



燃气轮机余热锅炉  
HRSG



垃圾焚烧锅炉  
WTE Boiler



燃气锅炉  
Gas Boiler



生物质锅炉  
Biomass Boiler



循环流化床锅炉  
CFB Boiler



污泥炉 / 污泥干化机  
Sludge Boiler/Sludge Dryer



煤粉锅炉  
PC Boiler



工程总包 (传统项目)  
EPC Project(traditional energy)



工程总包 (光伏)  
EPC Project (photovoltaic)



#### 技术咨询 Technical

顾全斌 (总工程师)  
电话: 13812002423  
Mr. Gu Quanbin (Chief Engineer)  
Tel: 13812002423



#### 销售团队 Sales Director

张学明 (销售总监)  
电话: 13861776940  
Mr. Zhang Xueming  
Tel: 13861776940



#### 电站装备 Power plant equipment

邹涵 (负责人)  
电话: 13338102881  
李艳松 (负责人)  
电话: 13951502076  
Mr. Zou Han  
Tel: 13338102881  
Mr. Li Yansong  
Tel: 13951502076



#### 生物质锅炉技术负责人 Technical director of biomass boiler

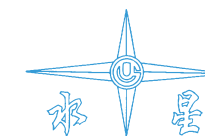
薛金彪 (生物质水冷振动炉排锅炉)  
电话: 13814223386  
陆晓焰 (生物质 CFB 锅炉和固废炉)  
电话: 13382880333  
顾小勤 (往复炉排锅炉和污泥干化处理系列产品)  
电话: 13814287571  
Mr. Xue Jinbiao (Biomass WCVG boiler)  
Tel: 13814223386  
Mr. Lu Xiaoyan (Biomass CFB boiler and ISW boiler)  
Tel: 13382880333  
Mr. Gu Xiaoqin (Biomass reciprocating boiler, sludge boiler and sludge dryer)  
Tel: 13814287571



(SH.600475)

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Achieve long-term development with prudent operation and surpass through ingenuity



华光环能生物质锅炉

| 技术与产品 |

WHEE Biomass Boiler Technology & Product Brochure

无锡华光环保能源集团股份有限公司  
WUXI HUAGUANG ENVIRONMENT & ENERGY GROUP CO., LTD.





华光环能成立于 1958 年，前身为无锡锅炉厂，2000 年完成股份制改造，2003 年在上海证券交易所挂牌上市（股票代码 600475），2017 年完成重大资产重组。2020 年更名为“无锡华光环能资源集团股份有限公司”。

华光是江苏省首家既完成资产重组又实现员工持股和股权激励的大型国有控股上市公司。形成了“能源与环保领域的产业投资运营平台”的功能定位，以“共建清洁低碳生活”为企业使命，以“诚信、责任、专业、超越”为公司核心价值观，确立了成为“中国领先的环保能源综合服务商”的发展愿景。

公司是中国机械五百强、中国机械工业百强、中国分布式能源企业百强、中国工业行业排头兵企业。装备板块主营新能源类和传统能源类锅炉装备及总包：

- ◆ **传统能源类锅炉：**节能环保型燃煤锅炉（CFB+PC）。
- ◆ **新能源类锅炉：**零碳生物质发电锅炉、减碳固废发电锅炉。
- ◆ **清洁能源类锅炉：**低碳燃气—蒸汽联合循环余热锅炉（HRSG）。

截至目前累计研制投运环保发电装备达到近五千台套，分布国内各省，以及海外 38 个国家和地区。

WHEE (formerly Wuxi Huaguang Boiler Co., Ltd. 2000-2020) was known as Wuxi Boiler Works when established in 1958. We completed our shareholding reform in 2000, listed on Shanghai Stock Exchange in 2003 (SH. 600475), and completed major asset restructuring in 2017. We altered our name to "Wuxi Huaguang Environment & Energy Group Co., Ltd." in 2020.

WHEE is the first large state-owned listed company in Jiangsu Province to complete asset restructuring and realize employee stock ownership and equity incentive. We have formed the functional orientation of "industrial investment and operation platform in the field of energy and environmental protection". With "jointly building a clean and low-carbon life" as the corporate mission and "integrity, responsibility, professionalism and transcendence" as the company's core values, we establishes the development vision of becoming "China's leading comprehensive environmental protection and energy service provider".

WHEE have been awarded the titles of one of China's top 500 machinery enterprises, China's top 100 machinery industry enterprises, China's top 100 distributed energy enterprises and the leading enterprise of Chinese industry. Our equipment business sector is mainly engaged in design, manufacture supply and EPC of the boiler products in term of both new energy and traditional energy:

- ◆ **Traditional energy boilers:** energy-saving and environment-friendly coal-fired boilers (CFB + PC).
- ◆ **New energy boilers:** Zero carbon biomass power generation boiler, carbon reduction solid waste power generation boiler.
- ◆ **Clean energy boiler:** low carbon gas steam combined cycle HRSG.

