

EPC LEADER OF  
METALLURGICAL  
ENGINEERING

冶金工程EPC引领者

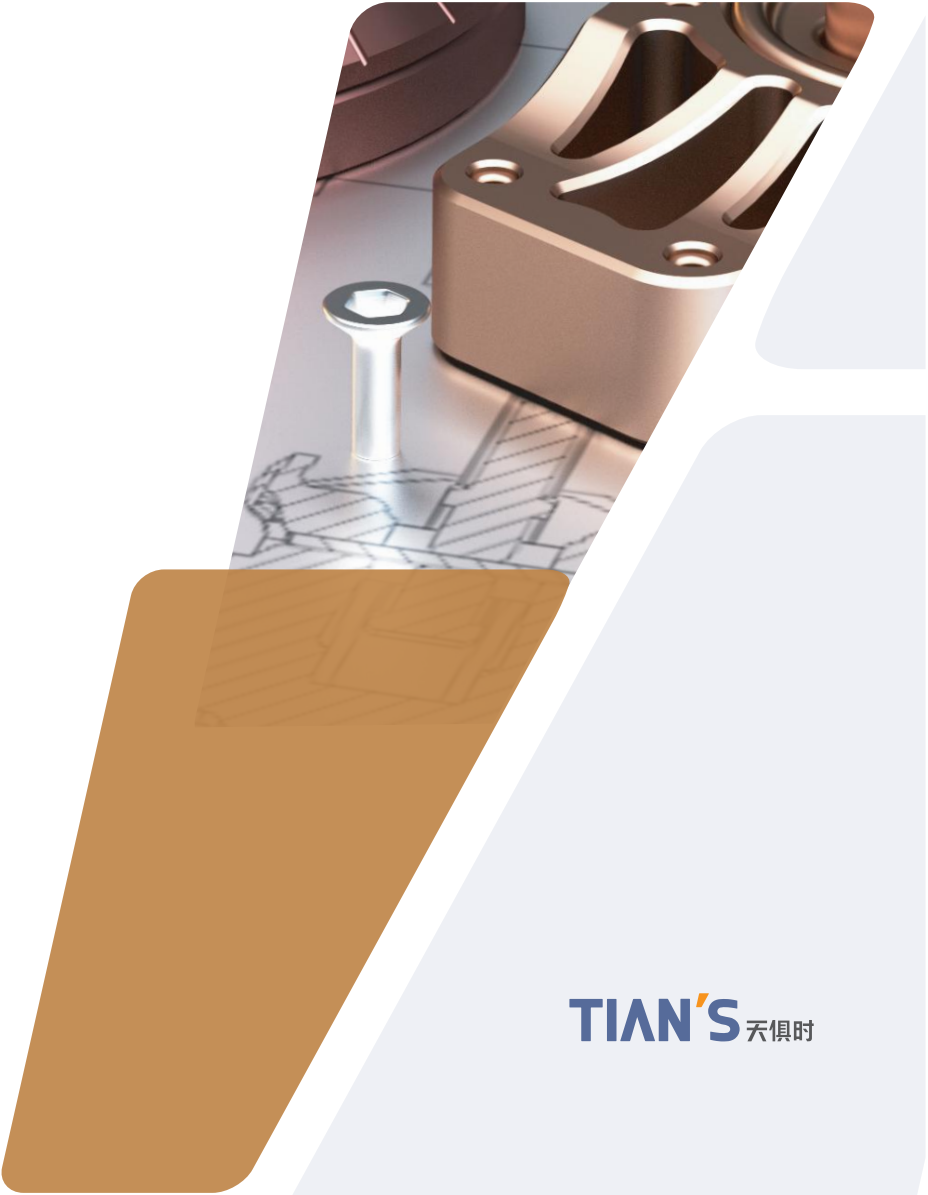


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TJS-2315-CE1000-20231204



TIAN'S 天俱时



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EXCEED  
CLIENT  
EXPECTATIONS

超越  
客户预期



# ABOUT TIANS

## 关于天俱时

### 集团简介

#### GROUP PROFILE

天俱时始创于1998年,是一家赋能新技术产业化的工程设计集团,依托先进的设计理念和前瞻性的国际视野,为全球客户提供技术研发、工程咨询与设计、工程总承包、智能装备、自动化与信息化于一体的综合解决方案,帮助客户实现FROM LAB TO FAB的产业化转化。业务涵盖冶金矿山、精细化工、电子化学品、合成生物、生物医药、化学制药、食品健康等高科技行业领域。

天俱时具有强大的工艺技术能力,拥有瑞士咨询创新中心、智能装备研发中心、生物工程实验室、化学工程实验室等多个技术研发平台,拥有10余位国内外院士和科学家,200余位资深工艺技术专家、工程设计专家及生产管理专家,先后为500余家知名企业提供咨询设计服务及工程解决方案,完成2000余个精品项目建设,业务遍及中国、东南亚、欧洲、美国、南非等30余个国家和地区。

TIANS Engineering Technology Group Co., Ltd., founded in 1998, is an engineering design group empowering industrialization of new technologies. Based on advanced design concept and forward-looking global perspective, we provide comprehensive solutions involving technology R&D, engineering consulting and design, EPC, intelligent equipment and automation & digitalization to help our clients achieving a From Lab to Fab industrialization transformation. Our business spans many high-tech fields, including metallurgy & mining, fine chemical engineering, electronic chemicals, synthetic biology, bio-pharmaceutical, chemical pharmaceutical and healthy food.

The greatest strength in TIANS lies in the process technologies as we set up a consultancy and innovation center in Switzerland, an intelligent equipment R&D center, a bioengineering laboratory, a chemical engineering laboratory and many other technology R&D platforms, employ a dozen of domestic and foreign academicians and leading scientists, and over 200 seasoned process technology experts, engineering design experts and production management specialists, provides consulting and design service and engineering solutions for more than 500 established companies, and accomplishes over 2,000 quality projects in more than 30 countries and regions, including China, Southeast Asia, Europe, the US and South Africa.

石家庄

上海

天津

济南

武汉

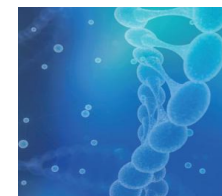
瑞士

### 行业领域

#### INDUSTRY



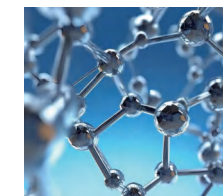
冶金矿山  
Metallurgical & Mining



生物医药  
Biopharmaceutical



合成生物  
Synthetic Biology



精细化工  
Fine Chemical



食品健康  
Food Health

### 企业文化

#### CORPORATE CULTURE



#### 核心价值观 VALUE

为客户创造价值·为员工创造价值·为社会创造价值  
Create value for customers; Create value for employees; Create value for society.

将公司建设成为全球一流的工程设计集团  
Building TIANS into a world-class engineering design group.

#### 企业愿景 VISION



#### 文化理念 CONCEPT

平等·尊重·信任·合作·分享  
Equality, Respect, Trust, Cooperation, Sharing



# ABOUT METALLURGICAL ENGINEERING TECHNOLOGY COMPANY

## 关于冶金工程技术公司

### 公司简介

#### COMPANY PROFILE

EXPERIENCED  
OVER 20 YEARS

20+

冶金工程技术公司深耕于行业20余年,专注于铁前工序,拥有从原料制备、球团生产到金属冶炼和轧制工艺的全工序工程建设总承包服务经验。其中链—回—环球团、高炉喷煤领域EPC总承包能力国内领先,已承建了数十条烧结球团生产线的设计和工程总承包项目,及数十条40-70吨制粉能力的喷煤EPC总承包项目。

冶金工程技术公司拥有冶金工程施工总承包壹级、机电工程施工总承包壹级、工程咨询单位甲级资信、冶金行业工程设计乙级等多项资质,设有冶金工程设计院和工程中心,与多家生产企业、设备制造商、高等院校建立长期战略合作。

作为国内EPC总承包模式的早期践行者,天俱时集团秉承“低碳环保、数字智能”的服务理念,依托技术及人才优势,打造出一条集“项目咨询—设计—采购—施工管理—试生产服务—运行培训”于一体的连续性产业链,形成了“天俱时交付”的独特品牌。

Metallurgical Engineering Technology Company has been deeply involved in the industry for more than 20 years, focusing on the pre-iron process with experience in general contracting services for the whole process of engineering construction from raw material preparation, pellet production to metal smelting and rolling process, among which the EPC general contracting capacity in the field of iron ore pellets in G-K-C system and high-coal injection furnace is domestically leading. The company has undertaken dozens design and engineering general contracting projects for sintering pellet production lines, and dozens projects of coal injection with 40-70 tons of pulverizing capacity.

Metallurgical Engineering Technology Company has a number of qualifications such as Grade I General Contracting of Metallurgical Engineering Construction, Grade I General Contracting of Electrical and Mechanical Engineering Construction, Class A Credit of Engineering Consultation Company and Class B Engineering Design of Metallurgical Industry. The Metallurgical Division boasts Metallurgical Engineering Design Institute and engineering center, and has established long-term strategic cooperation with a number of production enterprises, equipment manufacturers and universities.

