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浙江德创环保科技股份有限公司

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德创环保

TUNA CORPORATION

非电领域烟气治理

Flue Gas Treatment for Non Power Industries

专业烟气深度清洁治理

Professinal flue gas purification

德创环保
TUNA CORPORATION

浙江德创环保科技股份有限公司(股票代码603177)是一家致力于燃煤锅炉烟气治理领域的国家重点高新技术企业，已成为集脱硫、脱硝、高效除尘等烟气处理技术研究及配套装备研发、制造、工程服务于一体的综合性服务企业，主要服务于电力、冶金及石化等系统烟气净化工程。目前公司市场营销网络已经遍及28个省、市及自治区，已在华能、国电、华电、中电投等五大发电集团、上海宝钢、上海石化等企业1000多个工程项目应用，同时脱硫、脱硝产品已经出口欧美、土耳其、印度、尼日利亚、越南等10多个国家和地区。

公司研发中心为省级企业研究院和省级企业技术中心，创新工作成果显著，目前已参与制定多项标准；承担了国家重点新产品、国家火炬计划等重量级项目，并获得国家创新基金，积极开展产学研合作，与中国科学院、清华大学等高校院所建立紧密合作关系。

Zhejiang TUNA Environmental Science & Technology Co., Ltd. (stock code: 603177) is a national key high-tech enterprise that specializes in flue gas treatment industry. TUNA has become an integrated service enterprise that covers desulfurization(FGD), denitration(DeNOx), high-efficiency dust removal and other flue gas treatment integrating R & D, engineering, and manufacturing, providing service for power, metallurgical and petrochemical industries, etc. The products have been installed in more than 1,000 projects, clients including China’s Top 5 power generation groups (Huaneng, Guodian, Datang,Huadian, State Power Investment Corporation (SPIC)), have been exported to Europe, USA, Turkey, India, Nigeria, Vietnam, and many other countries.

The company's R&D center is the provincial-level enterprise research institutes and technology center. The innovative work results are significant. At present, TUNA has participated in the draft of a number of national standards and has undertaken key national new products, the National Torch Program and other important projects. TUNA has obtained the National Innovation Fund and actively carry out cooperation between production and research, and work closely with Chinese Academy of Sciences, Tsinghua University and other institutions.

德创环保
TUNA CORPORATION

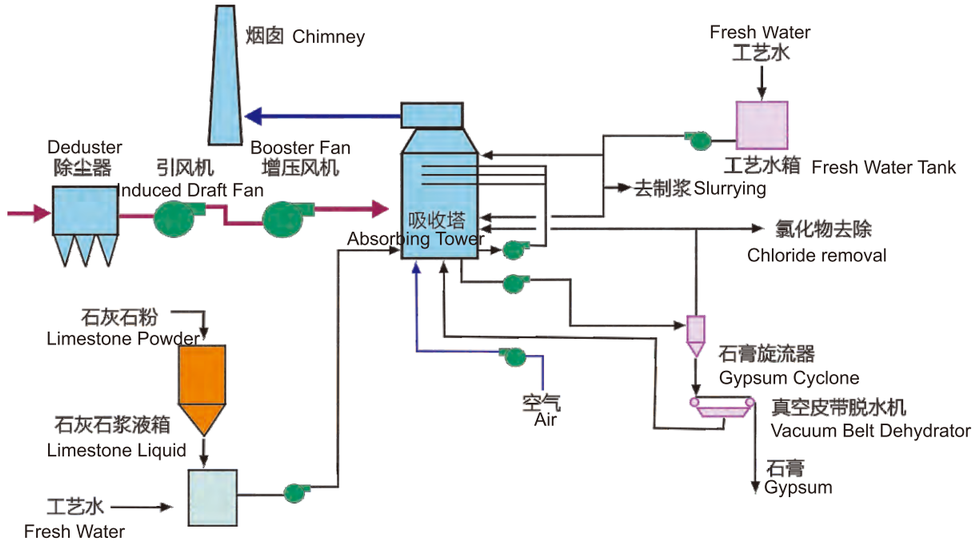
焦化烟气环保治理 Environmental Treatment for Coking Flue Gas

焦炉烟气特点 Characteristics of coking oven flue gas

●焦炉出口烟温约200~300℃ ，低于常规脱硝催化剂活性温度；
●烟气中含有较多煤焦油，易附着在脱硝催化剂表面造成堵塞；
●成分复杂，SO_2和NOx含量不稳定。
●The flue gas temperature at the coking oven outlet is about 200~300℃, which is lower than the ordinary DeNOx catalyst activity temperature.
●The flue gas contains fairly much coal tar, which is easy to adhere to the DeNOx catalyst surface and results in blocking.
●The composition is complex and the contents of SO_2 and NOx are not stable.

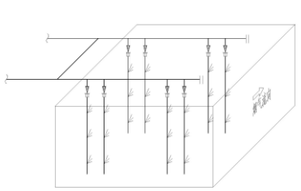
脱硫工艺 Desulfurization technology

根据当前严格的环保政策和焦化烟气特点，石灰石—石膏湿法是一种高效、合理的脱硫工艺。
According to the current and strict environmental protection policies and the characteristics of the coking flue gas, the limestone-gypsum wet-type desulfurization is one of the most efficient and reasonable desulfurization technology.



德创脱硫工艺特点 Characteristics of TUNA desulfurization technology

●设计特殊的降温装置，从根本上解决脱硫烟气入口烟温过高问题；
●优化真空皮带机真空度和滤布孔径，彻底解决焦化脱硫石膏含水率高难题；
●采用成熟先进的技术工艺，并以三维软件作辅助设计；
●能耗脱硫效率高达99%以上；关键设备拥有多项专利。
●Special cooling device is designed to eliminate the problem that the flue gas temperature is too high at the FGD inlet.
●The vacuum degree of the vacuum belt dehydrator and the aperture of the filtering cloth are optimized to eliminate the difficult problem that the water content of the coking desulfurization gypsum is high.
●The mature and advanced technology is utilized, and 3D software is used for aided design.
●Energy consumption is low, desulfurization efficiency is higher than 99%; there are many patents for the key equipments.



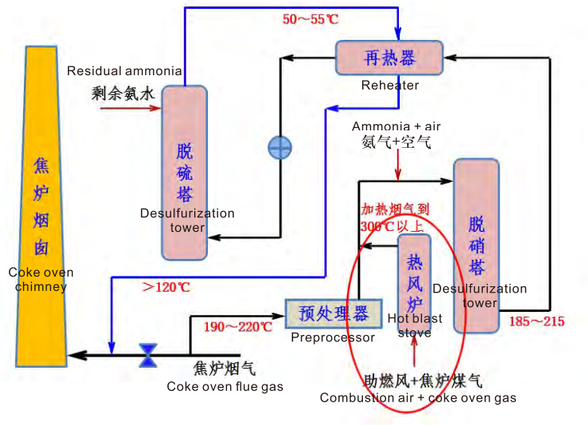
特殊降温装置
Special cooling device

真空皮带脱水机
Vacuum belt dehydrator

脱硝工艺 DeNOx technology

采用稳定可靠的选择性催化还原（SCR）脱硝工艺，利用我公司与清华大学联合开发的中低温脱硝催化剂和宽温催化剂，脱硝效率可达90%以上。
The stable and reliable selective catalytic reduction (SCR) DeNOx technology is utilized. With the moderate/low temperature and wide temperature range DeNOx catalyst jointly developed byTUNA and Tsinghua University, the DeNOx efficiency is higher than 90%.

