | 0.6/1kV |
| Temperature Range | -40 ~ +90 ℃ |
| Wall Thickness | Reduced |

### Properties

| Halogen Free | Flame Retardant | Low Smoke | Oil Resistant | Ozone Resistant |
|---|---|---|---|---|
| IEC 60754-1 | NF C 32-070<br>IEC 60332-1/2/3 | NF F16-101 | NF C32-028 | NF C32-028 |

### Product List

| # of Cores | Conductor | | Insulation | Sheath | | Cable |
|---|---|---|---|---|---|---|
| | mm² | Φ(mm) | Thickness(mm) | Thickness(mm) | Φ(mm) | Weight(kg/km) |
| 2 | 1.5 | 1.49 | 0.7 | 0.7 | 8.6 | 87.9 |
| 2 | 2.5 | 1.93 | 0.7 | 0.7 | 9.5 | 113.4 |
| 2 | 4.0 | 2.44 | 0.7 | 0.7 | 10.8 | 159.6 |
| 2 | 6.0 | 2.97 | 0.7 | 0.8 | 12.1 | 207.9 |
| 2 | 10.0 | 3.91 | 0.7 | 1.0 | 14.3 | 312.1 |
| 2 | 16.0 | 5.00 | 0.7 | 1.0 | 16.8 | 466.8 |
| 2 | 25.0 | 6.40 | 0.9 | 1.2 | 20.8 | 692.6 |
| 2 | 35.0 | 7.70 | 0.9 | 1.2 | 23.7 | 921.4 |
| 2 | 50.0 | 9.20 | 1.0 | 1.4 | 27.5 | 1262.7 |
| 3 | 1.5 | 1.49 | 0.7 | 0.7 | 9.1 | 110.8 |
| 3 | 2.5 | 1.93 | 0.7 | 0.7 | 10.0 | 146.4 |
| 3 | 4.0 | 2.44 | 0.7 | 0.7 | 11.4 | 207.8 |

| # of Cores | Conductor | | Insulation | Sheath | | Cable |
|---|---|---|---|---|---|---|
| | mm² | Φ(mm) | Thickness(mm) | Thickness(mm) | Φ(mm) | Weight(kg/km) |
| 3 | 6.0 | 2.97 | 0.7 | 0.8 | 12.7 | 274.5 |
| 3 | 10.0 | 3.91 | 0.7 | 1.0 | 15.4 | 435.0 |
| 3 | 16.0 | 5.00 | 0.7 | 1.0 | 17.8 | 634.5 |
| 3 | 25.0 | 6.40 | 0.9 | 1.2 | 22.1 | 949.3 |
| 3 | 35.0 | 7.70 | 0.9 | 1.2 | 25.1 | 1268.7 |
| 3 | 50.0 | 9.20 | 1.0 | 1.4 | 29.2 | 1752.4 |
| 4 | 1.5 | 1.49 | 0.7 | 0.7 | 9.9 | 136.1 |
| 4 | 2.5 | 1.93 | 0.7 | 0.7 | 11.2 | 193.8 |
| 4 | 4.0 | 2.44 | 0.7 | 0.8 | 12.6 | 264.7 |
| 4 | 6.0 | 2.97 | 0.7 | 1.0 | 14.3 | 356.7 |
| 4 | 10.0 | 3.91 | 0.7 | 1.0 | 16.9 | 549.5 |
| 4 | 25.0 | 6.40 | 0.9 | 1.4 | 24.9 | 1263.1 |

Other range on request.

# Flexible Multicore Power Cables

## NY500SO

### Application

General purpose
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 105°C for 20,000 working hours

### Design standard

NF F 63-826

### Construction

| | |
|---|---|
| Conductor | Flexible stranded tinned copper Class 5 |
| Insulation | Halogen-free compound (BK) |
| Separating tape | Polyester tape |
| Sheath | Halogen-free compound (BK) |

### Technical Data

| | |
|---|---|
| Voltage | 500V |
| Temperature Range | -25 ~ +90℃ |
| Wall Thickness | Standard |

### Properties

Halogen Free — IEC 60754-1
Flame Retardant — NF C 32-070, IEC 60332-1/2/3
Low Smoke — NF F16-101
Oil Resistant — NF C32-028
Ozone Resistant — NF C32-028
Chemical Resistant — NF C32-021

### Product List

| Cables (mm²) | Conductor Diameter (mm) | Max. Diameter (mm) | Weight (kg/km) |
|---|---|---|---|
| 2 x 1.5 | 1.50 | 9.9 | 115 |
| 4 x 1.5 | 1.50 | 11.4 | 160 |
| 7 x 1.5 | 1.50 | 13.3 | 245 |
| 13 x 1.5 | 1.50 | 18.0 | 425 |
| 19 x 1.5 | 1.50 | 19.9 | 675 |
| 37 x 1.5 | 1.50 | 27.1 | 1170 |
| 2 x 2.5 | 1.95 | 11.3 | 185 |
| 4 x 2.5 | 1.95 | 13.1 | 275 |
| 13 x 2.5 | 1.95 | 21.1 | 750 |
| 19 x 2.5 | 1.95 | 23.4 | 980 |

Other range on request.