As an early practitioner of EPC general contracting mode in China, TIANSHI Group, by adhering to the concept of “Low carbon and environmental production, digitization and intelligence” and relying on the strength in technology and talent, has formed a continuous industrial chain integrating “project consultation - design - procurement - construction management - pilot production service - training on operation” and

### 工艺技术中心

#### PROCESS TECHNOLOGY

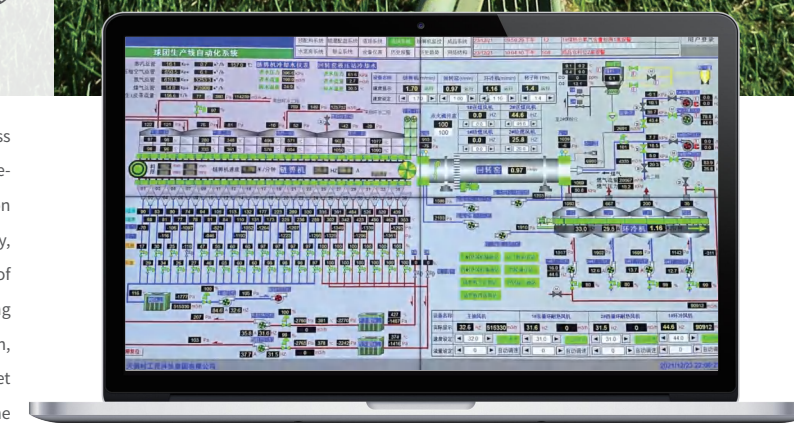
#### CENTER

## 懂工程 更懂工艺

UNDERSTAND ENGINEERING AND  
TECHNOLOGY BETTER

冶金工程技术公司设立工艺技术中心,拥有强大的专家团队,兼备丰富的生产管理经验和工程设计实施经验,能为客户提供信息、技术、人才、培训等全领域服务。洞察客户需求,了解生产工艺,从符合国家和地方规范着手,关注节能、环保和智能制造,在项目最初设计阶段到项目实施过程中始终符合客户需求,帮助客户实现方案、投资、进度和项目品质的多方保证。

Metallurgical Engineering Technology Company has set up a process technology center, with a strong expert team, rich production management experience and engineering design and implementation experience, which can provide customers with information, technology, talents, training and other services in all fields. Perceive into the needs of customers, understand the production process, start from meeting national and local specifications, pay attention to energy conservation, environmental protection and intelligent manufacturing, always meet the needs of customers from the initial design stage of the project to the implementation process of the project, and help customers guarantee the scheme, investment, progress and project quality.





## 冶金工程设计院 METALLURGICAL ENGINEERING DESIGN INSTITUTE

80+

专业设计人员

12+

全链条设计专业

30+

国家一级  
注册工程师

冶金工程设计院具有丰富的设计经验,以成为顶尖设计技术服务商为发展目标,为客户提供先进的设计理念,符合行业规范、水平先进的全过程咨询和工程设计服务。现有专业设计人员80余人,涵盖建筑、结构、给排水、电气自动化、暖通、燃气、热力、仪表、总图、消防、环保、BIM等专业;有国家一级注册建筑师、国家一级注册结构工程师和国家注册电气、公用设备、造价、咨询工程师等30余人,服务地区遍及全国各地。

Metallurgical engineering design institute has rich design experience. With the development goal of becoming a top design technology service provider, it provides customers with advanced design concepts, advanced whole process consulting and engineering design services in line with industry specifications. There are more than 80 professional designers in architecture, structure, water supply and drainage, electrical automation, HVAC, gas, heat, instrument, general drawing, fire protection, environmental protection, BIM and other disciplines. There are more than 30 national first-class registered architects, national first-class registered structural engineers and national registered electrical, public equipment, cost and consulting engineers, with service areas all over the country.

## 业务范围

BUSINESS SCOPE

可为您提供工程总承包服务或菜单式选择服务

EPC Contracting or Menu Selection Service Can be Provided

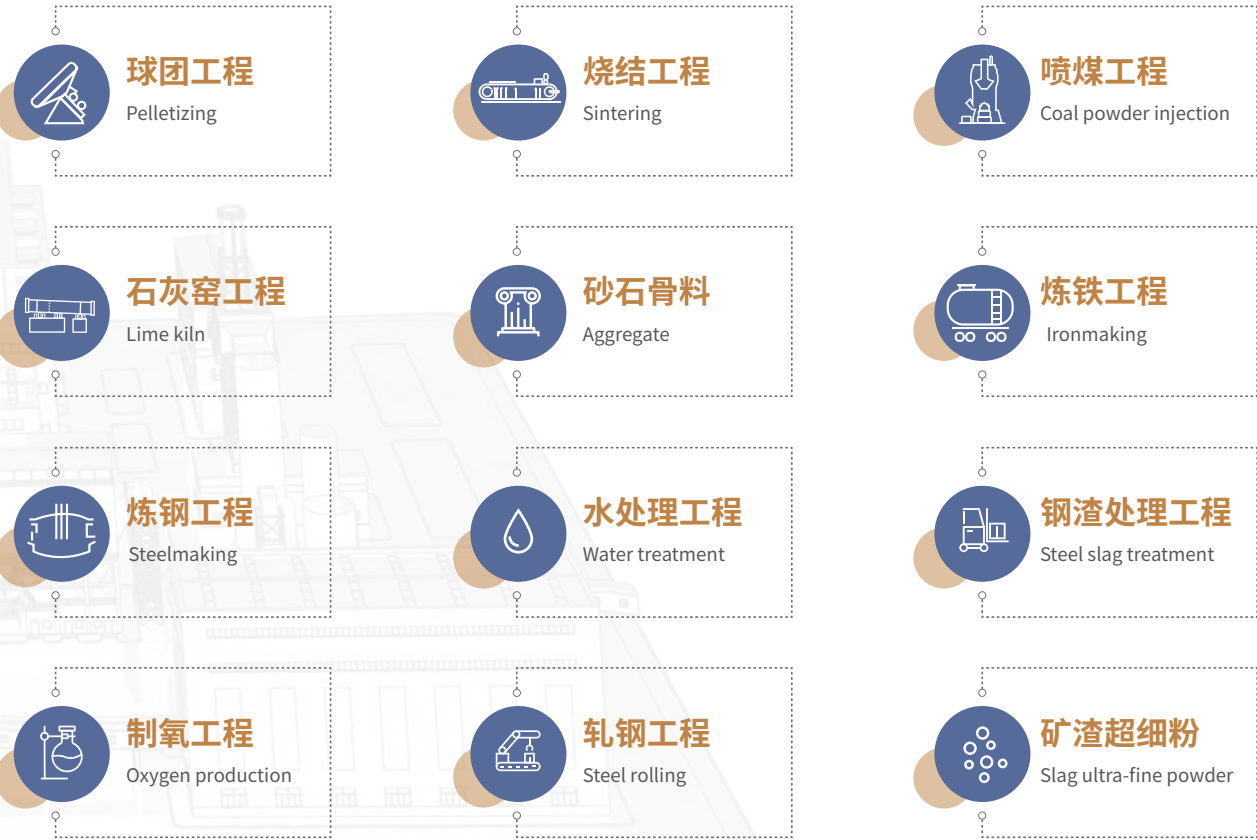
## 大业务体系





行业能力和经验

CAPABILITY AND EXPERIENCE  
IN METALLURGICAL INDUSTRY



QUALIFICATION  
企业资质

<div>设计资质</div> <div>DESIGN QUALIFICATION</div>	<div><div>■ 化工石化医药行业甲级</div><div>■ 建筑行业 (建筑工程) 甲级</div><div>■ 冶金行业工程设计乙级</div><div>■ 轻纺行业轻工工程乙级</div><div>■ 环境工程设计专项水污染防治工程甲级</div><div>■ 环境工程设计专项 (固体废物处理处置工程、大气污染防治工程) 乙级</div><div>.....</div></div> <div><div>Class A in chemical, petrochemical and pharmaceutical industry</div><div>Class A in construction industry (Construction engineering)</div><div>Class B for engineering design in metallurgical industry</div><div>Class B for light industry engineering in light textile industry</div><div>Grade A qualification for water pollution prevention and control project for environmental engineering design</div><div>Grade B qualification for environmental engineering design (solid waste treatment and disposal engineering and air pollution prevention and control engineering)</div></div>
<div>施工资质</div> <div>CONSTRUCTION QUALIFICATION</div>	<div><div>■ 冶金工程施工总承包壹级</div><div>■ 机电工程施工总承包壹级</div><div>■ 市政公用工程施工总承包贰级</div><div>■ 建筑工程施工总承包贰级</div><div>■ 电子与智能化工程专业承包壹级</div><div>■ 防水防腐保温工程专业承包壹级</div><div>■ 环保工程专业承包贰级</div><div>■ 消防设施工程专业承包贰级</div><div>■ 电力工程施工总承包叁级</div><div>.....</div></div> <div><div>Grade I general contracting of metallurgical engineering construction</div><div>Grade I general contracting of mechanical and electrical engineering construction</div><div>Grade II general contracting of municipal public works construction</div><div>Grade II general contracting of construction engineering</div><div>Grade I professional contracting of electronic and intelligent engineering</div><div>Grade I professional contracting of waterproof, anti-corrosion and thermal insulation engineering</div><div>Grade II professional contracting of environmental protection engineering</div><div>Grade II professional contracting of fire fighting facilities engineering</div><div>Grade III general contracting of power engineering construction</div></div>
<div>其他资质</div> <div>OTHER QUALIFICATION</div>	<div><div>■ 工程咨询单位甲级资信证书</div><div>■ 城乡规划编制单位丙级资质</div><div>■ 固定式压力容器规则设计</div><div>■ 工业管道安装GC2</div><div>■ 压力管道设计-工业管道GC1</div><div>■ 承装 (修、试) 电力设施许可证四级</div><div>■ (桥式、门式) 起重机械安装C级</div><div>.....</div></div> <div><div>Grade A credit of engineering consulting company</div><div>Grade C qualification of urban and rural planning preparation company</div><div>Rules design for fixed pressure vessel</div><div>Industrial pipe installation GC2</div><div>Pressure piping design - industrial piping GC1</div><div>Level IV license for electrical facilities installation (repairing or testing)</div><div>Class C license for (bridge and gantry) hoisting machinery installation</div></div>