Up to now, nearly 5000 sets of environmental protection power equipment have been developed and put into operation, which are distributed in all provinces in China and 38 countries and regions overseas.

## 01 关于我们 About Us

无锡华光环能资源集团股份有限公司（WHEE）始建于 1958 年，在全球范围内拥有 5000 台以上的业绩。纯烧或混燃的生物质锅炉产品涵盖以下技术：

- ◆ 水冷振动炉排生物质锅炉
- ◆ 循环流化床生物质、固废锅炉
- ◆ 往复炉排（含水冷炉排）生物质、固废锅炉
- ◆ 此外，公司也提供锅炉技改、备件和运维服务。

Wuxi Huaguang Environment & Energy Group Co., Ltd. (WHEE) was established in 1958. We have supplied more than 5000 units of steam generators around the world. We provide mixed fuel and 100% biomass fired boilers covering the technologies of:

- ◆ Water cooled vibrating grate (WCVG) biomass boiler
- ◆ CFB biomass and solid waste boiler
- ◆ Reciprocating grate (including water cooled) biomass and solid waste fired boiler
- ◆ We also provide services of technology modification and upgrade, spare parts and operation and maintenance.



生物质水冷振动炉排锅炉  
Biomass WCVG boiler



生物质循环流化床锅炉  
Biomass fired CFB boiler



炉排生物质锅炉  
Biomass fired grate boiler



固废流化床锅炉  
Solid waste CFB boiler



## 02 研发历程 R & D History



## 03 主要荣誉 Honors



国家重点新产品: 秸秆直燃锅炉  
National key new product: straw direct fired boiler



江苏省高新技术产品: 130t/h 高温高压纯燃烧生物质循环流化床锅炉  
High tech products of Jiangsu Province: 130t / h high temperature and high pressure pure combustion biomass circulating fluidized bed boiler



国家火炬计划: 国产化生物质发电锅炉系列产品  
National Torch Plan: domestic biomass power generation boiler series products



国家科技进步二等奖: 生物质大规模直燃资源化利用的关键技术研发工程应用  
The second prize of national science and Technology Progress Award: research and development and engineering application of key technologies for large-scale direct combustion and resource utilization of biomass



江苏省科学技术奖: 75-110t/h 国产化生物质直燃锅炉系列产品  
Jiangsu Science and Technology Award: 75-110t / h domestic biomass direct fired boiler series products

## 04 生物质水冷振动炉排锅炉 Water Cooled Vibrating Grate Biomass Boiler (Biomass WCVG boiler)

华光环能是国内最早开始研制生物质水冷振动炉排锅炉的企业，在生物质锅炉领域处于行业领先地位。

- ◆ **负荷:** 35t/h-200t/h
- ◆ **压力参数:** 1.3MPa-13.7Mpa
- ◆ **燃料:** 可燃用秸秆、稻壳等多种生物质燃料，燃料适应性广
- ◆ **业绩:** 近 100 台套

WHEE is one of the earliest enterprises in China to develop the biomass WCVG boilers, with advanced technologies and strong reference.

- ◆ **Steam output:** 35t/h-200t/h
- ◆ **Pressure:** 1.3MPa-13.7Mpa
- ◆ **Fuel:** with large fuel flexibility, capable of burning stalk, rice husk and other biomass fuels.
- ◆ **Reference:** nearly 100 boilers.

### 技术优势 Features

- ◆ 采用专有的水冷振动炉排技术，可有效防止燃烧低灰熔点生物质燃料在炉排面上结渣。
- ◆ 可燃用多种秸秆，燃料适应性广。
- ◆ 锅炉燃烧稳定可靠，热效率高。
- ◆ 低氮燃烧，有效降低污染物排放。
- ◆ 拥有管式预热器和烟冷器（外置式预热器）炉型，有效解决积灰和低温腐蚀，锅炉运行周期长。
- Patented WCVG technology, effectively prevent agglomeration by burning biomass fuel with low ash fusion temperature.
- Wide fuel flexibility, capable of firing various of biomass fuels.
- Stable and reliable combustion, high thermal efficiency.
- Low NO<sub>x</sub> combustion, effectively reduce pollutant emission.
- Options: both tubular air preheater and external air preheater can provide effective solutions to avoid ash deposit and low temperature corrosion.

