



LONJING ENVIRONMENT TECHNOLOGY CO., LTD.

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LONJING
D-MEC TECHNOLOGY
PROFILE

LONJING ENVIRONMENT TECHNOLOGY CO., LTD
福建龙净脱硫脱硝工程有限公司



COMPANY INTRODUCTION

Lonjing Environment Technology Co., Ltd (Lonjing) has employed around 1,000 people, among which the technical and engineering team accounts for nearly half of the employees, including 7 PhD. from US, German, Australia and China, as well as more than 80 staffs with master degree. The highly qualified team is made up of competence in all disciplines-design, manufacture, supply, installation, commissioning, operation, maintenance and other services, providing domestic and foreign users with comprehensive and efficient one-stop air pollution control solution.

Committing to the mission "Purify the environment for the benefit of mankind", Lonjing has always been persistent to the continuous improvement of D-MEC technology, and has been the world's first to realize the technology application on 300MW and 660MW power units, as well as applying to large sintering and pelleting plants, glass kilns, carbon black, aluminum, catalytic cracking, coking and other fields, continuously creating a number of world records. With around 600 sets of units in coal-fire and various industrial plants, Lonjing has ranked top of world in the industry, and the products have been extended to all across the country and abroad, including Brazil, India, Turkey, Serbia and Vietnam, etc.

China released the new regulations aiming for ultra-clean, ultra-low and near zero emissions (the "503510" standard, namely $\text{NO}_x < 50 \text{ mg/Nm}^3$, $\text{SO}_2 < 35 \text{ mg/Nm}^3$, $\text{dust} < 10 \text{ mg/Nm}^3$) in 2014. Upon the Company's plentiful application experience on hundreds of projects and units, Lonjing rapidly developed the upgraded water saving D-MEC process with CFB reactor as core part, integrating with DeNO_x system of SCR/SNCR and combined with the ultra-clean fabric filter.

Lonjing has developed the core equipment manufacturing independently, including multi-stage long distance hydrator, powder flow proportional control valve, wear resistant large flow ash discharger, high air tightness air slide, pneumatic valve, large diameter pilot control pulse valve, high temperature resistant filter bag bag cage and others, to ensure the project quality and construction period of the D-MEC system.

Lonjing has always been committed to air pollution control and making continuous contributions to protect world's environment.

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The Lonjing D-MEC system is a simple yet reliable process with high removal efficiency, the system can be combined with single DeNO_x process of SNCR, SCR or multi ones if needed.

Since the D-MEC system upgraded in 2014, it has been widely applied in various industries including large-coal-fired power plants, medium and small-sized thermal power plant, industrial boilers, industrial fields such as sintering and pelletizing, coking, glass, aluminum, carbon black, catalytic cracking, incineration plants, with more than 600 sets of application covering whole flue gas cleaning industries. Lonjing has topped in the world in both technology development and project applications.

TECHNOLOGY INTRODUCTION

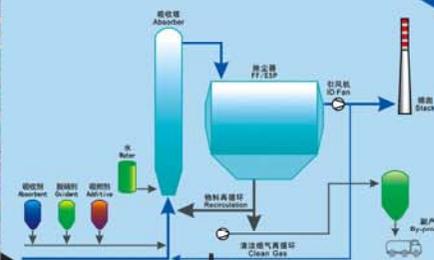
1. Process

The polluted flue gases from upstream process, after being treated by SCR/SNCR system (which can also be downstream arranged), enter the CFB reactor from the bottom. Upon the first-stage cleaning, flue gases flow through a venturi section which accelerates the flue gas velocity, forming an intensive turbulence inside the reactor and realizing the gas-solid-liquid reaction of gases, sprayed water and the particles. Acid gases like SO₂, NO_x are captured by reacting with absorbent Ca(OH)₂, fine particles accumulate into the larger coarse particles. The water injected into the reactor is fully evaporated. The downstream ultra-clean fabric filter is adopted for dust collection, most dusts collected by the hopper are recycled back to the reactor for high absorbent utilization, and the other dusts are discharged through the conveying equipment. Finally, the purified flue gas is discharged through ID fan and the stack.