# ENTERPRISE HONOR

## 荣誉奖项



繁峙县金程矿业有限公司年产120万吨  
链-回-环球团工程荣获2020年度有色金  
属建设行业(部级)优秀工程设计成果奖

The annual production of 1.2 million tons pellets project of  
Fanshi County Jincheng Mining Co., Ltd won Excellent  
Engineering Design Achievement Award in 2020 Non-ferrous  
Metal Construction Industry



新绛县高义冶炼有限公司高炉工程荣  
获河北省建设工程安济杯奖  
(省优质工程)

The blast furnace project of Xinjiang County  
Gaoyi Metallurgical Co., Ltd. won Hebei Anji Cup  
Prize of Construction Engineering(Provincial Quality  
Project)



芜湖市富鑫钢铁有限公司烧结安装  
工程荣获河北省建设工程安济杯奖  
(省优质工程)

The sintering installation project of Wuhu Fuxin  
Iron and Steel Co., Ltd. won Hebei Anji Cup Prize  
of Construction Engineering(Provincial Quality  
Project)



铜陵市富鑫钢铁有限公司120T转炉  
工程项目荣获石家庄市兴石杯(市优)  
工程

The 120t revolving furnace project of Tongling  
Fuxin Iron and Steel Co., Ltd. won Shijiazhuang  
Xingshi Cup Prize (Municipal Quality Project)



中国建设工程鲁班奖

China Construction Engineering Luban Prize



中国安装之星奖

China Installation Star

- > 中国工程总承包营业额榜单前**百强**
- > 中国建筑业协会**AAA级**信用企业
- > 中国安装协会**科技进步奖**三等奖
- > 河北省政府**质量奖**提名奖
- > 河北省产业技术研究院**工程环境研究所**
- > 河北省建筑业**先进企业**
- > 河北省工程勘察设计项目**一等奖**
- > 河北省工程勘察设计项目**二等奖**
- > 河北省建设工程**安济杯奖**(省优质工程)

- > Top 100 in China's EPC turnover
- > Credit Enterprise-AAA of China Construction Industry
- > Third Prize of Scientific and Technological Progress by China Installation Association
- > Nominee Award for Hebei Provincial Government Quality Award
- > Engineering Environment Research Department of Hebei Industrial Technology Research Institute
- > Hebei Provincial Advanced Enterprise in Construction Industry
- > First Prize of Engineering Investigation and Design Project in Hebei Province
- > Second Prize of Engineering Investigation and Design Project in Hebei Province
- > Hebei Anji Cup Prize of Construction Engineering (Provincial Quality Project)



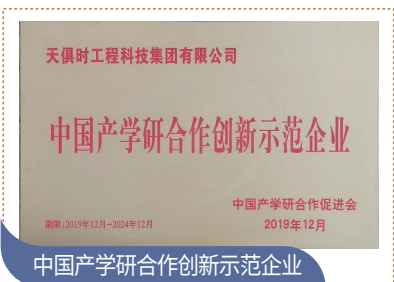
# TECHNOLOGICAL INNOVATION 科技创新

## 科技平台 TECHNOLOGY PLATFORM



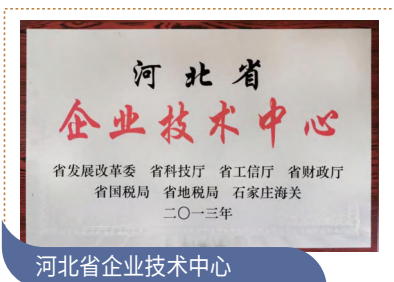
国家专精特新小巨人企业

National "Little Giant" SRDI (Specialized, refinement, differential, innovation) Enterprise



中国产学研合作创新示范企业

Demonstration Enterprise for Industry-University-Research Institute Cooperation and Innovation



河北省企业技术中心

Hebei Enterprise Technology Center



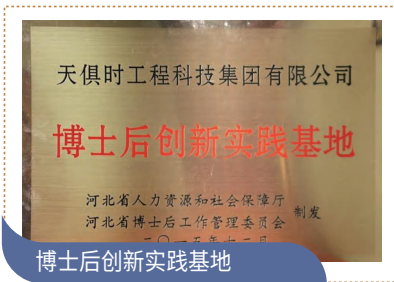
河北省院士合作重点单位

Key Cooperative Enterprise for Academicians in Hebei Province



国家知识产权优势企业

National intellectual property advantage enterprise



博士后创新实践基地

Post Doctoral Innovation Practice Base



外国院士工作站

Foreign Academician Workstation



河北省专精特新小巨人

Hebei "Little Giant" SRDI (Specialized, refinement, differential, innovation) Enterprise



河北省产业技术研究院

Hebei Institute of Industrial Technology

## 专利 PATENT

以科技引领未来，以创新驱动发展，天俱时集团作为国家高新技术企 业，拥有百余项专利及软著。旨在为客户创造核心价值，推动行业前行发展。

With science and technology leading the future and innovation driven development, TIANS group, as a national high-tech enterprise, has more than 100 patents and software copyrights. It aims to promote the development of the industry and create core value for customers.

● 一种中小型炼铁高炉重量法布料装置及其布料方法  
A small and medium-sized blast furnace weight method conveying device for iron-smelting and conveying method

● 一种造球机  
A pelletizer

● 一种钢渣自动破碎装置  
A device for automatic crushing of steel slag

● 渣罐倾翻车  
Tipping truck with slag tank

● 链算机回转窑球团富氧喷煤系统  
Grate - rotary kiln pellet oxygen-rich coal injection system

● 一种半悬浮回转窑  
Semi-suspension rotary kiln

● 链算机余热回收系统  
After-heat recovery system of travelling grate machine

● 竖式冷却筛分球团装置  
Shaft cooling & screening pellets device

● ...





# CHARACTERISTIC TECHNOLOGY

## 特色技术

### 链-回-环球团技术

GRATE - ROTARY KILN - ANNULAR COOLER PELLETIZING TECHNOLOGY

随着经济技术的不断发展,对钢材的质量要求越来越高,冶金行业对高炉炉料的技术性能指标要求更高。链算机-回转窑法生产球团具有低耗、节能、高效的特点,是优质的炼铁炉料。

链算机-回转窑-环冷机球团生产线已经是成熟的生产工艺,它具有对原燃料适应性强、产品质量好和生产成本低等特点,根据原料的性质来决定具体生产工艺流程,主要工艺车间一般包括预配料室、烘干室、高压辊磨及二次配料室、强力混合室、造球室、筛分布料系统、链算机-回转窑-环冷机焙烧系统、成品储运、主引风系统和热风循环系统等。

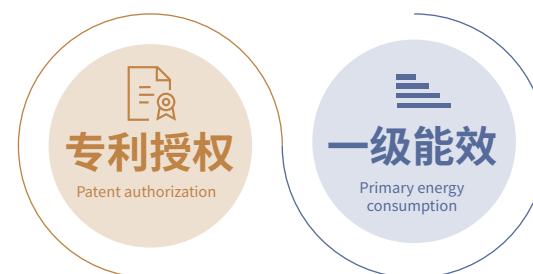
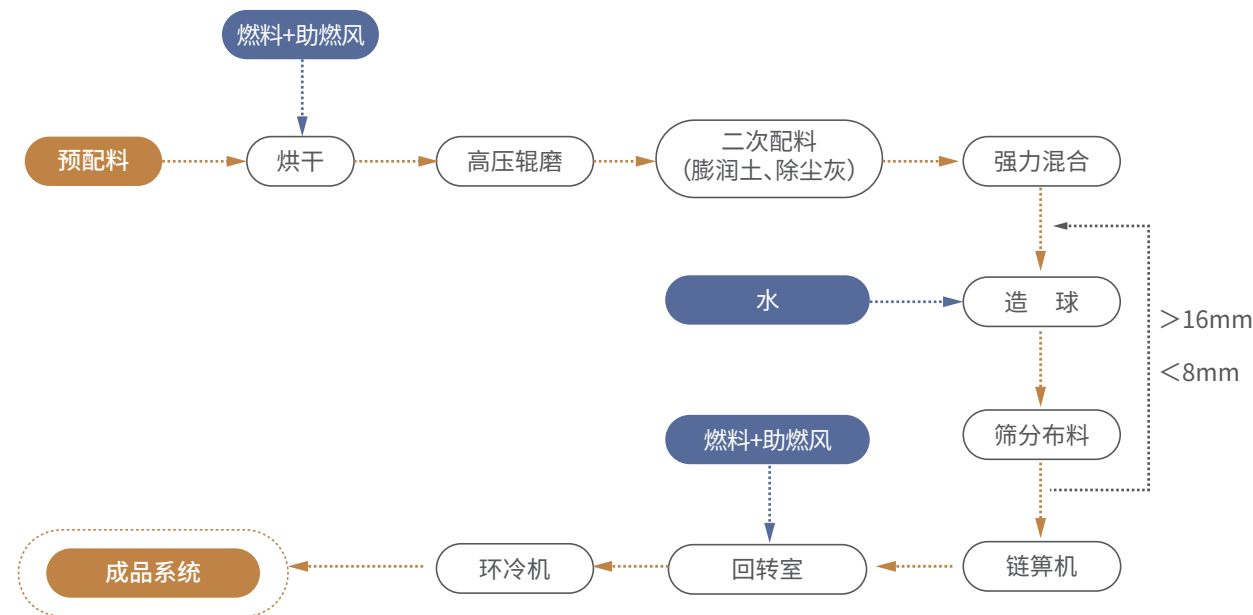
With the continuous development of economy and technology, the requirements for the quality of steel are higher and higher, and the metallurgical industry has higher requirements for the technical performance index of blast furnace charge. The pellet production by grate - rotary kiln method has the characteristics of low consumption, energy saving and high efficiency. It is a high-quality ironmaking charge.

