2022.5

股票代码：600499

KEDA

提供一站式煤制气解决方案

CLEAN COAL GASIFICATION SOLUTION

安徽科达洁能股份有限公司

KEDA（ANHUI）CLEAN ENERGY CO.,LTD

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ABOUT KEDA
企业简介

安徽科达洁能股份有限公司成立于 2007 年 4 月 28 日，为科达制造股份有限公司（股票代码：600499）在马鞍山市投资设立的控股子公司，具备完善的质量、环境、职业健康安全管理体系和知识产权管理体系。

公司主要从事清洁煤气化系统的技术研发、装备制造和煤气的生产与销售，同时从事化工环保技术和气化灰渣固废资源化利用技术的研发和相关装备的生产制造与销售。

展望未来，安徽科达洁能将继续专注于环保节能板块的多元化发展，全力打造成为具有国际竞争力的清洁能源供应商，为企业提供整套清洁能源解决方案，实现可持续发展，让幸福更久远！

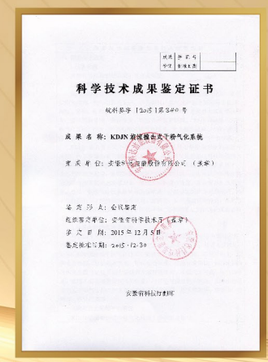
KEDA（ANHUI）CLEAN ENERGY CO.,LTD was established On Apr. 28, 2007 in Ma' anshan City, as a subsidiary company of KEDA INDUSTRIAL GROUP CO., LTD. (Stock Code: 600499). The company has adopted the certification system of ISO9001, ISO14001,OHSAS18001, and IP management system.
The company has specialized in R&D, equipment manufacturing, gas production & sales, at the same time, the company has also engaged in R&D of chemical and environmental protection technology and gasification ash solid waste resource utilization technology, and the production and sale of related equipment.
In the future, KEDA will continue to focus on the diversified development of clean energy environmental protection plate, to create a clean energy supplier with international competitiveness, provide a set of clean energy solutions for the enterprise to realize sustainable development and make happiness longer.

企业愿景 Vision
做值得人尊重的机械装备制造企业
To be a respectable manufacturer for machinery and equipment.

企业使命 Mission
让幸福更久远——为节能减排提供装备与服务
Green solution, greener life.

企业核心价值观 Core Value
创新永无止境；为客户创造价值；诚实守信，多赢才是赢；品质至上，质量决定成败。
Innovate infinitely; Create value for the customer; To be honest, multi-win with credibility; Quality first, quality decides success or failure.

KEDA HONOR
企业荣誉



DEVELOPMENT
企业发展

2007/04

公司成立

Our company was established.

2008/08

清洁煤制气装置成功运用于陶瓷行业

Clean coal gasification equipment applied for ceramics industry.

2013/01

清洁煤制气装置成功运用于氧化铝行业

Clean coal gasification equipment applied for alumina industry.

2014/04

工业园集中供气项目正式运营

Central gas supply for ceramic industry park project in official operation.

2015/07

常压气流床煤制气装置点火运行

The atmospheric pressure entrained-flow gasification equipment launched.

2022/05

清洁煤制气装置成功运用于金属镁行业

Clean coal gasification equipment applied for magnesium industry.

2021/05

清洁煤制气装置成功运用于合成氨行业

Clean coal gasification equipment applied for ammonia industry.

2021/05

首个海外氧化铝项目点火运行

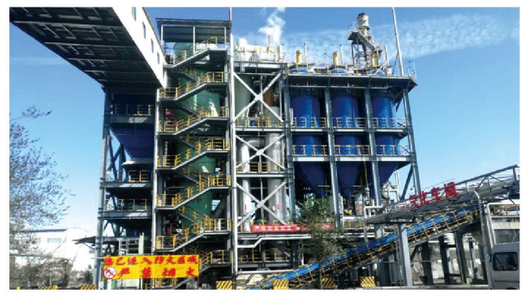
The first overseas alumina project started operation.

2018/09

清洁煤制气装置成功运用于钢铁行业

Clean coal gasification equipment applied for steel industry.

2017/06



清洁煤制气装置成功运用于碳素行业

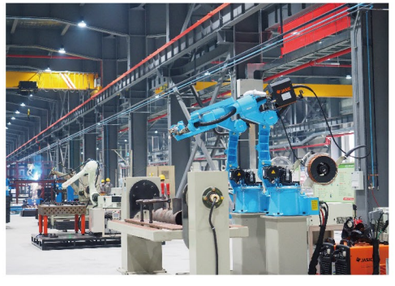
Clean coal gasification equipment applied for carbon industry.

STRENGTH
企业实力

硬件实力 Hardware Strength

安徽科达洁能股份有限公司投资近 5 亿元在马鞍山市打造了占地 180000m² 的 "清洁煤气化系统"生产研发基地，其中厂房面积 40000m²。工厂内设施设备先进、齐全，厂内桥式起重机起重能力可达 260 吨，并配备数控龙门加工中心、数控落地镗铣床、钢板预处理线、数控龙门等离子切割机、热处理炉、无损探伤间、喷漆系统等起重和加工设备，满足清洁能源、锂电和化工环保等设备部件的生产制造。

KEDA builds a R&D and manufacturing base of clean coal gasification system with an area of 180,000m² in Ma' anshan City, including a workshop area of 40,000m². The facilities and equipment in the factory are advanced and completed, and the bridge crane lifting capacity is up to 260T, matching production facilities including CNC gantry machining-center, CNC floor-type boring and milling machine, steel plate preprocessor, CNC double column plasma incise machine, thermal treatment furnace, nondestructive testing room, paint spray booth, etc., these facilities can meet the production and manufacture of equipment components such as clean energy, lithium battery,chemical and environmental protection.



