

CREATE A WORLD RENOWNED BRAND
BUILD AN EXCELLENT INTERNATIONAL ENTERPRISE

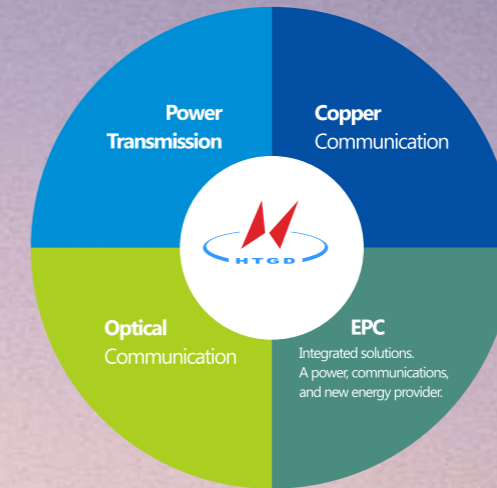


Global Information and
Energy Network Service Provider

www.htgd.com.cn

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HENG TONG OPTIC-ELECTRIC

Connecting A Smarter Future

HENG TONG OPTIC-ELECTRIC, a member of the HENG TONG GROUP, is a global information and energy network service provider focusing on high-end technology and products. It adapts to telecommunications and electricity trends and is dedicated to optical communication, power distribution and transmission, and a range of special transmission applications.



HENGTONG OVERVIEW

<p>Founded in 1991, IPO in 2003, Stock code: SH.600487</p>	<p>The world's second largest cable manufacturer (CRU 2014)</p>	<p>China's top 500 enterprises (328th, 2015)</p>	<p>Annual turnover USD 7.2 billion (2015)</p>	<p>50 subsidiary companies, 13,000 staff(2015)</p>
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Business Units

- Optical Communication**
 Preform-Optical fibers (Capacity: 60 million fkm/year) - Optical fiber cables - ODN, Submarine optical fiber cables.
- Power Transmission**
 From Low-voltage to High-voltage, EHV(up to 500KV), Submarine power cables, High-speed railway contact wires, OPGW.
- Copper Communications**
 Railway signal cables, Balise cables, Axle counting cables, Lan cables.
- Raw Material for Wires and Cables**
 Provider of integrated power, communications, and new energy solutions



Global Partners



Application Areas



Industry Locations




CHINA
HENG TONG Optic-Electric Co., Ltd.
Series of Telecom and Power
Transmission Products

ABERDARE

SOUTH AFRICA
Aberdare Cable Proprietary Limited
LV/MV/HV Power Cables /
Overhead Bare Conductors



SPAIN
Cables de Comunicaciones Zaragoza, S.L
Optical Fiber Cables / Telecom Cables /
Railway Signal Cables



BRAZIL
HT Cabos E Tecnologia LTDA
Optical Fiber Cables

ALCOBRE

PORTUGAL
ALCOBRE - Condutores Eléctricos, S.A.
Telecom Cables / LV Power Cables /
Railway Signal Cables



INDONESIA
PT Voksel Electric Tbk
LV/MV/HV Power Cables / Telecom Cables /
Optic Fiber / OPGW