Grate - rotary kiln - annular cooler pellet production line is a mature production process. It has the characteristics of strong adaptability to raw fuels, good product quality and low production cost. The specific production process is determined according to the nature of raw materials. The main process workshops generally include pre batching room, drying room, high-pressure roller mill and secondary batching room, strong mixing room, pelletizing room, screening and distribution system, grate - rotary kiln - annular cooler roasting system, finished product storage and transportation, main induced draft system and hot air circulation system.



### 链-回-环球团技术工艺流程图

PROCESS FLOW CHART OF GRATE - ROTARY KILN - ANNULAR COOLER PELLETIZING TECHNOLOGY



首先对原料进行处理后,进行造球,然后筛分出合格粒度的生球,链算机的作用是对原料造出来的生球进行干燥和预热,使生球具有一定的强度和达到一定的氧化程度,经链算机预热的球团在回转窑1200℃高温中进行氧化焙烧和固结,最后在环冷机中进一步氧化并冷却到120℃以下,最终进入成品储运系统。

我公司链-回-环生产线采用先进的自动控制水平、热风循环系统、中高温烟气脱硝技术、高效脱硫除尘装备、链算机余热回收技术(专利授权号CN213687924U)等一系列先进技术措施,使生产操作高度自动化,工序能耗达到一级能效,满足钢铁企业超低排放标准。

Firstly, the raw materials are processed and pelletized, and then the green balls with qualified particle size are screened. The function of the grate is to dry and preheat the green balls made from the raw materials, so that the green balls have a certain strength and reach a certain degree of oxidation. The pellets preheated by the grate are oxidized, roasted and consolidated in the high temperature of 1200 °C in the rotary kiln, and finally further oxidized and cooled to below 120 °C in the annular cooler, Finally, it enters the finished product storage and transportation system.

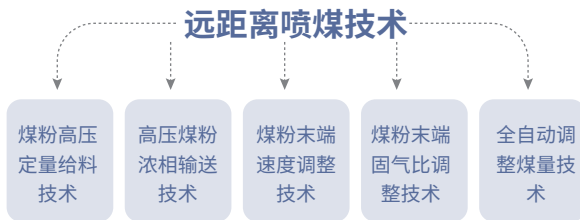
The grate - rotary kiln - annular cooler production line of our company adopts a series of advanced technical measures, such as advanced automatic control level, hot air circulation system, medium and high temperature flue gas denitration technology, high-efficiency desulfurization and dust removal equipment, grate waste heat recovery technology (patent authorization No.: cn213687924u), so as to make the production operation highly automated, the process energy consumption reach the first-class energy efficiency and meet the ultra-low emission standard of iron and steel enterprises.



## 回转窑超远距离直接喷煤技术

ULTRA LONG DISTANCE DIRECT COAL  
INJECTION TECHNOLOGY OF ROTARY KILN

回转窑远距离喷煤技术是从高炉喷煤制粉系统直接向回转窑喷吹煤粉，喷吹距离最远可以达到1500米左右。通过直接喷吹，改变了原来间接喷吹的模式，可以取消回转窑的煤粉站，简化工艺流程，提高系统的安全性和可靠性，降低人工成本和投资成本。



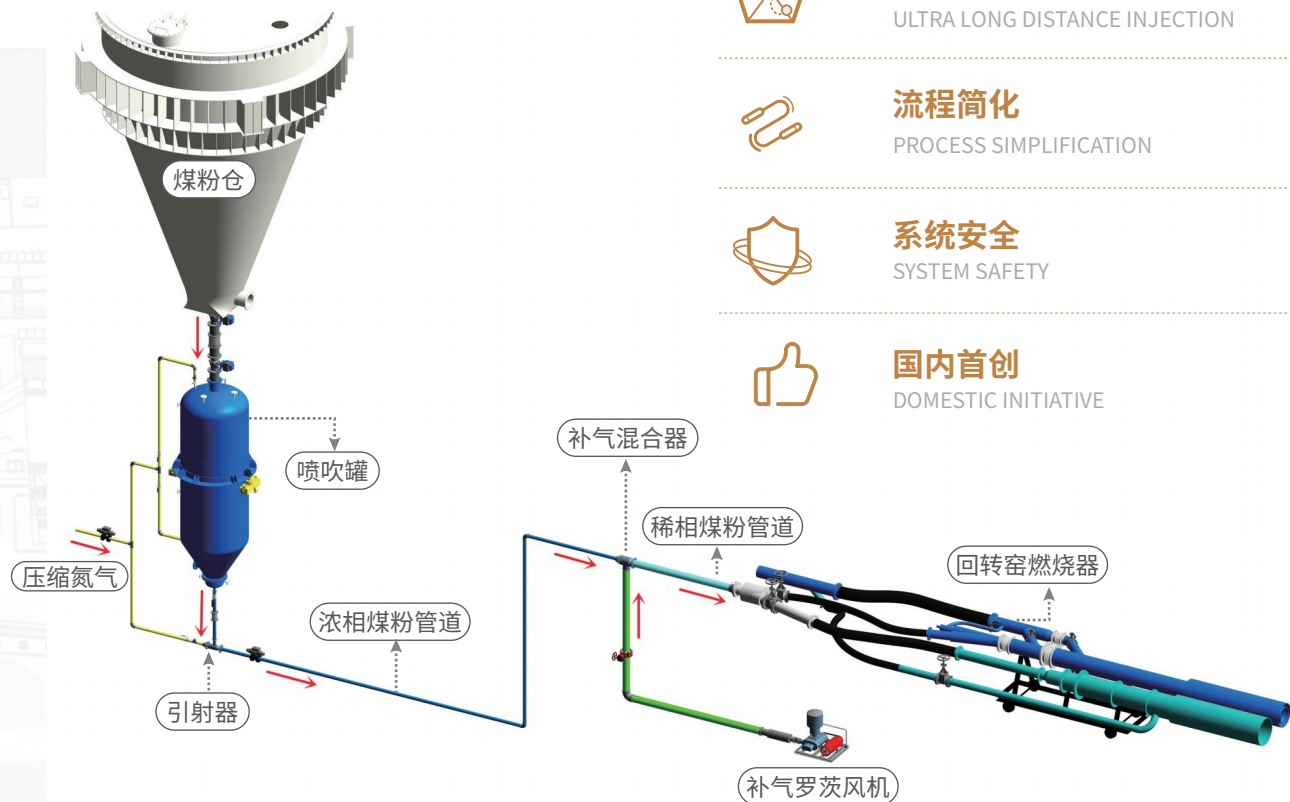
通过以上技术，既保证了煤粉长距离输送的可靠性，又满足了回转窑燃烧器对煤粉浓度和速度的要求，满足了回转窑对煤粉燃烧的工艺要求。

The long-distance coal injection technology of rotary kiln is to directly inject pulverized coal into the rotary kiln from the coal injection and pulverization system of blast furnace, and the injection distance can reach about 1500 meters at most. Through direct injection, the original indirect injection mode is changed, the pulverized coal station of rotary kiln can be cancelled, the process flow can be simplified, the safety and reliability of the system can be improved, and the labor cost and investment cost can be reduced.

Long distance coal injection technology includes high-pressure quantitative feeding technology of pulverized coal, high-pressure dense phase conveying technology of pulverized coal, speed adjustment technology at the end of pulverized coal, solid gas ratio adjustment technology at the end of pulverized coal and full-automatic coal volume adjustment technology.

Through the above technology, it not only ensures the reliability of long-distance transportation of pulverized coal, but also meets the requirements of rotary kiln burner for pulverized coal concentration and speed, and meets the process requirements of rotary kiln for pulverized coal combustion.