软件实力 Software Strength

公司拥有一支由多学科博士、硕士和学士人员组成的专业技术研发和管理团队，依托"清洁煤气化重点实验室"、"院士工作站"、"技术研发中心"、"碳基原料清洁利用联合研究中心"（安徽科达洁能与清华大学山西清洁能源研究院联合成立）等产学研平台，自主研发了循环流化床气化系统和低压气流床气化系统两种核心技术，并获得授权专利 177 项；同时全面引进各类先进的设计软件，可为用户提供工程设计、三维建模、仿真计算等技术支持和服务。同时，公司具备特种设备设计和制造、石油化工工程施工总承包、冶金工程施工总承包、化工石化医药行业设计资质，可为客户提供 EPC 总包服务。

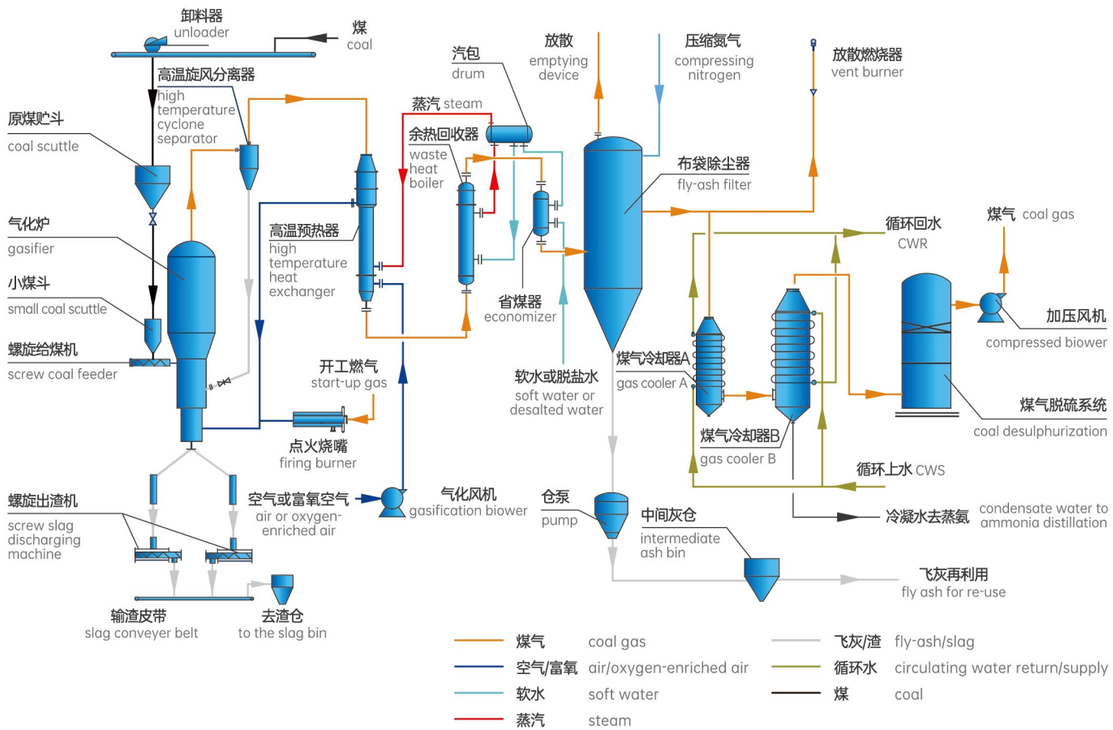
KEDA assembled a technical and management team which is composed of Ph.D., masters and bachelors; the company has set up the platform of producing-studying-researching, including "Key Laboratory of Clean Coal Gasification", "Technology R&D Center" , "Academician Work Station" , "Joint Research Center for Clean Utilization of Carbon-Based Raw Materials" (jointly established by Anhui Keda Clean Energy and Tsinghua University Shanxi Clean Energy Research Institute)etc.; the company has independently developed two core technologies of circulating fluidized gasification system and low pressure entrained-flow gasification system, and it obtained 177 authorized patents; the company also imported advanced software for engineering design, 3D modeling, simulation calculation, etc.Besides, KEDA holds the qualification of design or construction general contracting(EPC) at certain subject, such as special equipment, petrochemical and metallurgical and chemical engineering.

安徽科达洁能清洁煤制气装置主要包含备煤系统、煤气化系统、除尘系统、脱硫系统、加压系统、气力输送系统、水处理系统、DCS控制系统等，有循环流化床和低压气流床两种核心技术，是安全、清洁、高效、经济的煤制气装置。

KEDA clean coal gasification equipment mainly comprises coal storage system, gasification system, flyash removal system, desulphurization system, compressing system, pneumatic conveying system, water treatment system, DCS operating system, etc.,and includes circulating fluidized gasification system and low pressure entrained-flow gasification system, and it is a safe, clean, efficient and economical coal gasification equipment.