### 典型项目 Typical projects



130t/h 高温高压生物质水冷振动炉排锅炉  
130t/h high temperature and high pressure biomass WCVG boiler



140t/h 高温高压生物质水冷振动炉排锅炉  
140t/h high temperature and high pressure biomass WCVG boiler

## 05 生物质循环流化床锅炉 Biomass Fired CFB Boilers

华光环能自上世纪 90 年代开始从事生物质循环流化床锅炉产品的研制，具备掺烧与 100% 纯烧生物质的循环流化床直燃技术，也可解决含有大量铁质杂物的建材模板的出渣问题，拥有多个生物质循环流化床锅炉项目业绩，可针对不同类型的生物质燃料为用户量身定制，设计研发运行经验丰富。

- ◆ **负荷:** 65t/h-300t/h 全覆盖
- ◆ **压力参数:** 1.6MPa-13.7Mpa
- ◆ **温度参数:** 可达 540℃（可带再热系统）
- ◆ **燃料:** 可燃秸秆、稻壳、稻草、棕榈壳、椰壳、甘蔗渣、树木树皮、建材模板等多种生物质燃料。

WHEE has been engaged in the development of the biomass fired CFB boilers since 1990s. We own the technologies for both mixed fuel and 100% biomass direct firing, and have developed the solution for ash removing when building material formwork containing a large amount of iron is fired. We have many reference projects of biomass fired CFB boilers, capable of supplying customized boilers based on features of various biomass fuels and have rich experiences in boiler development and design.

- ◆ **Steam output:** 65t/h-300t/h
- ◆ **Pressure:** 1.6MPa-13.7Mpa
- ◆ **Temperature:** Up to 540℃ (with the option of reheat system)
- ◆ **Fuel:** various biomass fuel including stalk, rice husk, rice straw, palm husk, coconut husk, bagasse, tree bark, building materials formwork, etc.

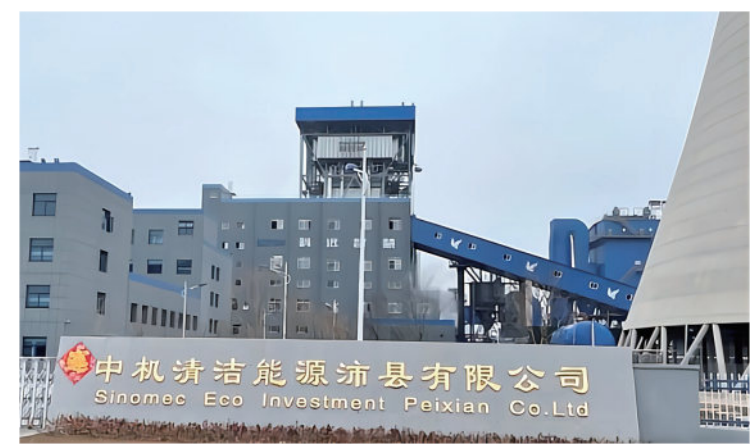
### 技术优势 Features

- ◆ 锅炉整体布置合理，占地面积较小。
- ◆ 可满足散料入炉，前处理设备投资少。
- ◆ 成熟的低温燃烧技术，可解决结团结焦问题。
- ◆ 合理的尾部受热面布置，可有效避免烟道积灰堵塞。
- ◆ 过热器采用创新蒸汽流程布置，可避免高温粘结区重合，解决高温腐蚀。
- ◆ 针对含铁质杂质较多的建材模板具有专用技术，可保证出渣通畅，连续运行时间长。
- Proper overall arrangement, small footprint.
- Adaptable to loose material feeding, requires less investment for pre-treatment equipment.
- Mature low temperature combustion technology, which can solve the problem of agglomeration and coking.
- The heat recovery area is properly arranged so as to effectively prevent the flue gas duct from blocking by deposited ash.
- The superheater is provided with innovative steam flow process to avoid the overlap of high-temperature agglomerating area and solve the problem of high temperature corrosion.
- State-of-the-art technology for the building material formwork containing a large amount of iron, providing smooth ash removing and extend the continuous operating time.



典型项目

Typical projects



投运时间：2020 年 10 月  
Operation: Oct.2020

中机清洁能源沛县有限公司 2×130t/h 高温超高压中间一次再热循环流化床生物质锅炉  
The 2×130t/h high temperature, super high pressure CFB biomass boilers with reheater for Sinomec ECO investment Peixian Co., Ltd

项目技术特点

Features

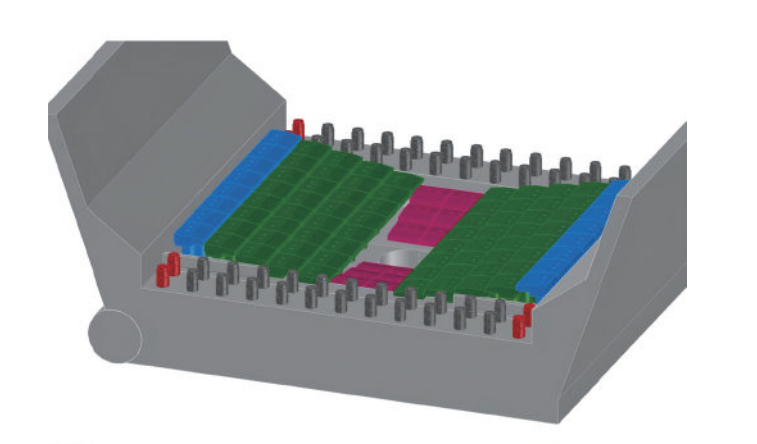
- ◆ 锅炉设计中，结合生物质燃料的燃烧特性，吸收借鉴循环流化床燃煤锅炉低氮燃烧技术，高效节能。
  - Combine the characteristics of the biomass fuel to the CFB low-NO<sub>x</sub> combustion technology to ensure a high efficiency and low energy consumption.

