Established in 1987

始于 1987

江龙炭素集团
JIANG LONG CARBON GROUP

专业 合作 诚信 共赢

江龙炭素集团
JIANG LONG CARBON GROUP

江苏江龙新能源科技有限公司
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敬业创新　诚信友好
打造受人尊重的一流企业

碳材料及制品
Carbon Materials & Products

目录 CONTENTS

领导致辞

THE WORDS FROM CHAIRMAN

业精于专，品鉴在炼。江苏江龙炭素集团秉持“协作缔造价值，合作必须共赢”的经营理念，用先进的工艺和设备，匠心独运做实业，为国内外广大客户提供优质的石墨制品和碳素材料。

潮起海天阔，扬帆正当时。发展中的江龙炭素将弘扬“精益求精，创新发展，感知责任，诚信共赢”的企业精神，开拓进取，追求卓越，用一流的管理关爱员工，一流的产品满足客户，一流的服务回报社会。

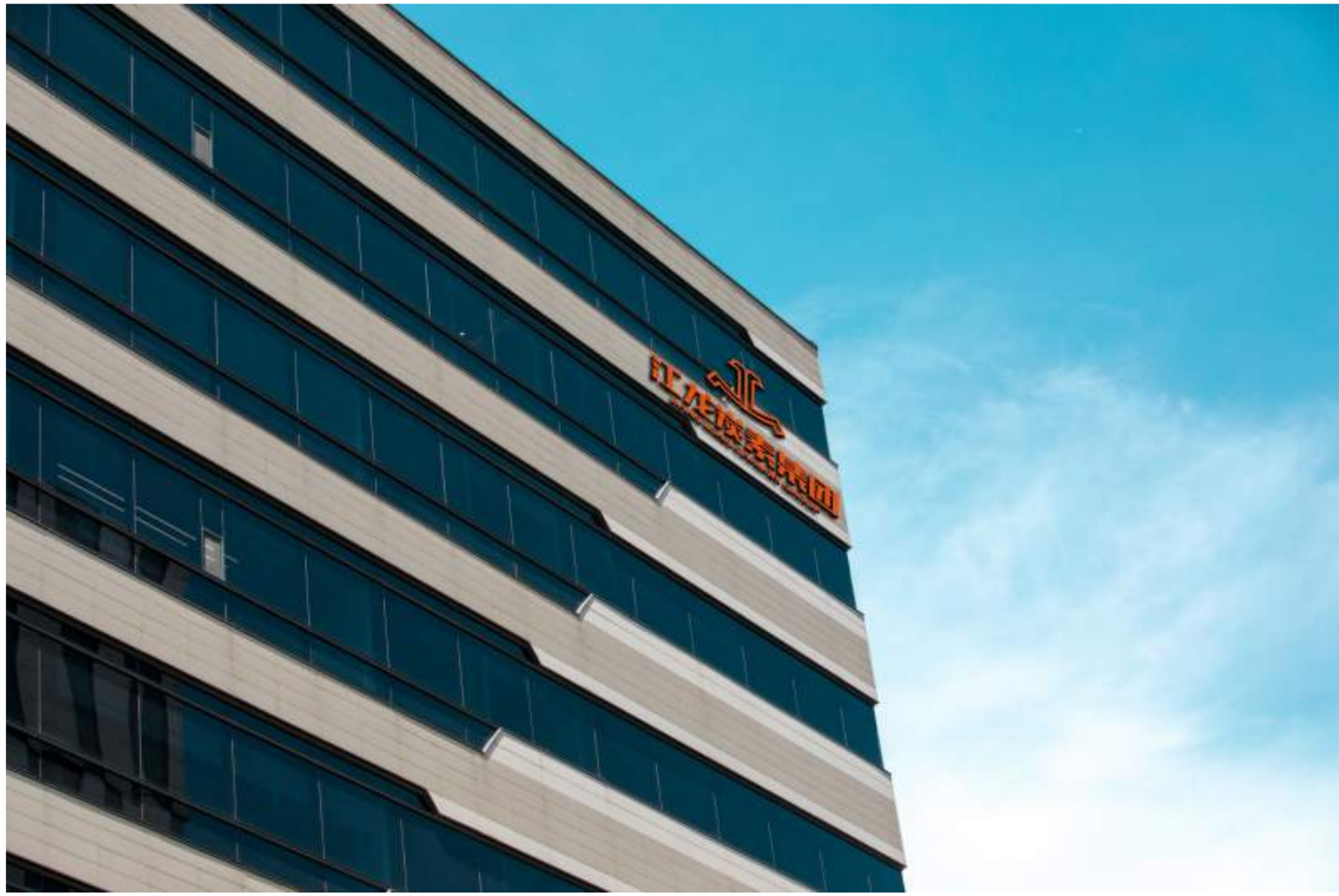
发展才能永恒，合作方可持续。用江龙电极之弧光，绽放您更绚烂的钢花。江龙炭素集团坚守专业、合作、诚信、共赢的价值观，以更加开放的心态和更加宽阔的胸怀，用至诚之心为人，用唯美之心做事，真诚地与广大客户、社会各界人士精诚合作，共谋发展，互利共赢，致力于打造中国乃至世界的江龙炭素品牌。

Excellent business comes from absorbed working and high quality must be thoroughly tempered!Jiangsu Jianglong Carbon Group adheres to the business concept of "Team efforts creates values, Cooperation leads to win-win", with advanced technology and equipments, ingenuity to run an industrial company, to provide high-quality graphite products and carbon materials to domestic and oversea customers.

It’ s time to set sail when the tide is about to rise. The developing Jianglong Carbon will carry forward the enterprise spirit of " Excellence Seeking, Innovation, Social Responsibility, Integrity and Win-win", pioneering and enterprising, pursuing excellence. Jianglong is caring employees with first-class management, satisfying customers with first-class products and contributing to society with first-class service.

Only development can last forever and win-win cooperation can be sustained. Jianglong carbon group adhere to " Professionality, Cooperation, Integrity, Win-win" as enterprise values, with more open and wider mind, with sincere heart for conducts and business. Sincerely cooperate with customers and all walks of life, to seek mutual development, win-win results, strive to build a well-known brand “JL CARBON” in China and the whole world.

董事长：王自江
Chairman



Established in 1987

始于 1987 年

江苏江龙炭素集团是中国徐州地区唯一建有整套全工序的炭素制品制造企业，前身为始建于 1987 年的徐州电极五厂，位于苏鲁豫皖交界处的江苏省沛县杨屯镇沛北开发区和龙固镇工业区。专业从事石墨电极及碳素制品的科技研发、生产销售及国际贸易，已具备 30 多年炭素制品的生产研发经验，拥有自主知识产权和自营出口许可证，产品涵盖石墨电极、炉用增碳剂和炭素新材料三大领域，是目前中国石墨电极行业中质量优、品种全、规格多的专业化生产研发企业，产品在国内外享有盛誉。

经过多年不断的创新发展，充分利用工厂周边得天独厚的焦炉煤气和电力资源等能源优势，现已形成煅烧、压型、焙烧、浸渍、石墨化、机加工等完善的碳素生产工序及国内外先进的检验检测设施和手段，公司已通过ISO9001：2015质量体系管理认证，生产工艺过程可控，产品质量稳定；各工序配套形成了先进的环保设备，通过了 ISO14001：2015 环境体系认证和 OHSAS18001：2007 职业健康安全管理体系认证，关爱员工，绿色文明生产，深受地方好评，并以“江龙路”命名地方道路，突显追求环境友好和可持续发展。

集团下属五个子公司，占地总面积 40 万平方米，现有职工 588 人，主要产品有年产 6 万吨的 Ø50mm 到 Ø700mm 超高功率（ UHP ）、高功率（ HP ）石墨电极；年产 3 万吨的各规格细结构高品位增碳剂及其它负极新材料等。

公司“江龙”牌产品广泛用于钢铁企业和特殊冶炼行业，不仅畅销国内而且还远销日本、美国、英国、法国、意大利、俄罗斯、韩国、马来西亚、越南、南非等国家，以其低电阻率、低消耗、强度高、良好的抗氧化性能赢得了用户的青睐。

Jianglong carbon group is the only manufacturing enterprise of carbon products with the complete set of processes in Xuzhou. Its predecessor is No.5 Xuzhou electrode factory, which was founded in 1987. It is located at Peibei development zone and Longgu industrial zone, Pei county, which is the intersection of 4 provinces Jiangsu, Shandong, Henan and Anhui. Jianglong specializing in technology research and development, manufacturing and sales of graphite electrodes and other carbon products. Jianglong has more than 30 Years of experience in manufacturing, research and development of carbon products. It has independent intellectual property rights and export license. The products of Jianglong cover graphite electrodes, carbon additive and new carbon materials. Jianglong is the professional enterprise of China in manufacturing, research and development with excellent quality, full varieties, and win a high reputation in China and abroad.