# Jumper Cables

## Application

General purpose or mobile links between cars or car-bogie
Power cable for installations inside and outside of Rolling Stock
Auxiliary and main circuit wiring application
Thermal endurance temperature is 105°C for 20,000 working hours

## Construction

| | |
|---|---|
| Conductor | Extra flexible tinned copper Class 6<br>(Option : separator tape) |
| Insulation | Halogen-free compound (BK) |

## Technical Data

| | |
|---|---|
| Temperature Range | -40 ~ +90℃ |

## Product List

| Cross Section ($mm^2$) | Core Dia. (mm) | Insulation Thickness (mm) | Overall Diameter (mm) | Weight (kg/km) |
|---|---|---|---|---|
| 10 | 3.9 | 2.3 | 9.5 | 187 |
| 16 | 5.0 | 2.3 | 10.8 | 266 |
| 25 | 6.4 | 2.3 | 12.2 | 354 |
| 35 | 7.7 | 2.4 | 13.7 | 440 |
| 50 | 9.2 | 2.5 | 15.5 | 613 |
| 70 | 11.0 | 2.7 | 17.7 | 875 |
| 95 | 12.5 | 2.7 | 19.8 | 1045 |
| 120 | 14.2 | 2.8 | 21.9 | 1350 |
| 150 | 15.8 | 2.8 | 23.8 | 1650 |
| 185 | 17.5 | 2.9 | 25.9 | 2130 |

Other range on request.

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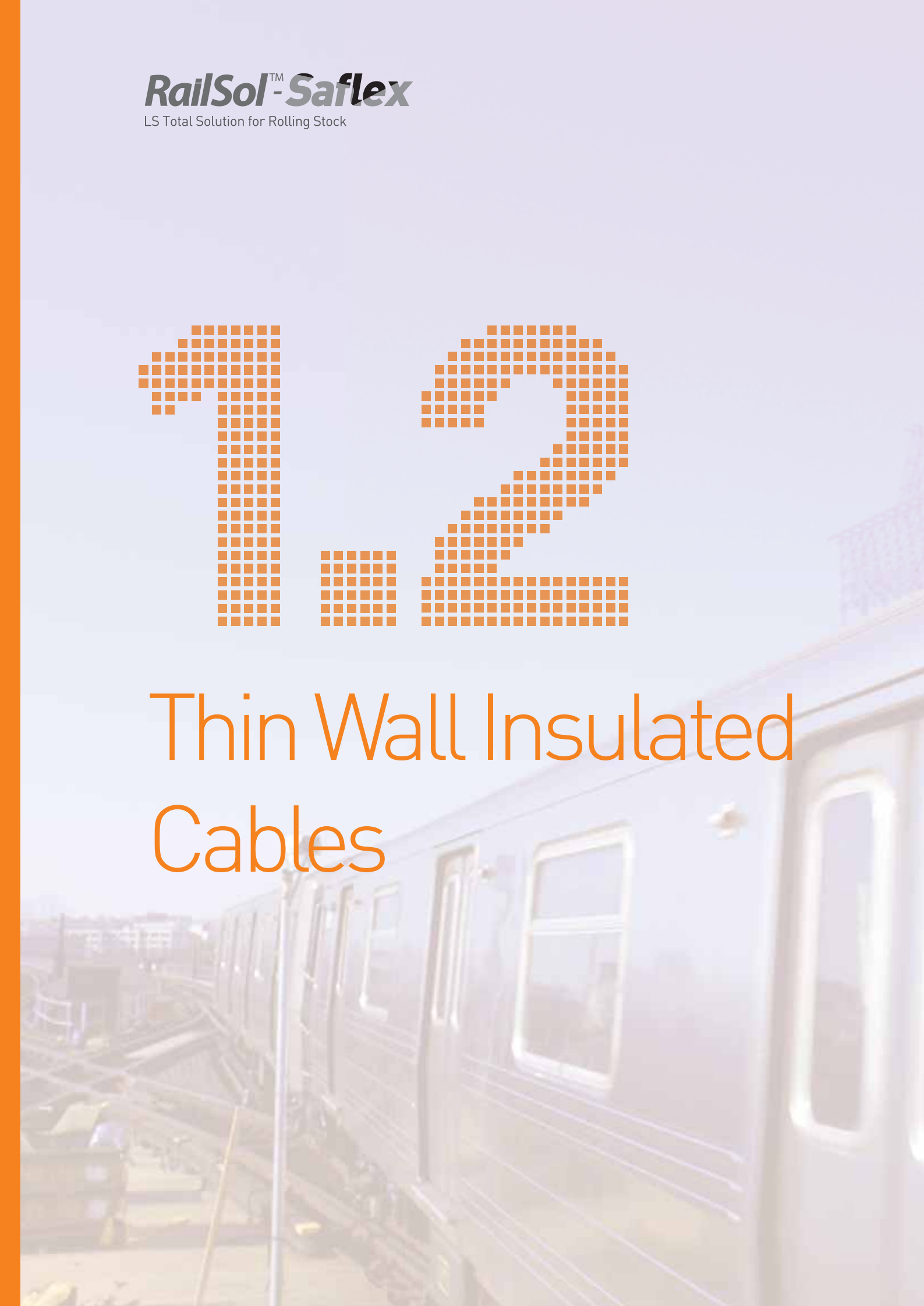
# 1.2

# Thin Wall Insulated Cables



# Standard Wall Sheathed Multicore Cables

## Shielded Type

## LSRS-SB

### Application

Compact system wiring in restricted space and weight
Cable ducts or cabinets or conduits in a Rolling Stock
Thermal endurance temperature is 125°C for 20,000 working hours

### Design standard

EN50306-4

### Construction

| | |
|---|---|
| Conductor | Stranded tinned copper |
| Insulation | Thin wall halogen-free compound |
| Shield | Tinned copper braid (Option : polyestertape) |
| Sheath | Standard wall halogen-free compound |