参数 Parameters	温度 Temperature	压力 Pressure	流量 Flow
主蒸汽 Main steam	540℃	13.73MPa	130 t/h
再热蒸汽进（出）口 RH steam inlet (outlet)	328/540℃	2.8/2.6MPa	110t/h



典型项目

Typical projects



投运时间：2022 年 5 月  
Operation: May.2022

首个运用鸭嘴型定向风帽  
布置的锅炉项目  
Duckbill shape directional air  
nozzle arrangement

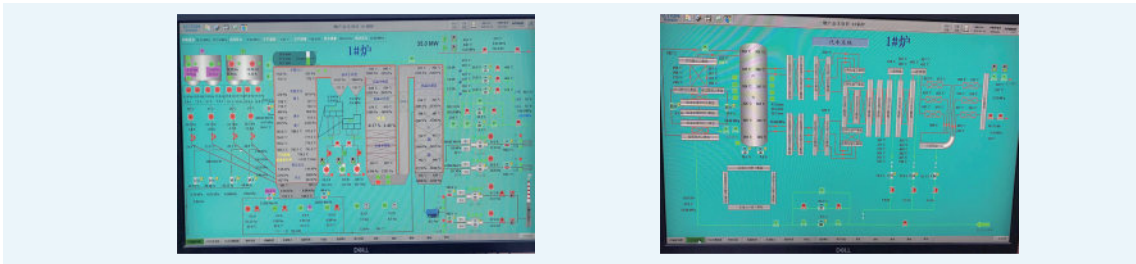
浙江物产金义生物质热电有限公司 2×130t/h 高温高压循环流化床生物质锅炉  
The 2×130t/h high temperature, high pressure CFB biomass boilers for Zhejiang Wuchan Jinyi biomass thermal power Co., Ltd

项目技术特点

Features

- ◆ 首次运用了鸭嘴型定向风帽布置结构。该锅炉项目为纯烧建筑模板的生物质循环流化床锅炉，对排渣要求较高。燃烧建筑模板时，铁钉、捆扎件等并不能完全除干净。长期运行后，会导致排渣不畅，造成用户被迫停炉，影响锅炉连续运行时间。在锅炉布风排渣结构设计中，结合建筑模板的特性，采用鸭嘴型定向风帽布置结构，将蘑菇型风帽与鸭嘴型定向风帽相结合，形成落渣口周围阶梯式布置。
- ◆ 省煤器设置中间旁路调节阀，以便调节 SCR 区域温度。
  - The boiler is specially designed for disposal of the 100% building formwork. For this boiler, the ash discharge is challenging. When burning the building formwork, the accumulation of the iron nails and binding pieces after long term operation may cause blockage of ash discharging system and result in forced shutdown of the boiler. In our design of the boiler air distribution and ash discharge structure, the characteristics of the building formwork is considered and the duckbill shape directional air nozzles are used with the stepped arrangement around the ash drain.
  - The economizer is provided with an intermediate bypass control valve to regulate the temperature of SCR area.

参数 Parameters	温度 Temperature	压力 Pressure	流量 Flow
主蒸汽 Main steam	540℃	9.81MPa	130 t/h



## 06 往复炉排生物质锅炉 Biomass Reciprocating Grate Boiler

华光环能通过自主研发，开发了炉排生物质锅炉系列产品，包括链条炉排生物质锅炉、固定炉排生物质锅炉、水冷往复炉排生物质锅炉，可以根据项目特点、结合用户需求，提供合适的生物质锅炉产品。华光环能自上世纪 90 年代初开始出口生物质锅炉，目前在海外尤其东南亚市场处于领先地位。

- ◆ **负荷：**10t/h-150t/h
- ◆ **压力参数：**9.8MPa 及以下
- ◆ **燃料：**纤维、EFB、木片、棕榈壳、椰子壳、稻壳、花生壳、树皮、甘蔗渣、秸秆、造纸废物、咖啡壳、鸡粪等。

WHEE has independently developed various of series of biomass fired grate boiler Products, including biomass fired travelling grate stoker boilers, biomass fired stationary grate boilers and biomass water cooled reciprocating grate boilers. We offer proper solutions based on the characteristics of the project and the requirements of the client. WHEE has been supply biomass boilers to international market since the early 1990s, we are leading in the overseas biomass market, especially in Southeast Asia.