After years of continuous innovation and development, Jianglong has built the perfect carbon production processes including calcining, forming, baking, impregnation, graphitization and machining and also has advanced inspection and testing facilities and techniques. The company can make full use of the energy advantages around the plant such as unique coke oven gas and electric power to save cost. Jianglong has been awarded ISO 9001:2015, ISO 14001:2015, OHSAS18001:2007 certifications. It has controllable production, stable product quality, advanced environmental protection equipment for each process. And also, Jianglong is well received by local by caring staff, keeping green and civilized production. The local government named a local road as "Jianglong road" to highlight the pursuit of environmentally friendly and sustainable development.

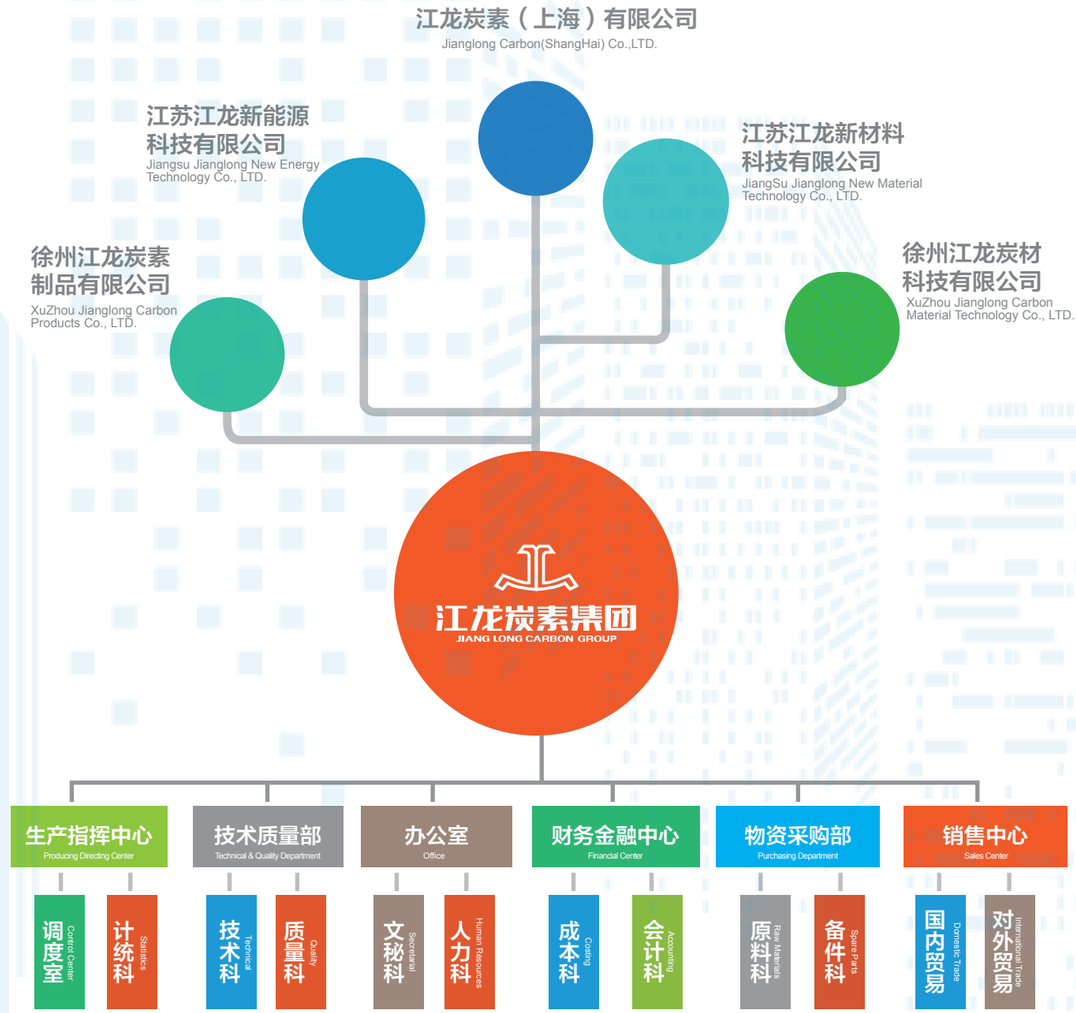
Jianglong Group has five subsidiaries, covering a total area of 400,000 square meters, having 588 employees. The main products of Jianglong are Ø 50 mm to 700 mm Ø ultra high power (UHP), High power (HP) graphite electrodes with annual output of 60,000 tons, as well as high quality carbon additive and other negative electrode new materials with annual output of 30,000 tons.

The products of brand "Jianglong" are widely used in steel enterprises and special smelting industry, not only sell well in China but also exported to Japan, the United States, Britain, France, Italy, Russia, South Korea, Malaysia, Vietnam, South Africa and other countries. The products won the favor of customers with the low electrical resistivity, low consumption, high strength and good oxidation resistance.

组织机构
The Organization

江苏江龙炭素集团下属徐州江龙炭素制品有限公司、徐州江龙炭材科技有限公司、江苏江龙新能源科技公司、江苏江龙新材料科技有限公司 、江龙炭素（上海）有限公司。其中徐州江龙炭素制品有限公司、江苏江龙新能源科技公司、徐州江龙炭材科技有限公司均获评江苏省高新技术企业资质。

Jiangsu Jianglong Carbon Group owns 5 subsidiaries: Xuzhou Jianglong Carbon Products CO., LTD.， Xuzhou Jianglong Carbon Material Technology CO., LTD.，Jiangsu Jianglong New Energy Technology CO., LTD.，Jiangsu Jianglong New Material Technology CO., LTD. Jianglong Carbon (Shanghai) CO.,LTD, The three companies, Xuzhou Jianglong Carbon Products CO., LTD., Jiangsu Jianglong New Energy Technology CO., LTD., Xuzhou Jianglong Carbon Material Technology CO., LTD., have been awarded the high-tech enterprise qualification of Jiangsu province.



市场网络

Market Network

江苏江龙炭素集团市场营销网络按全球化布局，分国内贸易和国际贸易，高效灵活，深耕市场，贴近客户，快速反应，及时准确地为客户提供优质服务。

The marketing network of Jiangsu Jianglong Carbon group is divided into domestic trade and international trade according to the global guidelines. As a team being efficient, flexible, deep-rooted in market-exploration, close to customers, quick-responsive, we will provide customers with high-quality services timely and accurately.

我们的主要客户
Main Customer

ANSTEEL 鞍钢股份有限公司

TISCO 太原钢铁(集团)有限公司

建龙集团 JIANLONG GROUP

TATA STEEL (THAILAND)

FHS

posco

沙钢集团 SHAGANG GROUP

日照钢铁 RIZHAO STEEL

HBIS GROUP 河钢股份有限公司 HBIS COMPANY LIMITED

南京南钢钢铁联合有限公司 NANJING IRON&STEEL UNITED CO.,LTD.