### Technical Data

| | |
|---|---|
| Voltage | 0.6/1kV (300V acc. to EN50306) |
| Temperature Range | -40 ~ +105 ℃ |
| Minimum Bending | 10D (Dynamic Use),<br>5D (Static Use) |
| Fire performance | NFPA130 : 2010<br>BS6853 : Cat. Ia |

* D : Cable diameter

### Properties

Halogen Free
EN 50267-2-1
IEC 60684-2

Flame Retardant
IEC 60332-1-2
IEC 60332-3-24
UL 1685

Low Smoke
IEC 61034-2

Oil Resistant
IRM 902
IRM 903

Chemical Resistant
EN 50305

Toxicity Index
BS6853 Annex B.1
BSS 7239

### Product List

**Base Core**

| Cross Section (㎟) | Construction (n x Ø) | Max. Conductor Dia. (㎜) | Max. Insulation Dia. (㎜) |
|---|---|---|---|
| 0.50 | 19 x 0.18 | 0.95 | 1.45 |
| 0.75 | 19 x 0.23 | 1.15 | 1.65 |
| 1.00 | 19 x 0.25 | 1.30 | 1.80 |
| 1.50 | 37 x 0.23 | 1.65 | 2.21 |
| 2.50 | 37 x 0.30 | 2.15 | 2.75 |

**Product**

| Cables | Max. Dia. (㎜) | Weight (kg/㎞) |
|---|---|---|
| 2 x 2 x 0.5 | 7.40 | 66 |
| 3 x 2 x 0.5 | 7.70 | 79 |
| 4 x 2 x 0.5 | 8.60 | 103 |
| 7 x 2 x 0.5 | 10.00 | 152 |

Other range on request.

| Cables | Max. Dia. (㎜) | Weight (kg/㎞) |
|---|---|---|
| 2x0.50 | 10.0 | 112 |
| 3x0.50 | 10.6 | 139 |
| 4x0.50 | 11.7 | 163 |
| 7x0.50 | 14.0 | 252 |
| 2x0.75 | 10.8 | 135 |
| 3x0.75 | 11.5 | 170 |
| 4x0.75 | 12.6 | 195 |
| 7x0.75 | 15.4 | 307 |
| 2x1.00 | 11.4 | 143 |
| 3x1.00 | 11.9 | 185 |
| 4x1.00 | 13.1 | 212 |
| 7x1.00 | 16.0 | 355 |
| 2x1.50 | 13.2 | 210 |
| 3x1.50 | 14.1 | 270 |
| 4x1.50 | 15.7 | 307 |
| 7x1.50 | 19.0 | 515 |

# Thin Wall Multi Core Cable

## Shielded Type
## LSRS-SB

### Application
Compact system wiring in restricted space and weight
Cable ducts or cabinets or conduits in a Rolling Stock
Thermal endurance temperature is 125°C for 20,000 working hours

### Design standard
EN 50306-3

### Construction

| | |
|---|---|
| Conductor | Stranded tinned copper |
| Insulation | Thin wall halogen-free compound |
| Shield | Tinned copper braid (Option : polyester tape) |
| Sheath | Thin Wall halogen-free compound |

### Technical Data

| | |
|---|---|
| Voltage | 0.6/1kV (300V acc. to EN50306) |
| Temperature Range | -40 ~ +105℃ |
| Minimum Bending | 10D (Dynamic Use),<br>5D (Static Use) |
| Fire performance | NFPA130 : 2010<br>BS6853 : Cat. Ia |

* D : Cable diameter

### Properties

Halogen Free
EN 50267-2-1
IEC 60684-2

Flame Retardant
IEC 60332-1-2
IEC 60332-3-24
UL 1685

Low Smoke
IEC 61034-2

Oil Resistant
IRM 902
IRM 903

Chemical Resistant
EN 50305

Toxicity Index
BS6853 Annex B.1
BSS 7239

### Product List

**Base Core**

| Cross Section (㎟) | Construction (n x Ø) | Max. Conductor Dia. (㎜) | Max. Insulation Dia. (㎜) |
|---|---|---|---|
| 0.50 | 19 x 0.18 | 0.95 | 1.45 |
| 0.75 | 19 x 0.23 | 1.15 | 1.65 |
| 1.00 | 19 x 0.25 | 1.30 | 1.80 |
| 1.50 | 37 x 0.23 | 1.65 | 2.21 |
| 2.50 | 37 x 0.30 | 2.15 | 2.75 |

**Product**

| Cables | Max. Dia. (㎜) | Weight (kg/㎞) |
|---|---|---|
| 2 x 0.5 | 5.1 | 28 |
| 3 x 0.5 | 5.3 | 37 |
| 4 x 0.5 | 5.7 | 49 |

Other range on request.

| Cables | Max. Dia. (㎜) | Weight (kg/㎞) |
|---|---|---|
| 2x0.50 | 4.3 | 31 |
| 3x0.50 | 4.5 | 41 |
| 4x0.50 | 5.0 | 49 |
| 2x0.75 | 4.7 | 39 |
| 3x0.75 | 5.0 | 51 |
| 4x0.75 | 5.5 | 53 |
| 2x1.00 | 5.2 | 44 |
| 3x1.00 | 5.5 | 58 |
| 4x1.00 | 6.0 | 72 |
| 2x1.50 | 6.1 | 58 |
| 3x1.50 | 6.4 | 79 |
| 4x1.50 | 7.0 | 98 |
| 2x2.50 | 7.4 | 85 |
| 3x2.50 | 7.8 | 115 |
| 4x2.50 | 8.5 | 155 |