PRODUCTS 主要产品

循环流化床气化系统 Circulating Fluidized Bed Gasification System



工艺流程 Process Flow

原煤经过破碎、筛分，10mm 以下的颗粒，通过皮带运输至原煤贮斗，由螺旋给煤机送入气化炉中。气化剂（空气或富氧空气）经高温预热器预热至高温，进入气化炉与粉煤在 950℃左右反应。气化炉内物料处于流化状态，炉内不含干馏层，煤炭在炉内受热均匀；高温下焦油及酚、氰类物质裂解燃烧完全。反应后粗煤气经过高温旋风分离器、高温预热器、余热回收器、布袋除尘器、煤气冷却器 A/B 降温除尘，脱硫系统脱硫、加压系统加压后送至用户。

After crushing and sieving, the coal (size≤10mm) is carried to coal scuttle by belt conveyors, conveyed to gasifierby screw feeder; and reacts with gasification agent（air or oxygen-enriched air）which is preheated to high temperature roughly through high temperature preheater in the gasifier, temperature is about 950℃. Streams are in the fluidization state , the furnace contains no dry distillation layer, and the tar, phenol and cyanide decompose completely under high temperature.
Coal gas flows through cyclone separator, high temperature preheater, waste heat recovery, fly-ash filter and gas coolerA/B for cooling down and dust removal. After desulphurization and compression, the gas can be sent to users.

工艺特点 Features

- **清洁：** 生产过程中焦油及酚、氰类物质零排放；煤气中 H_2S≤20mg/Nm³, 粉尘≤10mg/Nm³, 其清洁程度可与天然气媲美。
- **高效：** 采用全逆流换热可回收 90% 以上的煤气显热；高温助燃技术可显著提高煤气热值。
- **运行成本低：** 使用碎煤, 不必采用昂贵的块煤, 显著降低制气成本。
- **单炉产气量大：** 炉型有 10kNm³/h、20kNm³/h、40kNm³/h、50kNm³/h、60kNm³/h、80kNm³/h, 可调负荷范围广。
- **运行安全稳定：** 完善的安全保护连锁、一键停车设置；关键设备可在线更换维修, 单炉最长运行周期超过 12 个月。

- **Clean:** no discharge of tar, phenol-cyanogen waste-water; H_2S content≤20 mg/Nm³, dust≤10 mg/Nm³, almost the same cleanness as natural gas.
- **Efficient:** with full counter-current heat transfer, more than 90% of gas sensible heat can be recovered;high-temperature combustion technology can significantly increase gas calorific value.
- **Low cost:** fine coal can be used, the cost of gas production can be significantly reduced.
- **High output:** 10kNm³/h, 20kNm³/h, 40kNm³/h, 50kNm³/h, 60kNm³/h 、80kNm³/h available, and load range can be adjusted.
- **Safe and stable operation:** perfect safety protection interlock, one-button parking; key equipment can be replaced online, the longest running period of a single furnace is more than 12 months.

煤质指标（Coal Index）

推荐煤种 Recommended coal	煤的热值 Qnet,ar	空干基挥发分 Vad	空干基灰分 Aad	焦渣特性 CRC	软化温度 S.T.
烟煤、次烟煤、褐煤 bituminite, sub-bituminous,lignite coal	≥4500kcal/kg	≥28%	≤20%	≤4	≥1150℃

备注：褐煤发热量为干燥后指标。Note: the calorific value of lignite is the index after drying.

煤气成分（Gas Composition）

空气和水蒸气作为气化剂时，煤气成分如下表：
If the mixture of air and steam are used as gasifying agent, the gas composition are as follows:

主要成分 Component	CO	H_2	CH_4	CO_2	N_2	Qnet/kcal/Nm³
体积 Vol.(%)	20~24	18~22	1~3	8~12	45~50	≥1250

富氧和水蒸气作为气化剂时，煤气成分如下表：
If oxygen-enriched air and steam are used as gasifying agent, the gas composition are as follows:

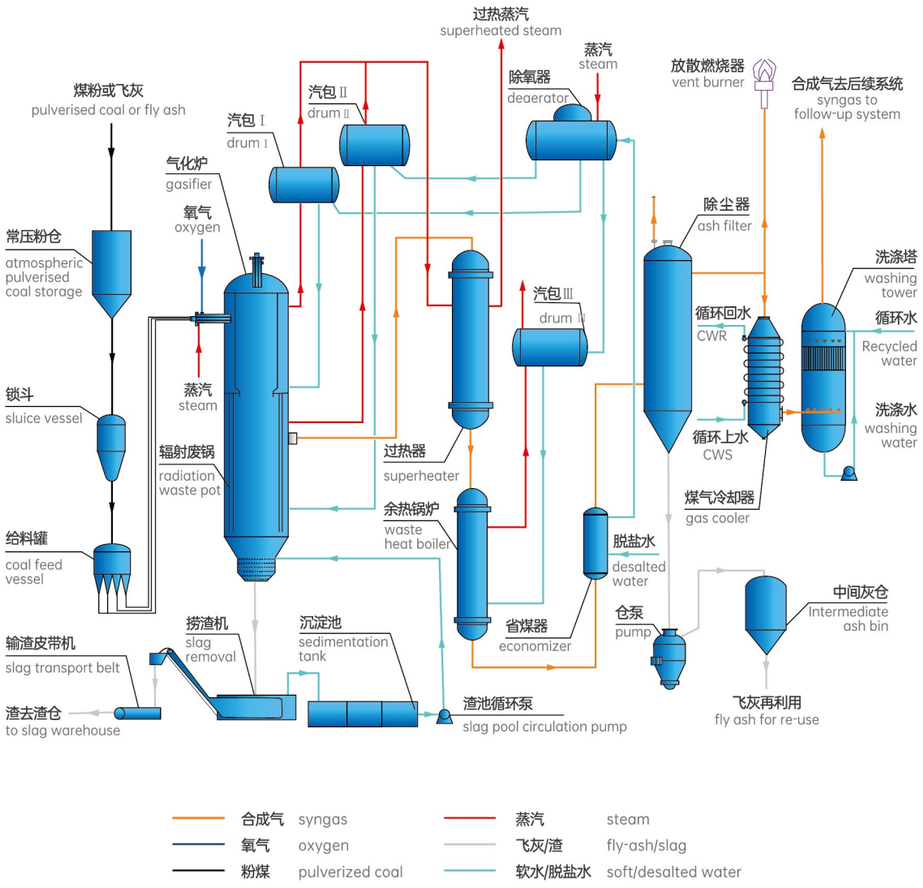
主要成分 Component	CO	H_2	CH_4	CO_2	N_2	Qnet/kcal/Nm³
体积 Vol.(%)	23~40	23~40	2~3	12~14	30~35	1400~2200