永钢集团 YONGGANG GROUP

青山控股集团 TSINGSHAN HOLDING GROUP

天钢集团

新兴铸管 XINXING PIPES

XIN YEGANG

生产设施

Production Facilities

压型工序
41MN、25MN、15MN压机

Forming
41MN, 25MN and 15 MN Extrusion Press

焙烧工序
18室、20室、24室、36室环式炉

Baking
Ring baking furnaces with 18, 20, 24 and 36 rooms

焙烧工序
高压浸渍釜

Baking
High pressure impregnation kettle

焙烧工序
隧道窑

Baking
Tunnel kilns

石墨化工序
艾奇逊大直流石墨化炉，LWG内串石墨化炉。

Graphitization
Acheson DC graphitization furnace
LWG graphitization furnace

机加工序
引进日本电极数控机床，国内双螺纹梳铣机床。接头全自动数控机床。

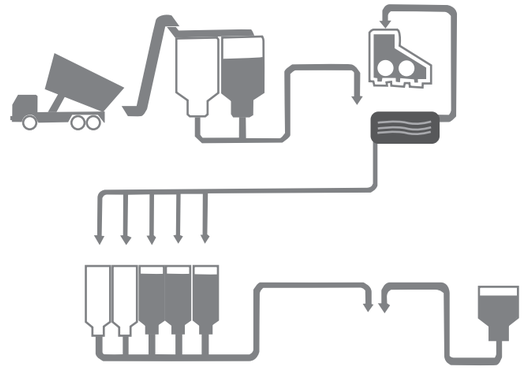
Machining
Electrode CNC Machine imported from Japan
Domestic Double-thread Combing and Milling Machines
Full-automatic CNC Machine for Nipples.

工艺流程
Process Flow Chart

1 原料破碎
The Raw Material Crushing

优质针状焦或石油焦自煅后经机械设备破碎成符合工艺要求的粒度。

The high quality needle coke or petroleum coke broken by mechanical equipments to particle size in accordance with process requirements after self-calcination.



2 配料混捏
Dosing & Kneading

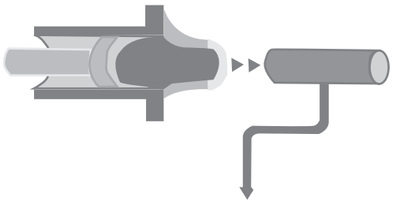
针状焦在机械设备里破碎，经筛分后按配方要求比例配料。经筛分后的原料粒子按配方要求与一定比例的沥青混合，加热搅拌成具有一定塑性的糊料。

Needle coke is crushed in mechanical equipment, screening, and then the dosing is according to the proportion of ingredients required by the formula. The sifted raw material particles are mixed with a certain proportion asphalt according to the formula and stirred into the paste with a certain plasticity by heating.

3 挤压成型
Extrusion Forming

将温度适合的糊料加入到成型机中，加压挤出，按规格成型为生坯。

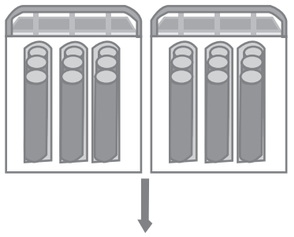
Put the paste with suitable temperature into the forming machine, pressure extrusion, form green-pressing with different sizes



4 一次焙烧
The First Baking

生坯电极在焙烧炉内，按工艺要求焙烧至一定的温度。

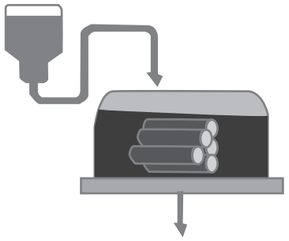
In the baking furnace, the green-pressing electrode is baked with a certain temperature according to the process requirements.



5 高压浸渍
High Pressure Impregnation

焙烧后的制品，采用专用沥青，真空高压处理，使制品更加密实。

The baked products, are treated through vacuum and high pressure with special asphalt, in order to be more compact.

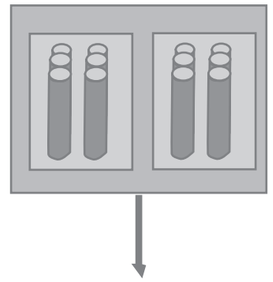


6 二次焙烧

The Second Baking

浸渍后的制品，经隧道窑二次烧制，使沥青充分结焦，提高制品密度和强度。

The products after impregnation are baked again through the tunnel kilns, to make asphalt coking fully, to improve the density and strength of the products.

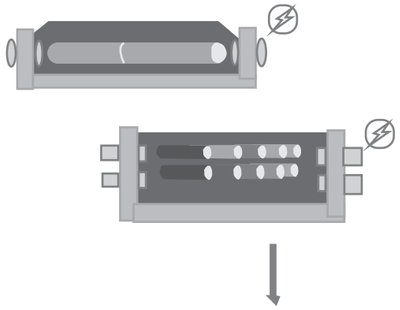


7 石墨化

Graphitization

焙烧品在石墨化电阻炉内送电升温至 3000℃以上，使碳原子结构重新排列成特定的石墨晶体形式。

The products after baking are put into graphitization furnace with temperature above 3000 ° C, which rearrange the carbon atoms into specific graphite crystals.

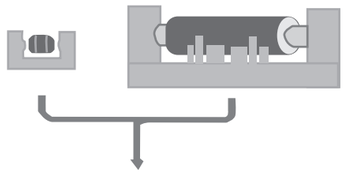


8 机加工

Machining

石墨化后的制品，经机械加工成符合尺寸精度要求的成品。

The products, after been graphitized, are machined into graphite electrodes which meet the requirements of dimensional accuracy.

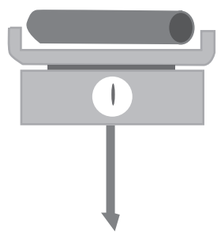


9 质量检查

Quality Inspection

加工后的制品需要进行各项理化性能指标检测和加工精度检测。

The finished products are inspected in specifications and machining precision.

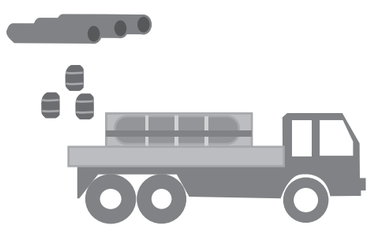


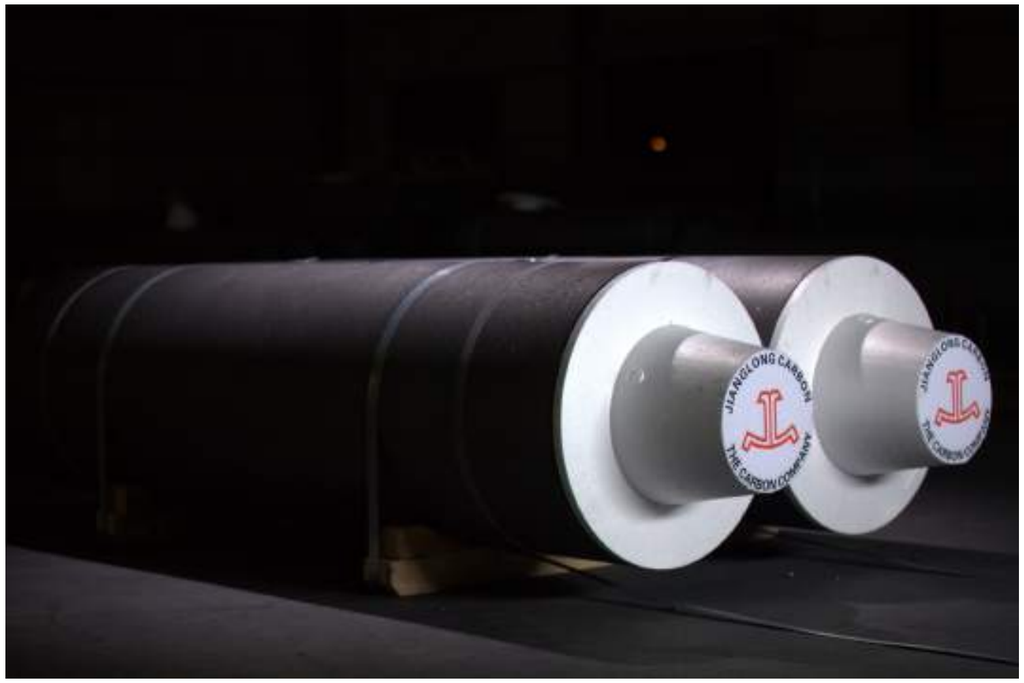
10 包装发运

Packaging & Shipment

成品电极按客户要求进行包装后即可装船装车发运到用户。

Qualified graphite electrodes are packaged according to clients' requirements and delivered to customers by vessel, train or truck.