-  喷吹距离最远达 **1500米**  
ULTRA LONG DISTANCE INJECTION
-  **流程简化**  
PROCESS SIMPLIFICATION
-  **系统安全**  
SYSTEM SAFETY
-  **国内首创**  
DOMESTIC INITIATIVE



## 块矿烘干技术

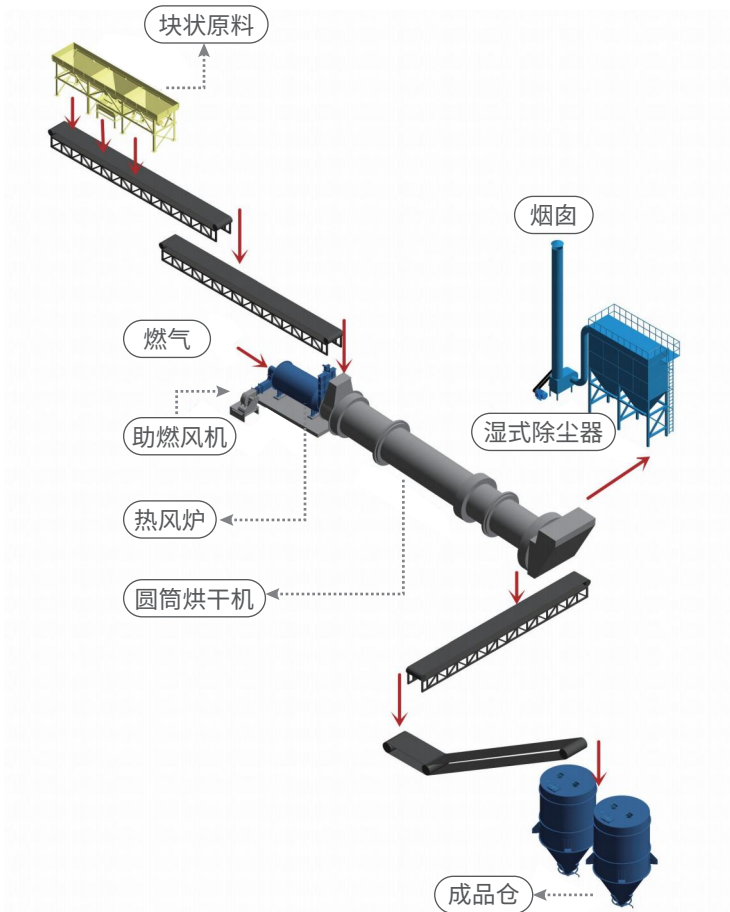
LUMP ORE DRYING TECHNOLOGY

块矿是含铁品位较高的块状矿石，是高炉炼铁的一种炉料，由于露天堆存，含水率和含粉率均较高。由于湿度大，振动筛常常被堵塞，同时块矿表面粘附着大量的粉料，如果直接进高炉冶炼，不但增加了高炉冶炼成本，对高炉透气性和炉温都有不良影响。天俱时根据钢铁企业自身实际环境和特点，以能源消耗少、低投资、高回报为目的，给客户量身定做合适的块矿烘干工艺技术。

Lump ore is a lump ore with high iron grade. It is a kind of burden for blast furnace ironmaking. Due to open-air stacking, the moisture content and powder content are high. Due to high humidity, the vibrating screen is often blocked, and a large amount of powder is adhered to the surface of lump ore. If it is directly fed into the blast furnace for smelting, it will not only increase the smelting cost, but also have an adverse impact on the permeability and temperature of the blast furnace. According to the actual environment and characteristics of iron and steel enterprises, with the purpose of less energy consumption, low investment and high return, TIANs tailor-makes appropriate lump ore drying technology for customers.

### 圆筒烘干法

CYLINDER DRYING METHOD



圆筒烘干法是将物料送入烘干筒内，通过烘干筒旋转和热风炉鼓入热风，物料在内置扬料板的作用，使物料分散吸收热量快，水分快速蒸发，使块矿水分达到入高炉要求。

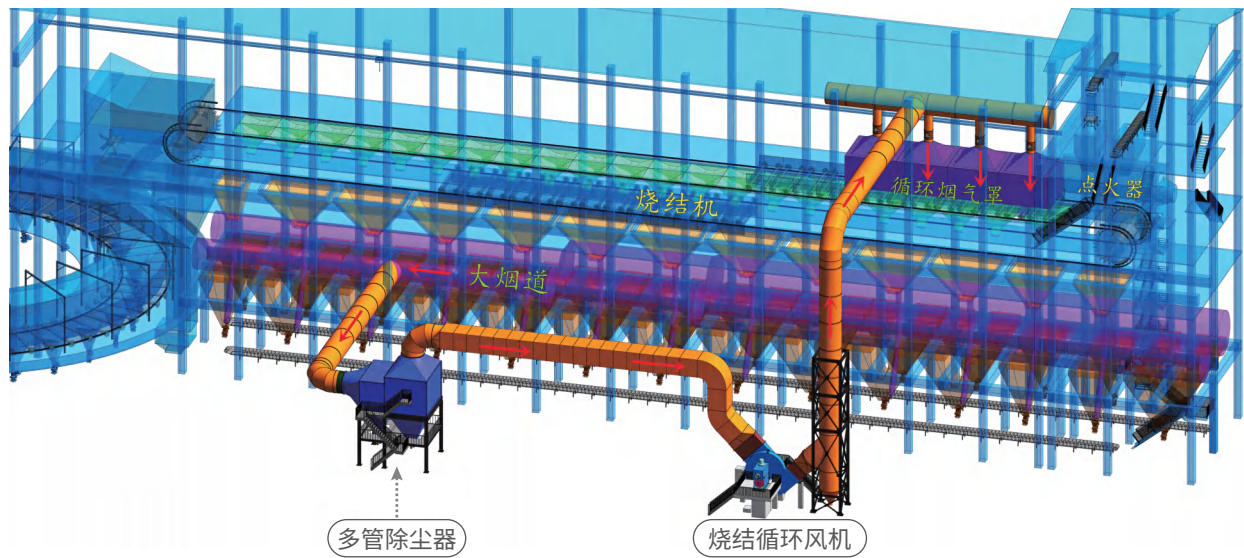
The cylinder drying method is to send the materials into the drying drum, rotate the drying drum and blow hot air into the hot blast stove. The materials are dispersed and absorb heat quickly under the action of the built-in lifting plate, and the water evaporates quickly, so that the moisture of lump ore can meet the requirements of entering the blast furnace.





## 烧结烟气循环技术

SINTERING FLUE GAS  
CIRCULATION TECHNOLOGY



成功案例众多

技术成熟

新建/改造工程均可

业界口碑良好

烧结烟气循环技术是选择性地将部分烧结烟气返回到点火器后烧结机台车上部的循环烟气罩中循环使用的一种烟气利用技术,通过回收烧结烟气中显热和潜热、提高二氧化硫、氮氧化物及粉尘的处理浓度,减少脱硫脱硝系统的烟气处理量,降低净化系统的固定投资和运行成本,最终实现节能减排。

近年来,随着国家对其不断研发,烧结烟气循环技术已成功进行了工业化应用。通过结合企业自身实际情况,对烟气循环模式进行合理应用,很大程度上也可帮助企业将烧结生产线中存在的问题得到有效解决。而且通过对烧结烟气循环技术进行合理应用,不但可以降低烧结烟气的排放量,同时对于企业面临的环保问题以及成本问题也可得到有效缓解。除此之外,该技术还可以降低机头除尘的处理量,除尘效果也会得到大幅度提高。

Sintering flue gas circulation technology is a flue gas utilization technology that selectively returns part of the sintering flue gas to the circulating flue gas hood on the upper part of the sintering pallet after the igniter. By recovering the sensible heat and latent heat in the sintering flue gas, increasing the treatment concentration of sulfur dioxide, nitrogen oxide and dust, reducing the flue gas treatment amount of desulfurization and denitration system, it can reduce the fixed investment and operation cost of purification system, and finally realize energy conservation and emission reduction.

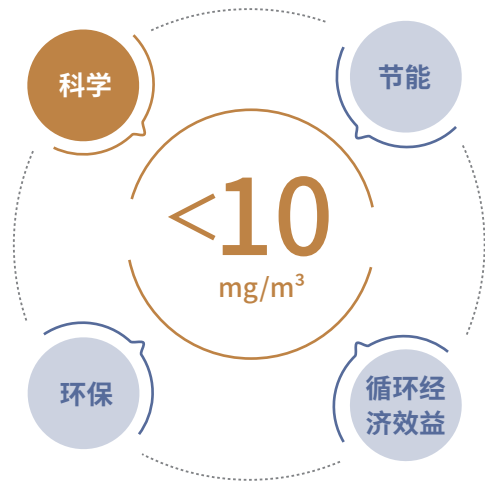
In recent years, with the continuous research and development of it by the state, the sintering flue gas circulation technology has been successfully industrialized. By combining with the actual situation of the enterprise, the reasonable application of the flue gas circulation mode can also help the enterprise effectively solve the problems existing in the sintering production line to a great extent. Moreover, the reasonable application of sintering flue gas circulation technology can not only reduce the emission of sintering flue gas, but also effectively alleviate the environmental protection and cost problems faced by enterprises. In addition, the technology can also reduce the processing amount of head dust removal, and the dust removal effect will be greatly improved.

## 钢渣处理技术

STEEL SLAG TREATMENT  
TECHNOLOGY

该工艺将破碎后的热熔钢渣入罐,压盖密封后适量间歇喷水冷却,利用罐内渣的余热产生大量饱和蒸汽,与钢渣中不稳定的f-CaO、f-MgO(游离MgO)发生水化等反应,加上C<sub>2</sub>S等冷却过程中体积增大,使得钢渣自解粉化,同时渣钢分离。此工艺的优点在于钢渣热闷工艺适应性强,液态、半固态都能处理,处理时间短,处理后渣铁分离好、渣性能稳、粒度小,便于后续综合利用。

该工艺的除尘系统:采用双塔一脱除尘形式,一级喷雾蒸发洗涤塔起到降温及粗除尘的作用;高效除尘器放在一级塔之后,主要用于精除尘,内部设有精细喷雾装置和声波除雾器,提高高效除尘器除尘效率,净化后的烟气经旋流脱水器和引风机进入放散烟囱排放,设计排放标准<10mg/m<sup>3</sup>。



In this process, the crushed hot-melt steel slag is put into the tank. After the gland is sealed, an appropriate amount of intermittent water spray cooling is used. A large amount of saturated steam is generated by the waste heat of the slag in the tank, which reacts with the unstable f-CaO and f-mgo (free MgO) in the steel slag. In addition, the volume increases during the cooling process such as C<sub>2</sub>S, so that the steel slag is self disintegrated and powdered, and the slag and steel are separated at the same time. The advantage of this process is that the steel slag hot pressing process has strong adaptability, and both liquid and semi-solid can be treated. The processing time is short. After treatment, the slag iron can be separated well, the slag performance is stable and the particle size is small, which is convenient for subsequent comprehensive utilization.