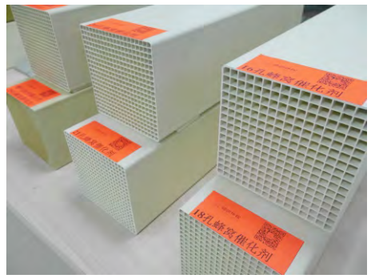
●$4NH_3+4NO+O_2 \xrightarrow{SCR} 4N_2+6H_2O$　●$4NH_3+2NO_2+O_2 \xrightarrow{SCR} 3N_2+6H_2O$



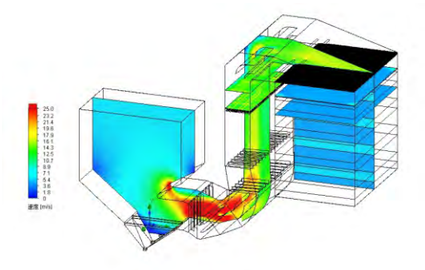
工艺流程简图
Technological process diagram

德创脱硝工艺特点 Characteristics of TUNA DeNOx technology

●设计特殊的烟气预除油装置，解决催化剂焦油粘附失效问题；
●设置热风炉系统加热烟气，解决催化剂硫铵粘附中毒难题；
●三维流场模拟，保证脱硝NOx、NH_3的流场均匀性；
●系统能耗低、脱硝效率高、性能稳定；
●The flue gas pre-oil removal device is specially designed to solve the problem that tar adheres to the catalyst and results in deactivation of the catalyst.
●The hot blast furnace system is provided to heat the flue gas to solve the difficult problem that the ammonium sulfate adheres to the catalyst and results in poisoning of the catalyst.
●3D flow filed is simulated to guarantee the uniformity of the flow field of NOx and NH_3 during DeNOx process.
●The system is of low energy consumption, high DeNOx efficiency and stable performance.



中低温催化剂
Moderate and low temperature catalyst



三维流场模拟
3D flow field simulation

除尘工艺 Dust removal technology

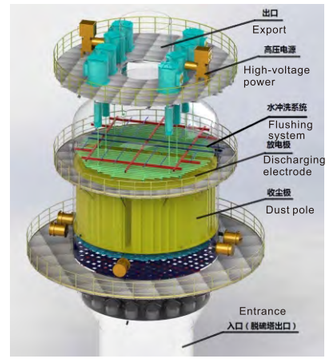
采用湿式电除尘器末端治理，保证焦化烟气的达标排放。
The WESP is utilized for end treatment to guarantee that emission of the coking flue gas can meet the relevant standard.

WESP工作原理 Dust removal technology

湿式电除尘器是利用静电收尘原理，靠高压电晕放电使得粉尘荷电，荷电后的粉尘在电场力的作用下收集到集尘板/管。再采用水冲洗的方式，使粉尘随着冲刷液的流动而清除。
The principle of electrostatic dust collection is applicable to WESP. With high voltage corona discharge, the dust is charged. The charged dust is collected to the dust collection plate/tube with the effect of electric field force. By water flushing, the dust is removed when the flushing liquid flows.

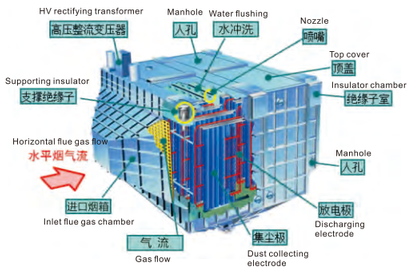
DWG型立式湿式电除尘器 DWG vertical type WESP

●集尘极采用管式结构；材料采用导电玻璃钢（C-FRP）；
●放电电极采用2205/钛合金；
●阳极板模块化安装；
●内部冲洗管道：316L及以上；
●喷嘴：PP无堵塞专用冲洗喷嘴；
●有效脱除重金属。
●The dust collecting electrode is of tubular structure, and is made of conductive fiberglass reinforced plastic (C-FRP).
●The discharging electrode is made of stainless steel 2205/titanium alloy.
●The dust collecting plate is installed in modular manner.
●The inside flushing pipe is made of stainless steel 316L and above.
●PP blocking-free and special-purpose flushing nozzle.
●Heavy metal can be efficiently removed.



DWB型卧式湿式电除尘器 DWB horizontal type WESP

●集尘极采用板式结构，材料采用不锈钢316L/2205；
●放电电极采用不锈钢316L/2205/钛合金；
●壳体内表面：树脂内衬；
●内部冲洗管道：不锈钢管/树脂（CPVC）；
●喷嘴：无堵塞专用喷嘴；
●The dust collecting electrode is of plate structure, and is made of stainless steel 316L/2205.
●The discharging electrode is made of stainless steel 316L/2205/titanium alloy.
● The inside surface of the shell is lined with resin.
●The inside flushing pipe is made of stainless steel pipe/resin (CPVC).
●Blocking-free and special-purpose nozzle.



烧结烟气环保治理 Environmental Treatment for Sintering Flue Gas

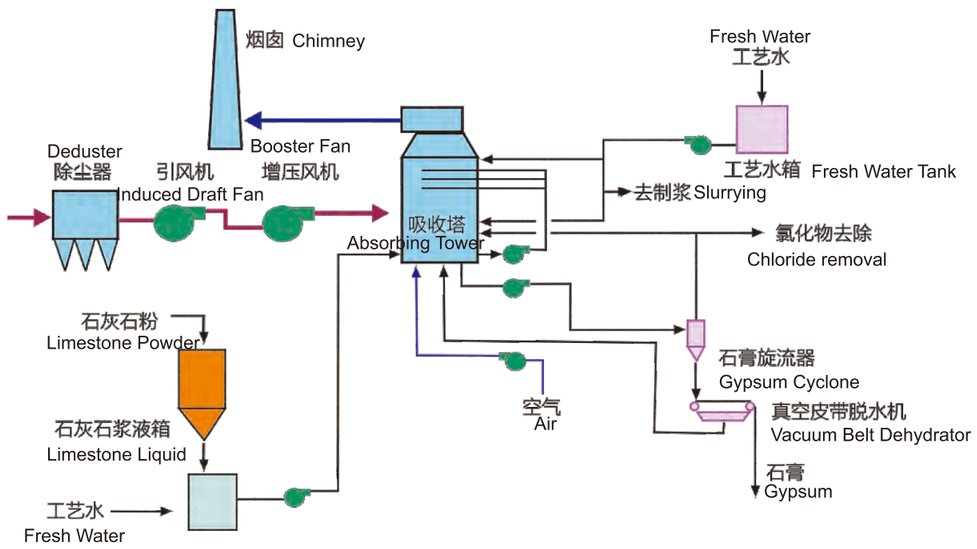
烧结烟气特点 Characteristics of sintering flue gas

- 漏风率高，烟气量大，含氧量高；
- 烟气温度低，出口烟温约在120~160℃，烟温波动大；
- SO2和NOx浓度变化范围大；
- 烟气含尘量高，粉尘粘度大；
- 烟气中含多种污染物组分，如HCl、HF、二噁英等，需协同处理。
- Large volume of flue gas with high air leakage rate and high oxygen content.
- Low flue gas temperature, the flue gas temperature at the outlet is about 120~160℃ with large fluctuation.
- Concentrations of SO2 and NOx have a large fluctuating range.
- Flue gas has high dust content, and the dust has great viscosity.
- The flue gas contains many pollutant constituents (such as HCl, HF, dioxin and so on) requiring to be treated simultaneously.