低压气流床气化系统
Low Pressure Entrained-flow Gasification System

工艺流程 Process Flow

原煤经磨煤系统干燥制粉处理后(90% 粒径≤90μm, 水份含量≤2%)送入给粉系统, 经给粉系统加压输送至煤烧嘴, 在煤烧嘴头部与蒸汽、氧气接触发生剧烈燃烧形成高温射流在炉膛内经过充分氧化还原反应生成粗合成气。此过程中煤粉燃尽后剩余的灰份发生融熔粘连，形成液态渣。部分液态渣粘在炉壁形成固态渣层；部分液态渣随粗合成气下行落入渣池，经水激冷后由渣系统送往渣堆场。粗合成气经后续系统设备降温、除尘、脱硫后供给下游用户使用。

The coal is sent to the powder system after Coal Milling and Drying System (90% particle size≤90μm, moisture≤2%),and then it is transmitted to the coal burners by pressurizing .In the head of the coal burner, with steam and oxygen contact, a high temperature jet stream is formed with intense combustion in the furnace. In the process of coal combustion, the remaining ash will melt and adhesion, forming liquid slag. Some of the liquid slag is stuck to the furnace wall to form solid slag layer; some of the liquid slag falls into the slag pool with the raw syngas, and the slag is sent to the slag dump after cooled in the Cold Slag Handling System. The raw syngas is used after cooling, dusting and desulphurization.



工艺流程图 Flow Chart

工艺特点 Features

- **煤种适应性广：**反应温度高(1500~1700℃), 运行压力 0~1.6MPa, 可气化多种煤。
- **清洁：**生产过程中无焦油、酚类物质产生, 煤气中 H_2S 含量≤20mg/Nm³, 粉尘含量＜1mg/Nm³, 煤气清洁程度高。
- **高效：**煤炭综合利用率≥98%, 热回收效率≥95%；纯氧气化, CO+H_2≥85%；干煤粉气化, 比氧耗、比煤耗低。
- **产能高：**单炉产气量可达 100kNm³/h, 可调负荷 50~120%。
- **运行安全稳定：**气化炉为水冷壁结构, 气渣同流, 使用寿命长, 可实现长周期运行。

- **Wide adaptability:** high reaction temperature (1500~1700℃), operating pressure 0 ~1.6MPa, wide adaptability for kinds of coal .
- **Clean:** in the process, no discharge of tar and phenol-cyanogen waste-water; in the gas, H_2S≤20mg/Nm³, dust＜1mg/Nm³.
- **Efficient:** comprehensive utilization of raw coal≥98%, thermal recovery efficiency≥95%; dry pulverized coal gasification, in the condition of pure oxygen as gasification agent, CO+H_2≥85%; lower oxygen consumption ratio and coal consumption ratio.
- **High productive capacity:** the gas production of single gasifier can be up to100kNm³/h; and the scope of adjustable load lies in 50~ 120%.
- **Safe and stable operation:** applies water cooled wall structure to gasifier, can realize long period operation.

煤质指标（Coal Index）

推荐煤种 Recommended coal	煤的热值 Qnet,ar	全水 Mt	空干基灰分 Aad	灰熔点 F.T.	操作窗口 Operating-window	可磨指数 HGI
烟煤、次烟煤、褐煤 bituminite, sub-bituminous,lignite coal	≥4800kcal/kg	≤15%	12~35%	≤1450℃	>80℃	≥60%