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Company Introduction

R & D Innovation



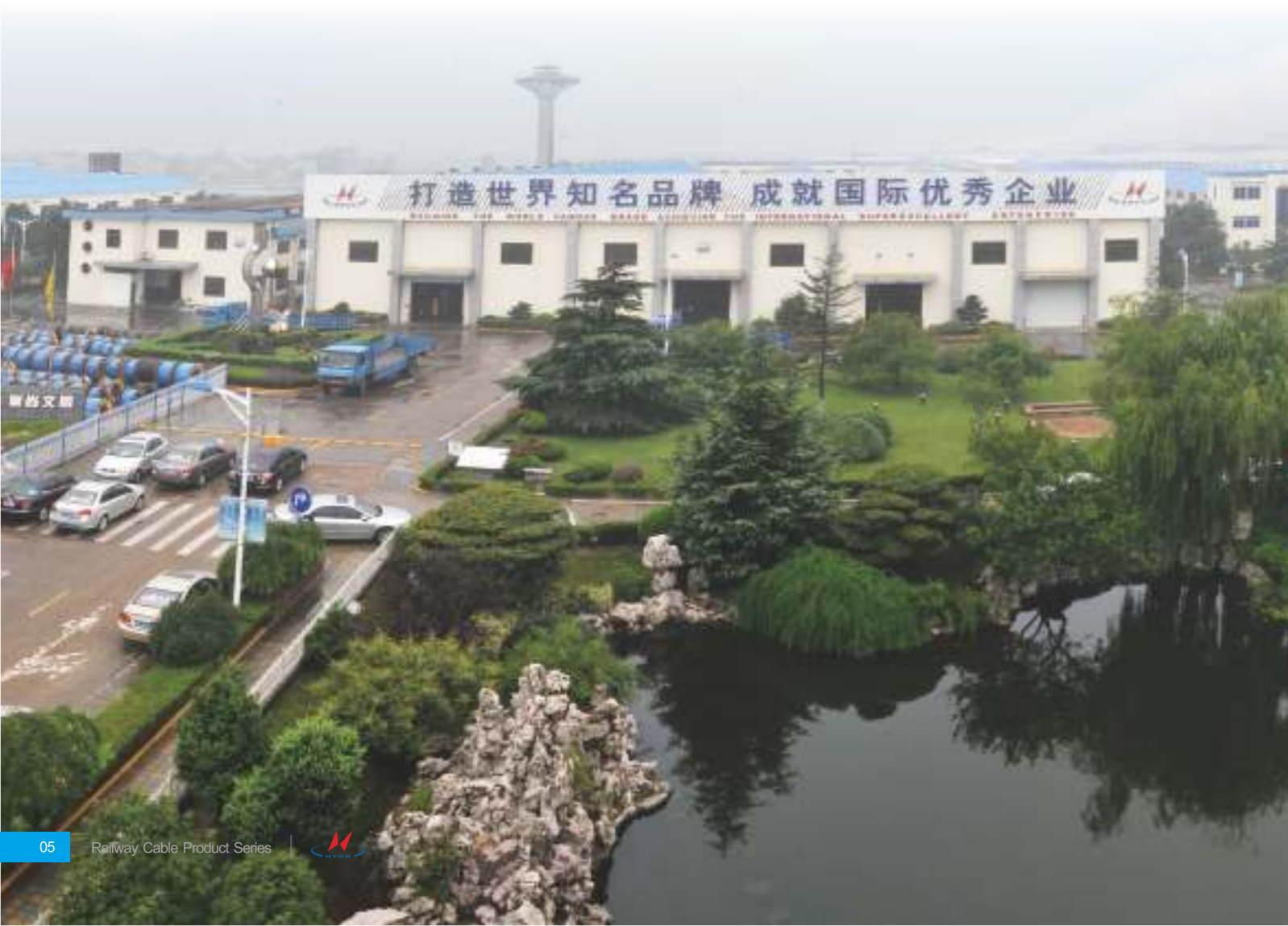
Fujikura Hengtong Aerial Cable System Ltd. (hereinafter referred to as KFH) was established in 2003, with the registered capital of 23 million US dollars, is located in the southernmost Qidu Industrial Park in Suzhou City, known as "Pearl of Taihu Lake, a land of plenty". Company business scope: the manufacturing, sales and technical services of optical fiber composite overhead ground wire (OPGW), optical fiber composition phase

conductor (OPPC), overhead power transmission line (ACSR, AAAC, AC wire, aluminum wire, etc.) and electric railway equipment and materials (copper alloy contact line, carrier cable and related products). It is the core initiator of smart power grid products in China, the drafting unit of national standards, the global grid key project difficulty solution provider.

R&D Innovation System

KFH is a national key high-tech enterprise, always adheres to promote "science and technology - quality - service" triune global brand strategy, leads the direction of the company with technological innovation and application, builds R & D enterprise, improves independent innovation capability, and strives to cultivate their own intellectual property rights.

Since the establishment, KFH has being focused on the basis of full integration of Huntoon and Fujikura R & D experience and technological achievements, constantly enhances the capability of independent innovation. Relying on the 2 technical centers in Suzhou and Tokyo, it introduces talents and international advanced equipment, establishes an incentive mechanism, encourages researches and innovations, and cultivates technology research and development teams to build a solid foundation for the scientific and technological innovations of the company's products.



Quality Certification

By CRCC certification



Advanced Equipment



Casting Machine

- Continuous up casting equipment developed by Rautomead Limited;
- The device mainly uses graphite element heating technology, combines a separate graphite crucible furnace smelting, casting and insulation technologies, which is an ideal high-quality magnesium copper alloy rod production equipment;
- Graphite crucible can remove oxygen in electrolytic copper anode, minimize the burning of alloying element magnesium;
- The device has design features of automatic feed, separate furnace and holding furnace, cooling transition;
- Produce continuous up casting rods with $\Phi 20\text{mm}$ - $\Phi 30\text{mm}$ rod diameter, an annual capacity up to 3,500t.