脱硫工艺 Desulfurization technology

根据当前严格的环保政策和焦化烟气特点，石灰石—石膏湿法是一种高效、合理的脱硫工艺。

According to the current and strict environmental protection policies and the characteristics of the coking flue gas, the limestone-gypsum wet-type desulfurization is one of the most efficient and reasonable desulfurization technology.



德创脱硫工艺特点 Characteristics of TUNA desulfurization technology

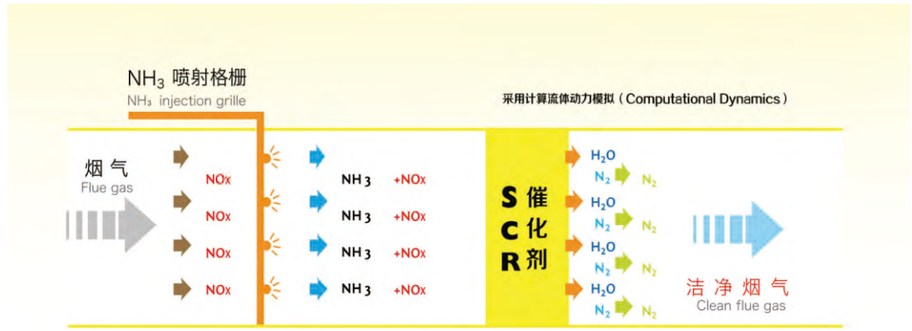
- 采用成熟先进的技术工艺，并以三维软件作辅助设计；
- 能耗脱硫效率高达99%以上；
- 公司具备主要关键设备的生产制造能力并拥有多项产品专利。
- The mature and advanced technology is utilized, and 3D software is used for aided design.
- Energy consumption is low, desulfurization efficiency is higher than 99%.
- TUNA owns the manufacturing capacity and several product patents for the key equipments.

脱硝工艺 DeNOx technology

采用稳定可靠的选择性催化还原（SCR）脱硝工艺，利用我公司与清华大学联合开发的中低温脱硝催化剂，脱硝效率可达90%以上。

The stable and reliable selective catalytic reduction (SCR) DeNOx technology is utilized. With the moderate and low temperature DeNOx catalyst jointly developed byTUNA and Tsinghua University, the DeNOx efficiency is higher than 90%.

- $4NH_3 + 4NO + O_2 \xrightarrow{SCR} 4N_2 + 6H_2O$
- $4NH_3 + 2NO_2 + O_2 \xrightarrow{SCR} 3N_2 + 6H_2O$

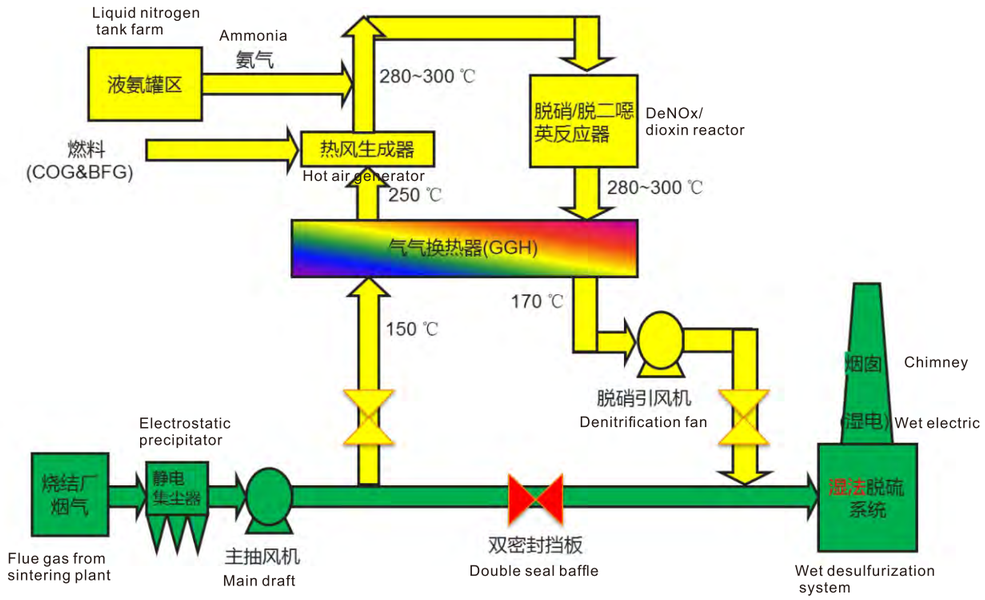


工艺流程 Technological process

烧结烟气先经过GGH烟气换热器预热后，在烟道中与加热炉产生的高温烟气混合进一步升温，继而与稀释风机送入的氨空气混合气混合，进入SCR反应器进行脱硝、脱二噁英反应，之后烟气由引风机引入出口烟道排放。

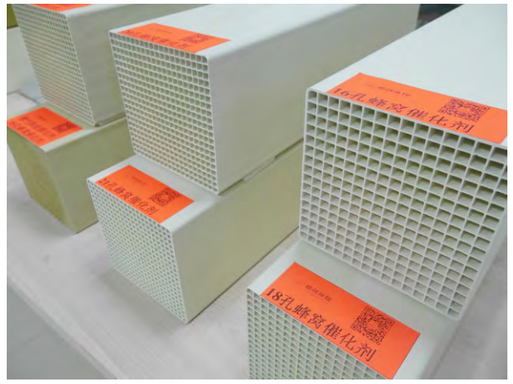
The sintering flue gas firstly passes through GGH (flue gas heat exchanger) and is pre-heated, and then mixes with the high-temperature flue gas produced from the heating furnace in the flue, the temperature rises further. Then, the sintering flue gas mixes with the mixed gas (of ammonia and air) fed by the dilution blower, and then enters SCR reactor for DeNOx and dioxin removal reactions. After that, the flue gas is induced by the induced draft fan to the outlet flue for emission.

工艺流程简图 Technological process diagram

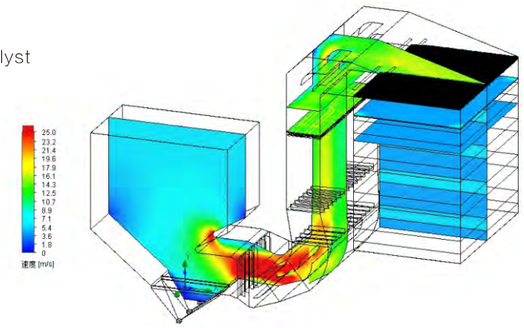


德创脱硝工艺特点 Characteristics of TUNA DeNOx technology

- 采用换热器回收热量再利用，减少热损失和能量能耗；
- 三维流场模拟，保证脱硝NOx、NH_3的流场均匀性；
- 系统能耗低、脱硝效率高，性能稳定，可协同脱除二噁英；
- 德创中低温催化剂是国家鼓励发展的。
- The heat exchanger is utilized for heat recovery and reuse, so that heat loss and energy consumption can be reduced.
- 3D flow filed is simulated to guarantee the uniformity of the flow field of NOx and NH_3 during DeNOx process.
- The system is of low energy consumption, high DeNOx efficiency and stable performance, and can remove dioxin simultaneously.
- The moderate and low temperature catalyst of TUNA Corporation is encouraged by the state.