- ◆ **Steam output:** 35t/h-200t/h
- ◆ **Load:**10t/h-150t/h
- ◆ **Pressure:** up to 9.8MPa
- ◆ **Fuel:** fiber, EFB, wood chips, palm shell, coconut shell, rice shell, peanut shell, bark, bagasse, straw, paper residue, coffee shell, chicken manure, etc

### ◎ 技术优势 Features

- ◆ **锅炉效率高**
  - 根据燃料特性选择不同类型的炉排，有效提高燃烧效率。
  - 受热面布置合理且充裕，排烟热损失低。
  - 炉墙及保温结构合理，散热损失低。
- ◆ **安全可靠**
  - 受热面合理选材并设置合理的防磨罩，防止受热面爆管。
  - 设置可靠的刚性梁，使炉膛具有良好的抗内爆特性。
  - 设置合理的膨胀及密封措施，保证锅炉运行不受阻碍。
- ◆ **High efficiency**
  - Grate selected based on fuel characteristics to increase combustion efficiency.
  - Proper and redundant heating surface arrangement to reduce exit gas temperature.
  - Appropriate boiler brickworks and insulation structure, reduce the heat loss.
- ◆ **Safe and reliable**
  - Selecting appropriate heating surface material and providing reasonable anti-erosion cover plates to prevent the heating surface from leakage.
  - With reliable buckstays, the furnace is provided with excellent anti-explosion performance.
  - Proper expansion and sealing measures to avoid hindrance of boiler operation.

- ◆ **低氮环保**
  - 根据燃料特性合理布风，有效提高氧利用率。
  - 根据不同项目可采用烟气在循环技术，降低 NO<sub>x</sub> 排放指标。
  - 可根据当地环保需要，设置 SCR 或 SNCR 装置。
- ◆ **Low NO<sub>x</sub> emission and environment friendly**
  - Air distribution based on fuel characteristics, effectively increases oxygen utilization.
  - Flue gas recirculating technology applied based on actual condition to reduce NO<sub>x</sub> emission.
  - SCR or SNCR system may be equipped based on local authority requirements.

### ◎ 典型项目 Typical projects



链条炉排生物质锅炉  
Biomass fired travelling grate stoker boiler



固定炉排生物质锅炉  
Biomass fired stationary grate boiler



## 07 工业固废锅炉 Boilers Burning ISW (Industrial Solid Waste)

华光环能是中国固废领域的领跑企业之一，在工业固废锅炉领域研发设计经验丰富，拥有多个循环流化床锅炉处理固废物的项目，目前均已顺利投运且运行效果良好。公司为多个知名造纸企业提供固废锅炉，处理造纸过程中产生的造纸污泥和造纸轻渣、浆渣。

- ◆ **负荷：**65t/h-300t/h 全覆盖
- ◆ **固废处理量：**100t/d-2000t/d
- ◆ **处理方式：**固废纯烧或掺烧
- ◆ **燃料：**纸渣、浆渣、污泥、布条、建筑模板、旧家具等

WHEE is one of the leading companies in the Chinese ISW disposal industry, with rich experiences in the R&D and engineering of the ISW burning boilers. We have a wide variety of references in the CFB ISW disposal projects, all of which are operating in good condition. We have supplied the ISW burning boilers for many well-known paper making enterprises to dispose the sludge, the waste residue and the pulp residue generated in the paper making process.

- ◆ **Steam output:** 65t/h-300t/h
- ◆ **ISW disposal capacity:** 100t/d-2000t/d
- ◆ **Disposal method:** 100% burning the ISW or mixed with other fuel(s)
- ◆ **Fuels:** paper making waste residue, pulp residue, sludge, cloth strip, building formwork, used furniture, etc.

### 技术优势 Features

- ◆ 创新的风帽设计和布风板布置，特殊的风帽孔动量设计，可解决床面不可燃重物的沉积问题。
- ◆ 采用外置床式高温过热器，可解决高参数下高温受热面腐蚀问题。
- ◆ 合理布置的烟气再循环系统，可达到氮氧化物低排放。
- ◆ 成熟可靠的尾部受热面布置，有效防止受热面积灰腐蚀。
- ◆ 独特的烟道设计，可满足 CO 排放指标。
- ◆ 前处理要求低，前处理设备投资少。
- ◆ 运行方式同常规流化床锅炉相似，简单可靠。
- Innovative air nozzle design and grid layout plus specialized air nozzle hole momentum arrangement to solve the problem of deposition of noncombustible heavy materials on the bed.
- High temperature fluidized bed heat exchangers are designed to avoid the corrosion of high temperature heating surface.
- Flue gas recirculating system with proper design to achieve a low emission level of NO<sub>x</sub>.
- Mature and reliable heat recovery area arrangement, effectively prevent the heating surface from suffering ash deposition and corrosion.
- Unique flue gas duct design to satisfy the CO emission requirement.
- The boiler operates easily and reliably, similar to that of the regular CFB boilers.