质量控制与认证

Quality Control & Certification

公司技术力量雄厚，研发能力强劲，现拥有 11 项实用新型专利。
公司对质量控制精益求精，产品内控指标优于行业标准，严格按照 ISO9001：2015 体系要求，生产全流程受控。
在追求质量优先的同时，公司先后配套取得了 ISO14001：2015 体系和 OHSAS18001：2007 体系认证。

Jianglong has strong technical force and R&D capability. It has 11 utility model patents.
Jianglong keeps improving in quality control. The internal control specifications of products are better than industrial standards. The production safety is controlled strictly according with ISO 9001:2015.
Jianglong also is awarded ISO14001:2015 and OHSAS18001:2007 system certification besides pursuing quality first.

项目 Item		单位 Unit	公称直径（mm）Nominal Diameter YB/T4089行业标准(Industry Standard) 200\400	450\500	650\700
电阻率 Electric Resistivity	电极 Electrode	μΩM	≤7.0	≤7.5	≤7.5
	接头 Nipple		≤6.3	≤6.3	≤6.3
体积密度 Bulk Density	电极 Electrode	g/cm³	≥1.60	≥1.60	≥1.60
	接头 Nipple		≥1.72	≥1.72	≥1.72
抗折强度 Flexural Strength	电极 Electrode	MPa	≥10.5	≥10.0	≥ 8.5
	接头 Nipple		≥17.0	≥17.0	≥17.0
抗膨胀系数 CTE	电极 Electrode	10⁻⁶/℃	≤2.4	≤2.4	≤2.4
	接头 Nipple		≤2.2	≤2.2	≤2.2
弹性模量 Elastic Modulus	电极 Electrode	GPa	≤14.0	≤14.0	≤14.0
	接头 Nipple		≤16.0	≤16.0	≤16.0
灰分 Ash	电极 Electrode	%	≤0.5	≤0.5	≤0.5
	接头 Nipple				
真密度 Real Density	电极 Electrode	g/cm³	--	--	--

公称直径（mm）Nominal Diameter JSJL-HP 企业标准（Enterprise Standard） 250\400	450\500	550\600	650\700	JSJL-HP 实测值（Measured Value） 250\400	450\500	550\600	650\700
5.6-6.8	5.8-6.8	5.8-6.8	5.8-6.8	5.6-6.5	5.8-6.7	5.8-6.8	5.8-6.8
3.5-4.5	3.5-4.5	3.5-4.5	3.5-4.5	3.5-4.3	3.5-4.2	3.5-4.2	3.5-4.2
1.73-1.75	1.72-1.74	1.71-1.73	1.70-1.72	1.73-1.75	1.72-1.74	1.71-1.73	1.70-1.72
1.79-1.83	1.79-1.84	1.79-1.85	1.79-1.85	1.80-1.82	1.82-1.84	1.82-1.85	1.82-1.85
11.0-14.0	11.0-14.0	10.0-14.0	10.0-14.0	12.0-15.0	11.0-15.0	11.0-12.0	10.0-12.0
20.0-24.0	22.0-24.0	22.0-26.0	22.0-26.0	22.0-26.0	22.0-26.0	24.0-28.0	24.0-28.0
1.7-2.0	1.7-2.0	1.7-2.0	1.7-2.0	1.7-2.0	1.6-2.0	1.6-2.0	1.6-2.0
1.4-1.8	1.4-1.8	1.4-1.8	1.4-1.8	1.4-1.8	1.4-1.8	1.4-1.8	1.4-1.8
9.0-12.0	9.0-12.0	9.0-12.0	9.0-12.0	9.0-12.0	9.0-11.5	9.0-11.5	9.0-11.5
12.0-16.0	12.0-18.0	12.0-18.0	12.0-18.0	14.0-16.0	15.0-18.0	15.0-18.0	15.0-18.0
≤0.2	≤0.2	≤0.2	≤0.2	0.05-0.15	0.05-0.15	0.05-0.15	0.05-0.15
2.21-2.23	2.21-2.23	2.21-2.23	2.21-2.23	2.22-2.23	2.22-2.23	2.22-2.24	2.22-2.24

公称直径 Nominal Diameter		截面积 Cross Sectional Area	YB/T4089 行业标准（Industry Standard） 允许电流负荷 Permissible Current Load	电流密度 Current Density	JSJL-HP 企业标准（Enterprise Standard） 精炼炉（LF） 允许电流负荷 Permissible Current Load	电流密度 Current Density
in	mm	cm²	A	A/cm²	A	A/cm²
14	350	973	17400-24000	17-27	18270-25200	19-26
16	400	1275	21000-31000	16-24	22050-32550	17-26
18	450	1622	25000-40000	15-24	26250-42000	16-26
20	500	2000	30000-48000	15-24	31500-50400	16-25
22	550	2427	34000-53000	14-22	--	--
24	600	2892	38000-58000	13-21	--	--
28	700	3935	45000-72000	12-19	--	--

高功率石墨电极技术指标

HP TECHNICAL PARAMETERS

外形尺寸

Dimensions

高功率石墨电极外形尺寸重量表 Table of HP Dimensions & Weight

直径 Nominal Dia		允许范围（mm） Permissible Range		长度 Length		允许范围（mm） Permissible Range		参考重量（kg） Reference Weight Kg			
in	mm	max	min	in	mm	max	min	T3N	T3L	T4N	T4L
14	350	357	352	72	1800	1900	1700	290	--	293	290
				84	2100	2200	2000	338	--	342	338
16	400	408	403	60	1500	1600	1400	313	312	317	315
				72	1800	1900	1700	379	378	383	381
				84	2100	2200	2000	442	441	447	444
18	450	460	454	72	1800	1900	1700	475	473	484	480
				84	2100	2200	2000	555	553	563	561
				96	2400	2500	2300	638	636	646	644
20	500	511	505	72	1800	1900	1700	581	--	589	584
				84	2100	2200	2000	684	--	692	687
				96	2400	2500	2300	786	--	784	789
22	550	562	556	84	2100	2200	2000	--	--	--	825
				96	2400	2500	2300	--	--	--	949
				108	2700	2800	2600	--	--	--	1073
24	600	613	607	84	2100	2200	2000	--	--	993	985
				96	2400	2500	2300	--	--	1140	1132
				108	2700	2800	2600	--	--	1287	1279
28	700	714	710	84	2100	2200	2000	--	--	--	1321
				96	2400	2500	2300	--	--	--	1532
				108	2700	2800	2600	--	--	--	1733

项目 Item		单位 Unit	公称直径（mm）Nominal Diameter							
			JSJL-SHP企业标准（Enterprise Standard）				JSJL-SHP 实测值 （Measured Value）			
			300\400	450\500	550\600	650\700	300\400	450\500	550\600	650\700
电阻率 Electric Resistivity	电极 Electrode	μΩM	5.4-6.0	5.2-5.8	5.2-5.8	5.2-5.8	5.4-5.8	5.2-5.6	5.2-5.8	5.2-5.8
	接头 Nipple		3.5-4.0	3.5-4.0	3.5-4.0	3.5-4.0	3.5-4.0	3.5-4.0	3.5-4.0	3.5-4.0
体积密度 Bulk Density	电极 Electrode	g/cm³	1.72-1.75	1.71-1.74	1.70-1.73	1.70-1.72	1.73-1.75	1.71-1.73	1.70-1.72	1.70-1.72
	接头 Nipple		1.79-1.84	1.79-1.85	1.82-1.86	1.84-1.88	1.80-1.84	1.80-1.84	1.83-1.86	1.84-1.87
抗折强度 Flexural Strength	电极 Electrode	MPa	13.0-15.0	12.0-15.0	10.0-15.0	10.0-15.0	13.0-16.0	12.0-15.0	10.0-13.0	10.0-13.0
	接头 Nipple		20.0-26.0	22.0-23.0	22.0-30.0	24.0-30.0	22.0-26.0	22.0-27.0	25.0-30.0	25.0-30.0
抗膨胀系数 CTE	电极 Electrode	10⁻⁶/℃	1.4-1.8	1.4-1.8	1.4-1.8	1.4-1.8	1.5-1.7	1.5-1.7	1.5-1.7	1.5-1.7
	接头 Nipple		1.2-1.4	1.2-1.4	1.2-1.4	1.2-1.4	1.1-1.3	1.1-1.3	1.1-1.4	1.1-1.4
弹性模量 Elastic Modulus	电极 Electrode	GPa	10.0-12.0	10.0-12.0	10.0-12.0	10.0-12.0	10.0-12.0	10.0-12.0	10.0-12.0	10.0-12.0
	接头 Nipple		16.0-18.0	16.0-19.0	18.0-20.0	18.0-20.0	16.0-18.0	16.0-20.0	18.0-20.0	18.0-20.0
灰分 Ash	电极 Electrode	%	≤0.2	≤0.2	≤0.2	≤0.2	0.03-0.15	0.03-0.15	0.03-0.15	0.03-0.15
	接头 Nipple									
真密度 Real Density	电极 Electrode	g/cm³	2.22-2.24	2.22-2.24	2.24-2.24	2.22-2.24	2.22-2.23	2.22-2.23	2.22-2.23	2.22-2.23

