

河南国高矿山机械有限公司

Henan Guogao Mining Machinery Co., Ltd.

# 氧化铜矿石阴极铜生产线

Copper Oxide Ore Cathode Copper Production Line

## 技术方案 Technical solution

Design output: Cathode copper 3Tons per day

Date: 6th April, 2025

# 第一章 Chapter 1

## 一、项目概述 Project Overview

### 1. 原料状况 Raw material conditions

铜矿石图片  
Copper Ore Pictures



铜矿石形状、尺寸 Copper ore shape and size

粒径 Diameter 50-500mm

铜矿石铜平均含铜量 Average copper content of copper ore

Cu 2.5%

铜矿石日需求量 Daily demand for copper ore

根据含量设计为需求量 120 吨/天 Designed according to the content, the demand is 120 tons/day

阴极铜板纯度 Cathode copper plate purity

Cu 99.99%



## 2. 电解铜铜板产品状况 Product status of cathode copper plate

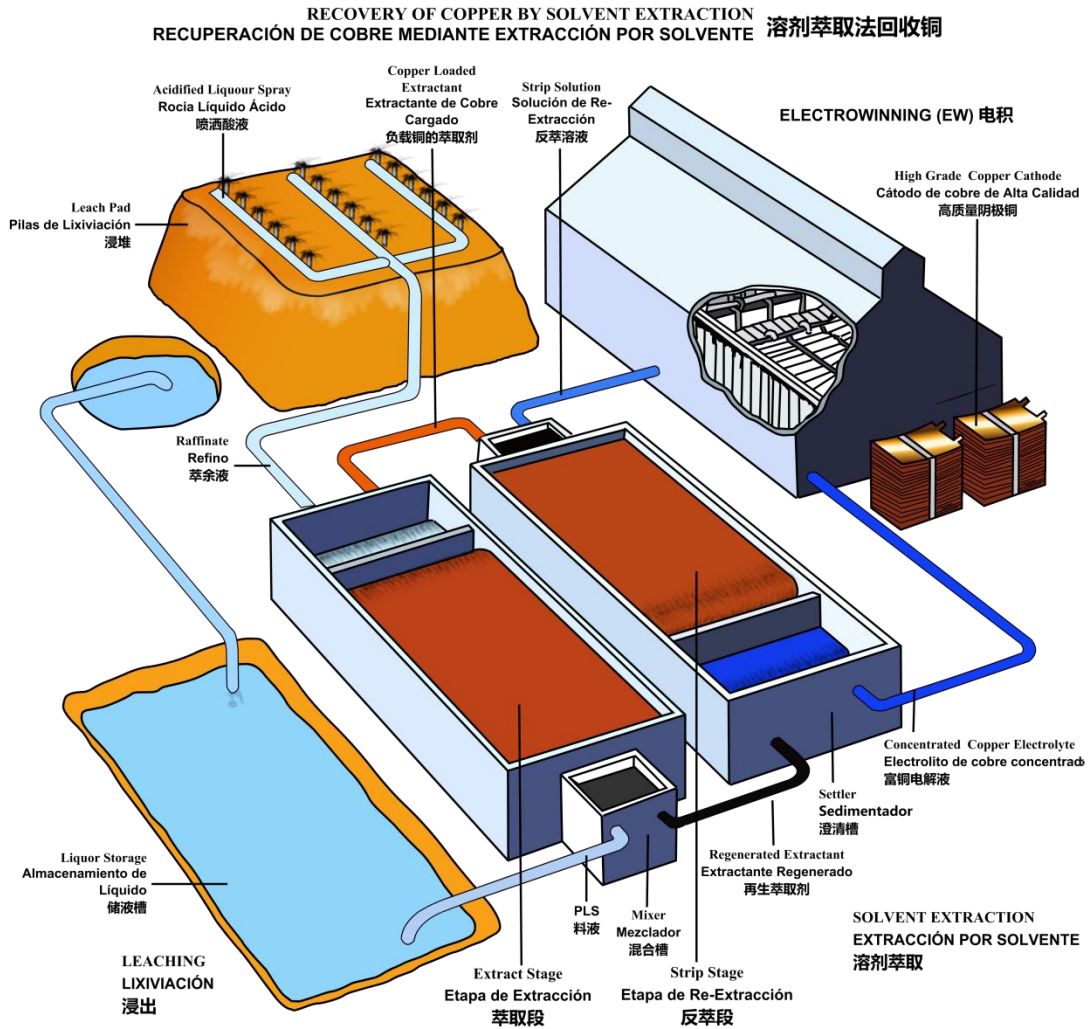
阴极铜板图片 Cathode copper plate picture	
阴极单片重量 Cathode copper single piece weight	约 About 77kg
阴极铜板尺寸 Cathode copper plate size	880*880*10mm
阴极铜板纯度 Purity	Cu 99.99%
铜板日产出量 Daily output of cathode copper plates	设计产量 3 吨/天/24 小时 Designed output: 3 tons/day/24 hours

## 3. 客户方场地状况 Customer site conditions

场地总面积 Total site area	8.5 公顷 hectares
场地现状 Site status	地表平整 Surface leveling
设计厂房面积 Design factory area	总计 Total 4000 m <sup>2</sup> 硫酸铜萃取车间 Copper sulfate extraction workshop 2000 m <sup>2</sup> 电积铜车间 Electrolytic copper workshop 2000 m <sup>2</sup>
设计尾矿坝面积 Designed tailings dam area	总计 5 公顷          Total 5 hectares