### 典型项目 Typical projects



投运时间：2020 年 10 月  
Operation: Oct.2020

龙游县金怡热电有限公司 90t/h 高温高压循环流化床固废炉  
The 90t/h high temperature, high pressure CFB ISW boiler for Jinyin Thermal Power Co., Ltd of Long You, Zhejiang Province

### 项目技术特点 | Features

- ◆ 炉膛采用低烟速以及 2 秒以上 850℃燃烧时间，燃烧效率高，污染物排放低。
- ◆ 采用空烟道技术，CO 排放低。
- ◆ 给料管采用夹心风形式，解决了给料系统烟气反串问题。
- ◆ 返料采用外置床形式，过热器高温段设置在外置床中避免了高温氯腐蚀的问题。
- ◆ 专为固废物燃料设计的排渣系统及运行方式解决了排铁问题，连续运行 4 个月以上。
- Low flue gas velocity inside the furnace, the combustion temperature of 850 °C last for more than 2 seconds, with high combustion efficiency and low pollutant emission(based on local environment regulation).
- Additional flue gas duct are provided to reduce the CO emission.
- Special air arrangement inside the fuel feeding duct to prevent back flow of the flue gas.
- The high temperature superheater is arranged inside the fluidized bed heat exchanger to avoid the high temperature chlorine corrosion.
- With the ash discharge system specially designed for solid waste, a continuous operation for 4 month is ensured.

参数 Parameters	温度 Temperature	压力 Pressure	流量 Flow
高压蒸汽 High perssure steam	510℃	9.81MPa	90t/h



## 08 危废余热锅炉 Boilers Burning HW (Hazardous Waste)

公司自 2010 年开始研制危废余热锅炉，可为危废处置项目配套提供危废余热锅炉。项目主要为危废减容、减重和无害化处理，兼顾热能的回收利用，主流处理技术采用高温焚烧，焚烧工艺先进，有效控制二噁英、HCl、重金属和有害性微量有机物的排放。同时，焚烧技术集成度高、自动化程度高、管理保障度高，防止二次污染。

- ◆ **危废处理量：**150t/d 及以下
- ◆ **压力参数：**3.82MPa 及以下
- ◆ **业绩：**累计生产近 10 台套

WHEE has developed the HW fired boilers since 2010. We design, manufacture and supply the boilers for HW disposal projects. The boilers are mainly used to reduce the volume and weight and achieving a bio-safe disposal while recovering and utilizing the heat from HW. The major disposal technology is high temperature incineration, with advanced incinerating process, the emission of dioxins, HCl, heavy metals and harmful trace organics are controlled in an effective manner. Meanwhile, the incineration technology is characterized in high integration, high automation, high management security and capable of preventing secondary pollution.

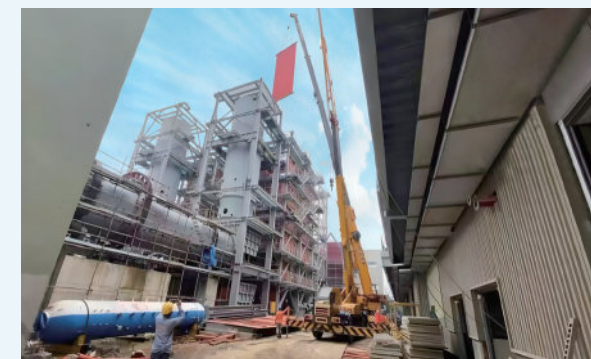
- ◆ **HW disposal capacity:** up to 150t/d
- ◆ **Pressure:** up to 3.82MPa
- ◆ **Number of reference projects:** WHEE has produced 10 sets of HW boilers

### ◎ 技术优势 Features

- |                                |   |
|--------------------------------|---|
| ◆ 危废来源广                        | ◆ Large HW burning flexibility  |
| • 可接受各种各类危废焚烧后所产生的烟气           | • Adaptable to the flue gas generated from the incinerating process of all kinds of HW.   |
| • 合理的炉内除尘 / 排灰结构               | • Appropriate arrangement of boiler dedusting and ash extracting structure.   |
| ◆ 换热效率高                        | ◆ Efficient heat exchange   |
| • 合理的烟道设计，有效清除水冷壁积灰，控制过热器入口烟温。 | • Flue gas ducts are designed in a proper manner so as to effectively remove the ash deposit on the water wall and control the superheater inlet gas temperature. |
| • 合理的受热面布置，保证蒸汽参数，充分利用余热资源。    | • The heating surfaces are arranged to ensure the steam parameters and to make full use of the heat recovered.  |
| • 高效的清灰形式，确保对流受热面的高效换热。        | • With efficient soot-blowing method, an efficient heat exchange is ensured for the convective heating surfaces.  |

- |                 |   |
|-----------------|---|
| ◆ 稳定、可靠性高       | ◆ Stability and reliability   |
| • 炉膛水冷壁高温腐蚀解决方案 | • Solution for the high temperature corrosion of furnace water wall |
| • 高温过热器的防腐解决方案  | • Solution for the corrosion of high temperature superheater        |
| • 省煤器低温腐蚀解决方案   | • Solution for the low temperature corrosion of economizer          |
| • 尾部受热面防结焦措施    | • Prevention of the coking in heat recovery area                    |
| • 合理的结构设计       | • Proper structural design  |
| • 制造工艺质量控制措施    | • Manufacture process quality control                               |