公称直径 Nominal Diameter		截面积 Cross Sectional Area	JSJL-SHP企业标准（Enterprise Standard）			
			粗炼炉（EAF）		精炼炉（LF）	
			允许电流负荷 Permissible Current Load	电流密度 Current Density	允许电流负荷 Permissible Current Load	电流密度 Current Density
in	mm	cm²	A	A/cm²	A	A/cm²
14	350	973	19000-26400	20-27	20000-27750	21-29
16	400	1275	23000-34000	18-27	24100-36000	19-28
18	450	1622	27500-44000	17-27	29000-46500	18-29
20	500	2000	33000-52800	17-26	35000-55000	18-28
22	550	2427	37400-58300	15-24	--	--
24	600	2892	41800-63800	14-22	--	--
28	700	3935	50000-79200	13-21	--	--

准超高功率石墨电极技术指标

SHP TECHNICAL PARAMETERS

外形尺寸

Dimensions

准超高功率石墨电极外形尺寸重量表 Table of SHP Dimensions & Weight

直径 Nominal Dia		允许范围（mm） Permissible Range		长度 Length		允许范围（mm） Permissible Range		参考重量（kg） Reference Weight			
								Kg			
in	mm	max	min	in	mm	max	min	T3N	T3L	T4N	T4L
14	350	357	352	72	1800	1900	1700	292	--	295	292
				84	2100	2200	2000	340	--	344	340
16	400	408	403	60	1500	1600	1400	314	313	318	317
				72	1800	1900	1700	381	380	385	384
				84	2100	2200	2000	444	443	450	447
18	450	460	454	72	1800	1900	1700	477	476	485	481
				84	2100	2200	2000	558	556	567	564
				96	2400	2500	2300	641	640	650	647
20	500	511	505	72	1800	1900	1700	583	--	592	587
				84	2100	2200	2000	687	--	695	690
				96	2400	2500	2300	790	--	794	793
22	550	562	556	84	2100	2200	2000	--	--	--	830
				96	2400	2500	2300	--	--	--	950
				108	2700	2800	2600	--	--	--	1084
24	600	613	607	84	2100	2200	2000	--	--	1000	990
				96	2400	2500	2300	--	--	1146	1138
				108	2700	2800	2600	--	--	1294	1286
28	700	714	710	84	2100	2200	2000	--	--	--	1329
				96	2400	2500	2300	--	--	--	1536
				108	2700	2800	2600	--	--	--	1738

项目 Item		单位 Unit	公称直径（mm）Nominal Diameter				公称直径（mm）Nominal Diameter							
			YB/T4090行业标准(Industry Standard)				JSJL-UHP企业标准（Enterprise Standard）				JSJL-UHP 实测值 （Measured Value）			
			300\400	450\500	550\600	700\800	300\400	450\500	550\650	650\700	350\400	450\500	550\650	650\700
电阻率 Electric Resistivity	电极 Electrode	μ Ω M	≤6.2	≤6.3	≤6.0	≤5.8	4.8-5.8	4.8-5.8	4.5-5.6	4.5-5.6	4.5-5.8	4.5-5.8	4.5-5.6	4.5-5.2
	接头 Nipple		≤5.3	≤5.3	≤4.5	≤4.3	3.4-3.8	3.4-3.8	3.4-3.8	3.0-3.5	3.4-3.8	3.4-3.8	3.4-3.8	3.0-3.5
体积密度 Bulk Density	电极 Electrode	g/cm³	≥1.67	≥1.66	≥1.66	≥1.68	1.72-1.74	1.70-1.72	1.70-1.72	1.70-1.72	1.73-1.75	1.70-1.73	1.70-1.72	1.70-1.72
	接头 Nipple		≥1.74	≥1.75	≥1.78	≥1.78	1.79-1.84	1.80-1.86	1.82-1.88	1.84-1.88	1.80-1.84	1.80-1.84	1.83-1.87	1.84-1.88
抗折强度 Flexural Strength	电极 Electrode	MPa	≥10.5	≥10.5	≥10.0	≥10.0	12.0-15.0	12.0-14.0	10.0-14.0	10.0-14.0	12.0-14.0	12.0-14.0	10.0-14.0	10.0-14.0
	接头 Nipple		≥20.0	≥20.0	≥22.0	≥23.0	22.0-26.0	22.0-28.0	22.0-30.0	25.0-30.0	22.0-26.0	23.0-28.0	23.0-30.0	25.0-30.0
抗膨胀系数 CTE	电极 Electrode	10 $^{-6}$/℃	≤1.5	≤1.5	≤1.5	≤1.5	1.2-1.4	1.2-1.4	1.2-1.4	1.2-1.4	1.2-1.4	1.2-1.4	1.2-1.4	1.2-1.4
	接头 Nipple		≤1.4	≤1.4	≤1.3	≤1.3	1.0-1.4	1.0-1.2	1.0-1.2	1.0-1.2	1.0-1.2	1.0-1.2	1.0-1.2	1.0-1.2
弹性模量 Elastic Modulus	电极 Electrode	GPa	≤14.0	≤14.0	≤14.0	≤14.0	10.0-14.0	10.0-14.0	10.0-14.0	10.0-14.0	10.0-13.0	10.0-13.0	9.0-13.0	9.0-13.0
	接头 Nipple		≤20.0	≤20.0	≤22.0	≤22.0	16.0-18.0	16.0-19.0	18.0-20.0	18.0-20.0	16.0-18.0	16.0-18.0	18.0-20.0	18.0-20.0
灰分 Ash	电极 Electrode	%	≤0.5	≤0.5	≤0.5	≤0.5	≤0.2	≤0.2	≤0.2	≤0.2	0.01-0.15	0.01-0.15	0.01-0.15	0.01-0.15
	接头 Nipple													
真密度 Real Density	电极 Electrode	g/cm³	--	--	--	--	2.22-2.24	2.22-2.24	2.21-2.24	2.22-2.24	2.22-2.23	2.22-2.23	2.22-2.24	2.22-2.24

公称直径 Nominal Diameter		截面积 Cross Sectional Area	YB/T4090 行业标准 (Industry Standard)		JSJL-UHP企业标准 (Enterprise Standard)			
			允许电流负荷 Permissible Current Load	电流密度 Current Density	粗炼炉（EAF） 允许电流负荷 Permissible Current Load	电流密度 Current Density	精炼炉（LF） 允许电流负荷 Permissible Current Load	电流密度 Current Density
in	mm	cm²	A	A/cm²	A	A/cm²	A	A/cm²
14	350	937	20000-30000	20-30	21000-32000	22-32	23000-34000	24-35
16	400	1275	25000-40000	19-30	26000-42000	20-33	28000-46000	22-36
18	450	1622	32000-45000	19-27	33000-49000	20-30	36800-52000	23-32
20	500	2000	38000-55000	18-27	40000-60000	20-30	43000-63000	22-32
22	550	2427	45000-65000	18-27	45000-68000	18-28	45000-69000	18-28
24	600	2892	50000-75000	18-26	52000-81000	18-28	--	--
28	700	3935	70000-91000	18-23	70000-100000	18-27	--	--