2. Technical advantages

- 1). It can steadily achieve "50355+530" ultra-low emission standard: NO₂<50mg/Nm³, SO₂<35mg/Nm³, dust<5mg/Nm³, SO_x<5mg/Nm³, Hg<3μg/Nm³, no waste water.
- 2). Various pollutants can be removed including NO₂, SO_x, particles, HCl, HF, dioxin, furan, heavy metal and other pollutants.
- 3). High adaptability to full load working condition: the D-MEC can be started before the upstream system on, and shut down after the upstream system off, so as to meet emission requirements under full load.
- 4). No waste water, no need for anti-corrosion, no visible stack plume.
- 5). Dry and stable by-product, no secondary pollution, by-products can be used for comprehensive utilization according to local conditions.
- 6). Small space requirement and flexible layout to effectively solve the space limitation problem, especially for retrofit project.
- 7). Less investment, low operating cost.
- 8). Simple process, high level of automation.

Schematic of D-MEC System





Overseas Application

(Total nearly 20 sets)

Brazil Candiota Plant 350MW Unit

Brazil CSA Steel
3X2100 kt/a Coking Furnace De-SO_x and De-dust Project

TECHNOLOGY APPLICATION



Vietnam Hoa Phat Duang Quat Plant
4x60MW Coking Project



Turkey SILOPI Power Plant
2x135MW Project

NO.	Project Name	Furnace	Inlet SO ₂	Outlet SO ₂	Outlet Dust	Efficiency
1	HBIS Group Serbia Steel Company 180m ² Sinter Plant	Sinter	2000	180	15	91%
2	Vietnam Hoa Phat Steel 4x60MW Coking Furnace 1 - 8#	Coking	1000	200	50	80%
3	Turkey SILOPI 135MW Power Plant(Phase 2)1#	CFB	2000	200	30	90%
4	Turkey SILOPI 135MW Power Plant(Phase 2) 2#	CFB	2000	200	30	90%
5	Brazil Candiota 350MW Power Plant Phase II Unit C#	PC	8092	700	250	92%
6	ThyssenKrupp Brazil CSA Steel Plant A# 2100 kt/a Coking	Coking	3139	300	20	91%
7	ThyssenKrupp Brazil CSA Steel Plant B# 2100 kt/a Coking	Coking	3139	300	20	91%
8	ThyssenKrupp Brazil CSA Steel Plant C# 2100 kt/a Coking	Coking	3139	300	20	91%
9	India Grasim Industries Limited - 23MW Power Plant Unit 1#	CFB	1432	285	50	80%
10	India Grasim Industries Limited - 23MW Power Plant Unit 2#	CFB	1432	285	50	80%
11	India Grasim Industries Limited - 23MW Power Plant Unit 3#	CFB	1432	385	50	80%
12	India Grasim Industries Limited - 23MW Power Plant Unit 4#	CFB	1432	285	50	80%





Large Thermal
Power Unit

Yankuang Heze Power Plant
1×300MW CFB Boiler Ultra-low Emission Project

Shenhua Hequ Power Plant
2X350MW CFB Boiler Ultra-low Emission Project



Xinjiang Tianshan Aluminum Coal-fired Power Plant
6X350MW Ultra-low Emission Project



TECHNOLOGY APPLICATION



Qinghai Yanhu Industry Co.,Ltd Chemical Branch
3X250/h+4X480/h CFB Boiler Ultra-low Emission Project

Fujian Zhangping Power plant
2X300MW CFB Boiler Ultra-low Emission Project



Medium and Small Thermoelectric Units and Boilers

Hangzhou Pro-energy Heat and Power Co.,Ltd
3X150t/h+75t/h CFB Boiler
(G20 Summit)

Jiangsu SOPO Group
3X240t/h CFB Boiler Ultra-low Emission Project

Xiamen Xinyang Thermal power plant
3X75t/h CFB Boiler Ultra-low Emission
Project (BRICS Summit)



TECHNOLOGY APPLICATION



Sinopec Guangzhou TPP
2X220t/h Coal-fired Boiler Ultra-low Emission Project

Sinopec Guangzhou TPP
2X100MW CFB Boiler Ultra-low Emission Project

Sintering and Pelleting

Shougang Jingtang
2X500m² Sintering Ultra-low Emission Project



Shougang Jingtang
2# 4MT/A Pelleting Ultra-low Emission Project

Fujian Sanming Steel
2x180m²+210m² Sintering De-SO_x and De-dust Retrofit Project