# Thin Wall Multi Core Cable

## Unshielded Type

## LSRS

### Application

Compact system wiring in restricted space and weight
Cable ducts or cabinets or conduits in a Rolling Stock
Thermal endurance temperature is 125°C for 20,000 working hours

### Design standard

EN 50306-3

### Construction

| | |
|---|---|
| Conductor | Stranded tinned copper |
| Insulation | Thin wall halogen-free compound |
| Sheath | Standard wall halogen-free compound |

### Technical Data

| | |
|---|---|
| Voltage | 0.6/1kV (300V acc. to EN50306) |
| Temperature Range | -40 ~ +105℃ |
| Minimum Bending | 10D (Dynamic Use),<br>5D (Static Use) |
| Fire performance | NFPA130 : 2010<br>BS6853 : Cat. Ia |

* D : Cable diameter

### Properties

Halogen Free
EN 50267-2-1
IEC 60684-2

Flame Retardant
IEC 60332-1-2
IEC 60332-3-24
UL 1685

Low Smoke
IEC 61034-2

Oil Resistant
IRM 902
IRM 903

Chemical Resistant
EN 50305

Toxicity Index
BS6853 Annex B.1
BSS 7239

### Product List

**Base Core**

| Cross Section (㎟) | Construction (n x Ø) | Max. Conductor Dia. (㎜) | Max. Insulation Dia. (㎜) |
|---|---|---|---|
| 0.50 | 19 x 0.18 | 0.95 | 1.45 |
| 0.75 | 19 x 0.23 | 1.15 | 1.65 |
| 1.00 | 19 x 0.25 | 1.30 | 1.80 |
| 1.50 | 37 x 0.23 | 1.65 | 2.21 |
| 2.50 | 37 x 0.30 | 2.15 | 2.75 |

**Product**

| Cables | Max. Dia. (㎜) | Weight (kg/㎞) |
|---|---|---|
| 2 x 0.5 | 4.55 | 24 |
| 3 x 0.5 | 4.75 | 30 |
| 4 x 0.5 | 5.10 | 37 |
| 2 x 0.75 | 5.00 | 30 |

Other range on request.

| Cables | Max. Dia. (㎜) | Weight (kg/㎞) |
|---|---|---|
| 2x0.50 | 3.8 | 21 |
| 3x0.50 | 4.0 | 30 |
| 4x0.50 | 4.5 | 37 |
| 2x0.75 | 4.2 | 29 |
| 3x0.75 | 4.5 | 39 |
| 4x0.75 | 5.0 | 40 |
| 2x1.00 | 4.7 | 32 |
| 3x1.00 | 5.0 | 46 |
| 4x1.00 | 5.5 | 58 |
| 2x1.50 | 5.6 | 43 |
| 3x1.50 | 5.9 | 63 |
| 4x1.50 | 6.5 | 81 |
| 2x2.50 | 6.9 | 67 |
| 3x2.50 | 7.3 | 95 |
| 4x2.50 | 8.0 | 133 |

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# Multimedia & Data Transmission Cables

# Coaxial Cable

## RG/KX Type

### Application

Data and video signal transmission in on-board equipments

### Construction

| | |
|---|---|
| Conductor | Stranded bare or tinned or silvered copper |
| Insulation | PE |
| Shield | Single or double braided bare or tinned or silvered copper |
| Sheath | Halogen-free compound (BK) |

### Technical Data

| | |
|---|---|
| Impedance | 50 Ω (Capacity : ＜ 106 pF/m) ,<br>75 Ω (Capacity : ＜ 72.2 pF/m) |
| Temperature Range | -30 ~ +80 ℃ |
| Compatible with standard connector (BNC, SMA, SMB, TNC etc.) | |

### Properties

Halogen Free — IEC 60754-1

Flame Retardant — IEC 60332-1/2/3

Low Smoke — IEC 61034

### Product List

Product : 50Ω

| Type | Conductor | | Insulation (㎜) | Shield | | Cable Dia. (㎜) | Weight (kg/㎞) | Voltage ($V_{ac}$) |
|---|---|---|---|---|---|---|---|---|
| | Construction | Dia.(㎜) | | 1st | 2nd | | | |
| KX 3B | 7 x 0.16CCS | 0.48 | 1.50 ± 0.10 | 0.10TPC | - | 2.54 ± 0.13 | 10 | 1100 |
| RG 58 | 19 x 0.18TPC | 0.90 | 2.95 ± 0.10 | 0.10TPC | - | 4.95 ± 0.10 | 41 | 1400 |
| RG 174 | 7 x 0.16CCS | 0.48 | 1.52 ± 0.08 | 0.10TPC | - | 2.79 ± 0.13 | 12.5 | 1100 |
| RG 213 | 7 x 0.75 BC | 2.25 | 7.24 ± 0.18 | 0.18BC | - | 10.30 ± 0.18 | 165 | 3700 |
| RG 214 | 7 x 0.75 BC | 2.25 | 7.24 ± 0.18 | 0.16SPC | 0.16 SPC | 10.80 ± 0.18 | 198 | 3700 |

Product : 75Ω

| Type | Conductor | | Insulation (㎜) | Shield | | Cable Dia. (㎜) | Weight (kg/㎞) | Voltage ($V_{ac}$) |
|---|---|---|---|---|---|---|---|---|
| | Construction | Dia.(㎜) | | 1st | 2nd | | | |
| KX 6A | 7 x 0.20BC | 0.6 | 3.70 ± 0.12 | 0.16BC | - | 6.10 ± 0.15 | 57 | 1700 |
| KX 8 | 7 x 0.40BC | 1.20 | 7.25 ± 0.15 | 0.18BC | - | 10.30 ± 0.20 | 145 | 3700 |
| RG 11 | 7 x 0.40TPC | 1.20 | 7.24 ± 0.18 | 0.18BC | - | 10.30 ± 0.18 | 146 | 3700 |
| RG 59 | 1 x 0.57CCS | 0.57 | 3.71 ± 0.10 | 0.16BC | - | 6.15 ± 0.10 | 58 | 1700 |
| RG 216 | 7 x 0.40TPC | 1.20 | 7.24 ± 0.18 | 0.16BC | 0.16 BC | 10.80 ± 0.18 | 185 | 3700 |

Other range on request.