超高功率石墨电极技术指标

UHP TECHNICAL PARAMETERS

外形尺寸

Dimensions

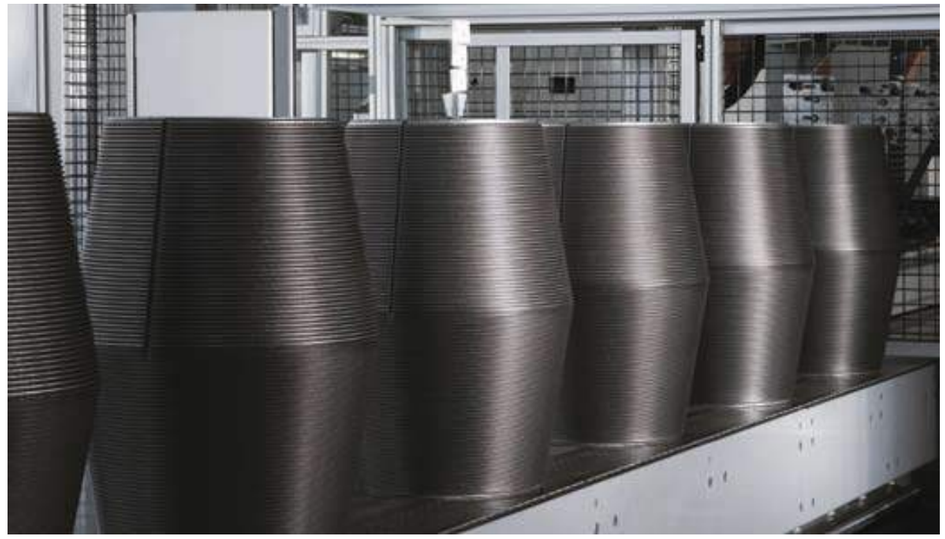
超高功率石墨电极外形尺寸重量表Table of UHP Dimensions & Weight

直径 Nominal Dia		允许范围（mm） Permissible Range		长度 Length		允许范围（mm） Permissible Range		参考重量（kg） Reference Weight			
								Kg			
in	mm	max	min	in	mm	max	min	T3N	T3L	T4N	T4L
14	350	357	352	72	1800	1900	1700	294	--	297	294
				84	2100	2200	2000	342	--	347	342
16	400	408	403	60	1500	1600	1400	315	314	320	318
				72	1800	1900	1700	383	382	388	386
				84	2100	2200	2000	447	446	453	450
18	450	460	454	72	1800	1900	1700	477	476	486	483
				84	2100	2200	2000	561	560	570	567
				96	2400	2500	2300	645	644	654	651
20	500	511	505	72	1800	1900	1700	587	--	595	590
				84	2100	2200	2000	691	--	699	694
				96	2400	2500	2300	795	--	803	798
22	550	562	556	84	2100	2200	2000	--	--	--	835
				96	2400	2500	2300	--	--	--	959
				108	2700	2800	2600	--	--	--	1085
24	600	613	607	84	2100	2200	2000	--	--	1003	995
				96	2400	2500	2300	--	--	1152	1144
				108	2700	2800	2600	--	--	1301	1293
28	700	714	710	84	2100	2200	2000	--	--	--	1337
				96	2400	2500	2300	--	--	--	1540
				108	2700	2800	2600	--	--	--	1743

3TPI超高功率接头外形尺寸重量表

TABLE OF 3TPI NIPPLE DIMENSIONS &WEIGHT

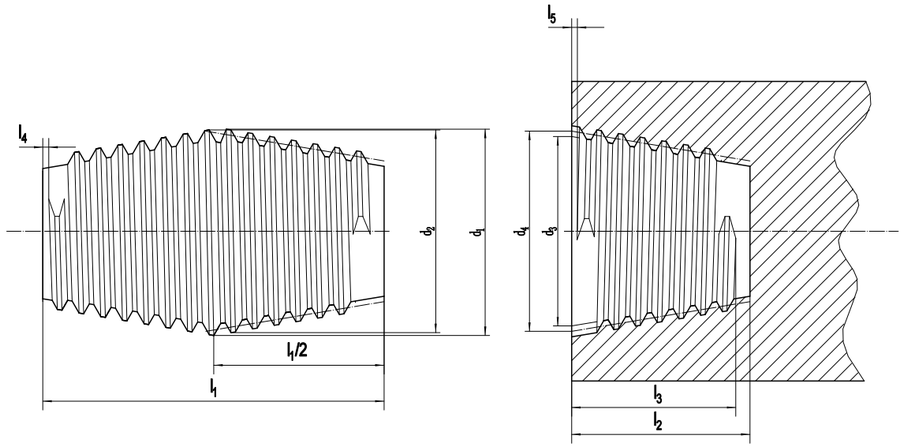
3扣超高功率接头外形尺寸重量表 Number of threads per inch=3					
电极直径 in	Eletrode Dia mm	扣 型 Nipple Shape	接头直径 Nipple Diameter mm	接头长度 Nipple Length mm	参考重量（kg） Reference Weight UHP
10	250	155T3N	155.57	220.00	5.48
12	300	177T3N	177.16	270.90	8.70
14	350	215T3N	215.90	304.80	14.97
16	400	241T3N	241.30	338.70	21.25
18	450	273T3N	273.50	355.60	29.00
20	500	298T3N	298.45	372.60	36.84

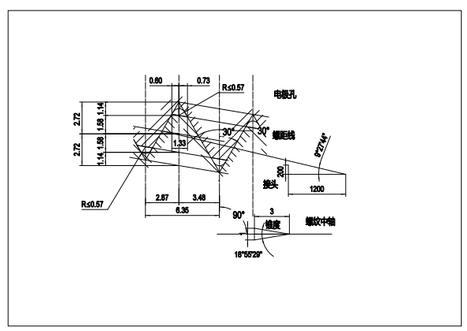


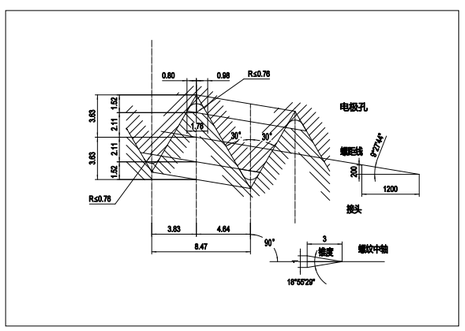
4TPI超高功率接头外形尺寸重量表

TABLE OF 4TPI NIPPLE DIMENSIONS &WEIGHT

4扣超高功率接头外形尺寸重量表 Number of threads per inch=4					
电极直径 in	Eletrode Dia mm	扣 型 Nipple Shape	接头直径 Nipple Diameter mm	接头长度 Nipple Length mm	参考重量（kg） Reference Weight UHP
10	250	152T4N	152.40	190.50	4.77
12	300	177T4L	177.80	215.90	7.52
14	350	203T4N	203.20	254.00	11.56
14	350	203T4L	203.20	304.80	14.95
16	400	222T4N	222.25	304.80	16.21
16	400	222T4L	222.25	355.60	18.16
18	450	241T4N	241.30	304.80	19.59
18	450	241T4L	241.30	355.60	22.02
20	500	269T4N	269.88	355.60	28.21
20	500	269T4L	269.88	457.20	34.25
22	550	298T4L	298.45	457.20	43.34
24	600	317T4N	317.50	355.60	41.17
24	600	317T4L	317.50	457.20	50.28
28	700	374T4L	374.65	558.80	84.79