中低温催化剂
Moderate and low temperature catalyst

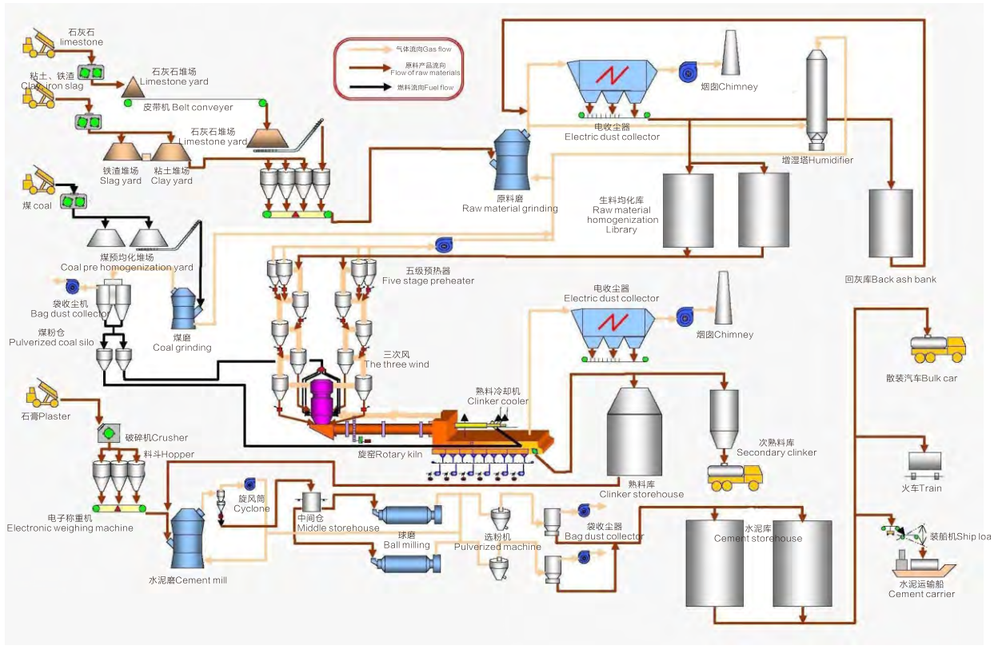


三维流场模拟
3D flow field simulation

水泥窑烟气治理 Environmental Treatment for Cement Kiln Flue Gas

水泥窑烟气特点 Characteristics of cement kiln flue gas

●烟气含尘量高，对催化剂磨损严重、除尘压力大。
●烟气中Ca含量高，易造成催化剂中毒；
●Flue gas dust content is high, which causes serious wear against the catalyst with high dust removal pressure.
●The calcium content in the flue gas is high, which will easily result in catalyst poisoning.

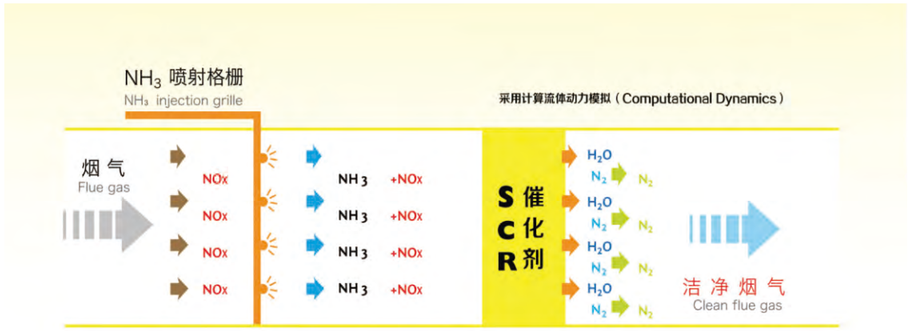


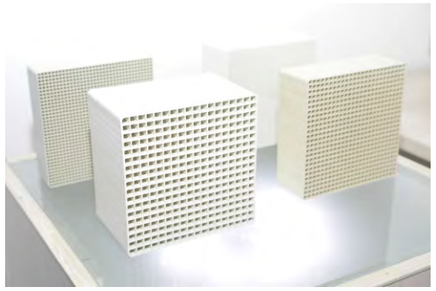
水泥生产流程图
Cement production flow diagram

脱硝工艺 DeNOx technology

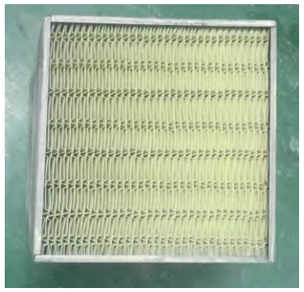
选用稳定可靠的选择性催化还原（SCR）脱硝工艺，采用我公司生产的耐磨高温、宽温蜂窝催化剂或平板催化剂。
The stable and reliable selective catalytic reduction (SCR) DeNOx technology is utilized. The wear-resistant, high-temperature-resistant and wide-temperature-range honeycomb type or plate-type catalysts produced by TUNA are utilized.

●$4NH_3+4NO+O_2 \xrightarrow{SCR} 4N_2+6H_2O$　●$4NH_3+2NO_2+O_2 \xrightarrow{SCR} 3N_2+6H_2O$





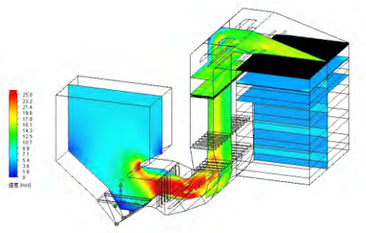
高温、宽温蜂窝催化剂
High-temperature and wide-temperature-range honeycomb type catalyst



平板催化剂
Plate-type catalyst

德创脱硝工艺特点 Characteristics of TUNA DeNOx technology

●三维流场模拟，保证脱硝NOx、NH_3的流场均匀性；
●系统能耗低、脱硝效率高、性能稳定；
●具备多种类、多系列催化剂研发和生产能力，选择余地大。
●3D flow filed is simulated to guarantee the uniformity of the flow field of NOx and NH_3 during DeNOx process.
●The system is of low energy consumption, high DeNOx efficiency and stable performance.
●TUNA has the R & D and manufacturing capacities for several types and series of catalysts there are many choices.



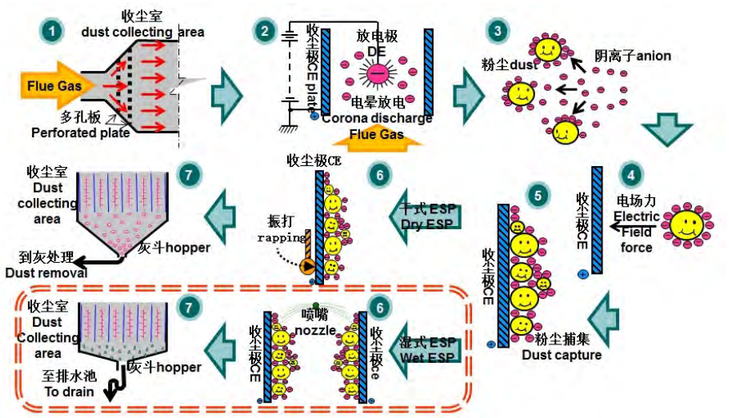
三维流场模拟
3D flow field simulation

除尘工艺 Dust removal technology

采用湿式电除尘器末端治理，保证焦化烟气的达标排放。
The WESP is utilized for end treatment to guarantee that emission of the coking flue gas can meet the relevant standard.

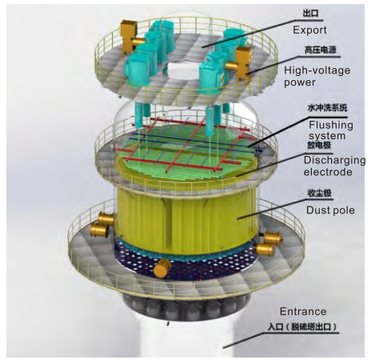
WESP工作原理 Dust removal technology

湿式电除尘器是利用静电收尘原理，靠高压电晕放电使得粉尘荷电，荷电后的粉尘在电场力的作用下收集到集尘板/管。再采用水冲洗的方式，使粉尘随着冲刷液的流动而清除。
The principle of electrostatic dust collection is applicable to WESP. With high voltage corona discharge, the dust is charged. The charged dust is collected to the dust collection plate/tube with the effect of electric field force. By water flushing, the dust is removed when the flushing liquid flows.