The dedusting system of the process: the form of two towers and one dedusting is adopted, and the primary spray evaporation washing tower plays the role of cooling and coarse dedusting; The high-efficiency dust collector is placed behind the primary tower and is mainly used for fine dust removal. It is internally equipped with a fine spray device and an acoustic demister to improve the dust removal efficiency of the high-efficiency dust collector. The purified flue gas is discharged through the cyclone dehydrator and the induced draft fan into the emission stack. The design emission standard is <10mg/m<sup>3</sup>.





# EXPERT TEAM

## 专家团队

强大的工艺、设计、工程专家团队为企业提供信息、技术、人才、培训等全方位服务。  
A strong team of process, design and engineering experts provides enterprises with all-round services such as information, technology, talents and training.



郭磊

- 冶金工程设计专家
- 高级工程师
- 中国机电装备维修与改造技术协会冶金分会专家库专家
- 河北省钢铁行业环保、节能评审知名专家
- 河北省冶金行业协会理事

Expert on metallurgical engineering design  
Senior engineer  
Expert database member of Metallurgical Branch of China Mechanical and Electrical Equipment Maintenance and Modification Technology Association  
Well-known expert in environmental protection and energy conservation review of the stee industry in Hebei  
Director of Hebei Metallurgical Industry Association



马政峰

- 冶金喷煤工艺专家
- 高级工程师
- 中国机电装备维修与改造技术协会冶金分会专家库专家
- “老马高炉喷煤演义”公众号创始人

Expert on metallurgical coal injection process  
Senior engineer  
Expert database member of Metallurgical Branch of China Mechanical and Electrical Equipment Maintenance and Modification Technology Association  
Author of the public account"Lao Ma's Coal Injection Deduction"



孙常文

- 冶金工程工艺专家
- 起草制定两项行业标准
- 获河北省高新技术企业 科学技术进步奖

Metallurgical engineering process specialist  
Involved in drafting and developing two pieces of industry standards  
Won Hebei Provincial Science and Technology Progress Award for High-tech Enterprises



王秀玲

- 冶金工程结构设计专家
- 高级工程师
- 一级注册结构工程师
- 注册监理工程师
- 河北省科协智库专家

Expert on metallurgical engineering structure design  
Senior engineer  
Grade I Registered Structural Engineer  
Registered Supervision Engineer  
Think Tank Expert of Hebei Association for Science and Technology



陈志刚

- 给排水技术、设计专家
- 高级工程师
- 注册公用设备(给水排水)工程师
- 注册一级建造师

Expert on water supply and drainage technology and design  
Senior engineer  
Registered Utility Equipment(Water Supply And Drainage) Engineer  
Grade I Registered Constructor



张专

- 冶金工程自控专家
- 高级工程师
- 中国机电装备维修与改造技术协会冶金分会专家库专家
- 获河北省建设行业科技技术进步奖等十余项省、市级奖项

Expert on metallurgical engineering automatic control  
Senior engineer  
Expert database member of Metallurgical Branch of China Mechanical and Electrical Equipment Maintenance and Modification Technology Association  
Winner of over 10 provincial and municipal awards including Award for Science and Technology Progress of Hebei Construction Industry



董晓峰

- 冶金工程电气专家
- 高级工程师
- 注册电气工程师
- 获全国工程设计奖1项
- 省部级工程设计奖10项

Expert on metallurgical engineering electrical  
Senior engineer  
Registered Electrical Engineer  
Winner of 1 National Engineering Design Award  
Winner of 10 Provincial and Ministerial Engineering Design Awards



贾立斌

- 冶金除尘技术专家
- 主持过一百多个除尘系统设计项目
- 拥有《一种含导流罩的移动式集烟罩》等多项除尘专利

Metallurgical dust removal specialist  
Having presided over more than 100 dust removal system design projects  
Having obtained a number of dust removal patents such as "a mobile exhaust fume collecting hood with deflector"



闫红亮

- 冶金热力技术专家
- 高级工程师
- 入选“中国国电集团”等多个发电集团专家库专家
- 拥有《一种高温高压节能蒸汽机》等多项专利

Metallurgical thermal specialist  
Senior engineer  
Expert in the expert database of many power generation groups such as "China Guodian Group".  
Having obtained a number of patents such as "a high-temperature and high-pressure energy-saving steam engine"



徐继锋

- 冶金工程项目管理专家
- 高级工程师
- 河北省建筑业优秀项目经理
- 石家庄市第六届创新团队成员

Expert on metallurgical engineering project management  
Senior engineer  
Excellent Project Manager of Hebei Province Construction Industry  
Member of the 6th Innovation Team of Shijiazhuang City



王 晓

- 冶金工程项目管理专家
- 高级工程师
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- 河北省工程建设质量管理小组活动优秀管理者

Expert on metallurgical engineering project management  
Senior engineer  
Excellent Project Manager of Hebei Province Construction Industry  
Excellent Manager of Hebei Province Engineering Construction Quality Management Team Activities,Hebei Province



# ONE STOP SERVICE - EPC 一站式服务—EPC

天俱时集团是EPC模式的引领者和践行者,致力于为客户提供提供项目建设全过程各阶段的整体解决方案,以工艺技术与设计为核心,以系统集成优化为特色,以一次性试生产成功为目标,帮助客户建设精品项目。

As the leader and practitioner of the EPC model, TIAN'S Group is committed to providing clients with overall solutions for all stages of the whole process of project construction, with process technology and design as the core, system integration optimization as the feature, and one-time trial production success as the goal, help clients build quality projects.



# ADVANTAGES OF EPC MODEL EPC模式的优势





# WHOLE PROCESS PROJECT MANAGEMENT

## 全过程项目管理





# TYPICAL PROJECTS

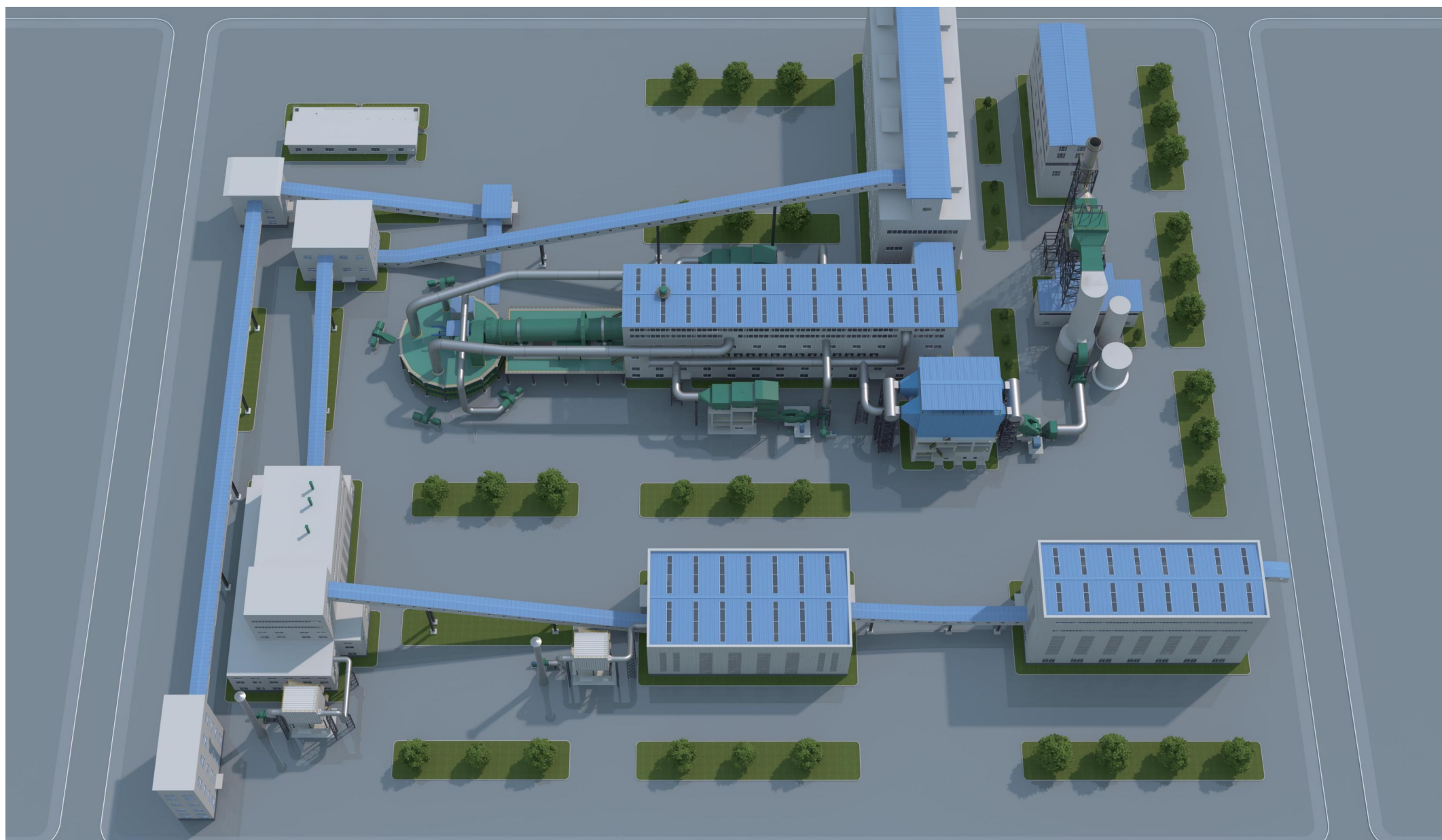
## 典型案例

江苏镇鑫钢铁集团有限公司  
JIANGSU BINXIN STEEL GROUP CO., LTD.