## 二、项目示意图 Project diagram

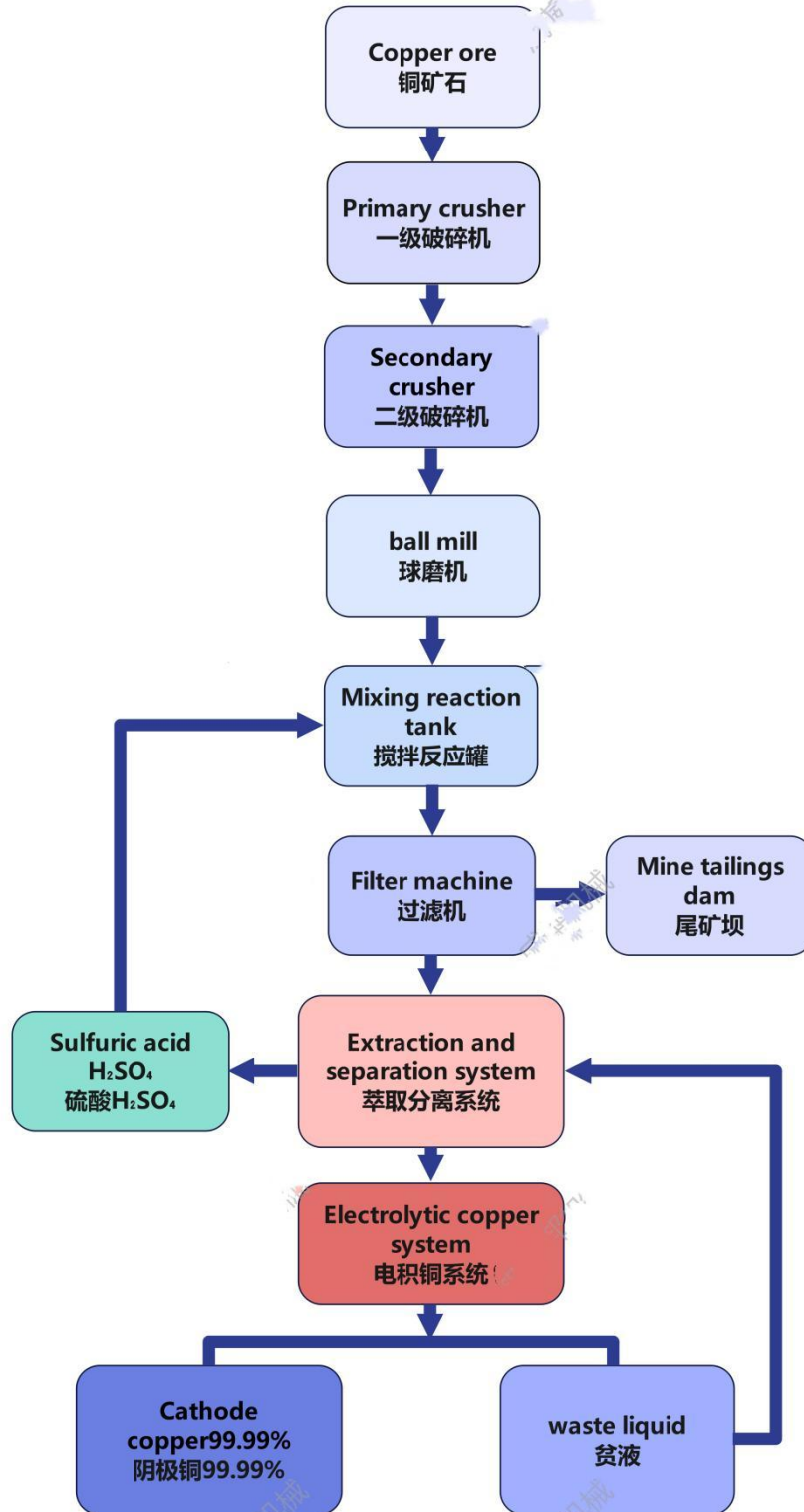






Copper ore wet process flow chart

铜矿石湿法工艺流程



### 1. 生产成本核算表单，生产 1 吨铜板的消耗量

#### Production cost accounting form, consumption of producing 1 ton copper plate

序号 Serial number	消耗品 Consumables	需求值 (铜板 /1 吨 ) consumption(cathode copper plate/1 ton)	3 吨铜板消耗量 3 tons of cathode copper plate consumption
1	铜矿石 copper ore	40tons	120tons
2	硫酸 sulfuric acid	3-5tons	9-15tons
3	电力 Electric power	5000kwh	15000kwh
4	萃取剂 Extractant	2kg USD10000/Ton	6kg
5	稀释剂 航空煤油 aviation kerosene	17kg USD2100/Ton	51kg
6	机械设备耗材 Mechanical equipment consumables	USD100	USD300
7	辅助原料耗材 Chemical Equipment Consumables	USD30	USD90
8	人员 Staff	20 Persons	20Persons
9	燃油 loader diesel	150L	450L
10			

### 2. 电力配置系统需求表单

#### Power Configuration System Requirements Form

序号 Serial number	配置系统 Configure tsystem	单机功率 Unit power	总功率 Total power
1	皮带输送机 Belt conveyor	11KW*8set	88KW
2	震动给料机 Vibrating feeder	11KW*1set	
3	粗鄂破机 Jaw crusher	55KW*1set	55KW
4	细鄂破机 Fine Jaw crusher	30KW*2set	60KW
5	震动筛 Vibrating screen	22KW*1	22KW
6	球磨机 Ball mill	180KW*2set	360KW
7	螺旋分级机 Spiral classifier	14KW*2set	28KW




8	渣浆泵 Slurry pump	18.5KW	18.5KW
9	搅拌浸出单元 Stirring reaction unit	100KW	100KW
10	过滤硫酸铜单元 Copper sulfate filtration unit	30KW	30KW
11	萃取分离单元 Extraction separation unit	100KW	100KW
12	电积铜单元 Electrolytic copper unit	300KW	300KW
13	生活用电 Life use electric		
14	其他用电 Other use electric		
			1172.5KW

### 三、破碎磨粉单元 Crushing&Grinding Unit

500TPD Capacity Copper oxide ore crushing&Grinding

Plant(10MT//Day cathode copper)

500 吨/天产能氧化铜矿破碎和研磨（10 吨每天/ 阴极铜）

序号 Serial number	名称 Name	参数 Parameter	数量 Qty	备注 Remark
1	料斗 Silo	钢制 Steel		现场钢材焊接制作 On-site steel welding and fabrication
2	震动给料机 Vibrating feeder	1.型号 model ZSW380x96 2.最大给料粒度 500mm The maximum feed size is 500mm. 3. 处理能力 90-200 吨 Processing capacity: 90-200 tons 4.功率 power 11kw 5.料槽尺寸 3800x960mm The size of the feeding trough	1set	







		<p>3800x960mm</p> <p>6.外形尺寸 Overall dimensions 3882x2224x2121 mm</p> <p>7.机器重量 3.98 吨 The machine weighs 3.98 tons.</p>		
3	<p>粗鄂破 Jaw crusher</p>	<p>1. 型号 model PE500x750</p> <p>2. 处理能力 45~110 吨/小时 Processing capacity: 45~110 tons/hour</p> <p>3. 给料最大尺寸 425mm The maximum size of the feed is 425mm</p> <p>4. 出料口调整范围 65~140mm The adjustment range of the discharge port is 65~140mm</p> <p>5. 尺 寸 size 2035x1921x2000mm</p> <p>6. 功率 power 55KW</p> <p>7. 重型轴承座 Heavy-duty bearing housing</p> <p>8. 高锰钢耐磨衬板 High manganese steel wear-resistant lining plate</p> <p>9. 机器重量约 11 吨 The machine weighs about 11 tons.</p> <p>10. 控制柜 1 台 1 control cabinet</p>	1 set	