WESP系统主要组成 Main components of WESP system

主要由壳体、进口烟箱、阴极系统、水冲洗系统（循环水系统）、高压电源、出口烟箱、气流分布板、电控系统等组成。
WESP system mainly consists of the shell, inlet flue gas chamber, discharging system, dust collecting plate/tube, water flushing system (circulating water system), HV power supply, outlet flue gas chamber, gas flow distribution plate, electric control system and so on.

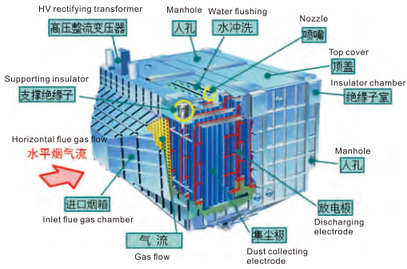


DWG型立式湿式电除尘器 DWG vertical type WESP

- 集尘极采用管式结构；材料采用导电玻璃钢（C-FRP）；
- 放电电极采用2205/钛合金；
- 阳极板模块化安装；
- 内部冲洗管道：316L及以上；
- 喷嘴：PP无堵塞专用冲洗喷嘴；
- 有效脱除重金属。
- The dust collecting electrode is of tubular structure, and is made of conductive fiberglass reinforced plastic (C-FRP).
- The discharging electrode is made of stainless steel 2205/titanium alloy.
- The dust collecting plate is installed in modular manner.
- The inside flushing pipe is made of stainless steel 316L and above.
- PP blocking-free and special-purpose flushing nozzle.
- Heavy metal can be efficiently removed.

DWB型卧式湿式电除尘器 DWB horizontal type WESP

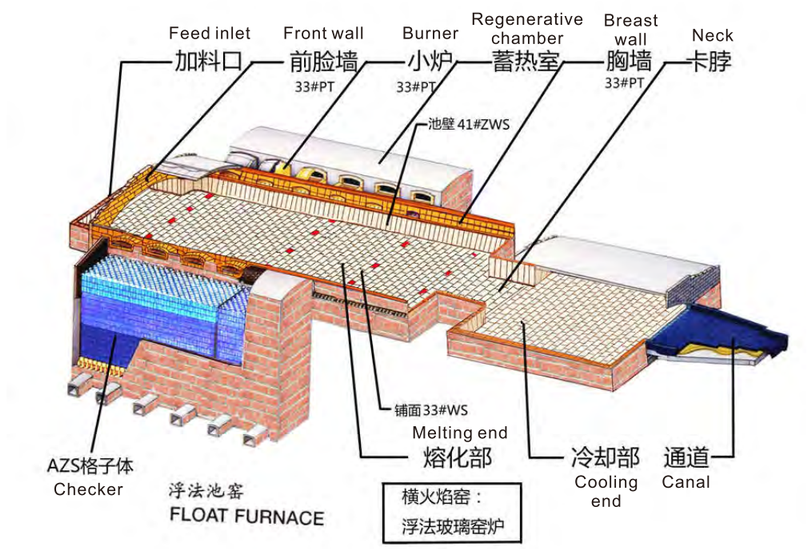
- 集尘极采用板式结构，材料采用不锈钢316L/2205；
- 放电电极采用不锈钢316L/2205/钛合金；
- 壳体内表面：树脂内衬；
- 内部冲洗管道：不锈钢管/树脂（CPVC）；
- 喷嘴：无堵塞专用喷嘴；
- The dust collecting electrode is of plate structure, and is made of stainless steel 316L/2205.
- The discharging electrode is made of stainless steel 316L/2205/titanium alloy.
- The inside surface of the shell is lined with resin.
- The inside flushing pipe is made of stainless steel pipe/resin (CPVC).
- Blocking-free and special-purpose nozzle.



玻璃窑烟气治理 Environmental Treatment for Glass Kiln Flue Gas

玻璃窑烟气特点 Characteristics of glass kiln flue gas

- 烟气量小、粉尘粒径细小；
- 碱(Na+盐、CaO等)含量高、粘附性强和腐蚀性高
- 玻璃窑的频繁换火使污染物浓度剧烈变化。
- Flue gas volume is small, dust particle size is fine.
- Alkali (sodium salt, CaO and so on) content is high, strong adhesion, and high corrosiveness.
- Frequent fire exchange of the glass kiln results in great change of the pollutant concentration.



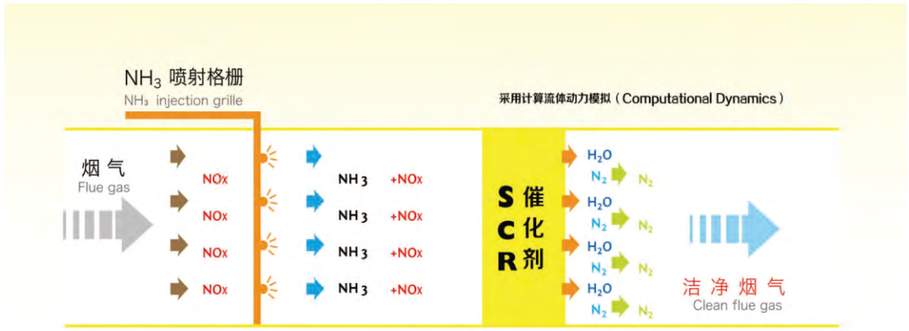
浮法玻璃生产工艺
Float glass production technology

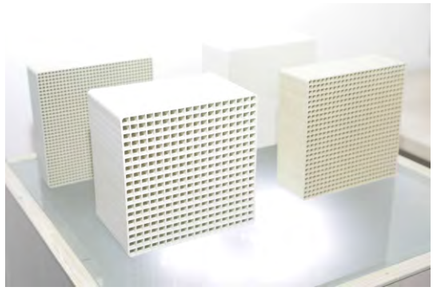
脱硝工艺 DeNOx technology

选用稳定可靠的选择性催化还原（SCR）脱硝工艺，采用我公司生产的耐磨高温、宽温蜂窝催化剂或平板催化剂。

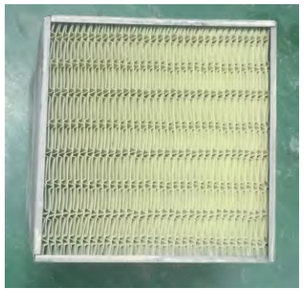
The stable and reliable selective catalytic reduction (SCR) DeNOx technology is utilized. The wear-resistant, high-temperature-resistant and wide-temperature-range honeycomb type or plate-type catalysts produced by TUNA are utilized.

- $4NH_3 + 4NO + O_2 \xrightarrow{SCR} 4N_2 + 6H_2O$
- $4NH_3 + 2NO_2 + O_2 \xrightarrow{SCR} 3N_2 + 6H_2O$





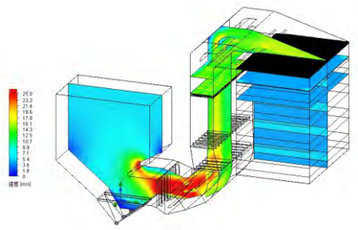
高温、宽温蜂窝催化剂
High-temperature and wide-temperature-range honeycomb type catalyst



平板催化剂
Plate-type catalyst

德创脱硝工艺特点 Characteristics of TUNA DeNOx technology

- 三维流场模拟，保证脱硝NOx、NH_3的流场均匀性；
- 系统能耗低、脱硝效率高、性能稳定；
- 具备多种类、多系列催化剂研发和生产能力，选择余地大。
- 3D flow filed is simulated to guarantee the uniformity of the flow field of NOx and NH_3 during DeNOx process.
- The system is of low energy consumption, high DeNOx efficiency and stable performance.
- TUNA has the R & D and manufacturing capacities for several types and series of catalysts there are many choices.