### 2\*150万吨链-回-环球团EPC总承包工程

EPC general contracting of grate - rotary kiln - annular cooler pelletizing project(2\*1.5 million tons)

中国·江苏 EPC总承包





## 山西高义钢铁有限公司

SHANXI GAOYI IRON AND STEEL CO., LTD.

中国·山西 EPC总承包

### 炼铁、烧结、球团、炼钢、轧钢、钢渣处理、水处理工程项目

Ironmaking, sintering, pelletizing, steelmaking, steel rolling, steel slag treatment, water treatment projects





## 辛集市澳森特钢集团有限公司

XINJI AOSAN GROUP CO., LTD



### 220m²带式烧结机项目

220m² belt sintering machine project

中国·河北 EPC总承包





## 原平市华悦球团制造有限公司

YUANPING CITY HUAYUE PELLETTIZING CO., LTD.

### 2\*120万吨链-回-环球团工程 EPC总承包

EPC general contracting of grate - rotary kiln - annular cooler pelletizing project (2\*1.2 million tons)

中国·山西 EPC总承包



## 繁峙县金程矿业有限公司

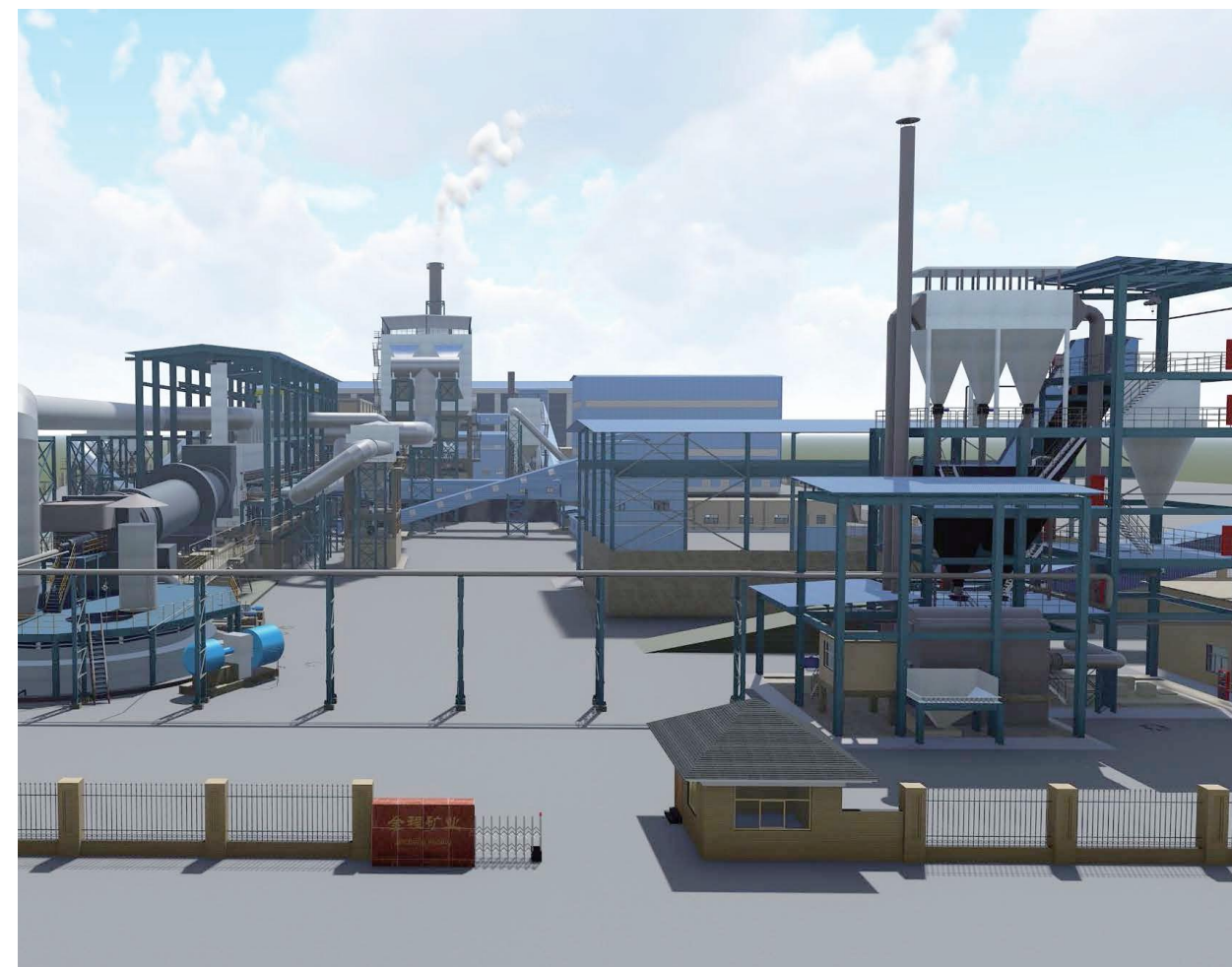
FANSHI COUNTY JINCHENG MINING CO., LTD.

### 120万吨链-回-环球团总承包工程

General contracting of grate - rotary kiln - annular cooler pelletizing project (1.2million tons)

120万吨

中国·山西 总承包工程





## 抚顺新钢铁有限责任公司

FUSHUN NEW STEEL CO., LTD.

### 炼铁厂整体喷煤新建工程项目

Iron plant overall coal injection new construction project

中国·辽宁 EPC总承包



## 陕钢集团汉中钢铁有限责任公司

SHANXI STEEL GROUP HANZHONG IRON AND STEEL CO., LTD.

### 炼铁厂3#喷煤系统工程项目

Iron plant 3# coal injection system engineering project

中国·陕西 总承包工程





## 本溪参铁集团有限公司

BENXI SHENTIE IRON (GROUP) CO., LTD.

### 260m<sup>3</sup>高炉EPC总承包

EPC general contracting for 260m<sup>3</sup> blast furnace

中国·辽宁 总承包工程



## 衡阳华菱连轧管有限公司

HENGYANG VALIN MPM TUBE CO., LTD.

### 炼铁厂喷煤系统扩建项目

Iron plant coal injection system expansion project

中国·湖南 总承包工程





## 皋兰兰鑫钢铁集团有限公司

GAOLAN LANXIN IRON AND STEEL GROUP CO., LTD.

高炉、炼钢、轧钢、电炉、烧结、球团工程项目

Blast furnace, steelmaking, steel rolling, electric furnace, sintering, pelletizing engineering projects

中国·甘肃 总承包工程



## 芜湖市富鑫钢铁有限公司

WUHU FUXIN IRON AND STEEL CO., LTD.

高炉、烧结、钢渣处理、超低排放、炼钢厂新建接跨工程项目

Blast furnace, sintering, steel slag treatment, ultra-low emission, steel mill new cross-project projects

中国·安徽 总承包工程





山西富渊通科技有限公司  
SHANXI FUYUANTONG TECHNOLOGY CO., LTD

骨料生产线、环保脱硫剂、余热发电、回转窑石灰线项目

Aggregate production line, environmental desulfurizer, waste heat power generation, rotary kiln lime line project

中国·山西 EPC总承包



PERFORMANCE TABLE  
业绩清单

项目类别	建设单位	项目名称
烧结、球团	辛集市澳森特钢集团有限公司 Xinji Aosen Group Co., Ltd.	220m³带式烧结机EPC总承包 EPC general contracting of 220m³ belt sintering project
	江苏省镇鑫钢铁集团有限公司 Jiangsu Binxin Steel Group Co., Ltd.	2*150万t/a球团EPC总承包 EPC general contracting for 2 * 1.5 million ton pellets
	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	150万吨链篦机回转窑EPC总承包 EPC general contracting for 1.5 million ton chain grate rotary
	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	14m³竖炉技改80万吨/年链篦机回转窑球团EPC总承包 EPC general contracting for 14 m³ shaft furnace technology reform 0.8 million ton/year chain grate rotary kiln pellets
	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	360m³烧结建安工程 360m³ sintering construction project
	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	14m³竖炉 EPC 总承包 EPC general contracting of 14m³ shaft furnace project
	繁峙县金程矿业有限公司 Fanshi County Jincheng Mining Co., Ltd.	120万吨链篦机回转窑球团总承包 1.2 million tons of pellet construction project
	原平市华悦球团制造有限公司 Yuanping Huayue Pellet Manufacturing Co., Ltd.	120万吨球团建安总承包 Safety general contracting for 1.2 million ton of pellets phasey I
	原平市华悦球团制造有限公司 Yuanping Huayue Pellet Manufacturing Co., Ltd.	120万吨球团二期EPC总承包 General contracting for 1.2 million ton of pellets phase II
	山西富渊通矿业有限公司 Shanxi Fuyuantong Mining Co., Ltd.	800吨/天回转窑石灰线EPC总承包 EPC general contracting for 800-ton/day rotary kiln lime production line turnkey project
	盐城市联鑫钢铁有限公司 Yancheng Lianxin Iron and Steel Co., Ltd.	240m³烧结项目 240m³ sintering project
	河北鑫跃焦化有限公司 Hebei Xinyue Coking Co., Ltd.	280m³烧结项目 280m³ sintering project
	连云港兴鑫钢铁有限公司 Lianyungang Xingxin Iron and Steel Co., Ltd.	三期 72m³烧结项目 Phase iii 72m³ sintering project
	文安县新钢钢铁有限公司 Wen'an Xingang Iron and Steel Co., Ltd.	110m³烧结建安工程 110m³ sintering construction project