CCS : Copper Clad Steel, SPC : Silver Plated Copper, TPC : Tin Plated Copper, BC : Bare Copper

# Databus Cable

## MVB, 120Ω

### Application

Communication system in a Rolling Stock

### Construction

| | |
|---|---|
| Conductor | Stranded tinned copper |
| Insulation | Special compound |
| Shield | Al/Mylar tape + tinned copper braid |
| Sheath | Halogen-free compound |

### Technical Data

| | |
|---|---|
| Impedance | 120Ω ±12Ω @ 0.5 ~ 3MHz |
| Temperature Range | -40 ~ +90℃ |
| Attenuation | ≤15dB/km @ 1.5 MHz<br>≤20dB/km @ 3MHz) |
| Minimum Bending | 6D (Single bending),<br>12D (Multi bending) |

* D : Cable diameter

### Properties

Halogen Free — IEC 60754-1

Flame Retardant — IEC 60332-1

Low Smoke — IEC 61034

### Product List

| Conductor | Cross-Section (㎟) | Overall Dia. (㎜) | Screen | Approx. Weight (kg/㎞) |
|---|---|---|---|---|
| Tinned copper | 4 x 0.5 | 7.4 | Al/Mylar tape + tinned copper braid | 90 |

# Databus Cable

## WTB, 120Ω

### Application

Communication system in a Rolling Stock

### Construction

| | |
|---|---|
| Conductor | Stranded tinned copper,<br>Special compound |
| Insulation | Foam PE (Quad), halogen-free compound (Cores) |
| Shield | Al / Mylar tape + tinned copper braid |
| Sheath | Halogen-free compound |

### Technical Data

| | |
|---|---|
| Impedance | 120Ω ±12Ω @ 0.5 ~ 2MHz |
| Temperature Range | -30 ~ +85℃ |
| Attenuation | ≤11dB/km @ 1MHz<br>≤17dB/km @ 2MHz |
| Minimum Bending | 6D (Single bending),<br>12D (Multi bending) |

* D : Cable diameter

### Properties

Halogen Free — IEC 60754-1

Flame Retardant — IEC 60332-1

Low Smoke — IEC 61034

### Product List

| Conductor | Cross-Section (㎟) | Overall Dia. (㎜) | Screen | Approx. Weight (kg/㎞) |
|---|---|---|---|---|
| Tinned copper | 2 x 0.75 | 8 | Al/Mylar tape + tinned copper braid | 100 |

# MM Glass Fiber Cables

## Application

Communication system in a Rolling Stock

## Construction

| Simple x unit | |
|---|---|
| - Core | Φ62.5 ± 3 ㎛ |
| - Cladding | Φ125 ± 3 ㎛ |
| - Coating | Φ245 ± 10 ㎛ |
| - Buffer | Φ900 ± 50 ㎛ |
| - Strength member | Aramid yarns |
| - Simplex unit jacket | LSZH Φ2.00 ± 0.15 |
| Outer sheath | LSZH (BK) |

## Technical Data

| | |
|---|---|
| Attenuation | ≤3.5dB/km @ 850m<br>≤1.5dB/km @ 1300m |
| Temperature Range | -30 ~ +70 ℃ |

## Properties

Halogen Free — IEC 60754-1

Flame Retardant — IEC 60332-1/2/3

Low Smoke — IEC 61034

## Product List

| No. Fiber | Cable Diameter (㎜) | Cable Weight (kg/㎞) | Max. Loading | | Min. Bending Radius | |
|---|---|---|---|---|---|---|
| | | | Static (N) | Dinamic (N) | Static (㎜) | Dinamic (㎜) |
| 4 | 8.5 | 75 | 2000 | 1000 | 85 | 170 |
| 6 | 9.5 | 95 | 2000 | 1000 | 95 | 190 |
| 8 | 11.0 | 120 | 2000 | 1000 | 110 | 220 |

# Databus Cable

## CAT 5e

### Application

Communication system in a Rolling Stock
Ethernet based network : infotainment, multimedia, PIS etc.