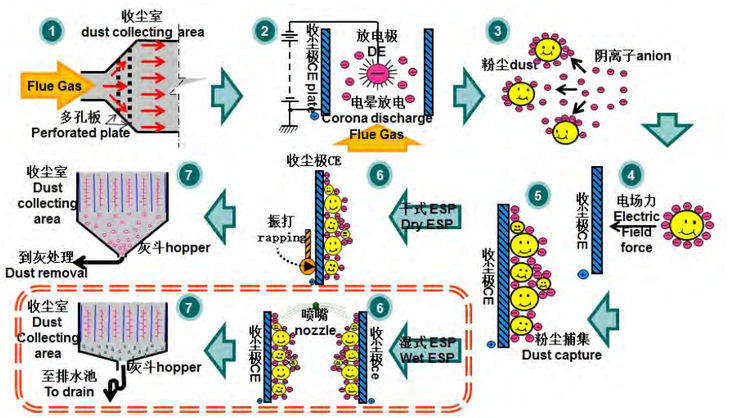
三维流场模拟
3D flow field simulation

除尘工艺 Dust removal technology

采用湿式电除尘器末端治理，保证焦化烟气的达标排放。
The WESP is utilized for end treatment to guarantee that emission of the coking flue gas can meet the relevant standard.

WESP工作原理 Dust removal technology

湿式电除尘器是利用静电收尘原理，靠高压电晕放电使得粉尘荷电，荷电后的粉尘在电场力的作用下收集到集尘板/管。再采用水冲洗的方式，使粉尘随着冲刷液的流动而清除。
The principle of electrostatic dust collection is applicable to WESP. With high voltage corona discharge, the dust is charged. The charged dust is collected to the dust collection plate/tube with the effect of electric field force. By water flushing, the dust is removed when the flushing liquid flows.



WESP系统主要组成 Main components of WESP system

主要由壳体、进口烟箱、阴极系统、水冲洗系统（循环水系统）、高压电源、出口烟箱、气流分布板、电控系统等组成。
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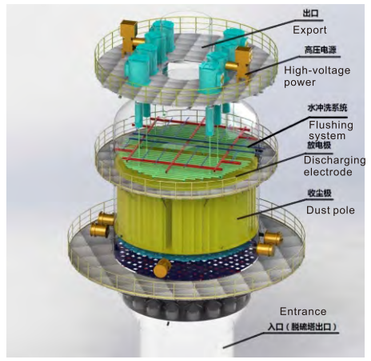

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- 阳极板模块化安装；
- 内部冲洗管道：316L及以上；
- 喷嘴：PP无堵塞专用冲洗喷嘴；
- 有效脱除重金属。
- The dust collecting electrode is of tubular structure, and is made of conductive fiberglass reinforced plastic (C-FRP).
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- PP blocking-free and special-purpose flushing nozzle.
- Heavy metal can be efficiently removed.

DWB型卧式湿式电除尘器 DWB horizontal type WESP

- 集尘极采用板式结构，材料采用不锈钢316L/2205；
- 放电电极采用不锈钢316L/2205/钛合金；
- 壳体内表面：树脂内衬；
- 内部冲洗管道：不锈钢管/树脂（CPVC）；
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- The dust collecting electrode is of plate structure, and is made of stainless steel 316L/2205.
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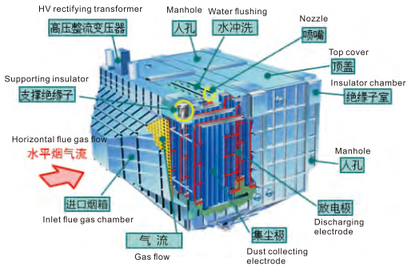
- The inside surface of the shell is lined with resin.
- The inside flushing pipe is made of stainless steel pipe/resin (CPVC).
- Blocking-free and special-purpose nozzle.



燃气机组脱硝 DeNOx for Gas Turbine/HRSG

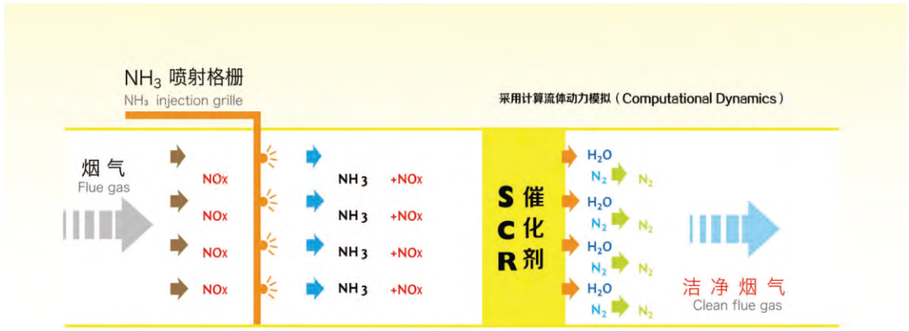
燃气机组烟气特点 Characteristics of gas turbine/HRSG flue gas

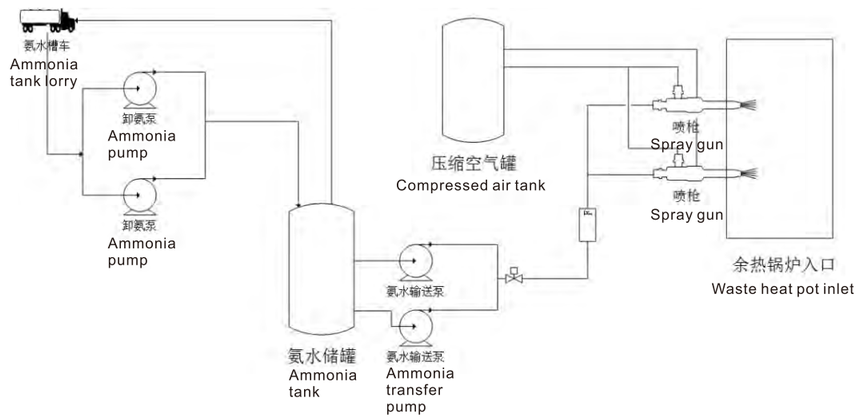
●烟气量大、烟气洁净、几乎无SO_2和粉尘；
●燃气机组经自身低氮燃烧，NOx排放浓度约30~50mg/Nm^3；
●烟气水平流通，余热锅炉内空间狭小。
●The flue gas volume is large, flue gas is clean, there is hardly SO_2 and dust.
●With its own low-nitrogen combustion, NOx emission concentration of the gas turbine/HRSG is about 30~50mg/Nm^3.
●The flue gas ventilates horizontally, the space in the HRSG is small.

脱硝工艺 DeNOx technology

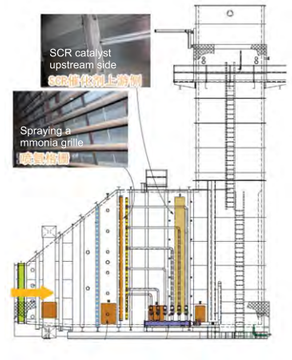
选用稳定可靠的选择性催化还原（SCR）脱硝工艺，采用我公司自主研发的高孔系列蜂窝催化剂。
The stable and reliable selective catalytic reduction (SCR) DeNOx technology is utilized. The high-cell series of honeycomb-type catalysts independently developed by TUNA are utilized.