项目类别	建设单位	项目名称
烧结、球团	山西通才工贸有限公司 Shanxi Tongcai Industry and Trade Co., Ltd.	360m³烧结烟气循环项目 360m³ sintering flue gas recycling program
	芜湖市富鑫钢铁有限公司 Wuhu Fuxin Iron & Steel Co., Ltd.	2*142m³烧结总承包 General contracting of sintering, pellet upgrading
	邯郸钢铁集团有限责任公司 Handan Iron and Steel Group Co., Ltd	240万吨球团建安工程、400m³烧结安装工程 2.4 million tons of pellet construction project, 400m³ sintering installation project
	安徽省贵航特钢有限公司 Anhui Guihang Special Steel Co., Ltd.	142m³烧结项目 142m³ sintering project
	皋兰兰鑫钢铁有限公司 Gaolan Lanxin Iron & Steel Co., Ltd.	126m³烧结总承包 General contracting of 126m³ sintering project
	唐山不锈钢有限公司 Tangshan Stainless Steel Co., Ltd.	132m³烧结及烟气脱硫项目 132m³ sintering and flue gas desulphurisation program
	山西运城新绛县洞峪石料有限责任公司 Xinjiang Dongyu stone material Co., Ltd.	骨料生产线EPC总承包工程 EPC general contracting of aggregate production line project
	江苏徐州宝丰特钢有限公司 Jiangsu Xuzhou Baofeng Special Steel Co., Ltd.	10m²竖炉EPC总承包工程 EPC general contracting of 10m² shaft furnace project
	山西省绛县明迈特有限公司 Shanxi Jiangxian Mingmaite Co.,Ltd.	矿热炉原料输配及储存系统工程 Mineral heat furnace raw material transmission, distribution and storage system project
高炉、转炉	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	2*1080m³高炉建安工程 Safety general contracting for 2*1080m³ blast furnace
	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	4#高炉扩容大修 EPC 总承包 4# blast furnace expansion overhaul EPC general contracting
	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	3#1080m³高炉扩容 EPC 总承包 3#1080m³ blast furnace expansion EPC general contracting
	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	1580m³高炉建安工程 1580m³ blast furnace safety engineering
	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	5#1680m³高炉产能置换工程 5#1680m³ blast furnace capacity replacement project
	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	100吨转炉升级改造工程 100 ton converter upgrade project
	盐城市联鑫钢铁有限公司 Yancheng Lianxin Iron and Steel Co., Ltd.	1080m³高炉建安工程 Safety engineering of 1080m³ blast furnace

项目类别	建设单位	项目名称
高炉、转炉	盐城市联鑫钢铁有限公司 Yancheng Lianxin Iron and Steel Co., Ltd.	2*1080m³高炉工程、6*180m³石灰窑工程、 2*1080m³ blast furnace project, 6*180m³ limestone kiln project
	霸州市新利钢铁有限公司 Bazhou Xinli Iron and Steel Co., Ltd.	2#1068m³高炉建安工程 Safety engineering of 2#1068m³blast furnace
	芜湖市富鑫钢铁有限公司 Wuhu Fuxin Iron & Steel Co., Ltd.	二期1080m³高炉 EPC 总承包 EPC general contracting for phase ii 1,080 m³ blast furnace
	皋兰兰鑫钢铁有限公司 Gaolan Lanxin Iron & Steel Co., Ltd.	高炉、烧结、竖炉扩容项目 Blast furnace, sintering and shaft furnace expansion program
	芜湖市富鑫钢铁有限公司 Wuhu Fuxin Iron & Steel Co., Ltd.	转炉钢渣处理EPC总承包 EPC general contracting for converter steel slag treatment
	文安县新钢钢铁有限公司 Wen'an Xingang Iron and Steel Co., Ltd.	600m³高炉项目 600m³ blast furnace project
	迁安市九江线材有限公司 Qian'an Jiuijiang Wire Co., Ltd.	2*80T转炉建安工程 2*80 ton converter safety project
	鲁丽集团有限公司 Luli Group Co., Ltd.	2*120吨转炉及轧钢建安工程 2*120 ton converter and rolling safety program
	安徽省贵航特钢有限公司 Anhui Guihang Special Steel Co., Ltd.	2*120T转炉建安工程 2*120 ton converter safety program
	铜陵市富鑫钢铁有限公司 Tongling Fuxin Iron & Steel Co., Ltd.	120吨转炉建安总承包 EPC safety general contracting of 120 ton converter project
	本溪参铁（集团）有限公司 Benxi Shentie Iron (Group) Co., Ltd.	260m³高炉EPC总承包 EPC general contracting for 260m³ blast furnace
	四川德胜集团钒钛有限公司 Sichuan Desheng group Vanadium Titanium Co., Ltd.	轧钢一车间加热炉大修EPC总承包工程 EPC project for overhaul of heating furnace in no. 1 workshop
喷煤项目	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	新建喷煤EPC总承包 EPC general contracting for newly-buily coal injection plant
	陕钢集团汉中钢铁有限责任公司 Shanxi Steel Group Hanzhong Iron and Steel Co., Ltd.	喷煤总承包 Coal injection general contracting program
	衡阳华菱连轧管有限公司 Hengyang Valin MPM Tube Co., Ltd.	炼铁厂喷煤系统扩建项目EP工程 Expansion of coal injection system in ironmaking plant EP general contract
	抚顺新钢铁有限责任公司 Fushun New Steel Co., Ltd.	炼铁厂喷煤EPC总承包项目 EPC general contracting for ironmaking plant coal injection



项目类别	建设单位	项目名称
喷煤项目	山西华鑫源钢铁集团有限公司 Shanxi Huaxinyuan Iron and Steel Group Co., Ltd.	炼铁喷煤系统EPC总承包项目 EPC general contracting for iron smelting coal injection system
其他冶金项目	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	新建闷渣处理 EPC 总承包 EPC general contracting for newly-built mulling slag treatment
	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	1200万吨石料选厂总承包 General contracting for 12 million ton of stone processing plant
	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	新建 750 带钢项目 Newly-built 750 strip steel program
	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	年处理70万吨钢渣处理EPC总承包工程 EPC contracting of annual processing of 700,000 tons of steel slag project
	山西高义钢铁有限公司 Shanxi Gaoyi Iron and Steel Co., Ltd.	年产200万吨矿渣超细粉生产线机电安装工程 Electromechanical installation project of slag powder production line with an annual output of 2 million tons
	皋兰兰鑫钢铁有限公司 Gaolan Lanxin Iron & Steel Co., Ltd.	二期炼钢、轧钢、废钢车间、电炉车间总承包 Safety engineering of the second-phase steelmaking, steel rolling
	皋兰兰鑫钢铁有限公司 Gaolan Lanxin Iron & Steel Co., Ltd.	100t电炉建安工程 100t electric furnace safety project
	兰鑫钢铁集团有限公司 Lanxin iron and Steel Group Co., Ltd.	140万吨/年焦化项目 1.4 million ton/year coking program
	芜湖市富鑫钢铁有限公司 Wuhu Fuxin Iron & Steel Co., Ltd.	炼铁厂超低排改造项目 Ironmaking plant ultra-low emission renovation program
芜湖市富鑫钢铁有限公司 Wuhu Fuxin Iron & Steel Co., Ltd.	转炉钢渣处理EPC总承包 EPC general contracting for converter slag treatment	
万荣县文珍白云岩矿业有限公司 Wanrong County Wenzhen Dolomites Mining Co., Ltd.	镁业资源加工一体化项目 Integrated magnesium resources processing program	
万荣县文珍白云岩矿业有限公司 Wanrong County Wenzhen Dolomites Mining Co., Ltd.	EPC总承包 EPC general contracting	
山西富渊通矿业有限公司 Shanxi Fuyuantong Mining Co., Ltd.	焦炉煤气收集及储存EPC总承包工程 EPC general contracting of coke oven gas collection and storage project	
山西晋丰煤化工有限责任公司闻喜分公司 Shanxi Jinfeng Coal Chemical Co., Ltd Wenxi branch	2#气化系统环保综合治理改造项目空分装置(含循环水)EPC总承包项目 2# gasification system environmental protection comprehensive treatment and transformation project air separation unit (including circulating water) EPC project	
山西新凯达再生资源利用有限公司 Shanxi xinkaida renewable resources utilization Co., Ltd.	废钢回收综合利用加工总承包工程 General contracting of scrap steel recycling, comprehensive utilization and processing project	

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