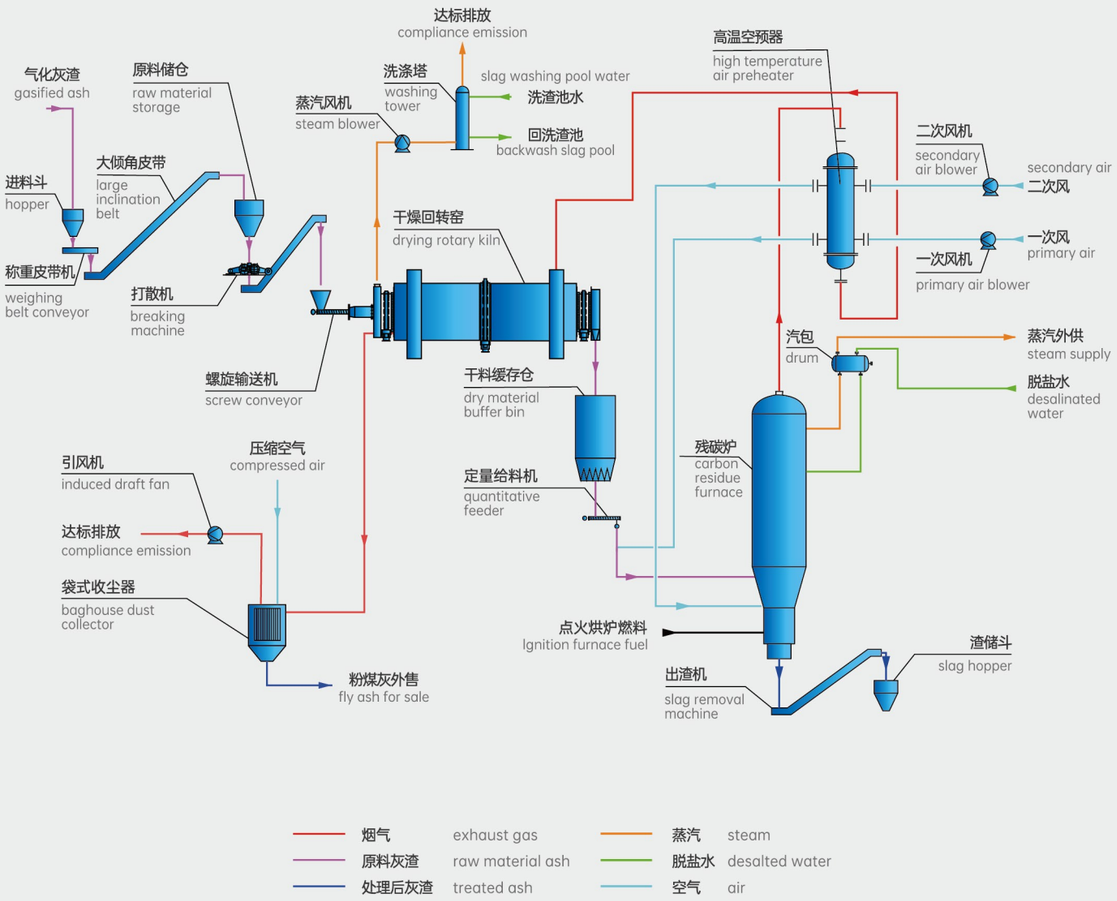
煤气成分（Gas Composition）

99% 富氧作为气化剂时, 煤气的成分如下表:

If 99% oxygen-enriched air for gasifying agent, the gas composition are as follows:

主要成分 Component	CO	H_2	CH_4	CO_2	N_2	Qnet/kcal/Nm³
体积 Vol.(%)	60~70	13~25	0~1	2~5	8~13	≥2400

气化灰渣固废资源化利用系统
Gasification Ash Solid Waste Resource Utilization System



工艺流程图 Flow Chart

工艺流程 Process Flow

气化灰渣经大倾角皮带输送至原料储仓，经打散机破碎后送入干燥回转窑中，干燥后灰渣送入保温缓存仓，经高温一次风定量吹送进入残碳炉，与高温二次风共同进行反应。
高温烟气与残碳炉内水冷壁换热产生蒸汽，随后烟气进入高温空预器换热，降温后的烟气通过间接换热将干燥回转窑中的气化灰渣进行脱水干燥。同时烟气进一步降温后进入袋式收尘器将粉煤灰收集，实现对气化灰渣固废的资源化利用。

The gasification ash and slag are transported to the raw material storage silo by the large inclination belt, crushed by the dispersing machine and sent to the drying rotary kiln. The secondary air reacts together.
The high temperature flue gas exchanges heat with the water wall in the carbon residue furnace to generate steam, and then the flue gas enters the high temperature air preheater for heat exchange, and the cooled flue gas dehydrates and dries the gasification ash in the drying rotary kiln through indirect heat exchange. At the same time, the flue gas is further cooled and then enters the bag filter to collect the fly ash, so as to realize the resource utilization of gasification ash and solid waste.

工艺特点 Features

- **节能：** 系统自身可实现热量平衡，保证持续稳定反应，无需额外热源伴烧。
- **环保：** 无需增加烟气处理系统即可满足国家固废处理标准，无废水、固废排放。
- **经济：** 气化灰渣固废经资源化处理后的粉煤灰可用作陶瓷、水泥、商品混凝土等建材替代材料；系统余热可根据用户需求合理配置余热回收方案，实现高效利用。

- **Energy saving:** The system itself can achieve heat balance to ensure continuous and stable reaction, without the need for additional heat sources to accompany burning.
- **Environmental protection:** It can meet the national solid waste treatment standard without adding a flue gas treatment system, and there is no waste water and solid waste discharge.
- **Economical:** The fly ash after the gasification ash solid waste treatment can be used as a substitute material for building materials such as ceramics, cement and commercial concrete; the waste heat of the system can be reasonably equipped with waste heat recovery schemes according to user needs to achieve efficient utilization.