Baotou Steel Group
2x213m² Sintering Project



TECHNOLOGY APPLICATION



BaoSteel Group Iron plant
4# 600m² Sintering De-SO_x and De-dust Project

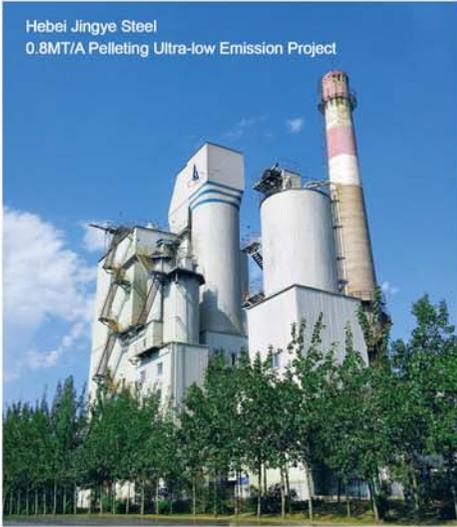
Bao Steel Meishan Steel
2x450m² Sintering Ultra-low Emission Project

Sintering and Pelleting

Jiangyin Huaxi
180m² Sintering Ultra-low Emission Project



Hebei Jingye Steel
0.8MT/A Pelleting Ultra-low Emission Project



Shanxi Zhongsheng
180m² Sintering Ultra-low Emission Project



TECHNOLOGY APPLICATION



BaoSteel Zhanjiang Plant
5MT/A Pelleting Ultra-low Emission Project

BaoSteel Desheng Stainless Steel
2x126m² Sintering Ultra-low Emission Project



Ningxia Baota Energy Chemical Industry
1500 kt/a Catalytic Cracking Ultra-low Emission Project



China Sinopec Jingmen Branch
2800 kt/a Catalytic Cracking Ultra-low Emission Project