Conform Extrusion Machine

- Extrude $\phi 20$ continuous up casting rods into $\phi 18$ - $\phi 30$ extruded rods to meet different process requirements;
- Continuous extrusion process can improve the tensile strength and pull-off force of contact lines;
- Extrusion process can make grain refined, and improve anti-fatigue, wear-resistance, hardness and other properties of contact line system to some extent;
- Daily capacity of 2 extruders is 35t.



SPECTROMAX Stationary Metal Analysis Spectrometer

- Detect alloy content of liquid copper, control the content of alloying elements in liquid copper in real-time to achieve the appropriate process requirements;
- Detect continuous up casting rod alloy content, and calculate the alloy burning rate to obtain the optimal alloy ratio;
- Detect contact line alloy content can help to analyze the relationship between the contact line performance and alloy content to achieve the purpose of process optimization.



Axio Scope.A1 Type Metallographic Microscope

- Metallographic analysis is one of the main methods to research metals and alloys structure. In actual production, to explore the properties of metal materials, it is often necessary to check and analyze metallographic structure;
- By examination and analysis of contact line metallographic structure to determine whether the transverse grain size of contact line meet the process requirements;
- Examination and analysis on defective sample metallographic structure can contribute to the analysis and determination of defects.



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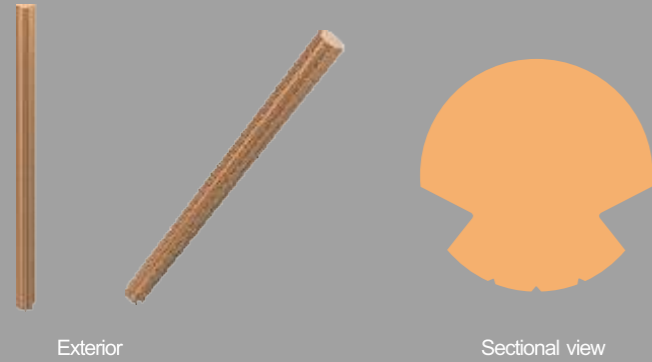
亨通光电线缆产业园



Locomotive Contact Wire

Copper and Copper Alloy Contact Wire

Copper and copper alloy contact lines are used as the copper and silver alloy wires contacting with locomotive pantograph slide plates in contact lines and transmitting current



Conductor	Copper And Copper Alloy Wire
Temperature range	-40°C to 40°C
Voltage rating	25KV



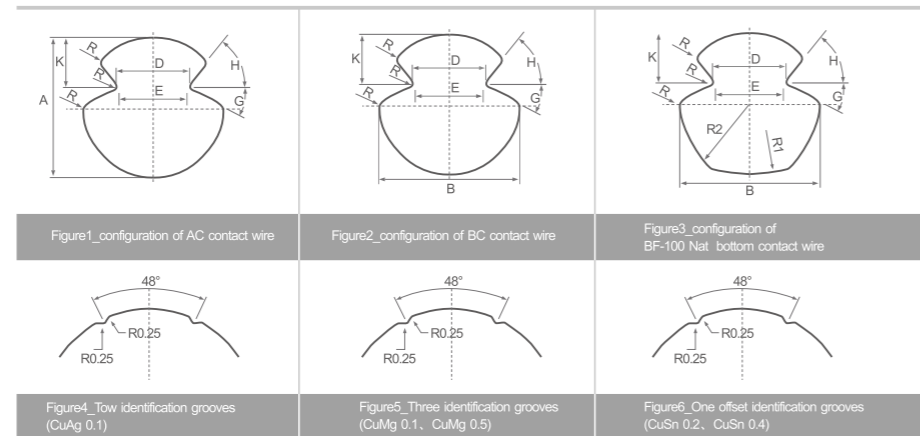
Features

- Good electrical properties
- Good mechanical properties
- High wear resistance
- Good thermal softening resistance
- Relatively high corrosion resistance
- Good grain size

Applications

- Mainly used in contact line systems of electric railway (normal speed railway, high-speed railway), urban rail transport (including subway, light rail, trolley bus) and other aspects.

Structure diagram



Technical Specification

According to EN 50149-2012

Type	Material designation ^a					
	Cu-ETP	CuAg0.1	CuMg0.2	CuMg0.5	CuSn0.2	CuSn0.2 (high conductivity)
80	0.229	0.229	0.289	0.385	0.309	0.278
100	0.183	0.183	0.231	0.286	0.247	0.222
107	0.171	0.171	0.216	0.268	0.231	0.208
120	0.153	0.153	0.192	0.239	0.206	0.185
150	0.122	0.122	0.154	0.191	0.165	0.148

^a: Values in Ω/km at 20°C—Calculate on minimum cross sectional area.