原料灰渣指标（Raw Material Ash Index）

干基残碳 carbon residue on dry basis	初始含水 initial moisture
⩾15%	⩽50%

粉煤灰指标（Fly Ash Index）

烧失量 loss on ignition	需水量比 water demand ratio	强度活性指数 Intensity activity index	SiO_2+Al_2O_3+ Fe_2O_3	安定性 stability
⩽3%	⩽95%	⩾70%	⩾70%	⩽5

SERVICE
全周期服务

我们的服务——提供整套能源解决方案
Our Service——provide A Set Of Energy Solution

科达洁能秉承客户至上的服务理念，为客户提供从前期咨询、工程设计、生产制造、安装调试至运行维护等全周期服务，为客户提供一整套的能源解决方案，解决企业环保压力，降低企业运营成本，提升企业竞争力，为企业树立良好的社会形象。

Adhering to the service concept of customer first, we provide customers with full-cycle services from pre-consultation, engineering design, manufacturing, installation and debugging to operation and maintenance, and provide customers with a complete set of energy solutions to solve the environmental protection pressure of enterprises and cut the operating cost, enhance the companycompetitiveness and reputation.

专业的技术和管理团队，丰富的运行经验
Professional technology and management team，rich experience

拥有一支专业化的强大的技术、运营管理团队，十余年的 EPC 工程总包经验和运行服务经验以及优秀的生产制造能力和完善的供应链体系，可确保工程快速交付，保证系统快速、稳定运行。

We have a professional and strong technical and operation management team, more than ten years of EPC project general contracting experience and operation service experience, which can ensure the rapid delivery of the project and ensure the rapid and stable operation of the system.

多元化合作模式
Versatile cooperation modes

可根据用户需求，提供各种合作模式，包括但不限于交钥匙工程、EPC 总包、EPC+ 融资、EPC+ 运维、工艺包 + 核心设备等。

Various cooperation modes can be provided according to user needs, including but not limited to turnkey projects, EPC general contracting, EPC+ financing, EPC+ operation and maintenance, process package + core equipment, etc.

完善的售后服务体系
Complete after-sales service

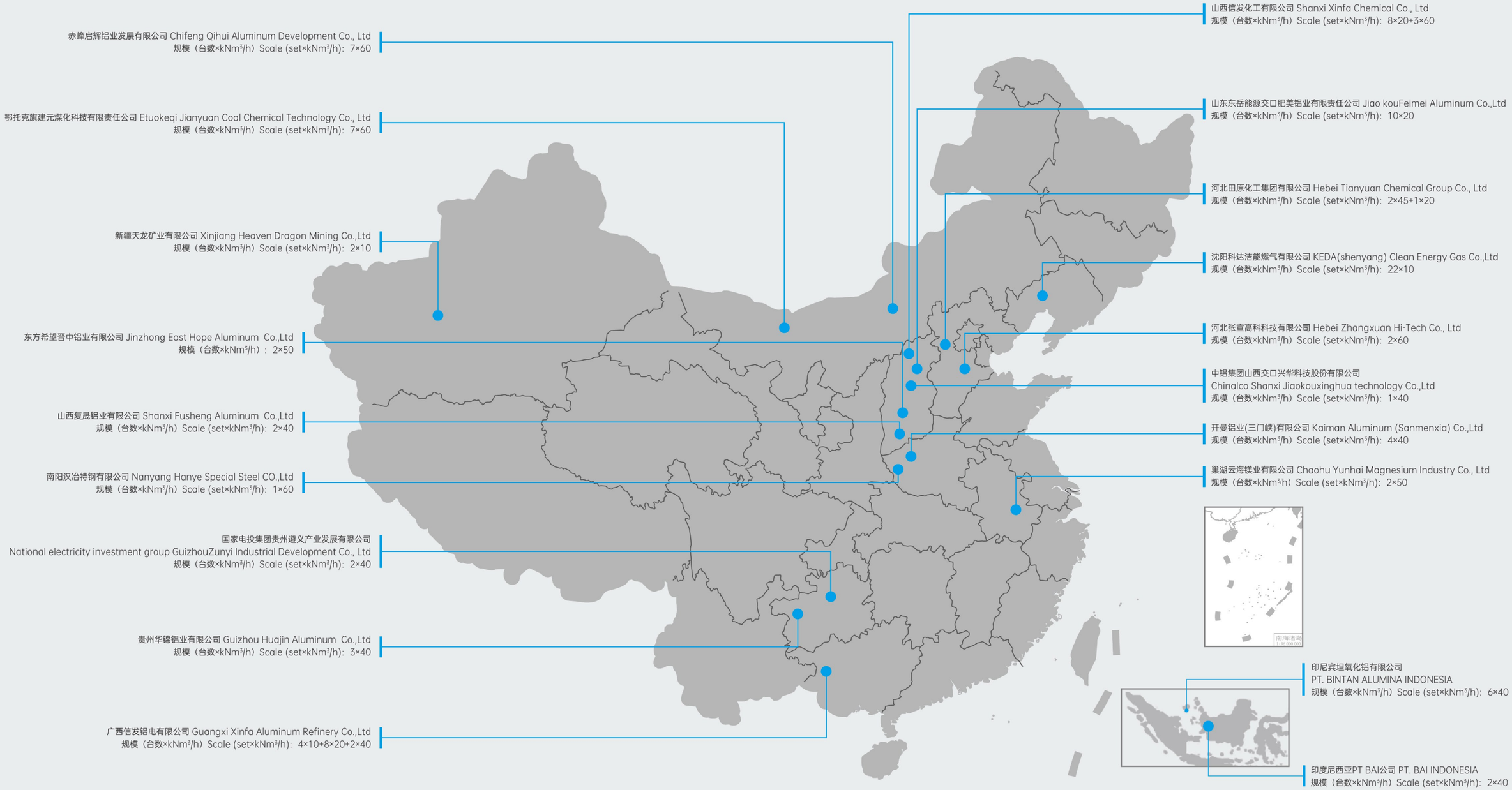
核心设备自主制造，配件供应体系健全；专业的售后服务队伍，可快速响应客户要求，及时处理客户问题，并提供技术支持。