<p>4</p>	<p>细鄂破 Fine Jaw crusher</p>	<p>1.型号 model PEX250x1000 2.处理能力 15~60 吨/小时 Processing capacity 15~60tons/hour 3.给料最大尺寸 210mm The maximum size of the feed is 210mm. 4. 出料口调整范围 15~60mm The adjustment range of the discharge port is 15~60mm 5.尺寸 Dimension 1550x1964x1380mm 6.功率 Power 30KW 7.重型轴承座 Heavy-duty bearing seat 8. 高锰钢耐磨衬板 High manganese steel wear-resistant lining plate 9. 机器重量约 5 吨 The machine weighs about 5 tons. 10.控制柜 1 台 1 control cabinet</p>	<p>2sets</p>	
<p>5</p>	<p>震动筛 Vibrating screen</p>	<p>1.型号 model 2YA1860 2.处理能力 80~450 吨/小时 Processing capacity: 80~450 tons/hour 3.功率 power 22KW 4.重量 7 吨 Weight: 7 tons 5.双层 筛网尺寸 3-100mm Double layer, mesh size 3-100mm 6.筛网规格 1800x6000mm</p>	<p>1set</p>	



		Screen size 1800x6000mm		
6	料仓 Silo	储存破碎后的铜矿石原料 Storage of crushed copper ore raw materials	1set	On-site steel welding
7	电磁震动给料机 Electromagnetic Vibrating Feeder	1. 型号 model GZ3 2. 功率 power 0.2KW	2sets	
8	湿式球磨机 Wet ball mill	1. 型号 model $\Phi 1800 \times 4500$ 2. 处理能力 10~18 吨/小时 Processing capacity: 10~18 tons/hour 3. 进料粒度小于等于 25mm Feed particle size is less than or equal to 25mm 4. 24 小时工作 24-hour work 5. 功率 Power 155KW 6. 高锰钢耐磨衬板 High manganese steel wear-resistant lining plate 7. 钢球一次容量 15 吨 The capacity of steel balls is 15 tons at a time. 8. 球磨机本机重量约 32 吨 The ball mill weighs about 32 tons. 9. 控制柜 1 台 1 control cabinet	2sets	 



<p>9</p>	<p>螺旋分级机 Spiral classifie</p>	<p>1.型号 Model 1800x12000 2.功率 Power 22KW 3.螺旋叶片耐磨板，更换快捷 Spiral blade wear-resistant plate, quick replacement 3. 机器重量约 11 吨 The machine weighs about 11 tons.</p>	<p>2sets</p>	
<p>10</p>	<p>皮带输送机 Belt conveyor</p>	<p>1. 宽度 650mm 长度 15 米根据 实际情况调整长度 Width: 650mm Length: 15m Adjust the length according to the actual situation 2. 耐磨多层纤维橡胶带 Abrasion-resistant multi-layer fiber rubber belt 3. 输出产量 130-320 吨/小时 Output capacity: 130-320 tons/hour 4. 输出速度 1.3-1.6m/秒 Output speed 1.3-1.6m/s 5. 功率 power 11KW</p>	<p>8sets</p>	
<p>11</p>	<p>浆池 slurry pond</p>	<p>1. 长 3 米 宽 3 米 深 3 米 Length 3 meters, width 3 meters, depth 3 meters 2. 储存矿浆 Storing ore slurry 3. 底部倾斜，接泵 The bottom is slanted, connected to the pump.</p>	<p>1Group</p>	<p>On-site made 现场制作</p>





<p>12</p>	<p>渣浆泵 Slurry pump</p>	<p>1. 型号 model 80ZJ-I-A33 2. 品牌 石家庄石泵 Brand: Shijiazhuang Shi Pump 3. 功率 power 18.5kw 4. 流量 43~174 立方/小时 扬程 8~43.2 米 Flow rate 43~174 cubic meters/hour Hydraulic head 8~43.2 meters 5. 过流部件材质为高铬耐磨合金 The material of the overcurrent part is high chromium wear-resistant alloy.</p>	<p>2 sets One for backup and one for use 一备一用</p>	
<p>13</p>	<p>控制柜 control cabinet</p>	<p>分控皮带机 振动筛 Distributed belt conveyor, vibrating screen</p>	<p>1set</p>	
<p>14</p>	<p>装载机 Loader</p>	<p>客户自备 customer purchase byself</p>		



## 四、浸出搅拌单元 Leaching stirring unit(3tons per day cathode copper)

序号 Serial number	名称 Name	参数 Parameter	数量 Qty	装机功率 Power
1	<b>搅拌浸出工段 Stirring leaching section</b>			
1.1	耐酸渣浆泵 Acid resistant slurry pump	1.型号 Model 6/4D-AH Q=100m <sup>3</sup> /h Head=20m 2. 材质耐酸防腐 Material acid resistant and anti-corrosion	2sets	18.5KW
1.2	搅拌浸出罐 Mixing leaching tank	1. 尺寸 SizeΦ4000*4500mm 2. 材质 Material PP-Agrade plate 3. 厚度 30mmPP 板材 Thickness 30mm PP plate 4. 外部槽钢加强支撑骨架 External channel steel reinforced support frame	4sets	On-site welding Made
1.3	搅拌轴 Stirring shaft	1. 材质 316L 不锈钢外包 PP 耐磨树脂层 Material: 316 L stainless steel with PP wear-resistant resin layer 2. 尺寸 Dimension 120*4500mm	4sets	配搅拌叶片 With mixing blade
1.4	搅拌机 mixer	1. 型号 ModelRF90-17	4sets	减速机配电机 Speed reducer with