Technical Specification

According to EN 50149-2012

Material	Designation	Nominal crosssection	Tensile Strength	Breakingload	Elongation (no softening)		Torsionallaps (to disconnect)	Repeated bending (to break)		Winding	
					min. %	max. %		Bending radius	Frequency	Windingdiameter	Laps
Normal strength copper	Cu-ETP	80	355	27.5	3	10	5	30	6	1d	3
		100	355	34.5	3	10	5	30	6	1d	3
		107	350	36.3	3	10	5	30	6	1d	3
		120	330	38.4	3	10	5	30	6	1d	3
		150	310	45.1	3	10	5	30	6	1d	3
High strength copper and highstrength copper-silver alloy	Cu-ETP CuAg0.1	80	375	29.1	3	8	5	30	6	1d	3
		100	375	36.4	3	8	5	30	6	1d	3
		107	360	37.4	3	8	5	30	6	1d	3
		120	360	41.9	3	8	5	30	6	1d	3
		150	360	52.4	3	8	5	30	6	1d	3
Normal strength copper-silver alloy	CuAg0.1	80	365	28.3	3	10	5	30	6	1d	3
		100	360	34.9	3	10	5	30	6	1d	3
		107	350	36.3	3	10	5	30	6	1d	3
		120	350	40.7	3	10	5	30	6	1d	3
		150	350	50.9	3	10	5	30	6	1d	3
Copper magnesium alloy	CuMg0.2	80	460	35.7	3	10	5	30	6	2d	3
		100	450	43.7	3	10	5	30	6	2d	3
		107	440	45.7	3	10	5	30	6	2d	3
		120	430	50.1	3	10	5	30	6	2d	3
		150	420	61.1	3	10	5	30	6	2d	3
Copper magnesium alloy	CuMg0.5	80	520	40.4	3	10	5	30	6	2d	3
		100	510	49.5	3	10	5	30	6	2d	3
		107	500	51.9	3	10	5	30	6	2d	3
		120	490	57.0	3	10	5	30	6	2d	3
		150	470	68.4	3	10	5	30	6	2d	3
Copper-tin alloy	CuSn0.2 CuSn0.2 (high conductivity)	80	460	35.7	2	8	5	30	6	2d	3
		100	450	43.7	2	8	5	30	6	2d	3
		107	430	44.6	2	8	5	30	6	2d	3
		120	420	48.9	2	8	5	30	6	2d	3
		150	420	61.1	2	8	5	30	6	2d	3

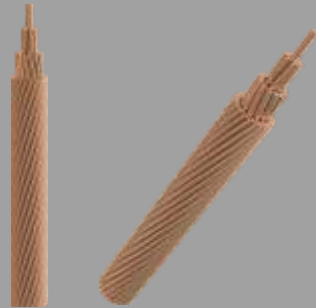
^a: Calculated on minimum cross sectional area.



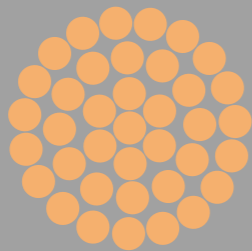
Locomotive Contact Wire

Hard Drawn Stranded Magnesium Copper Conductors

Cu-Mg alloy stranded wire is the material to transmit current (or) bear a certain tension, is made of several non-insulated copper or magnesium alloy single wire or strands.



Exterior



Sectional view

Conductor	Cu-Mg alloy stranded wire
Temperature range	-40°C to 40°C
Voltage rating	25KV

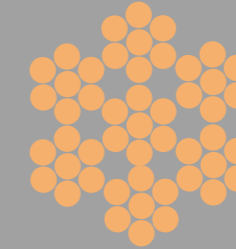


Flexible Copper Stranded Conductors Dropper Wire

Cu-Mg alloy stranded wire is the material to transmit current (or) bear a certain tension, is made of several non-insulated copper or magnesium alloy single wire or strands.



Hanging suspended line



Flexible Copper Stranded Conductors Dropper Wire

Conductor	Cu-Mg alloy stranded wire
Temperature range	-40°C to 40°C
Voltage rating	25KV



Features

- Good electrical properties
- Good mechanical properties
- High corrosion resistance
- Compound stranding structure

Applications

- Mainly used in contact line systems of electric railway (normal speed railway, high-speed railway) and other aspects.