石墨接头外形及重量

NIPPLE DIMENSIONS AND WEIGHT

电极冶炼中出现问题分析指导

Guidance to Analysis of Electrodes Problems

电极在冶炼中出现各种问题的分析指导
GUIDANCE TO ANALYSIS OF ELECTRODES PROBLEMS

影响因素 Factors		电极折断 Body Breakage	接头折断 Nipple Breakage	电极柱松动 Loosening	端部掉块 Tip Spalling	线极损失 Bolt loss	氧化 Oxidation	电极消耗 Consumption
废钢中的不导电物	Nonconductor In Charge	◆	◆					
废钢块太大	Heavy Scrap In Charge	◆	◆					
变压器容量太大	Transformer Capacity Too Large	◆	◆		◆	◆	◆	◆
三相不平衡	Phase Lmbalance	◆	◆		◆	◆		◆
相旋转	Phase Rotation		◆	◆				
震动过大	Excessive Vibration	◆	◆	◆				
夹持器压力太高或太低	Clamper Pressure Too High Or Too Low	◆		◆				
炉盖电极孔与电极不同心	Roof Electeode Socket Disalignment With Electrode	◆	◆	◆				
炉盖上电极喷水冷却	Water Sprayed On Eledctrodes Above Roof							△
废钢预热	Scrap Preheating							△
二次电压太高	Secondary Voltage Too High	◆	◆		◆	◆		◆
二次电流太高	Secondary Current Too High	◆	◆		◆	◆	◆	◆
功率因数太低	Power Factor Too Low	◆	◆		◆	◆		◆
油消耗太高	Oil Consumption Too High				◆	◆	◆	◆
氧消耗过高	Oxygen Consumption Too High				◆	◆	◆	◆
出钢到出钢时间太长	Long Time Gap From Tapping To Tapping						◆	◆
电极浸入钢水中	Electrode Dipping					◆		◆
连接部位不清洁	Dirty Joint		◆	◆				
提升塞和扭紧工具未得到好的保养	Poorly Maintained Lift Plug And Tightening Tool		◆	◆			◆	
电极连接不紧	Lnsufficient Joint Tightening		◆	◆			◆	

注：△ 表示该项有益于电极行为。◆ 表示该项不利于电极行为。

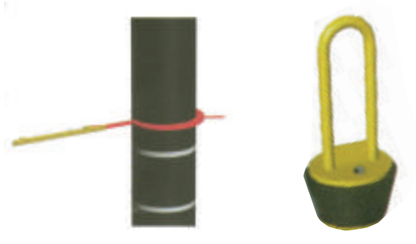
Note: △Lndicates Increased Performance. ◆ Lndicates Decreased Performance.

石墨电极推荐接合扭矩

Graphite Electrode Recommended Joint Torque

石墨电极推荐接合扭矩
GRAPHITE ELECTRODE RECOMMENDED JOINT TORQUE

电极直径 Eletrode Dia		扭矩 Torque	
mm	inch	Nm	ft-lbs
300	12	650	480
350	14	850	630
400	16	1100	810
450	18	1500	1100
500	20	2500	1850
550	22	3500	2570
600	24	4000	2940
700	28	6000	4410



预防保护与折损原因

Preventive Protection and Breakage Reasons

防止电极折断，脱扣和过度氧化的预防措施

Preventive Measures for Breakage, Releasing and Over Oxidation

- 调节好电极相序，三相交流电弧炉中，电极相序要正确，相序应为逆时针方向，若为顺时针方向，电极使用时会松动，造成折损。
- 减少由机械外力、炉内塌料和操作不当引起的折损和破损，装炉时大块钢料应尽量装在炉下层，且废钢料在炉内要分布均匀。
- 避免废钢中存在非导电材料，不要使石灰等非导电物体聚集在电极正下方，影响通电或折断电极。
- 注意炉盖位置，电极柱与炉顶孔对中，且电极柱平行，炉顶孔壁要经常清理，避免残留钢渣堆积而挤断电极。
- 保持电炉倾动系统的状况良好，使电炉倾动保持平稳。
- 选用强度高，加工精度好的优质接头，使用时避免多家产品混用。
- 保护好电极端面，防止端面氧化和嵌入异物造成端面不平整而影响电极间的连接。
- 电极和接头上，防止钢渣或异物嵌入影响连接，使用前，要用压缩空气吹净。
- 减少电极周界的氧化消耗，加强炉子的密封性，减少空气入侵炉内，尽量减少赤热电极在炉外暴露时间，规范吹氧操作。
- 对于熔炼炉，若条件允许，电极采用喷淋冷却技术，能有效降低电极侧面氧化消耗。

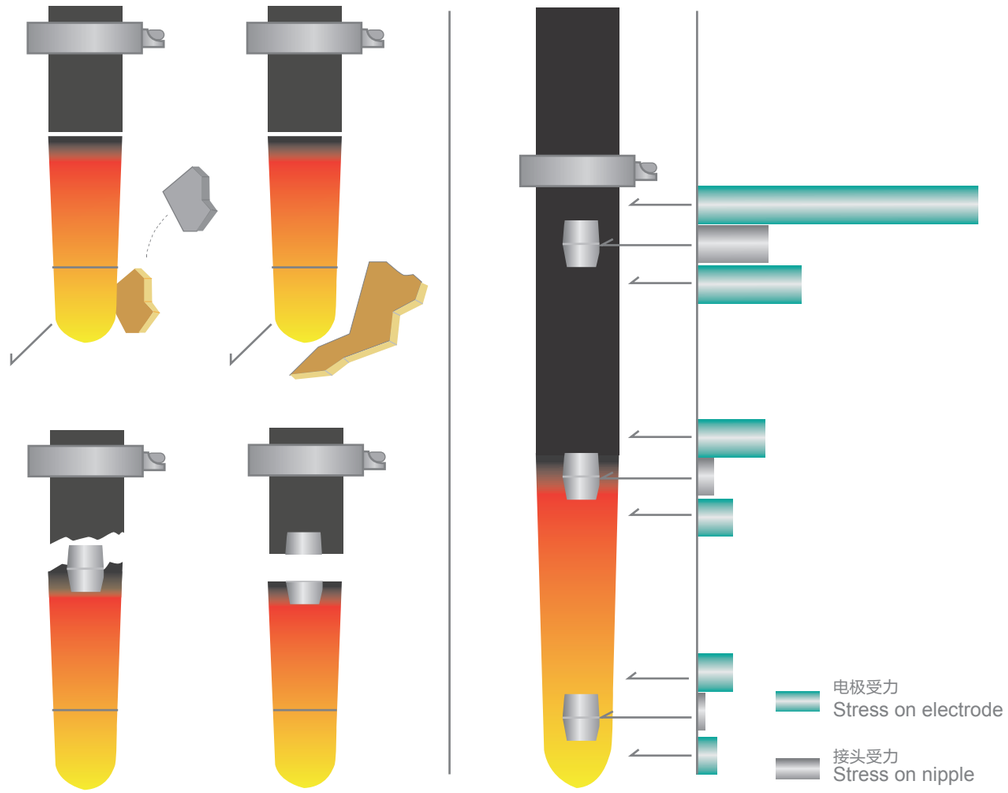
- The electrode phase sequence must be correct. In three-phase AC arc furnace, the electrode phase sequence should be counter-clockwise. If it was clockwise, the electrodes will be loose and to be damaged.
- In order to reduce the breakage and damage caused by mechanical force, inside material collapse and improper operation, the large steel material should be put in the lower layer of the furnace, and the scrapped steel should be evenly distributed in the furnace.
- Avoiding non-conductive materials are in scrap steel, do not allow non-conductive objects such as lime to accumulate directly below the electrodes, otherwise it would affect the electrification or break the electrode.
- Pay attention to the position of the furnace cover. The electrode pillar should be centered in the furnace top hole, and the electrode pillars should be parallel. The furnace roof should be cleaned regularly to avoid the electrodes being broken due to the accumulation of residual steel slag.
- Keep the tilting system in the good steady condition and keep the furnace being tilted reposefully.
- Using high-quality nipples with high strength and high precision. Avoid mixed-use nipples that are produced by different manufactures.
- Protect the end surface of the electrodes from being uneven because of oxidation and foreign matter inserting. Otherwise, it will influence the connection of electrodes.
- Clean electrodes and nipples with compressed air before applying it, in case it influences the connection due to slag or foreign matter.
- Reducing the oxidation consumption around the electrodes, strengthening the sealability of furnace and reducing air intrusion into the furnace. Minimizing the exposure time of red-hot electrodes outside the furnace and standardizing blowing oxygen operation.
- For smelting furnaces, using spray cooling technology if the conditions permit, which can reduce the oxidation consumption of electrodes effectively.