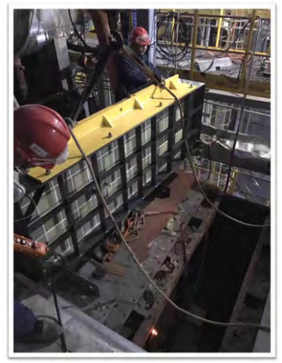
●$4NH_3+4NO+O_2 \xrightarrow{SCR} 4N_2+6H_2O$　●$4NH_3+2NO_2+O_2 \xrightarrow{SCR} 3N_2+6H_2O$





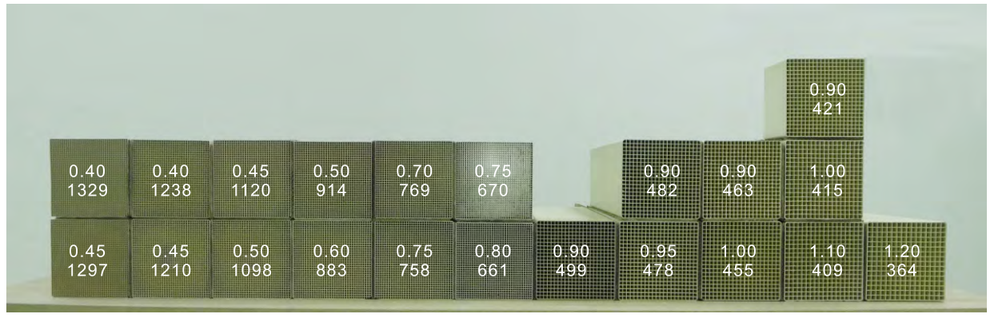
安装位置 Installation position:

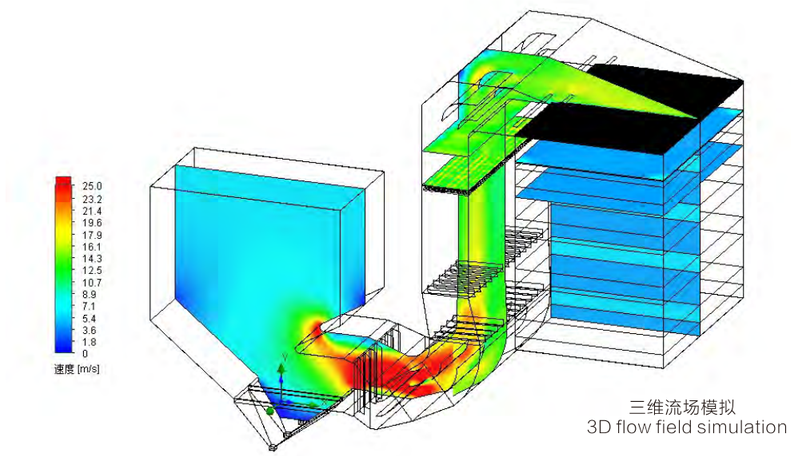




德创脱硝工艺特点 Characteristics of TUNA DeNOx technology

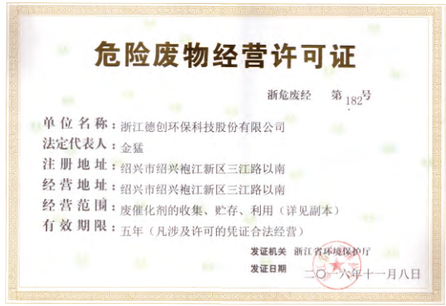
●三维流场模拟，保证脱硝NOx、NH_3的流场均匀性；
●流程简单，设备易维护，一次投资及运行成本低；
●系统能耗低、脱硝效率高、性能稳定；
●具备高孔多系列催化剂研发和生产能力，选择余地大。
●3D flow filed is simulated to guarantee the uniformity of the flow field of NOx and NH_3 during DeNOx process.
●The process is simple, the equipment is easily maintained, the initial investment and operating cost are low.
●The system is of low energy consumption, high DeNOx efficiency and stable performance.
●TUNA has the R&D and manufacturing capacities of high-cell series of honeycomb-type catalysts, there are many choices.





三维流场模拟
3D flow field simulation

催化剂资质 Catalyst qualification


危险废物经营许可证

浙危废经 第182号

单位名称：浙江德创环保科技股份有限公司
法定代表人：金猛
注册地址：绍兴市绍兴袍江新区三江路以南
经营地址：绍兴市绍兴袍江新区三江路以南
经营范围：废催化剂的收集、贮存、利用（详见副本）
有效期限：五年（凡涉及许可的凭证合法经营）

发证机关 浙江省环境保护厅
发证日期 二〇一六年十一月八日


China National Accreditation Service for Conformity Assessment
LABORATORY ACCREDITATION CERTIFICATE

Zhejiang Tuna Environmental Science & Technology Co., Ltd.


中国合格评定国家认可委员会
实验室认可证书

浙江德创环保科技股份有限公司检测中心

研发实验室 R&D laboratory

优良环境 多项研发

为更好地提供技术支持平台，营造良好的研发环境，公司特于2006年组建德创环保研发中心，配备蜂窝催化剂实验室、平板催化剂实验室、活性实验性、磨损实验室等多个实验室，并形成一支产业化设计和市场化能力极强的产业化技术开发队伍，不断开发市场发展需要的技术产品。

Excellent environment for R&D

To better provide thet echnical support platform, TUNA has established the environmental protection R&D center in 2006, equipped with honeycomb-type catalyst lab, plate-type catalyst lab, activity evaluation lab, and wear lab etc. forming a technical team with strong ability of marketization industrial design and industrial technology development to continuously develop technology products demanded from the market.

仪器分析室
Instrumental analysis lab

理化分析室
Physicochemical analysis lab

活性实验室
Activity evaluation lab

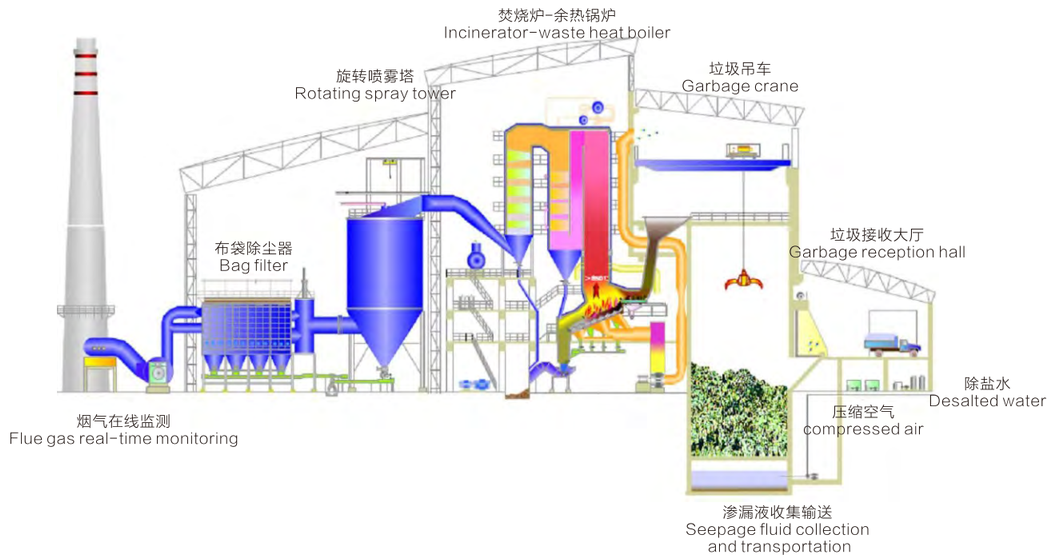
X射线荧光光谱仪
X-ray fluorescence spectrometer