		2. 电机功率 Motor power 18.5KW		motor 18.5KW*4=74KW
1.5	搅拌钢支撑架 Stirring steel support frame	1. 重型槽钢材焊接支撑座 Heavy steel welded support base 2. 固定于水泥平台 Fixed on cement platform	4set	现场 225 槽钢焊接制作 On-site welding and fabrication of 225 groove steel
1.6	出料闸板阀门 Discharge gate valve	1. 型号 Model DN150 2. 材 质 316L Material: Acid-resistant PTFE lining	4sets	闸板阀 Gate valve
1.7	搅拌支架水泥平台 Stirring support concrete platform	1. 钢材焊接 Steel welding 2. 槽钢链接四周楼梯 Connecting the stairs around the channel steel	/	客户负责基建混凝土和预埋螺栓 The customer is responsible for the construction concrete and embedded bolts
1.8	工艺管道 Process piping	1. 材 质 texture of timber PVC/pp/PE 2. 尺寸 size 20-63mm 3. 数量约 200 米 The quantity is about 200 meters	200m	配套法兰 Supporting flange
1.9	清水消防管道 Clean water pipe	1. 室外抗氧化材质 PE PE outdoor anti-oxidation material 2. 尺寸 20-63mm Size: 20-63mm 3. 数量约 200 米 The quantity is about 200 meters.	200m	
2	<b>浓硫酸工段 Concentrated sulfuric acid section</b>			



2.1	浓硫酸储存罐 Concentrated sulfuric acid storage tank	1.罐体 Cylinder Φ3000*9000 2. 容量 capacity100t 3. 现场焊接罐体 On-site welding tank	1sets	客户自备，或者付费 我方提供 Customers can prepare it by themselves, or we can provide it for a fee
2.2	浓硫酸泵 Concentrated sulfuric acid pump	1. CQB32-180FT 2. 功率 Power5.5KW 3. 耐酸腐蚀氟合金磁力泵 Acid corrosion resistant fluorine alloy magnetic pump	2sets	5.5KW*2=11KW
2.3	酸泵变频控制器 Acid pump frequency converter controller	1.FRN7.5G1S-4C 2.富士台达机电品牌 Fuji Taida Electromechanical brand	1set	单独防水电柜 Separate waterproof electrical cabinet
2.4	渗水井泵 Seepage well pump	1.PBZ50-50-125 Q=20m3/hour、Head=16m 2.功率 power 3KW	1set	3KW, 316L 潜水泵 Submersible pump
2.5	回液泵 Recirculation pump	1. Q=50m3/hour Head=40m 2. 功率 Power7.5KW 3. 不锈钢潜水泵 Stainless steel submersible pump	2sets	7.5KW*2=15KW
3	<b>浸出液工段 Leaching liquid section</b>			
3.1	浸出液储池 Leachate storage pool	1.水池尺寸 Size of the pool 30000*15000*5000mm 2.容积量 Volume: cubic meter2250m <sup>3</sup>	2Group	客户负责基建挖水池 我方负责现场施工防 渗漏含材料 The customer is responsible for the construction and digging of the water pool. We are responsible for the





				on-site construction of anti-leakage materials.
3.2	浸出液泵 Leaching liquid pump	1.型号 Model: IHF125-100-250 Q=100m <sup>3</sup> /hour Head=20m 2.功率 Power15KW 3.材质聚四氟乙烯 Material: Polytetrafluoroethylene	2sets	15KW*3=45KW 1 备 1 用 One for backup and one for use
3.3	浸出液泵变频器 Leaching liquid pump frequency converter	1.变频调速器 Variable frequency speed governor 2.台达品牌 Delta brand 3.18.5KW	2sets	单独防水电柜,1 备 1 用 Separate waterproof cabinet, One for backup and one for use
3.4	浸出液超声波流量计 Ultrasonic flowmeter for leaching liquid	1. 型号 Model W900 2.电子式 Electronic type	1set	数字显示流量数值 The digital display shows the flow value
4	<b>萃余液工段 Extraction residue liquid process section</b>			
4.1	萃余液水池 Residual liquid pool	1. 尺寸 size 30000*21000*5000mm 2. 容积 volume 3150m <sup>3</sup>	1Group	客户负责基建挖水池 我方负责现场施工防渗漏含材料 The customer is responsible for digging the pool. We are responsible for the on-site construction anti-leakage materials.



4.2	萃余液泵 Azeotrope pump	1. 型号 Model IHF125-100-25 2. 功率 power 15KW 3. 材质耐酸防腐 The material is resistant to acid and corrosion.	2sets	15KW 一备一用 One for backup and one for use
4.3	萃余液水泵调速器 Water pump speed regulator for residual liquid	1. 变频调速器 Variable frequency speed governor 2. 台达品牌 Delta brand 3.37KW	1set	单独防水电柜 Separate waterproof electrical cabinet
4.4	萃余液超声波流量计 Ultrasonic flowmeter for residual liquid	1.型号 Model: W900 2.电子式 Electronic type	1set	屏幕显示流量数值 The screen displays the flow value.
5	<b>清水工段 Clean water section</b>			
5.1	清水储存池 Clean water storage pool	1. 尺寸 Dimension 30000*9000*5000mm 2. R 容积 capacity1350m <sup>3</sup> cube	1Group	客户负责基建挖水池 我方负责现场施工防渗漏含材料 The customer is responsible for digging the pool. We are responsible for the on-site construction anti-leakage materials.
5.2	清水抽水泵 Clean water pump	1. 型号 Model: IHF125-100-200 2. 功率 Power 11KW	1set	11KW 潜水泵 Submersible pump
5.3	清水超声波流量计 Clean water ultrasonic flow meter	1.型号 Model: W900 2.电子式 Electronic type	1pcs	屏幕显示流量数值 The screen displays the flow value.



5.4	洗涤液超声波流量计 Washing liquid ultrasonic flow meter	1.型号 Model W900 2.电子式 Electronic type	1 pcs	屏幕显示流量数值 The screen displays the flow value.
6	事故泵 Accident pump	1. 型号 Model HYF80-10 2. 功率 Power 4KW 3. 材质耐酸防腐 The material is resistant to acid and corrosion.	2sets	4KW 备用一个 Spare one 液下泵长杆 Long rod of submersible pump
6.1	配套管道、法兰链接 Supporting pipelines and flange connections	设备之间液体输送管道 Liquid transportation pipeline between equipment	50meters	材质 Material PVC、PP、PE
7	真空罐 vacuum tank	1. 型号 Model 1200L 2. 双球形封头 Double spherical head 3. 材质 Material PP	4sets	耐压结构 Pressure resistant structure
7.1	浸出液管道单向止回阀 One-way check valve for leaching liquid pipeline	1.材质 PP	10pcs	防止漏气 Prevent air leakage
8	管道、配件材质 PVC Pipe and accessories material PVC			
8.1	管道 Pipe	1.型号 Model DN32-DN200 材质 Material PVC、PE、PP	400meters	
8.2	阀门 Valve	1.型号 Model DN32-DN200 材质 Material PVC、PE、PP	200pcs	
8.3	活动连接 active connection	1.型号 Model DN32-DN200 材质 Material PVC、活接头 Live joint	100pcs	波纹管柔性连接，两端法兰固定 Flexible connection with corrugated pipe,