### Design standard

EN 50288-2-2

### Construction

| | |
|---|---|
| Conductor | Stranded tin plated copper (22AWG) |
| Insulation | Special compound |
| Shield | Al/Mylar tape + tinned copper braid |
| Separator | Plastic tape (Option) |
| Sheath | Halogen-free compound |

### Technical Data

| | |
|---|---|
| Voltage | 300 V |
| Impedance | 100 ± 15Ω @ 1~100 MHz |
| Temperature Range | -40 ~ +90℃ |
| Attenuation | 2.4 dB/100m @ 1MHz<br>4.9 dB/100m @ 4 MHz<br>7.8 dB/100m @ 10 MHz<br>14.0 dB/100m @ 31.25 MHz<br>26.4 dB/100m @100 MHz |
| Next | 65.3 dB/100m @ 1MHz<br>56.3 dB/100m @ 4 MHz<br>50.3 dB/100m @ 10 MHz<br>42.9 dB/100m @ 31.25 MHz<br>35.3 dB/100m @100 MHz |
| Return loss | 23 dB/100m @ 4 MHz<br>25 dB/100m @ 10 MHz<br>25 dB/100m @ 20 MHz<br>23.6 dB/100m @ 31.25 MHz<br>20.1 dB/100m @100 MHz |

### Properties

Halogen Free — IEC 60754-1
Flame Retardant — IEC 60332-1
Low Smoke — IEC 61034

### Product List

| Conductor | Cross-Section (㎟) | Overall Dia. (㎜) | Screen | Approx. Weight (kg/㎞) |
|---|---|---|---|---|
| Tinned copper | 4 x 22 AWG | 6.5 | Al/Mylar tape + tinned copper braid | 65 |

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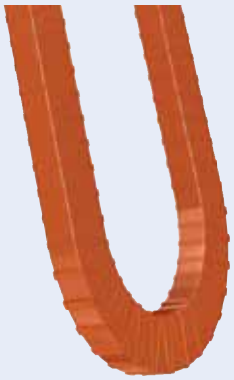
# Winding Wires

# Polyimide Tape Covered Winding Wire



## Application
Traction motor in a Rolling Stock

## Design standard
ICE 60172 / NEMA MW 1000 / IEC 60317-44

## Construction

| | |
|---|---|
| Insulation type | Polyimide foil coated on one or both Sides with an FEP (Teflon ®) Adhesive, e.g. Kapton FN, FCR or FWR |
| Insulation option | - 1 or 2 lapped fused tape layers<br>- Lapped tape layers in same direction or cross-lapped<br>- Overlap up to 66% |

## Technical Data

| | |
|---|---|
| Temperature Range | Up to 240℃ |

## Product List

Product : Standard Type

| Construction | Increase due to Insulation |
|---|---|
| One side FEP-coated PI-film, thickness 0.04 ㎜ 50% overlap | 0.15 ± 0.02㎜ |
| Two one side FEP-coated PI-films, thickness 0.04 ㎜ with 50% overlap each | 0.30 ± 0.03㎜ |
| One side FEP-coated PI-film, thickness 0.06 ㎜ 50% overlap | 0.25 ± 0.03㎜ |
| Two FEP-coated PI-films<br>1) both side coated 0.05 ㎜ thick<br>2) one side coated 0.04 ㎜ thick with 50% overlap each | 0.38 ± 0.04㎜ |

Product : Water-Resistant Type

| Construction | Increase due to Insulation |
|---|---|
| FEP-coated on one side Special PI-film(Kapton® FWR), thickness 0.04㎜ 50% overlap | 0.15 ± 0.02㎜ |
| Two one side FEP-coated Special PI-film(Kapton® FWR), thickness 0.04㎜ overlap 66% resp. 50% | 0.38 ± 0.03㎜ |

Product : Corona-Resistant Type

| Construction | Increase due to Insulation |
|---|---|
| FEP-coated on one side Special PI-film(Kapton® FCR), thickness 0.04㎜ overlap 50% | 0.15 ± 0.02㎜ |
| FEP-coated on one side Special PI-film(Kapton® FCR), thickness 0.04㎜ overlap 51~53% | 0.22 ± 0.02㎜ |

Other range on request.

# Continuously Transposed Cable (CTC)

## Application
Transformer in a Rolling Stock

## Design standard
IEC 60317, 60851

## Construction

| | |
|---|---|
| Number of conductors | 5 ~ 84 |
| Width | 3.4 ~ 14 mm |
| Thickness | 1.1 ~ 3.2 mm |
| Insulation material | Kraft paper, Thermally upgraded kraft paper, Crepe paper PET, PPS, Nomex |

## Technical Data

| |
|---|
| Made by Superior Essex |

## Product List

### Suggested Dimension Range

| Strand Dimension | Soft Annealed, CPR1 (mm) | CPR2, CPR3 (mm) |
|---|---|---|
| Width | 3,00 ... 12, 50 | 5,00 ... 12,50 |
| Thickeness | 1,00 ... 3, 15 | 1,40 ... 3,15 |

### Proposed Minimum Strand Dimensions

| No. of Strands | Minimum Strand Dimension (mm) |
|---|---|
| up to 39 | 3,00 x 1,00 |
| up to 49 | 4,00 x 1,20 |
| up to 69 | 5,00 x 1,20 |
| up to 83 | 6,00 x 1,30 |

Other range on request.

| Wrapping Material | Special Feature, Application |
|---|---|
| Kraft | 5A2-1H1, general purpose with high purity |
| Calendered kraft | 5A4-1M2, high density and dielectric strength |
| Upgraded | 5A2-1M2, high thermal properties |
| Upgraded, calendered | 5A3-M, high density, thermal and dielectric characteristics |
| Calendered, upgraded, creped | Outer layers with very high mechanical strength |
| Epoxy coated kraft | Bondable outer layers |
| Epoxy coated upgraded kraft | Bondable outer layers |
| Aramide | Very high thermal resistance, for traction transformers |
| Epoxy coated aramide | Bondable outer layers, for traction transformers |
| Perforated paper | CTC with Improved cooling of LV windings |
| Glass fabric tape | External protection for cast resin transformers |