Xinjiang Tianshan Yingda Carbon
300 kt/a Calcinator Ultra-low Emission Project

Catalytic Cracking
Aluminum Carbon



Shandong Yankuang Aluminum
Roasting Oven Ultra-low Emission Project



Yingkou Zhongwang Aluminum
490 kt/a Calcinator Ultra-low Emission Project

TECHNOLOGY
APPLICATION





Zhejiang Changxing Qibing Glass
2×600t/d De-SO_x and De-dust Project

Glass Kiln



Guangxi Nanning Float Glass
350t/d De-SO_x and De-dust Project



Shaanxi Shenmu Ruicheng Glass
800t/d Ultra-low Emission Project

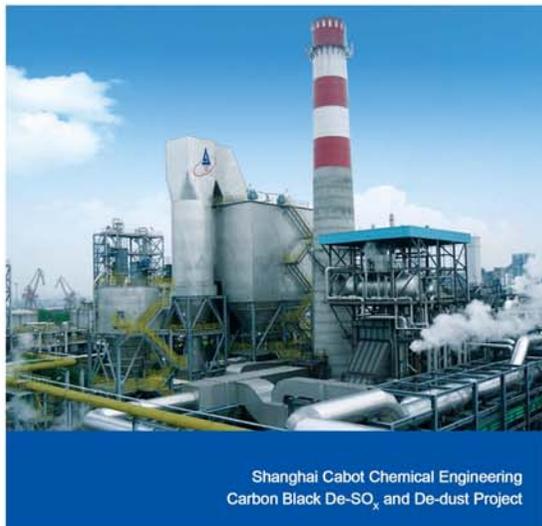


Fujian Zhangzhou Qibing Glass
4×600t/d De-SO_x and De-dust Project

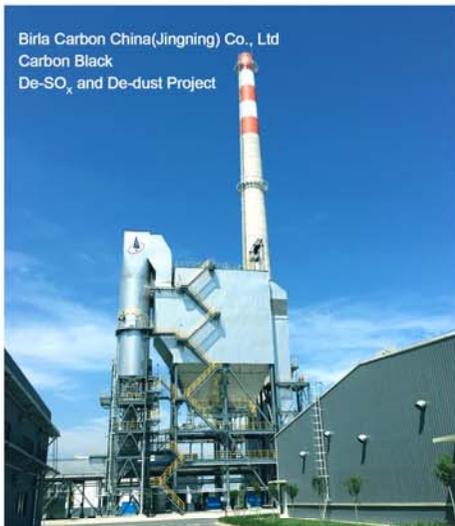


Hunan Liling Qibing Glass
4×600t/d De-SO_x and De-dust Project

TECHNOLOGY APPLICATION



Shanghai Cabot Chemical Engineering
Carbon Black De-SO_x and De-dust Project



Birla Carbon China(Jingning) Co., Ltd
Carbon Black
De-SO_x and De-dust Project



Shanxi Zhongyang Steel
600 kt/a Coking Furnace Ultra-low Emission Project



Brazil CSA Steel
3X2100 kt/a Coking Furnace De-SO_x and De-dust Project

Zhangzhou Papermaking
150t/h Waste Incinerator Ultra-low
Emission Project



Carbon Black
Waste Incineration
Coking

TECHNOLOGY
APPLICATION





BY-PRODUCT UTILIZATION

Upon governmental support and cooperation from several research organization and enterprises both in China and abroad, the Sino-American by-product research center("R&D Center") was set up in 2010 specializing in by-product utilization. The research center is focusing on providing the end-to-end solution to customers using D-MEC system, by offering by-products utilization evaluation, research and application guidance, as well as extending the service to the research of high quality absorbent application with variety.



RESEARCH

Dr. Muzheng Wu, a Chinese American with more than 20 years of experience in the resource utilization of coal-burning by-products, has been appointed as the director of the R&D center. A professional team has been established under guidance of Dr. Wu, as well as supported by technical consultant team of Prof. Tomas Robl, Prof. William Wolfe and Prof. Tarunjit Butalia. The R&D center has around 20 full-time researchers, including 2 PhD. and 4 staffs with master degree.

With the R&D Center, the first by-product utilization and absorbent testing platform has been set up in China. Using the experience from US, the Lonjing research platform has set up the "By-product/absorbent Physical and Chemical Analysis Lab" and "Dry-FGD By-product Utilization and Absorbent Development Lab", covering an area of more than 400 m². The platform has applied professional testing and analysis equipment, such as thermogravimetric analyzer(TGA) and BET analyser, laser particle sizer (LPS), atomic absorption spectrometer (AAS), high-speed shearing mixer, autoclaved kettle, constant loading press and others. We also share the testing platform with domestic and foreign research institutions.

The R&D center has been awarded with more than 10 national invention patents, and it can provide testing, utilization evaluation, standardized application guidance and other services for dry-FGD byproducts from different fields (coal-fired power plants, sintering pellets, industrial kilns, etc.). At present, the by-products are mainly used as materials for aerated concrete block, autoclaved brick,slag powder and mortar.

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Comprehensive Advantages □□□

Five reasons to choose Lonjing

- 1. Multi-emission Control**
 Lonjing D-MEC technology is an integrated system can collaboratively remove SOx, NOx, particles, heavy metal, dioxin, acids(HCl, HF), which represents the latest development of industrial flue gas multi-pollutant control.
- 2. Leading Technology, Excellent Performance**
 Lonjing has been listed as the long-term strategic partner of hundreds of enterprises in China, such as Baowu Steel, Shougang Group, Sinopec, Petrochina, Huaneng, Huadian, etc. The Company has achieved over 600 sets of application, covering full range on thermal power, sintering, pelletizing, coking, glass, cement, catalytic cracking, carbon black, carbon, garbage incineration and other fields and ranking first in the world.
- 3. Technical expertise and High Quality**
 Lonjing has more than 1,000 employees, and has been focusing on the development and innovation of dry-FGD system for more than 20 years. Holding the Engineering and Construction Integrated Qualification Class A Certificate, Lonjing could offer full range and professional design services combining with high quality manufacturing and extensive construction experience, to provide customers with maximum satisfaction.
- 4. Intelligent and Considerate Service**
 As the world's largest manufacturer of flue gas pollution control equipment, Lonjing has an annual production capacity of 500,000 tons. The intelligent remote diagnosis system can help to solve the site problems timely, to ensure the efficient, stable and economic operation.
- 5. One-stop Solution and Cost-saving**
 The end-to-end process focusing on absorbents and by-products could offer one-stop solution for customers. By lowering the operation cost yet improving the system efficiency, we aim to support our customers to increase its market competitiveness, realizing a win-win situation on both environmental control and enterprise development.



Purify Environment, Benefit Human!