				fixed with flanges at both ends.
8.4	法兰盘 Flange plate	1.型号 Model DN32-DN200 材质 Material PVC、PE、PP、	200pcs	
8.5	密封垫片 Sealing gasket	1.型号 Model DN32-DN200 材质软 PVC、PE、PP	100pcs	
8.6	活动球阀 Activity ball valve	1.型号 Model DN32-DN200 材质 Material PVC、PE、PP、	50pcs	
8.7	手柄蝶阀 handle butterfly valve	1.型号 Model DN32-DN200 材质 Material PVC、PE、PP、	30pcs	
8.8	不锈钢 316L 螺栓、螺母、垫圈 Stainless steel 316L bolts, nuts, washers	1. 型号 Model M8-M30 2. 材质 316L Material 316L	1000pcs	316L 材质 Material 316L
8.9	PVC 粘结剂 adhesive	1.化工级别 Chemical grade	100 桶 bucket	新台塑产 Made in Taiwan







## 五、萃取分离单元 Extraction separation unit (3tons per day cathode copper)

序号 Serial number	名称 Name	参数 Parameter	数量 Qty	备注 Remark
1	混合室 萃取 2 级 Mixing chamber Forward extraction 2 stages	1. 萃取箱尺寸 Extraction box size (1600×1600×2200mm) 2. 单个萃取箱混合室有效容积 4.1m <sup>3</sup> The effective volume of the mixing chamber in a single extraction box is 4.1 m <sup>3</sup> . 3. 总共 8 立方 A total of 8 cubic meters	4sets	内净尺寸, 箱体板材 厚度 20mm 四周加强筋 20mm 槽钢四周包围焊接  Internal net size, box board thickness 20mm Four-sided reinforcement 20mm



				Welding around the perimeter of the groove steel
1.1	<p>洗涤室 1 级 Laundry room level 1</p>	<p>1. 萃取箱尺寸 Extraction box size (1600×1600×2200mm) 2. 单个萃取箱混合室有效容积 4m<sup>3</sup> The effective volume of the mixing chamber in a single extraction box is 4m<sup>3</sup>.</p>	4sets	<p>内净尺寸, 箱体板材厚度 20mm, 四周加强筋 20mm 槽钢四周包围焊接</p> <p>Internal net size, box board thickness 20mm Four-sided reinforcement 20mm Welding around the perimeter of the groove steel</p>
1.2	<p>反萃取 1 级 Anti-extraction stage 1</p>	<p>1.反萃箱尺寸 Reverse extraction box size (1600×1600×2200mm) 2.单个萃取箱混合室有效容积 4m<sup>3</sup> The effective volume of the mixing chamber in a single extraction box is 4m<sup>3</sup> 3.总共 4 立方 A total of 4cubic meters</p>	4sets	<p>内净尺寸, 箱体板材厚度 30mm, 加强筋 20mm 槽钢四周包围焊接</p> <p>Internal net size, box board thickness 30mm Four-sided reinforcement 20mm Welding around the perimeter of the groove steel</p>
1.3	<p>萃取澄清室混凝土平台 Concrete platform in extraction clarification room</p>	<p>1. 长 2000*宽 2000mm Length 2000*width 2000mm 2. 平台高度 1100mm Platform height 1100mm 3. 中间镂空栅格结构, 具体按照施工图纸 Hollow grid structure in the</p>	1set	<p>客户现场混凝土施工 Customer on-site concrete construction</p>



		middle, according to the construction drawing		
1.4	萃取澄清室 Extraction clarification room 澄清速率 7m <sup>3</sup> /m <sup>2</sup> /h Clarification rate: 7m <sup>3</sup> /m <sup>2</sup> /h	1. 箱体尺寸(高度 1200×宽 5000×长 7000mm) Box size (height 1200×width 5000×length 7000mm) 2. 单级有效容积: 35m <sup>3</sup> Single-stage effective volume: 35m <sup>3</sup>	4sets	内部采用独特往复循环的复式结构, 能够有效提高两倍的澄清速度, 箱体板材厚度 20mm, 盖板 12mm, PVC 调节阀备用各 2 套 The double structure with unique reciprocating circulation inside can effectively double the clarification speed, the thickness of the box plate is 20mm, the cover plate is 12mm, and there are two sets of PVC regulating valves as spare parts.
1.5	萃取搅拌电机、减速机 Extraction mixing motor, reducer	1. 型号 F97-11-180-4-7.5 Model F97-11-180-4-7.5 2. 功率 7.5KW Power 7.5KW 3. 电机品牌西门子 Motor brand: Siemens 4. 齿轮减速机 Gear reducer	4sets	配套 100*100mm 槽钢支撑钢架 备用 1 套 Supporting steel frame with 100*100mm channel steel Backup 1 set
1.6	萃取搅拌轴 Extraction stirring shaft	1. 叶轮旋转 780*2200mm Impeller rotation 780*2200mm 2. 材质内部 316L, 外部包裹 PVC Material 316L inside, PVC wrapped outside	5sets	法兰盘链接方式 PVC 叶轮备用 1 个, 质保 5 年 Flange connection