Technical Specification

According to DIN 48201-1981 Part 2

Nominal Cross section	Calculated cross section	Wire		Cable diameter	Mean weight	Calculated breaking load	
		Quantity	Diameter			Bz I	Bz II
mm ²	mm ²		mm	mm	kg/km	kN	kN
25	24.25	7	2.10	6.3	218	11.98	14.24
35	34.36	7	2.50	7.5	310	16.97	20.17
50	49.48	7	3.00	9.0	446	23.97	26.58
	48.35	19	1.80	9.0	437	23.88	28.39
70	65.81	19	2.10	10.5	596	32.51	38.64
95	93.27	19	2.50	12.5	845	46.08	54.76
120	116.99	19	2.80	14.0	1060	56.68	67.57
150	147.11	37	2.25	15.8	1337	72.67	86.37
185	181.62	37	2.50	17.5	1649	89.72	106.63

Features

- Good electrical properties
- Good mechanical properties
- High corrosion resistance
- Compound stranding structure

Applications

- Mainly used in contact line systems of electric railway (normal speed railway, high-speed railway), urban rail transport (including subway, light rail, trolley bus) and other aspects.

Technical Specification

According to DIN 43138-1980

Nominal Cross section	Calculated cross section	Wire		Wires after strandin		Conductor		Material	Can be used for	
		Quantity	Diameter ±0.03mm	Tensile strength N/ mm ²	Applied load N	Diameter ±5%	Mean weight kg/km ±8%			
mm ²	mm ²									
10	9.6	49	0.50	589	116	4.5	89	Wrought copper alloy (Bz II) ³	Droppers	
16	16.3		0.65			5.9	152			
16	16.3	84	0.50			116	6.2			152
25	26.1	133	0.50			116	7.5			246
35	37.6		0.60	167	9.0	353				



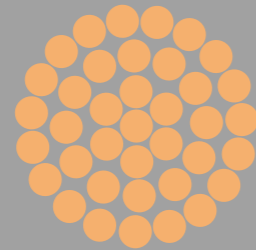
Locomotive Contact Wire

Flexible copper stranded conductors

Flexible copper stranded conductors is the material to transmit current (or) bear a certain tension, is made of several annealed non-insulated copper single wire or strands.



Exterior



Sectional view

Conductor	Flexible copper stranded conductors
Temperature range	-40°C to 40°C
Voltage rating	25KV



Features

- Good electrical properties
- Good flexibility
- High corrosion resistance
- Compound stranding structure

Applications

- Mainly used in contact line systems of electric railway (normal speed railway, high-speed railway), urban rail transport (including subway, light rail, trolley bus) and other aspects.

Technical Specification

According to DIN 43138-1980

Nominal Cross section mm ²	Calculated cross section mm ²	Wire		Wires after stranding		Conductor		Material	Can be used for		
		Quantity	Diameter ±0.03mm	Tensile strength N/ mm ²	Elongation at break (l=100)% min.	Diameter ±5%	Mean weight kg/km ±8%				
16	16.3	49	0.65	<300	25	5.9	152	E-CU 58 DIN 1787 DIN 40500 PART 4	Power connections		
25	26.1		0.50								
35	37.6	133	0.60								
50	51.2		0.70								
70	72.7	189	0.70	<300	25	13.0	685				
95	99.7	259	0.70								
120	118.5	336	0.67								
150	150.9	392	0.70								
185	185.1	525	0.67	<300	25	20.4	1745			E-CU 58 DIN 1787 DIN 40500 PART 4	Power connections
210	209.8	595	0.70								
240	245.2	637	0.70								
300	296.6		0.77								

SUCCESSFUL CASES



- 1 Ethiopia Addis Ababa light rail project supply system project
- 2 Shenhua Zhunchi Railway Co., Ltd. 12th Party A-supplied material procurement in 2013
- 3 Electrification Project of Liuzhou-Nanning Section of Hunan-Guangxi Railway
- 4 Lanzhou Project Department Material Procurement of China
- 5 Railway 21 Bureau Group Electric and Electrification Works Co., Ltd. (newly-built railway, Baoji-Lanzhou High-speed Railway, Lanzhou hub 4-power integration engineering project)
- 6 Contact line system power supply system installation and construction project of Suzhou Rail Transit Line 4 and branch lines
- 7 Passenger dedicated engineering in Guangyuan area of Lanzhou-Chongqing Railway
- 8 Shenzhen Urban Rail Transit Line 9 BT Project
- 9 Capacity expansion and reconstruction post-station 4-power system integration and related projects of Wuhu-Xuancheng Section of Anhui-Jiangxi Railway
- 10 Nanning Rail Transit Line 2