RailSol™-Saflex
LS Total Solution for Rolling Stock

RailSol™-Saflex

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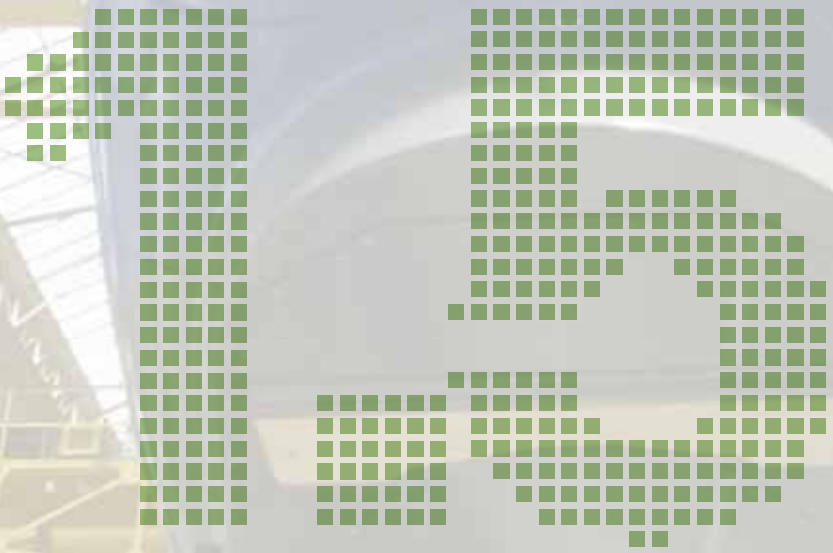


# Rubber Flooring

# Rubber Flooring

## Application

**Rubber Flooring for Rolling Stock**

## Construction

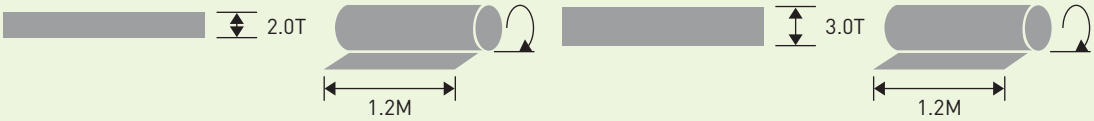
| | |
|---|---|
| Homogeneous rubber flooring | |
| Appearance | roll(sheet) type |
| Thickness | 2㎜~3㎜ |
| Width | 1.2m |
| Length | 12~15m |

| | |
|---|---|
| Various design is available | |
| Halogen-free compound | |
| Leading countries' standard | DIN 5510-2, NFPA 130, BS 6853 (Flammability, smoke density, toxicity) |
| Slip resistance | R9 |
| Residual indentation of static loading | ≤0.1㎜ |
| Resistance to cigarettes | Good |
| Resistance to stainning | Good |
| Static electrical propensity | ≤2kV |
| Abrasion resistance | ≤200㎟ |

## Product List

Product : SAFEGUARD

· Standard Size




· Standard Color

| | | |
|---|---|---|
| SOLID 8000 | SOLID 5043 | SOLID 8098 |
| SOLID 4100 | SOLID 4043 | SOLID 8191 |
| SOLID 1000 | SOLID 4143 | SOLID 8228 |
| SOLID 3000 | SOLID 9091 | SOLID 1021 |
| SOLID 5000 | SOLID 9121 | SOLID 3021 |
| SOLID 9000 | SOLID 9221 | SOLID 2031 |

Other range on request.

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**LSCT**
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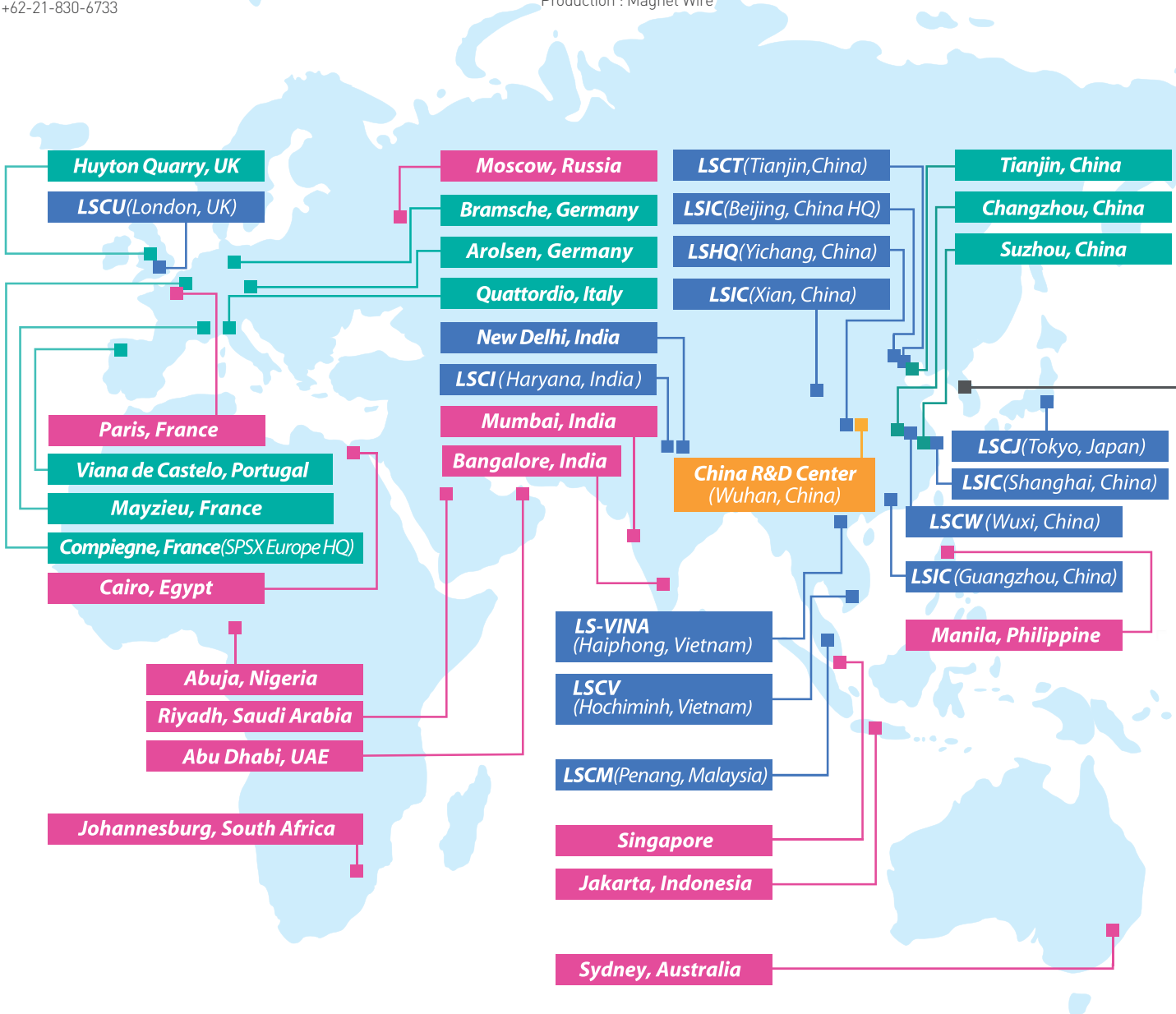
Tel : +86-22-2699-7618
Production : Magnet Wire