PE8000

垃圾焚烧炉脱二噁英 Dioxin Removal for Waste Incinerator

垃圾焚烧炉烟气特点 Characteristics of the flue gas of waste incinerator

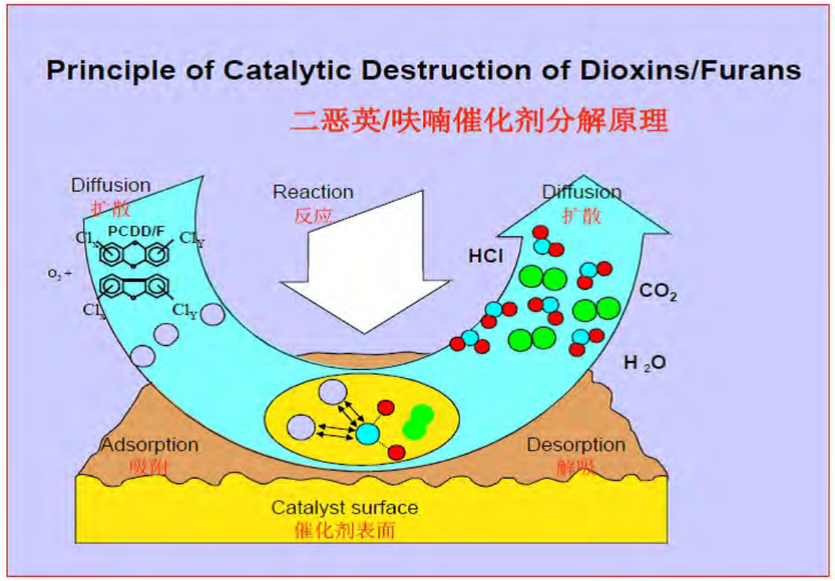
- 二噁英浓度波动较大；
- 烟气中成分复杂，重金属含量高；
- 炉后设备布置紧凑。
- Dioxin concentration fluctuates greatly.
- The flue gas composition is complex, and the heavy metal content is high.
- Equipments after the furnace are configured compactly.



脱二噁英系统 Dioxin removal system

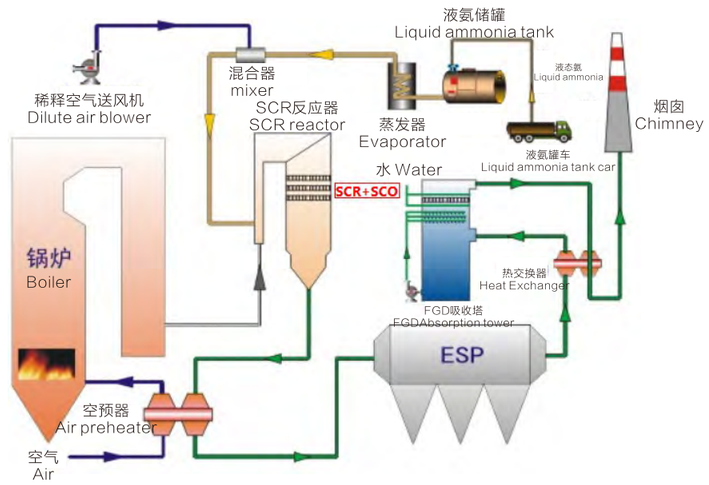
利用通过调控催化剂氧化还原性和酸碱性，实现其对NOx和二噁英的高效协同去除。
With regulating the oxidation/reduction property and acidity/alkalinity of the catalyst, the catalyst can efficiently and simultaneously remove NOx and dioxin.

$$PCDD/Fs+O_2 \xrightarrow[\text{催化氧气 Catalysis oxygen}]{\text{催化剂 Catalyst}} CO_2+H_2O+HCl$$



安装位置 Installation position:

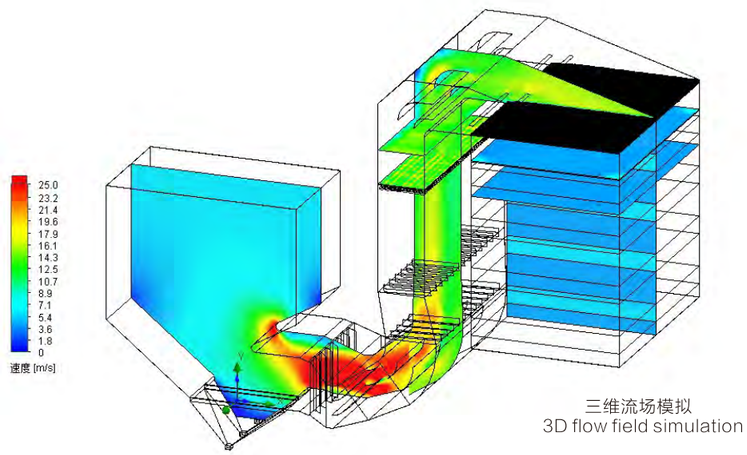
将脱二噁英催化剂设置在炉后300~420℃的空间内，具有较高的反应活性。
The dioxin removal catalyst is installed at the space (where the flue gas temperature is 300~420℃) after the furnace, so that the catalyst is of fairly great reaction activity.



德创环保
TUNA CORPORATION

德创脱二噁英催化剂工艺系统特点
Characteristics of TUNA dioxin removal catalyst technology system

- 三维流场模拟，保证烟气进脱二噁英系统流场的均匀性。
- 流程简单，设备易维护，一次投资及运行成本低；
- 脱除效率高、性能稳定；
- 具备多系列催化剂研发和生产能力，选择余地大。
- 3D flow filed is simulated to guarantee the uniformity of the flow field of flue gas entering the dioxin removal system.
- The process is simple, equipment is easily maintained, the initial investment and operating cost are low.
- Removal efficiency is high, and performance is stable.
- TUNA has the R&D and manufacturing capacities of series of catalysts, there are many choices.



三维流场模拟
3D flow field simulation

德创脱二噁英工程业绩 Characteristics of TUNA DeNOx technology

绍兴市中环再生能源发展有限公司4#循环流化床垃圾焚烧炉氮氧化物、二噁英协同脱除系统。脱二噁英效率高达96.5%，排放浓度0.07ng/Nm^{3}小于国家排放标准。

Shaoxing Zhonghuan Renewable Energy Development Co., Ltd. No. 4 circulating fluidized bed waste incinerator nitrogen oxides, dioxins collaborative removal system. The dioxin removal efficiency is up to 96.5% and the dioxin emission concentration (0.07ng/Nm^3) is less than the national emission standard.

项目 Items	单位 Unit	数值 Value
烟气量 Flow rate of flue gas	Nm^3/h	200,000
锅炉尾部NOx排放浓度 Inlet NOx concentration	mg/Nm^3	550
锅炉尾部二噁英排放浓度 Inlet dioxin concentration	ng/Nm^3	2
锅炉出口粉尘排放浓度 Inlet dust concentration	mg/Nm^3	38,000
上级省煤器进口温度 Flue gas temperature	℃	370-430
Nox最终排放浓度 Outlet NOx concentration	mg/Nm^3	38
二噁英最终排放浓度 Outlet dioxin concentration	ng/Nm^3	0.07
脱硝效率 DeNOx efficiency	%	93.1
脱二噁英效率 Dioxin removal efficiency	%	96.5