### ◎ 典型项目 Typical projects



300t/d 危废（医疗垃圾）焚烧处理系统  
300t/d HW (Medical Waste) Incinerating Disposal System



50t/d 危废（医疗垃圾）焚烧处理系统  
50t/d HW (Medical Waste) Incinerating Disposal System



## 09 污泥炉 + 干化机 Boilers Burning Sludge + Sludge Dryers

华光环能从 2010 年开始进行污泥炉的研制，与院校开展产学研合作，开发了鼓泡床污泥焚烧技术，污泥焚烧产生的热量用于产生蒸汽，供污泥干燥装置使用，形成污泥自持焚烧，不需额外添加燃料，该技术在行业内处于领先水平，已有多个项目成功投入运行。

- ◆ **污泥处理量：**100-200t/d
- ◆ **所产生的介质：**蒸汽（配合干化机）

华光环能从 2011 年开始进行污泥干化机的研制，与院校合作开发具有自主知识产权的污泥干化机，包含导热油型、蒸汽型圆盘干化机。截至目前已生产投运 10 余台套，设备性能稳定，达到设计要求。

- ◆ **污泥处理量：**50-150t/d
- ◆ **热源：**导热油、低压蒸汽（0.2-0.8MPa）

WHEE started the development of the sludge burning boilers in 2010. We have developed the BFB (Bubbling Fluidized Bed) boiler technology for sludge disposal. The heat recovered from sludge burning is utilized to generate steam, which is supplied to the sludge dryer so as to realize a self-sustained sludge combustion without feeding any other fuel. This technology is of industrial-leading and many sludge projects of WHEE have been successfully operated.

- ◆ **Sludge disposal capacity:** 100-200t/d
- ◆ **Generated media:** steam (to the dryer)

WHEE' s developing of the sludge dryers has been started since 2011. We have developed the heat transfer oil type sludge dryers and the steam (disc) type sludge dryers. For the time being, more than 10 sets of the sludge dryers were put into operation, the performance of the dryers are stable and all the design requirements are satisfied.

- ◆ **Sludge disposal capacity:** 50-150t/d
- ◆ **Heating resources:** heat transfer oil/ low pressure steam (0.2-0.8MPa)

### ◎ 技术优势 Features

#### ◆ 污泥炉技术优势

- 炉膛出口与尾部烟道进口之间设置旋风分离器，可减少烟气中的飞灰量，大大降低尾部环保设备的投资。
- 可 100% 处理烘干机产生的不凝气体，无需额外设置处理设备。

#### ◆ Features of our sludge burning Boilers

- With the cyclone separator between furnace and back pass, the amount of the fly ash in flue gas is largely reduced and subsequently greatly reduce the investment for boiler flue gas treatment equipment.
- The non-condensable gas generated by the dryer can be 100% disposed without other treatment equipment.

- 布置结构可使烟气通道内保持较高的燃烧温度及充足的停留时间，使二噁英和一氧化碳达标排放。
- 焚烧炉预留 SNCR 接口，用于烟气脱硝处理。
- ◆ 干化机技术优势
- 热源灵活，热源可为导热油也可为蒸汽。
- 干化机处理量可根据用户要求定制，目前已投运主要规格有 100、120、150t/d 等。
- 可为用户提供污泥干化焚烧处置整体解决方案。
- 从设计到制造全过程符合压力容器标准。
- 同等处理量时干化效果更好且干化机占地面积小。

- With a proper arrangement of the structure, a high combustion temperature and sufficient resident time inside the flue gas path is ensured, and therefore the requirements on emission of dioxins and carbon monoxide are satisfied.
- SNCR interfaces are reserved for flue gas deNOx equipment.
- ◆ Sludge dryers
- Flexible heat resources: heat conduction oil and steam
- Customized drying capacity (currently, the major capacities are: 100t/d, 120t/d, 150 t/d, etc.)
- Capable of providing overall solution for sludge drying and disposal.
- The design and manufacture comply with pressure vessel code.
- Excellent drying effect and small footprint.

### ◎ 典型项目 Typical projects



纯燃污泥 CFB 项目，污泥处理量 32t/d，可产 1MPa 饱和蒸汽 5t/h  
The CFB boiler 100% burning sludge, with disposal capacity of 32t/d, generating 1MPa saturated steam of 5t/h

◎ 典型项目 Typical projects



1×120t/d 污泥焚烧锅炉  
 1×120t/d sludge burning boiler



2×100t/d 污泥焚烧锅炉  
 2×100t/d sludge burning boilers

◎ 典型项目 Typical projects



3 台 150 t/d 卧式圆盘蒸汽污泥干化机  
 3×150 t/d disc type horizontal sludge dryers with steam as media



4 台 100t/d 卧式圆盘蒸汽污泥干化机  
 4×100 t/d disc type horizontal sludge dryers with steam as media



# 10 研发制造能力篇 R & D and Manufacturing Capabilities

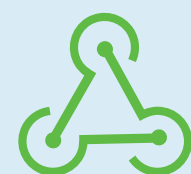
□ R&D and manufacture capacity | 研发 & 制造能力



**200+ 名**  
 拥有性能,标准,受热面,钢结构,  
 工艺等专业的 200 多名工程师。  
**200+ Engineers**  
 specialized in performance, standard,  
 heating surface design, steel structure  
 design, processing technology, etc.