		3. 叶轮抗酸耐磨 The impeller is acid-resistant and wear-resistant 4. 316L 轴直径 100mm 316L shaft diameter 100mm		method One spare PVC impeller, 5-year warranty
1.7	搅拌调速器 Mixing speed regulator	1. 型号 Model: FRN7.5G1S-4C 2. 台湾台达品牌 Taiwan Delta brand	5sets	备用一台, 单独支架固定 A spare one, fixed by a separate bracket
1.8	搅拌支撑架 Mixing support stand	1. 槽钢现场焊接 Slot steel on-site welding 2. Q235B-200	6sets	单独支架固定 四周槽钢包围焊接, 确保牢固强度 Separate bracket fixing The four-sided channel steel is surrounded by welding to ensure strong strength.
1.9	萃取箱缓冲槽 Extraction box buffer tank	1. 尺寸 Dimension: 1000x1000x1500mm 2. 材质 Material PVC 3. 容积 capacity 1.5m <sup>3</sup>	4pcs	板材厚度 20mm 盖板厚度 12mm Board thickness 20mm Cover thickness 12mm
1.10	有机相储存槽 Organic phase storage tank	1. 尺寸 Dimension 5800x3000x1500 2. 材质 Material PVC 3. 容积 volume 26.1cube 立方	2pcs	箱体厚度 20mm, 盖板厚度 12mm Box thickness 20mm, cover thickness 12mm
1.11	超声波流量计 Ultrasonic flow meter	1. 型号 Model WB800 2. 电子感应款 Electronic inductive payment	3sets	塑料板固定架 Plastic plate fixing bracket 屏幕显示流量数值 The screen displays the flow value.
2	<b>贫液槽 Poor liquid tank</b>			
2.1	电贫液脱气槽 Electrolyte deaeration tank	1. 尺寸 Dimension 5800x3000x1500mm 2. 容积 volume 26.1 cube 立方	1sets	内净尺寸, 箱体板材厚度 30mm, Internal net size, box





				board thickness 30mm,
2.2	电贫液输送泵 Electrolyte-poor liquid delivery pump	1.型号 Model IHF100-65-250 Q=50m <sup>3</sup> /hour 、Head=20m 2.功率 power 7.5KW	1set	
2.3	电贫液超声波流量计 Electro-poor liquid ultrasonic flowmeter	1.型号 Model WB800 2.电子感应款 Electronic inductive payment	1set	塑料板固定架 Plastic board fixing frame 屏幕显示流量数值 The screen displays the flow value
3	<b>电富液 Electro-rich liquid</b>			
3.1	电富液脱油槽 Electric rich liquid deoiling tank	1. 尺寸 Dimension 5800x3000x1500mm 2. 容积 capacity 26.1cube 立方 *3=78.3m <sup>3</sup> 3. 材质 Material PVC	3pcs	箱体板材厚度 20mm, 盖板 12mm The thickness of the box plate is 20mm, and the cover plate is 12mm.
3.2	电富液输送泵 Electro-rich liquid de-oiling tank	1.型号 Model IHF125-100-250 Q=100m <sup>3</sup> /hour Head=20m 2.功率 Power15KW	2sets	WN 品牌电机 Brand motor
3.3	电富液超声波流量计 Electro-rich liquid ultrasonic flowmeter	1.型号 Model WB800 2.电子感应款 Electronic inductive payment	1set	塑料板固定架 Plastic plate fixing bracket 屏幕显示流量数值 The screen displays the flow value
3.4	萃余液脱油槽 Azeotrope oil removal tank	1. 尺寸 size5800x3000x1500mm 2. 容积 capacity 26.1cube 立方 *3=78.3 3. 材质 Material PVC	3 group	箱体板材厚度 20mm, 盖板 20mm The thickness of the box plate is 20mm, and the cover plate is 20mm.
4	<b>洗涤液槽 Washing liquid tank</b>			
4.1	洗涤液脱油槽 Washing liquid	1. 尺寸 size5800x3000x1500	2 group	箱体板材厚度 20mm, The thickness of the



	de-oiling tank	2. 容积 <b>volume 26*2=52m<sup>3</sup></b> 3. 材质 Material PVC		box body is 20mm,
4.2	洗涤液输送泵 Washing liquid delivery pump	1.型号 Model IHF125-100-250 Q=50m <sup>3</sup> /hour 、Head=20m 2.耐酸碱 Resistant to acid and alkali 3.功率 Power <b>7.5KW</b>	2sets	WN 品牌电机 Brand motor <b>1 开 1 备</b> <b>1 open 1 backup</b> <b>防爆*变频型</b> <b>Explosion-proof* frequency conversion type</b>
4.3	洗涤液超声波流量计 Washing liquid ultrasonic flow meter	1.型号 Model WB800 <b>2.电子感应款</b> <b>Electronic inductive payment</b>	1pcs	塑料板固定架 Plastic plate fixing bracket <b>屏幕显示流量数值</b> <b>The screen displays the flow value.</b>
5	<b>有机相输送 Organic phase liquid transport</b>			
5.1	有机相液输送泵 Organic phase liquid transfer pump	1.型号 Model IHF125-100-250 Q=100m <sup>3</sup> /h、Head=20m 2.耐酸碱 Acid and alkali resistant 3.功率 <b>Power 15KW</b>	1set	WN 品牌电机 brand motor <b>1 开 1 备</b> <b>防爆*变频型</b> <b>Explosion-proof* frequency conversion type</b>
6	变频调速器 Variable frequency speed governor	1.型号 Model FRN7.5G1S-4C 2.台达品牌 Delta brand 3 功率 Power 15KW	2sets	单独支架固定 <b>一用一备</b> A single bracket is fixed for one use and one spare.
7	变频调速器 Variable frequency speed governor	1.型号 Model FRN7.5G1S-4C 2.台达品牌 Delta brand 3.功率 Power 15KW	2sets	单独支架固定 <b>一用一备</b> A single bracket is fixed for one use and one spare.
8	污物处理箱 Garbage disposal	1. 尺寸 Dimension 1500x1500x2000	1pcs	板材厚度 Board thickness <b>20mm</b>



	box	2. 材质 Material PVC		
8.1	污水泵 Sewage pump	1. 功率 Power 2.2KW 2. 四氟内衬耐酸 The inner lining is resistant to acid. 3. 型号 IHF-65-40-125	1set	结构液下泵 Structural submersible pump
9	<b>板框压滤机 Plate and frame filter press</b>			
9.1	压滤机 filter press	1. 过滤面积 50 平 Filter area of 50 square meters 2. 功率 3KW Power: 3KW 3. 自动拉开板框出料结构 Automatic opening of the frame and discharge structure 4. 液压开合锁紧结构 Hydraulic opening and closing locking structure	1set	塑料耐磨板框 滤布压条更换快捷, 防漏 Plastic wear-resistant plate frame Filter cloth strips are quick to replace and leak-proof
9.2	压滤机泵 Filter Press Pump	1. 型号 Model SAJZ100-65-400 Q=20m <sup>3</sup> /hour、Head=40m 2. 功率 power11KW 3. 材质双相不锈钢 Material: dual-phase stainless steel	1set	11KW 金属泵头双相不锈钢 Dual-phase stainless steel metal pump head
9.3	压滤机接液槽 Filter press receiving tank	1. 材质 Material PVC	1set	板材厚度 20Material thickness20mm
10	事故泵 Accident pump	1. 型号 modelHYF80-10 2. 功率 power4KW	1 台 1 unit	
11	管道、法兰、螺栓 Pipes, flanges, bolts	1. 管道 PipePVC 2. 螺栓 bolt316L	配套 Matc hing	