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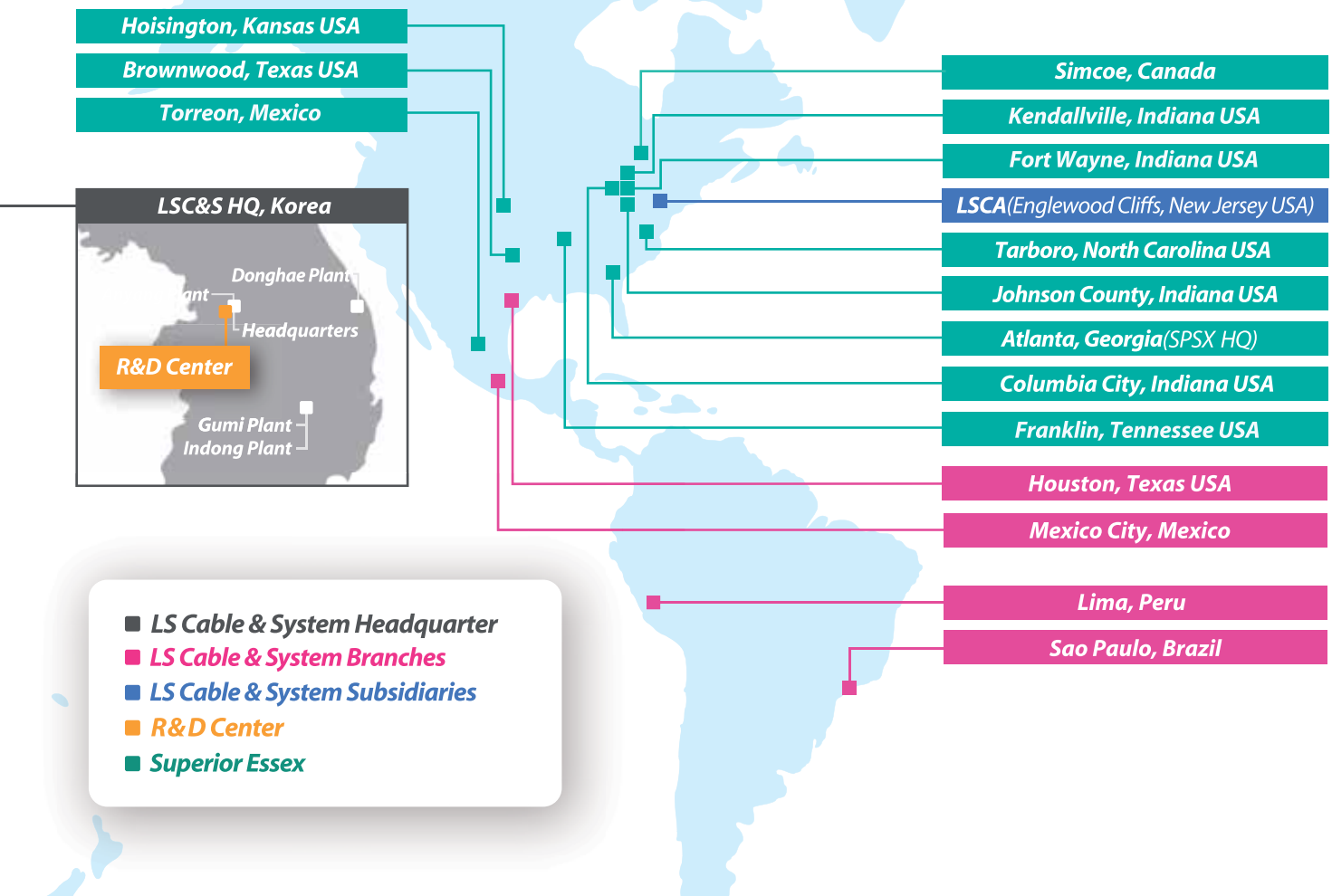

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