□ R&D and manufacture capacity | 研发 & 制造能力



**+90%**

采用参数化定制设计,  
设计出图效率提升  
90%, 可视化模拟安  
装现场, 保障安装可  
靠性。

**+90%**

Design efficiency Tailor designed for client,  
the design efficiency increased by 90%, Visual  
simulation of erection procedure to ensure the  
reliability of Erection.



**10000m<sup>2</sup>**

10000 平米的厂房,  
专为余热锅炉模块组  
装新建。

**10000 m<sup>2</sup>**

workshop Specially built for the assembly of  
HRSG modules.

**9 大体系**  
9 Systems



◆ ASME 体系	· ASME
◆ 质量管理体系	· Quality management system
◆ 环境管理体系	· Environmental management system
◆ 职业健康安全管理体系	· Occupational health and safety management system
◆ 知识产权管理体系	· Intellectual property management system
◆ 两化融合管理体系	· Information and industrialization integration management system
◆ 测量管理体系	· Measurement management system
◆ 研发管理体系	· R & D management system standardized management
◆ 党建标准化管理体系	· System of Party Building

## □ 体系证书全面 | Comprehensive system certificate

- ◎ 作为拥有 64 年创建历史的国有企业，公司高度重视制造质量。
- ◎ 1990 年，公司率先成为全国 9 家 A 级锅炉制造许可证企业之一；
- ◎ 1995 年 12 月，公司首次通过 ISO19001 质量体系认证；
- ◎ 1996 年 2 月，公司首次获得 ASME 体系“U”“S”钢印认证；
- ◎ 1999 年 12 月，公司首次取得 A1、A2 压力容器设计、制造许可证。
- ◎ 根据《特种设备生产和充装单位许可规则》的发布，2020 年调整为大型高压容器（A1）制造许可及固定式压力容器规则设计许可。我公司为无锡市唯一一家拥有 A1 级制造许可的单位。
- ◎ 2020 年 7 月，公司首次获得测量管理体系证书。
- ◎ 公司相继获得国家二级企业、全国质量效益型先进企业、全国用户满意企业、中国工业行业排头兵企业等荣誉称号。

- As a state-owned enterprise with a history of 64 years, WHEE attaches great importance to manufacturing quality.
- In 1990, we became one of the nine enterprises that obtained class A boiler manufacturing license in China.
- In December 1995, we passed ISO19001 quality system certification for the first time.
- In February 1996, we obtained the “U” and “S” steel stamp certifications of ASME system for the first time.
- In December 1999, we obtained the design and manufacturing license of A1 and A2 pressure vessels for the first time.
- According to the “Accreditation Criteria on Special Equipment Inspection Agencies”, the “design and manufacturing license of A1 and A2 pressure vessels” are converted to “the manufacturing license of large high-pressure vessel (A1) and the design license of fixed pressure vessel” in 2020. WHEE is the only one with A1 level manufacturing license in Wuxi.
- In July 2020, we obtained the measurement management system certificate for the first time.
- WHEE has successively won the honorary titles of national second-class enterprise, national advanced quality and benefit enterprise, national user satisfaction enterprise, the leading enterprise of Chinese industry and so on.



Class A boiler manufacturing license  
A 级锅炉制造许可证



The leading enterprise of Chinese industry  
中国工业行业排头兵企业



National advanced quality and benefit enterprise  
全国质量效益型先进企业



National second-class enterprise certificate  
国家二级企业证书

## 11 企业战略及文化 Corporate Strategy & Culture

### 品牌定位 Brand Positioning

为全球提供绿色动能  
Provide green energy for the world

### 企业使命 Corporate Mission

共建清洁低碳生活  
Building a clean and low-carbon life together

### 发展愿景 Development Vision

全球领先的环保能源领域系统解决方案服务商  
Becoming world's leading comprehensive service provider in the field of environmental protection and energy utilization

### 核心价值观 Core Values

诚信·责任·专业·超越  
Integrity, responsibility, professionalism and transcendence

### 企业精神 Enterprise Spirit

务实创新·团结拼搏  
Pragmatic innovation, unity and hard-working

### 经营理念 Business Philosophy

产品服务让用户满意，企业发展让股东满意，工作氛围让员工满意，公共责任让社会满意。  
Products and services to customers' satisfaction, enterprise development to shareholders' satisfaction, working atmosphere to staff satisfaction, and public responsibilities to society's satisfaction.