## 六、电积铜单元 Electrolytic copper unit (3tons per day cathode copper)

序号 Serial number	名称 Name	参数 parameter	数量 Qty	备注 Remark
1	电解整流机组 Electrolytic rectifier unit	1. 输出 output KHS15000A-50V 2. 可控硅控制器 Thyristor controller 3. 输出可控硅控制型 Output controllable thyristor control	1set	电压和电流都按照 20%富余量设计 Both voltage and



		<p>type</p> <p>4. 外壳加装防腐塑料箱体 Add a corrosion-resistant plastic box to the shell</p> <p>5. 循环水冷主付散热装置 Circulating water-cooled main and auxiliary heat dissipation device</p>		<p>current are designed with 20% margin 电流密度 220A Current density 220A</p>
2.	电积槽 Electrolytic cell	<p>1. 尺寸 Dimension 3600*1000*1300mm</p> <p>2. 材质玻璃钢树脂结构 Material: Glass Fiber Resin Structure 每个电积槽阳极板数量 31 片 Anode plate quantity: 31 pieces (Each electrolyzer)</p> <p>3. 单槽产量每天 262KG Single trough output is 262KG per day</p> <p>4. 总产量 total output 262KG*16=4192KG</p>	16sets	<p>玻璃钢材质 抗氧化耐酸 使用寿命 15-20 年 Glass fiber reinforced plastic material Antioxidant and acid-resistant Service life of 15-20 years</p>
3	阴极铜板清洗槽 Cathode copper plate cleaning tank	<p>1. 尺寸 size3600*1000*1300mm</p> <p>2. 材质 Material PP</p>	1set	<p>板材厚度 20mm Material thickness 20mm</p>
4	铅阳极板 Lead anode plate	<p>1. 尺寸 size 850*1037*8mm</p> <p>2. 材质铅合金，单块 88KG Material lead alloy, single block 88KG</p> <p>3. 导电棒一次成型浇铸 The conductive rod is cast in one piece.</p> <p>4. 数量 496 片 Quantity: 496 pieces</p>	496pcs	<p>使用寿命 10 年 Service life: 10 years</p>



4.1	阳极板支架 Anode plate holder	1. 材质 Q235 焊接, Material Q235 welding 2. 油漆防腐 Paint anti-corrosion 3. 高度 height 1299*长度 Length 3500mm	1set	防腐处理 Anti-corrosion treatment
5	316L 母板工段 Motherboard workstation			
5.1	阴极母板 Cathode motherboard	1. 尺寸 size 880*950*3.25mm 2. 材质 Material 316L 3. 表面极化特殊处理技术 Surface polarization special treatment technology	60pcs	每天可以产生始极铜片 120 件  120 pieces of primary copper can be produced every day.
5.2	母板铜吊耳 Motherboard copper hanger	1. 材质铜 Material Copper Cu T2 2. 数量 Qty120 件	120pcs	良好导电 Good conductivity
5.3	阴极导电棒、cathode conductive rod	1. 材质铜 Material copper T2 2. 尺寸 size 1200*30*30mm 3. 壁厚 Wall thickness 3mm 4. 夹心款 Stuffed version	496pcs	方形铜管, 具备优良导电和散热 Square copper tube, with excellent conductivity and heat dissipation
5.4	阴极板支架 Cathode plate holder	1. 材质 Q235 焊接 Material: Q235 welded 2 油漆防腐 Paint anti-corrosion 3. 高 1200*长 3500mm Height 1200 * Length 3500mm	2sets	确保阴极板表面光滑, 不易损伤 Ensure that the cathode plate surface is smooth and not easily damaged
5.5	阴极包边条 Cathode edge strip	1. 材质高强度 ABS Material: high-strength ABS 2. 配套使用阴极板边框	200pcs	备用 20 件 20 pieces in reserve



		Use the frame of the cathode plate in conjunction 3. 保护阴极板断面 Protect the cross-section of the cathode plate		
5.6	始极片整形机器 Strip Forming Machine 一体化机器 压楞钉耳机 Integrated machine Stiffening nail headphones	1. 材质 Materail <b>Q235+316L</b> 制作 Make 2. 尺寸 Size 1200*1200*30mm 3. 电机功率 Power 5.5KW 4. 整形尺寸 Plastic size880*1000mm	1set	始极片的垂直平整性，避免电解槽阳极短路 The vertical flatness of the start electrode to avoid the anode short circuit in the electrolysis cell
5.7	剪板机 Shearing machine	1. 电动切刀型 Electric cutting knife type 2. 电机功率 3KW Motor power 3KW	1set	加工始极片边缘平整 The edge of the processed anode plate is flat.
6	电积槽用导电排 Conductive bars are used in electrowinning tanks			
6.1	母导铜排 Mother lead copper strip	1. 材质 Material <b>Copper Cu T2</b> 2. 尺寸 size 6000*200*10mm	20pcs	整流器输出正极到电积槽 Rectifier output positive electrode to electrolytic cell
6.2	槽间主导电铜排双极铜排 Inter-slot dominant copper strip, bipolar copper strip	1. 材质纯铜 Material <b>Copper Cu T2</b> 2. 长 Length 3200*100*20mm 3. 三角形+平板形 Triangle + flat shape	14pcs	采用实现同极双向导电，避免导电不良情况，对比传统链接方式，提高电流