电极折损原因

The Causes of Electrode Breakage

- 电极受力状态，从上向下力的程度依次递减，位于夹持器下方的电极和接头部位受力最大。
- 当电极受到外力时：应力集中的外力 > 电极强度 → 导致电极折损 .
- 外力产生的原因有 : 熔化期大块炉料崩塌 , 废钢中电极下端不导电物体，块状流钢撞击等。
- 电极夹持器升降应答速度不协调，炉盖电极孔偏芯，电极连接不良使接缝处有间隙和使用强度不达标的接头等也易造成折断。
- 电极与接头加工精度不良，造成配合不好，也易造成接头折断。

- When the electrode is stressed, the degree of force decreases progressively from the top to bottom. The maximum stress is on the joint of electrode and nipple under the holder.
- When the electrode is subjected to external force: The external force of stress concentration > the strength of the electrode, and this will lead to the damage of the electrode.
- The causes of external force: the collapse of the big charging materials during the melting period, the non-conducting objects exist at the bottom of the electrode in the scrap steel, the impact of the nubby flowing steel.
- The causes of breakage:the incongruous response speed of the lifters, the deviated electrode the furnace cover holes from the core, the gaps between the joint of electrode and nipple and the unsubstandard nipples.
- Poor machining accuracy of electrodes and joints will also cause poor coordination and joint breakage.



块钢撞击使电极折损

The impact of steel block causes the breakage of electrode

增碳剂理化指标和粒度分布

Physicochemical Indexes and Grain Fineness Distribution of Carbon Additive

增碳剂
以煅烧石油焦为原料，将其置于石墨化炉中，经过石墨化加工工艺制作而成。
江龙增碳剂的特点是“两低一高”，即低硫、低氮、高碳。

Carbon Additive
Graphitized Petroleum Coke（GPC）is used Calcined Petroleum Coke as raw material. The calcined petroleum coke is placed in a graphitization furnace and made by graphitization process.
The Characteristics of Jianglong’s carbon additive: "Two Low One High": Low sulfur, Low nitrogen, High carbon.



石墨粉(0-2mm)

0-2mm Graphite Powder

成 分 Element	固定碳/F.C（最小/Min）	硫/S（最大/Max）	灰分/Ash（最大/Max）	挥发份/V.M.（最大/Max）	水分/H_2O（最大/Max）	氮/N（最大/Max）
含量 content %	99	0.02	0.2	0.3	0.1	0.1
粒度分布 grain fineness distribution	<0.15mm		0.15-2mm		>2mm	
含量 content %	<35		⩾ 57		<8	
粒度可按实际需求定制 Various granularity on -demand customization						

普通增碳剂(0-1mm)

0-1mm Common (Graphitized petroleum coke)

成 分 Element	固定碳/F.C（最小/Min）	硫/S（最大/Max）	灰分/Ash（最大/Max）	挥发份/V.M.（最大/Max）	水分/H_2O（最大/Max）	氮/N（最大/Max）
含量 content %	98	0.35	1.5	0.3	0.1	0.8
粒度分布 grain fineness distribution	<0.15mm		0.15-1mm		>1mm	
含量 content %	<10.5		⩾87.5		<2	
粒度可按实际需求定制 Various granularity on -demand customization						

普通增碳剂(1-5mm)

1-5mm Common (Graphitized petroleum coke)

成 分 Element	固定碳/F.C（最小/Min）	硫/S（最大/Max）	灰分/Ash（最大/Max）	挥发份/V.M.（最大/Max）	水分/H_2O（最大/Max）	氮/N（最大/Max）
含量 content %	98	0.15	1.6	0.4	0.1	0.5
粒度分布 grain fineness distribution	<1mm		1-5mm		>5mm	
含量 content %	<5		⩾ 92		<3	
粒度可按实际需求定制 Various granularity on -demand customization						

低氮增碳剂(1-5mm)

1-5mm Low Nitrogen（Graphitized petroleum coke）

成 分 Element	固定碳/F.C（最小/Min）	硫/S（最大/Max）	灰分/Ash（最大/Max）	挥发份/V.M.（最大/Max）	水分/H_2O（最大/Max）	氮/N（最大/Max）
含量 content %	98	0.1	1.3	0.4	0.1	0.3
粒度分布 grain fineness distribution	<1mm		1-5mm		>5mm	
含量 content %	<5		⩾ 92		<3	
粒度可按实际需求定制 Various granularity on -demand customization						

低氮增碳剂(5-10mm)

5-10mm Low Nitrogen（Graphitized petroleum coke）

成 分 Element	固定碳/F.C（最小/Min）	硫/S（最大/Max）	灰分/Ash（最大/Max）	挥发份/V.M.（最大/Max）	水分/H_2O（最大/Max）	氮/N（最大/Max）
含量 content %	98	0.1	1.4	0.4	0.1	0.2
粒度分布 grain fineness distribution	<5mm		5-10mm		>10mm	
含量 content %	<10		⩾ 85		<5	
粒度可按实际需求定制 Various granularity on -demand customization						

江龙的核心优势
Core Advantages of Jiang Long Carbon

地理区位优势
Advantages of Geographical Location

徐州地处苏、鲁、豫、皖四省交界，素有五省通衢之称，是国家综合交通枢纽。连霍、京福、京沪等国家高速公路主干线在此交汇，京沪、陇海两大干线铁路于此相交，京杭大运河傍城而过，徐州已经初步形成公路、铁路、水运、航空、管道五通汇流的立体化交通格局。强大的物流网络助力，产品配送迅捷，国内产品均可实现 48h 送达。

Xuzhou is located at the junction of provinces Jiangsu, Shandong, Henan and Anhui, known as the important national comprehensive transportation hub. It is the junction of national main lines of expressway and railway as well as Beijing-Hangzhou Grand Canal passes by. Xuzhou has already formed a three-dimensional traffic pattern of highway, railway, waterway, and airway. With the advantages of powerful logistics network, the products can be delivered fast within 48 hours in domestic.

机制灵活优势
Advantages of Flexible Management

江龙炭素是独资民营集团企业。管理扁平高效，运营响应灵敏，决策迅速精准; 明晰的权责、灵活的机制使公司在市场中往往夺得先机，深度拥有客户。坚持“协作缔造价值，合作必须共赢”的经营理念，深度耕耘市场，牢固客情关系。

Jianglong Carbon is a wholly-owned private group enterprise with efficient management system, can response and make decision quickly and accurately. It often catches the advantages and gets customers in the market with the clear responsibilities and flexible management. Jianglong insists the business concept “Team efforts creates values, Cooperation lead to win-win” to in-depth study market and establish customer relationship firmly.

煤电资源优势
Advantages of Resources

距工厂 1 公里，2 座百万吨焦炉煤气，是江龙炭素热处理焙烧工序优质稳定的气源保障。

The gas for baking is coke oven gas which is from coking plant 1 kilometer away from Jiang long factory, this coking plant has two coke ovens with capacity million tons. It is the guarantee of high quality and stable gas resources.

工厂毗邻不足 2 公里，装机容量 444MW 的火力发电厂是江龙炭素的战略伙伴，为公司石墨化热处理工序提供了强大可靠的电力能源保障。

The power for graphitization is the direct supplied from thermal power plant 2 kilometers away from Jiang long factory whose installed capacity is 444MW. The power plant is the strategic partner of Jianglong and provides the reliable power resources.

全程服务优势
Advantage of One-stop Service

精益求精，创新发展，感知责任，诚信共赢是江龙炭素的企业精神。公司的销售工程师团队，售前及时为客户提供价值咨询，售中始终为客户降本增效，售后坚持为客户分忧解惑。所有使用异议问题，24h 到达现场解决。

The enterprise spirit of Jianglong Carbon is continuous improvement, innovative development, sense responsibility, honesty & win-win.
Sales engineer team of Jianglong can provide pre-sales consultation service timely and valubly, help customers reduce cost and increase efficiency on sale and persist in solving customers' worries and puzzles after sales. All objection problems will be solved on site within 24 hours.

展望未来

Future Prospect

同心创业，大风歌里觅精神；合作共赢，微山湖畔绘蓝图；创新、开放、友好的江龙炭素将与各界携手共进，立足江苏，辐射全国，放眼全球，用自身实力和对社会的贡献，用诚信和品质打造中国炭素行业的卓越品牌，让江龙牌享誉国际。

Jianglong will insist the spirit consensus and synerg in business and win-win cooperation.
Jianglong will make progress together with all works of life with its innovation, open-mindedness and kindness attitude.
Jianglong will keep a foothold in Jiangsu, extend in China and all of the world.
Jianglong will build the outstanding brand of carbon industry with Its abundant strength, contribution to society, integrity and high quality.
Jianglong will to be renowned in the whole world with Its persistent efforts.