The core equipment is independently manufactured, and the parts supply system is sound; the professional after-sales service team can quickly respond to customer requirements, deal with customer problems in a timely manner, and provide technical support.

ACHIEVEMENTS
业绩版图

科达洁能目前在国内外已承建清洁煤制气装置 100 余套。应用范围涉及陶瓷、氧化铝、碳素、玻璃、钢铁、焦化、合成氨、金属镁、氢冶金等多个行业。

KEDA has contracted clean coal gasification equipment more than 100 sets at home and abroad. Application fields cover ceramic, aluminum, carbon, glass, steel, cooking, synthetic ammonia, magnesium, hydrogen metallurgy industry, etc.



PROJECT REFERENCES
典型案例

沈阳·法库项目 Faku, Shenyang

沈阳科达洁能燃气有限公司成立于 2010 年 4 月，占地面积 470 亩，旨在为法库县陶瓷企业提供优质能源解决方案。此项目为辽宁省重点建设项目之一，对于促进区域经济发展，具有巨大的社会和经济效益。

该项目共建有 22 套 10kNm³/h 清洁煤制气装置：一期 20 套循环流化床及二期 2 套 10kNm³/h 常压气流床清洁煤制气装置，向沈阳法库陶瓷工业园连续稳定供气。站内循环流化床煤气化装置共设四组，每组 5 套，单套产气量为 10kNm³/h，热值 1600kcal/ Nm³ 以上（富氧工况）。2 套 10kNm³/h 常压气流床煤制气装置 2015 年 7 月投入运行，以一期建设的循环流化床装置所产飞灰为原料，高富氧条件下气化，生产煤气热值≥2350kcal/Nm³。

沈阳清洁煤制气装置包括储煤系统、气化系统、除尘系统、脱硫系统、空分系统及操作系统等。

Shenyang KEDA Clean Energy Gas Co., Ltd was established in Apr. 2010, with the total area of 320,000m². The company aims to provide an energy supply solution for the ceramic producers in Faku country. This project is one of the key construction projects in Liaoning Province and has great social and economic benefits for promoting regional economic development.

This project has 22 sets of 10kNm³/h clean coal gasification equipment. The 20 sets of 10kNm³/h circulating fluidized bed gasification equipment and 2 sets of 10kNm³/h entrained-flow gasification equipment supplied gas to Faku Ceramic Industrial Park. The heat value of clean coal gas(CFBC) is more than 1,600 kcal/Nm³(oxygen enrichment condition), with the mixture of oxygen-enriched air and steam as gasification agent. In Jul. 2015, 2 sets of 10kNm³/h atmospheric pressure entrained-flow gasification equipment were put into operation in Shenyang KEDA Clean Energy Gas Co., LTD. has been supplied gas since then. Take the fly-ash produced by CFBC gasification equipment as raw material, it can provide clean coal gas with a calorific value of more than 2350kcal/Nm³, under the condition of high oxygen-enriched air as gasification agent.

It was composed of coal storage system, gasification system, fly ash removal system, desulphurization system, air separation system, operating system and so on.

储煤系统： 圆形煤仓，储煤量 4 万吨，可供气化系统正常运行 20 天。采用全自动运输系统，输煤管道大都深埋地下，有效节约了地面空间，系统运行更安全可靠。

Coal storage system: round coal bunker, with a coal storage capacity of 40,000 tons, and it can normally operate for 20 days. With an automated transport system, most of the coal pipelines are buried deep underground, effectively saving floor space and making the system safer and more reliable.

气化系统： 采用 KEDA 清洁煤气化技术，粉煤在气化炉内均匀燃烧，高温下挥发分裂解燃烧完全，生产过程中无焦油、酚氰等污染物产生。

Gasification system: using KEDA clean coal gasification technology, pulverized coal is uniformly burned in the gasifier, and the volatiles are completely pyrolyzed and burned under high temperature. No discharge of tar and phenol-cyanogen waste-water in the process.

布袋除尘系统： 工作温度可达 180~220℃，对 0.5μm 以上的微尘，除尘效率达 99.99%，除尘后煤气粉尘含量≤10mg/Nm³。

Flyashremoval system: the working temperature can be up to 180~220 °C, and the dust removal efficiency can reach 99.99% for fine dust of over 0.5μm, and the gas dust content after dust removal should be no more than 10mg/Nm³.

脱硫系统： 采用湿法脱硫，脱硫效率 95% 以上；4 套脱硫系统，总处理能力 200kNm³/h。脱硫后，煤气中 H_2S≤20mg/Nm³，满足环保要求。

Desulphurization system: adopted with wet desulphurization technology and the desulphurization efficiency is higher than 95%; the whole capacity of 4 sets system is 200kNm³/h. After desulphurization, H_2S content in gas ≤20mg/Nm³.