				使用效率 2-3 倍 It adopts the realization of bipolar two-way conductivity to avoid poor conductivity, and improves the current utilization efficiency by 2-3 times compared with the traditional linking method.
6.3	槽间辅导铜排双极铜排 Slot-to-slot coaching copper strip, double-pole copper strip	1.材质纯铜 Material Copper Cu T2 2.长 Length 3000*50*10mm	32pcs	这种结构可以辅助提升，由于导电棒搭接不良引起的生产效率低的现象 This structure can help improve the phenomenon of low production efficiency caused by poor contact between conductive rods.
6.4	绝缘垫板 Insulation board	1. pp 材质 Fiberglass material 2. 长 Length 3500*150*20mm	32pcs	保护阳极阴极标准定为 The protection standard for





				anode and cathode is
7	高压聚乙烯颗粒球 High pressure polyethylene pellets	1. 材质 Material PE 2.耐酸 Acid resistant	2000kg	避免电积槽酸性气体挥发 Avoid the evaporation of acidic gases in the electrowinning tank
8	平台操作格栅板 Platform operation grating plate	1. 玻璃钢材质 Glass fiber reinforced plastic material 2. 黄色 Yellow	150 m <sup>2</sup>	工人操作平台底板 Worker operating platform bottom plate
9	电积槽混凝土支座 Concrete support for electrolytic cell	1. 电积槽架高 Electrolytic cell rack height 2. 整个混凝土平台 The entire concrete platform	/	按照图纸施工 Construct according to the drawings
10	管道、阀门 Pipes, valves	材质 Material PVC	150pcs	
11	电积槽四周操作支撑架 Operating support frame around the electrolytic cell	Q235 焊接油漆防腐 Welding paint anti-corrosion	100m	现场制作 On-site made
12	护栏、楼梯 Guardrails, stairs	Q235 焊接油漆防腐 Welding paint anti-corrosion	100m	现场制作 On-site made
13	PVC 垫板 Cushion plate	支座用 For the bracket	650kg	缓冲电积槽 Buffer electrowinning tank
14	萃取剂 Extraction agent	62tons 航空煤油 Aviation fuel oil 10tons 萃取剂 extraction agent		客户当地购买 Customers purchase locally



15	吸收塔 Absorption tower	消除电积车间酸味 Eliminate the acid smell in the electrolytic workshop	1set	
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## 七、电力控制电柜单元 Power control electrical cabinet unit

序号 Serial number	名称 Name	规格参数 Specifications	数量 Qty	备注 Remark
1	<b>机械破碎单元 Crushing &amp; Grinding unit</b>			
1.1	输送机、给料机控制电柜 Conveyor and feeder control cabinet	1. 电器采用中国名牌正泰电器 Appliances use China's famous brand, Zhengtai appliances. 2. 电柜箱体密封 Electrical cabinet box sealing 3. 配套报警系统 Supplementary alarm system	1set	按钮控制 button control
1.2	一级粗鄂破碎机控制电柜 Primary Jaw crusher control cabinet	1. 电器采用中国名牌正泰电器 Electrical appliances use China's famous brand, Zhengtai electrical appliances. 2. 电柜箱体密封 Electrical cabinet box sealing 3. 变频启动电机 Variable frequency starting motor	1set	保护软启动 Protect soft start
1.3	二级细鄂破碎机控制电柜 Secondary fine Jaw crusher control cabinet	1. 电器采用中国名牌正泰电器 Electrical appliances use China's famous brand, Zhengtai electrical appliances. 2. 电柜箱体密封 Electrical cabinet box sealing 3. 变频启动电机 Variable frequency starting motor	1set	保护软启动 Protect soft start
1.4	1号球磨机控制电柜 No. 1 ball mill control cabinet	1. 电器采用中国名牌正泰电器 Electrical appliances use China's famous brand, Zhengtai electrical appliances. 2. 电柜箱体密封 Electrical cabinet box sealing 3. 变频启动电机	1set	保护软启动 Protect soft start



		Variable frequency starting motor		
1.5	2号球磨机控制电柜 No. 2 ball mill control cabinet	1. 电器采用中国名牌正泰电器 Electrical appliances use China's famous brand, Zhengtai electrical appliances. 2. 电柜箱体密封 Electrical cabinet box sealing 3. 变频启动电机 Variable frequency starting motor	1set	保护软启动 Protect soft start
1.6	分级机控制电柜 Classifier control cabinet	1. 电器采用中国名牌正泰电器 Electrical appliances use China's famous brand, Zhengtai electrical appliances. 2. 电柜箱体密封 Electrical cabinet box sealing 3. 变频启动电机 Variable frequency starting motor	1set	按钮控制 button control
2	<b>浸出搅拌单元 Leaching stirring unit</b>			
2.1	搅拌机控制电柜 Mixer control electrical cabinet	1. 电器采用中国名牌正泰电器 Electrical appliances use China's famous brand, Zhengtai electrical appliances. 2. 电柜箱体密封 Electrical cabinet box sealing 3. 变频启动电机 Variable frequency starting motor	1set	保护软启动 Protect soft start
2.2	输送泵控制电柜 Conveyor pump control cabinet	1. 电器采用中国名牌正泰电器 Electrical appliances use China's famous brand, Zhengtai electrical appliances. 2. 电柜箱体密封 Electrical cabinet box sealing	1set	按钮控制 button control
3	<b>浸出液净化单元 Leaching liquid purification unit</b>			
3.1	过滤机控制电柜 Filter machine control cabinet	1. 电器采用中国名牌正泰电器 Electrical appliances use China's famous brand, Zhengtai electrical appliances.	1set	按钮控制 button control





		2.电柜箱体密封 Electrical cabinet box sealing		
4	<b>硫酸铜萃取单元 Copper sulfate extraction unit</b>			
4.1	输送泵控制电柜 Delivery pump control cabinet	1.电器采用中国名牌正泰电器 Electrical appliances use China's famous brand, Zhengtai electrical appliances. 2.电柜箱体密封 Electrical cabinet box sealing	1set	按钮控制 button control
4.2	搅拌控制电柜 Mixing control electrical cabinet	1.电器采用中国名牌正泰电器 Electrical appliances use China's famous brand, Zhengtai electrical appliances. 2.电柜箱体密封 Electrical cabinet box sealing 3.变频启动电机 Variable frequency starting motor	4sets	变频旋钮控制 Frequency conversion knob control
5	<b>电积铜单元 Electrolytic copper unit</b>			
5.1	整流器电柜 Rectifier electrical cabinet	1.电器采用中国名牌正泰电器 Electrical appliances use China's famous brand, Zhengtai electrical appliances. 2.电柜箱体密封 Electrical cabinet box sealing	1台	按钮控制 button control
5.2	输送泵控制电柜 Delivery pump control cabinet	1.电器采用中国名牌正泰电器 Electrical appliances use China's famous brand, Zhengtai electrical appliances. 2.电柜箱体密封 Electrical cabinet box sealing 3.变频启动电机 Variable frequency starting motor	1set	按钮控制 button control



5.3	操作机械控制电柜 Operating mechanical control cabinet	1. 电器采用中国名牌正泰电器 Electrical appliances use China's famous brand, Zhengtai electrical appliances. 2. 电柜箱体密封 Electrical cabinet box sealing	1set	按钮控制 button control
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