空分系统： 采用深冷空分技术，制氧纯度可达 99.6%；2 套空分系统，每套制氧量为 10kNm³/h。采用富氧技术可满足客户对高热值煤气的需求。

Air separation system: using cryogenic air separation technology, oxygen purity can reach 99.6%; 2 sets of air separation systems, each set of oxygen production capacity is 10kNm³/h. Oxygen-enriched technology is used to satisfied customer demand for high-calorie gas.

操作系统： 采用 DCS 控制系统，管控一体化配置；系统的高自动化减少了人员配置。

Operating system:DCS control system, integrates management and control; the high automation of the system reduces the personnel configuration.

新疆 · 阜康项目 Fukang, Xinjiang

2017 年 6 月，新疆天龙矿业 2 套 10kNm³/h 清洁煤制气装置投入运行，煤气热值约 1450 kcal/Nm³。是公司继在氧化铝和陶瓷行业之后，首次将循环流化床气化技术应用于碳素行业。

In Jun. 2017, 2 sets of 10kNm³/h CFBC clean coal gasification equipment put into operation in Xinjiang heaven dragon mining Co.,Ltd., it is the first time for us to apply circulating fluidized bed gasification technology to carbon industry after alumina and ceramic industry.

印度尼西亚 · 宾坦项目 BINTAN,Indonesia

印尼宾坦项目是我公司首个海外氧化铝项目，项目分三期建设，一期 3 套 40kNm³/h 清洁煤制气装置、二期 2 套 40kNm³/h 清洁煤制气装置、三期 1 套 40kNm³/h 清洁煤制气装置，气化煤种均采用印尼褐煤。其中，一期已于 2021 年 5 月投入运行。

The Bintan project in Indonesia is the first overseas alumina project for KEDA. The project is constructed in three phases, including 3 sets of 40kNm³/h CFBC clean coal gasification equipment in the first phase, 2 sets of 40kNm³/h CFBC clean coal gasification equipment in the second phase, and 1 set of 40kNm³/h CFBC clean coal gasification equipment in the third phase, and gasification coals all use Indonesian lignite coal. Among them, the first phase has been put into operation in May 2021.

山西 · 孝义项目 Xiaoyi, Shanxi

2014 年 8 月，信发集团山西孝义 8 套 20kNm³/h 清洁煤制气装置投入运行。项目建成后，为氧化铝焙烧提供了清洁稳定的燃料，大大降低了企业的生产成本。

2018 年 8 月，信发集团 3 套 60kNm³/h 清洁煤制气装置点火运行。

In Aug. 2014, 8 sets of 20kNm³/h CFBC clean coal gasification equipment put into operation in Xinfa Group, located in Xiaoyi City, Shanxi Province. After the project was completed, it provided clean and stable fuel for alumina roasting, which greatly reduced the production cost of the enterprise.
In Aug.2018, 3 sets of 60kNm³/h CFBC clean coal gasification equipment in Xinfa Group put into operation.

广西 · 靖西项目 Jingxi, Guangxi

2012-2014 年，广西信发铝电有限公司先后订购 4 套 10kNm³/h、8 套 20kNm³/h、2 套 40kNm³/h 清洁煤制气装置。
2013 年起，一期、二期、三期项目陆续建成投产使用，合计产气量达 280kNm³/h，可满足厂区内氧化铝生产需求。
采用科达循环流化床煤气化生产工艺替代原有落后的单段式煤气发生炉制气工艺，极大的改善了环境污染问题，提高了煤气化效率，经业主核算每吨氧化铝可节约成本 100 元左右，年节约成本 2.8 亿元。

2012-2014, Guangxi Xinfa Aluminum Refinery ordered 4 sets of 10kNm³/h, 8 sets of 20kNm³/h, and 2 sets of 40kNm³/h clean coal gasification equipment.
Since 2013, phase I, phase ii and phase iii projects have been completed and put into operation, and the total gas production capacity is 280kNm³/h, which can meet the demand of alumina production in the factory.
Use KEDA circulating fluidized bed coal gasification system to replace the original backward single sections of gas occurrence boiler gasification system, greatly improving the environmental pollution problem, improve the efficiency of the coal gasification, the owner accounting alumina can save costs 100 yuan per ton, save costs 280 million yuan.

河北 · 田原项目 Tianyuan, Hebei

2021 年 5 月，河北田原化工集团有限公司 2 套 45kNm³/h 富氧循环流化床和 1 套 20kNm³/h 纯氧气流床清洁煤制气装置投入运行。
该项目是合成氨行业首次实现两种气化技术联合应用，代替了原有的固定床制气系统，在保证清洁高效的同时，显著降低了企业的生产成本，为合成氨行业转型升级提供了一种全新的技术。

In May 2021, 2 sets of 45kNm³/h CFBC and 1 set of 20kNm³/h low pressure entrained-flow clean coal gasification equipment put into operation in Hebei Tianyuan Chemical Group Co., Ltd.
This project is the first time for the synthetic ammonia industry to realize the combined application of two gasification technologies, replacing the original fixed-bed gas-making system. While ensuring clean and efficient production, it significantly reduces the production cost of the enterprise, and providing a technology for the transformation and upgrading of the synthetic ammonia industry.